The TEXACO STAR

SEPTEMBER 1930

Captain Frank M. Hawks, Superintendent of The Texas Company's Aviation Division, at the Controls of the Texaco Thirteen, Fastest Commercial Airplane Ever Flown

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The TEXACO STAR

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★ Since the first recorded production of petroleum in 1857, the world has produced more than eighteen billion barrels, two-thirds of which has come from the United States, according to the American Petroleum Institute.

★ The United States Bureau of Public Roads has developed an instrument for measuring the degree of unevenness in highway surfaces. The device is known as a roughometer. The State of California is using the roughometer with excellent results, having reduced the roughness of its asphaltic concrete highways from 22.1 inches per mile in 1927 to 10.5 inches per mile in 1929.

★ Stock of The Texas Corporation and its predecessor company, The Texas Company, has been listed on the New York Stock Exchange since 1910.

★ Oil pipe lines are generally from four to twelve inches in diameter. Natural gas lines are from sixteen inches in diameter upward.

★ The miniature golf craze has led to a new use for TEXACO asphalt. The product is mixed with shredded cypress to give a turf-like character to the greens and fairways.

★ A year's output from the average American oil well amounts to about three thousand barrels a year, approximately six hundred times as much as the oil from a single whale.

★ A party of six college students who recently traveled from San Francisco, California, to New York City on TEXACO Gasoline and TEXACO Motor Oils, did so at an individual cost of twelve dollars. This included draining the crankcase every thousand miles.

★ Approximately 80,000 miles of natural gas pipe lines have been laid throughout the United States and it is estimated that nearly a quarter million dollars will be invested in additional pipe lines this year.

★ Approximately 26,000 oil wells were drilled in the United States in 1929.

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For this Issue

Cover by Gulbransen

★ "In days of yore," observes a contemporary, "if anybody missed a stage coach, he was content to wait two or three days for the next one. Now he lets out a squawk if he misses one section of a revolving door."

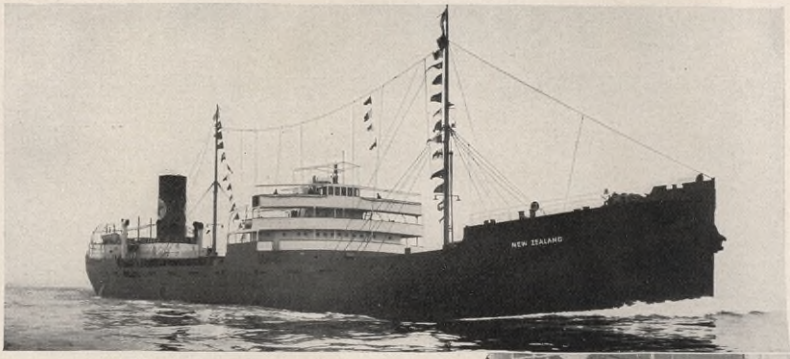
★ The town of Ely, Nevada, has streets that are literally paved with gold. Tailings from an old mine are being mixed with oil and used to surface and repair highways there.

★ The average temperature of crude oil running through a pipe line is between sixty and seventy degrees Fahrenheit. In winter the temperature may go as low as thirty degrees, while in summer it sometimes reaches one hundred degrees.

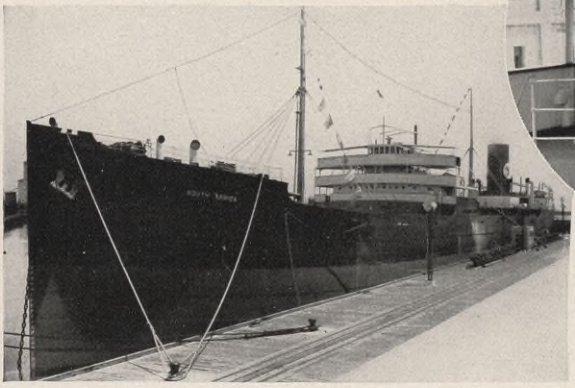
★ A well making five barrels daily has recently been completed in Australia. This is the first time that a well drilled in that country has yielded more than a trace of oil.

★ The Federal Trade Commission has ordered a Providence, Rhode Island, manufacturer to stop representing that tablets made by him, which contain the same ingredient as ordinary moth balls, will, when added to motor gasoline, remove carbon, give added mileage, and lessen odor, smoking and knocks.

★ The third edition of "Petroleum Facts and Figures," published by the American Petroleum Institute, is now available.



The New Zealand Steams into Los Angeles



The South Africa at her Dock (Left) and Company Officials on the Bridge

NEW TANKERS PUT INTO SERVICE

TWO new motor tankers, the *South Africa* and *New Zealand*, have recently been put into service by The Texas Company under a long term of charter arrangement with Norwegian owners. The *South Africa* will ply between Port Arthur, Texas, and South African ports, while the *New Zealand* will carry TEXACO products from Los Angeles, California, to ports in Australia and New Zealand.

The two vessels are practically identical in construction, the dimensions being length 500 feet overall, beam 65 feet 6 inches, and moulded depth 36 feet 9 inches, with a carrying capacity of approximately 110,000 barrels of refined oils. Both vessels are equipped with ten main tanks, port and starboard, six summer tanks, port and starboard, and are fitted with the usual cofferdams, pump rooms, oil-tight bulkheads and expansion trunks.

The *South Africa* is equipped with two Sulzer Diesel motors of 1800 horsepower each, whereas the *New Zealand* is equipped with two Doxford Diesel motors of 1800 horsepower each. Both vessels have a normal speed of eleven and one-half knots an hour under load with an approximate daily fuel consumption of one hundred barrels. The bunkers carry enough fuel for a cruise of 20,000 miles.

The *South Africa* was completed at Swan and Hunter's yard, at Newcastle, England, and on May 3, after a trial trip, she sailed for Port Arthur. The *New Zealand* was launched at Barclay Curle and Company's yard at Glasgow, Scotland, on May 12. The *South Africa* is commanded by Captain Kjell Gran, while the destinies of the *New Zealand* are in the hands of Captain L. B. Amundsen.

Captain Hawks and Sir Hubert Wilkins, noted explorer. (Right).

Mr. Hawks Drops in for Dinner

The Texaco No. 13 Arrives from the Pacific Coast with a Hungry Pilot

"THAT looks like him now," said the tall man in the light suit. He pointed toward the setting sun.

"Listen!"

Above the roar of the nearby planes on the field could be heard a low-pitched whine which quickly grew into a throbbing roar, pulsating, filling the air with the sound of a thousand beating drums. An infinitesimal white speck detached itself from a bank of clouds in the west, grew larger and resolved into a tiny, red and white monoplane, the sunlight glistening on its shiny fuselage and wings.

"Here he is!"

The tall man slapped a neighboring spectator on the back.

"Here he is!"

The little plane swooped gracefully above the field, circling at a great height and then zooming downward in a long, rushing glide. The two wheels and the tail skid touched the ground gently, reluctantly, bounced a little and again lightly tapped the earth. The plane swung about, headed directly toward the hangars, its silver propeller slashing the air in great sweeps.

Three motorcycle policemen headed for the plane and two ground crew men loped toward it on foot. A deep-throated roar went up from the crowd. A lone photographer, perilously near the swishing propeller, clicked his camera and scurried out of the way.

The ground crew men were holding the plane firmly by each wing, guiding it toward the concrete runway between the hangars. Through the transparent cowling of the cockpit a blond young man in a white shirt looked out and grinned broadly. The crowd rushed against the dark-blue line of police. The plane stopped and the young man in the cockpit pushed back the cowling and stuck out his head. A slim, little woman ran forward and embraced him. Photographers yelled and cursed each other for getting in the way of a good "shot." Sound movie men pressed forward with microphones held in front of them, like deaf old men with ear-trumpets. The pilot opened his mouth to speak and the crowd was silent:

"When do we eat?"

He reached behind him in the cockpit and drew out a mammoth sandwich.

"Come on, Frank," . . . . "Look this way, Cap'n Hawks." . . . . "How was the trip?" . . . .

"Give me a break, will ya," howled a photographer.

"I'm hungry," said the pilot. He clambered partly out of his seat.

"Hold that pose!" . . . . "Hold it!" . . . . "That's good!"

A tall, bearded man stepped forward and shook the pilot's hand.

"Hold it, Sir Hubert!" . . . . "That's good." . . . . "Sir Hubert Wilkins! Look this way, Please!"

Two stalwart policemen helped the pilot out of the cockpit and he trod the ground gingerly. Again he looked at the crowd and grinned. A group of bluecoats surrounded him and bore him away toward one of the hangars. The crowd followed but was held back by more policemen. Only those wearing blue or red badges were permitted to pass the line of police and enter the locker room of one of the hangars.

Still clutching a sandwich, Frank Hawks sat in a wicker chair and twenty or thirty men with wads of paper and stubby (*Continued on Last Page*)

New Records for TEXACO

Detailed Account of the Coast-to-Coast Flights of the Texaco No. 13

By FRANK M. HAWKS

AT 6:16 A. M. (NEW YORK TIME) ON AUGUST 13, CAPTAIN FRANK M. HAWKS, SUPERINTENDENT OF THE TEXAS COMPANY'S AVIATION DIVISION, LEFT LOS ANGELES, CALIFORNIA, AND HEADED EASTWARD. AT 6:41 P. M. HE LANDED THE TRAVELAIR MONOPLANE TEXACO NO. 13 AT CURTISS AIRPORT, VALLEY STREAM, LONG ISLAND, ESTABLISHING A NEW COAST-TO-COAST RECORD OF TWELVE HOURS, 25 MINUTES AND THREE SECONDS. SIX DAYS PREVIOUSLY CAPTAIN HAWKS HAD MADE A NEW EAST-WEST RECORD IN THE TEXACO NO. 13, FLYING FROM NEW YORK TO LOS ANGELES IN FOURTEEN HOURS, FIFTY MINUTES AND 43 SECONDS. THE FOLLOWING STORY, WRITTEN BY CAPTAIN HAWKS EXCLUSIVELY FOR THE TEXACO STAR, DESCRIBES THE RECORD-BREAKING FLIGHTS IN DETAIL.

TEXACO STAR PHOTOS

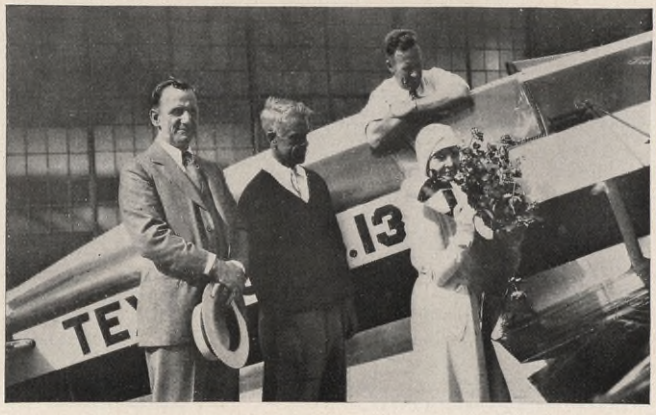
CUTTING down the time between two points of the compass or staying up in an airplane or a tree or a baby buggy longer than anyone has ever done before doesn't prove anything in itself. The question is to what practical use can such an accomplishment be put?

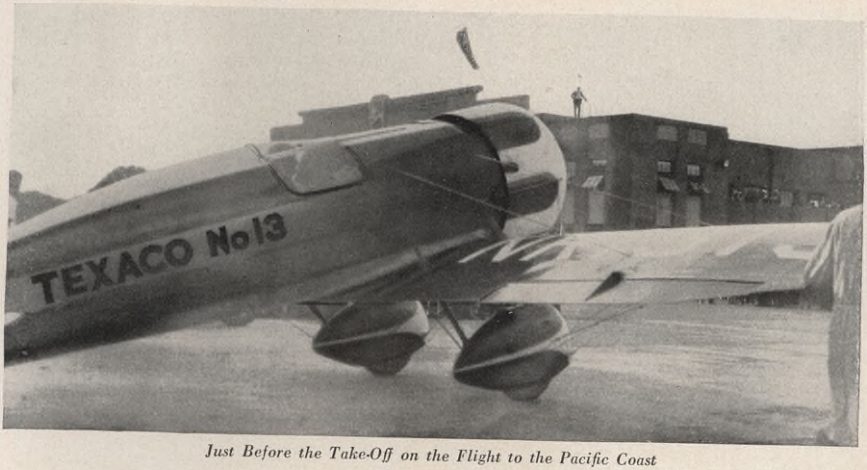
The transcontinental flights of the *Texaco No. 13* were not designed merely to bring the coast-to-coast speed record back to The Texas Company. Their larger purpose was to demonstrate the feasibility of establishing a fast "pony express" service between the east and west coasts for the transfer of valuable documents and other urgent material. Naturally the flights proved that TEXACO Aviation Gasoline and TEXACO Airplane Oils are efficient and reliable but that fact is being proved every day by planes all over the country.

Texaco No. 13 is a Travelair "mystery ship," a low-wing monoplane measuring thirty feet from tip to tip of the wings and twenty feet from nose to tail. Every line of the craft has been designed to promote speed; the motor is housed in a protective cowling and the wheels are provided with "pants," which cut down wind resistance considerably. The engine itself is a Wright-Whirlwind with nine cylinders and develops five hundred horsepower. The ship has a cruising speed of 210 miles an hour. The cruising radius of the plane is seven hundred miles.

An important passenger in the cockpit was my little wooden black cat. Our registration number is NR 1313 and our average time for the two flights was thirteen hours, so you see we were doing our best to give Lady Luck a chance to do her stuff.

The Christening: W. S. S. Rodgers, J. H. Lapham, Captain Hawks, Mrs. Hawks





Just Before the Take-Off on the Flight to the Pacific Coast

A few minutes before six on the morning of August 7, I climbed into the cockpit and taxied down the runway of the Curtiss Airport, at Valley Stream, Long Island. Mrs. Hawks had christened the plane appropriately a few days before and weather reports were reasonably favorable. The *Texaco No. 13* was washed slick and clean; all instruments were checked and the tanks were filled to capacity. I turned her nose into the wind and as the hands on the chronometer in the dashboard reached six o'clock, I gave her the gun and we started to give Mr. Sun a race to the west.

Five stops were made on the way out; Columbus, Ohio; St. Louis, Missouri; Wichita, Kansas; Albuquerque, New Mexico and Kingman, Arizona. These stops added about an hour and a quarter to our time.

The weather turned out to be uniformly bad. We bucked head winds a good bit of the way and ran into some rain which lasted all the way from Pittsburgh, Pennsylvania, to Terre Haute, Indiana. It cleared up a little but it was pretty tough going until we reached Needles, Arizona. We had to make several detours but I held her at an average of nine thousand feet throughout the trip. At one time I went to 14,000 feet to avoid a bad storm and part of the time I found the best winds at five thousand feet. As we crossed the Arizona mountains by a wide margin the altimeter read ten thousand feet.

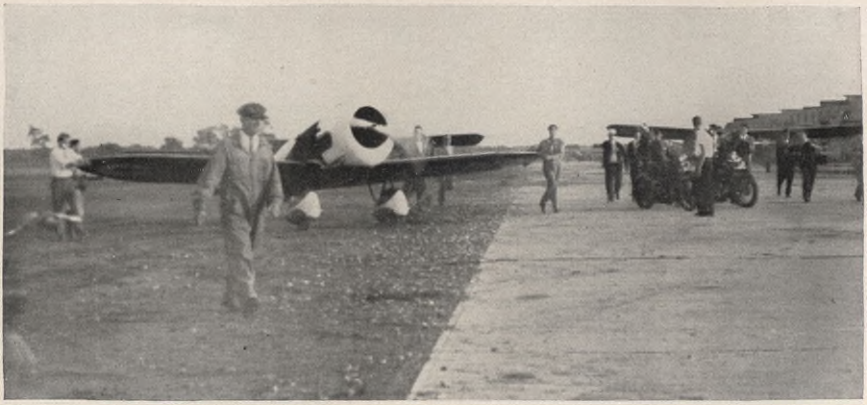
On a flight to the west you gain time, so that starting at six o'clock in the morning in New York, I arrived in Los Angeles about four in the afternoon, Pacific Time, and had time for eighteen holes of golf with my father before dinner.

The official time for the western flight was fourteen hours, fifty minutes and 43 seconds; thirteen hours, 35 minutes and 43 seconds of which was consumed in actual flying. The total distance traveled was 2510 miles and our average speed was two hundred miles an hour.

A few days in Los Angeles and I was ready for the return trip, which I was confident of making in twelve hours. I had planned to start back on Sunday, August 10, but the weather man wouldn't give our fair continent a clean bill of health until Tuesday.

Whereas one gains time on a westward flight, he is losing time steadily when traveling toward the east. Consequently, in order to arrive in New York before nightfall, I had to start from California at

The Wheels of the Texaco No. 13 Touch the Ground at Valley Stream



Taxiing Toward the Hangars at Valley Stream a Few Minutes after the Landing

two a.m., Pacific Time, which corresponds to six a.m., New York Time.

We took off from Glendale Airport at 6:16 a.m., New York Time. It was a beautiful moonlit night and I put her into a steep climb to clear the mountain peaks which rise to four thousand feet about thirty miles out of Los Angeles. As we shot out over the Mojave Desert, the air speed indicator showed that we were traveling 180 miles an hour. I pulled the transparent cowling over my head and settled down to a little fast flying.

The moon slipped past and down behind the San Bernardinos. Ahead a cream-colored glow was beginning to appear down near the horizon. The sky began to lighten and dawn found us clicking off the minutes over the national forests of Arizona. As we passed over Flagstaff, Arizona, the sun peeped over the rim of the earth, although it was still quite dark down below. A few minutes later I nosed her down and we slid into Albuquerque. Our distance so far was seven hundred miles, which we had covered in three hours and 26 minutes.

TEXACO mechanics were on hand to give the little ship another good dose of oil and gas. I didn't get out of the plane but refueled myself with a long drink of water.

We spent fifteen minutes at Albuquerque and then started on our way again. Now we began to show some real speed. I picked up a tail wind of 34 miles an hour out of Albuquerque at a height of about two thousand feet and we began making tracks for little old New York.

We had passed the desert now and were roaring over the wheat fields of Oklahoma and down into Kansas, reaching Wichita in two hours and twenty minutes. TEXACO service men awaited us there too and a brief check-up of the time showed me that we had come approximately half way across the continent in five hours, 47 minutes and eleven seconds, a comfortable margin over the existing record.

Up to this time the weather had been marvelous, but at Wichita they handed me a weather report which showed a storm area over St. Louis. It didn't amount to much, however; just a little rain, and I was able to climb out of it all right. We had left Wichita at 12:36 and were bound for Indianapolis, the last scheduled stop. I was pretty hungry when we rolled down the runway at Indianapolis at 3:22 p.m. and I was still hungry when we left the Indiana town at 3:35. The nice tail winds had left us and a cross wind had sprung up. It was very hazy and there seemed to be a blanket of smoke all the way from Indiana to New York. The ground was barely visible from our altitude of eight thousand feet.

The Ground Crew and the Mounted Police Take Charge

I reassured my stomach that we would be in New York in time for dinner and we started making knots again, flying north of Dayton and Columbus and fighting a cross wind into Pennsylvania. We passed Pittsburgh and the coal and iron works nearby. Then came the green forests and the dark blue and softly rounded tops of the Alleghanies.

Across the Delaware we sped and then I saw the waters of the Atlantic. The sun was setting behind us in the west. Dead ahead were the skyscrapers of Manhattan, and home . . . and dinner . . . were within reach. Nearing the airport I could see that a few thousand of the home folks were on hand but I was not in the mood for any stunting. We circled the field once and sat down nicely at 6:41 p.m.

I certainly want to go into the record as saying that if it had not been for the boys along the route who did a lot of the work and received very little of the applause, the flight would have been far from a record-breaker. The mechanics serviced the ship in wonderful time, working like demons to get her filled and off the ground in less than fifteen minutes at each stop. The builders of the plane and the motor men of the Wright people who unselfishly gave time and labor to tuning up the ship herself deserve a good share of the credit, and lastly, the weather observers of the United States Weather Bureau and of the T. A. T.—Maddux lines did a great job in reporting weather conditions en route.

The *Texaco No. 13* is, in my opinion, the fastest commercial airplane capable of maintaining a maximum speed over a great distance. The motor is as nearly perfect as it is humanly possible to make it. Nevertheless, without the carefully refined TEXACO oils and gasoline which were used during the flight, the attempt might well have ended in dismal failure if not actual disaster.

Many people have asked me why I do not attempt a transoceanic flight. In the first place, I have thought it more worth while to advance aviation in our country by the establishment of express routes and by proving that fast flights are practicable. Secondly, I would not attempt to cross a large body of water in a land plane. There would be no more sense in that than there would be in making a transcontinental flight in a flying boat. Just at present I am concentrating on aviation within our own borders and expect to concentrate on that feature of the industry for some time to come.

I do not expect that the records established by the *Texaco No. 13* will stand for very long; as a matter of fact I hope soon to break them myself. Planes could be made to fly at six hundred miles an hour and they would be no harder to fly. When speed records remain unbroken for a long time it generally indicates that an industry is not making much progress.

Journey's End—The Record is Made and Hawks Climbs from the Cockpit

The First McCormick Reaper, Forerunner of a Great Line

Behind the Scenes With TEXACO Users

VI—International Harvester Company

THE INTERNATIONAL HARVESTER COMPANY IS AN ORGANIZATION WHOSE HISTORY IS LARGELY THE HISTORY OF THE FARM OPERATING EQUIPMENT INDUSTRY. THE LONG LINE OF FARM MACHINES OF VARIOUS TYPES NOW MARKETED BY THE INTERNATIONAL HARVESTER COMPANY UNDER THE NAME "MCCORMICK-DEERING," DATES BACK TO THE FIRST REAPER, INVENTED BY CYRUS HALL MCCORMICK IN 1831. TEXACO PRODUCTS ARE EMPLOYED IN SEVERAL PLANTS OF THE INTERNATIONAL HARVESTER COMPANY AND THOUSANDS OF MCCORMICK-DEERING UNITS THE WORLD OVER ARE FUELED AND LUBRICATED BY TEXACO. THIS ARTICLE IS THE SIXTH OF A SERIES CONCERNING IMPORTANT CUSTOMERS OF THE TEXAS COMPANY.

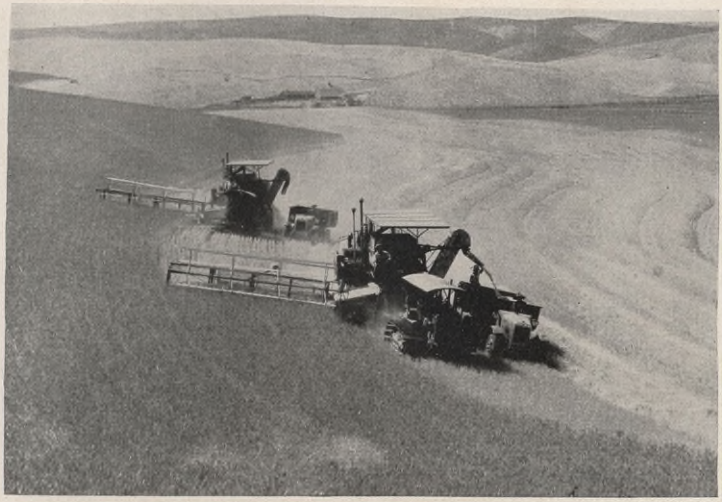
THE citizens of Steele's Tavern, Virginia, were talking about the new contraption that the McCormick boy had built out at his father's blacksmith shop. Pretty pass things had come to when a young whippersnapper could make people believe he had invented a machine that would harvest wheat. Wasn't this the year 1831 and wasn't the hand "cradle" just the most efficient harvesting tool ever developed?

One of the neighbors, a man named Ruff, had a nice field of wheat and young McCormick, then 22, secured permission to try his machine there. There was a good-sized crowd on the field. The ground was rough and hilly and the reaper worked badly, jolting and cutting irregularly. The owner of the field watched for a few minutes and then yelled a vehement request to cease operations.

Harvesting by the "Cradle"

"Your blankety blank machine is rattling the heads off my wheat," he shouted, in effect, and then came the boos and guffaws of those who had known all along that the pesky thing was no good.

Young McCormick climbed from the seat of his machine. Just at that moment another neighbor who had heard of the experiment happened by and



EWING GALLOWAY

Modern Harvesters at Work on a 1400-Acre Wheat Crop in Washington State

was told about the failure of the McCormick reaper.

"Pull down the fence and cross over into my field," he said to McCormick. "I'll give you a fair chance to try your machine."

The new field was not so hilly and consequently the reaper sailed along in fine trim, cutting six acres of wheat in less than half a day, as much as six men could have done.

But even with this successful demonstration of his new reaper, McCormick found that he had on his hands a job of selling almost equal to the task of actually inventing the reaper. For the ten years following his first demonstration in 1831, McCormick did not sell a single machine. Then he sold two for one hundred dollars each. Then came an order for eight. McCormick decided that his backwoods farm, one hundred miles from a railway, was a little too remote, so he set out on horseback, riding through Illinois, Missouri, Ohio and New York trying to find some one who would build his reapers in quantities. Finally in Brockport, New York, he found D. S. Morgan and W. H. Seymour, who agreed to make one hundred reapers. In 1847 he decided it was time to build his own factory at Chicago. He formed a partnership with W. B. Ogden, the first mayor of Chicago, and later bought Ogden out, continuing the enterprise by himself.

Threshing Wheat by Hand

By 1859 there were 50,000 reapers in the United States doing the work of 350,000 men, saving $4,000,000 in wages, and cramming the granaries with 50,000,000 bushels of grain. Of course McCormick did not let selling problems interfere with bettering his machine and by this time he had been able to add several notable improvements to the reaper. The need of a device to eliminate the laborious and back-breaking task of gathering the grain and fastening it into bundles was recognized. Inventors interested in the problem racked their brains for a solution. Two young farmers named Marsh particularly objected to the drudgery of everlastingly stooping over bundles and binding them into sheaves.

"Why can't we fix a platform on the reaper and have the grain carried up to us?" one of the Marsh boys ventured. This thought eventually resulted in the development of the Marsh type of harvester, a forerunner of the self binder, and the manufacture of it was taken up by a man named Gammon, of Chicago, who later, in 1870, took into partnership the famous pioneer, Deering, who made possible the development of the twine binder.

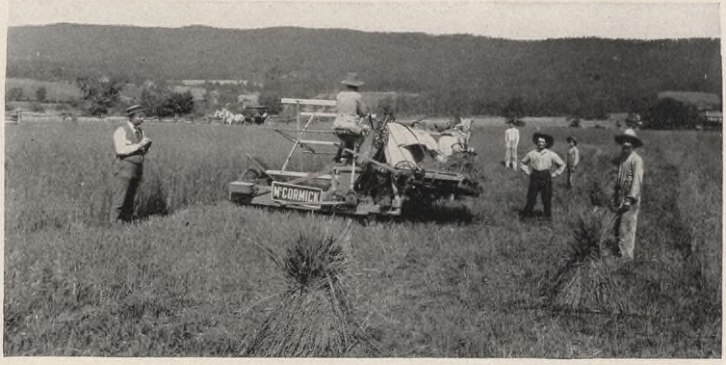
Until 1879 the best harvest-

er was a self binder that tied the sheaves with wire. Farmers objected to the use of wire, which they said would mix with the straw and kill the live stock.

In 1878, John F. Appleby, a mechanic, approached Deering with a plan for a twine self binder. So completely was Deering won over to Appleby's idea that he asserted he was willing to back it up to the extent of a million dollars, practically all the wealth he then possessed. After a year of trials and vicissitudes, the machine proved to be a success and quickly came to the fore among harvesting machines. The next step, of course, was to provide a reliable binder twine for tying the bundles and this was very soon forthcoming. The idea of flashing a cord around the bundle of grain, tying a knot, cutting the cord and flinging off a sheaf is today practically the same as it was under Deering's direction.

With the coming of the reaper and its steady improvement, a host of other labor-saving machines have appeared to benefit the industry. In cutting and handling hay, improved mowing, raking, stacking, and tedding devices have made this phase of farm work attractive and anything but toilsome. Similarly, plowing, cultivating, seeding, fertilizer spreading, grinding, and harvesting machines have been devised not only for the reduction of hand toil to a minimum, but also for the improvement of the soil and consequently of the crops. These implements and machines have resulted in improved methods of soil treatment, more efficient farm management, proper rotation of crops, better seeding, and other innovations that may be classed under the heading of scientific agriculture.

Today's Giant Threshers are Dependent on Gasoline



Another of McCormick's Early Harvester Models

Up to very recent years all our labor-saving and crop-increasing machinery had been designed for use with the same kind of power that McCormick, back in 1831, utilized in his first trial of the reaper; namely, horses or other *(Continued on Last Page)*

(Above) The Main Street of Cody, Wyoming, Center of the Annual Stampede

(Left) Bulldogging a Steer is a Fascinating But Dangerous Recreation

Hold Your Horses!

The Cody Stampede is an Annual Challenge to the Saddle-wise

By P. BEALL

Superintendent, Cody Refinery, Cody, Wyoming

CODY, Wyoming, founded in 1897 by Colonel William F. Cody (Buffalo Bill) and Governor George T. Beck, is approximately 55 miles from the eastern entrance to Yellowstone National Park. It is a town of about 1800 persons, located on the Shoshone River and entirely surrounded by majestic mountain peaks.

Life in Cody is essentially Western. For nine months of the year it is visited principally by ranchers and trappers; for the remaining three it is filled with tourists and "dudes" going to or coming from the ranches.

Ten years ago the merchants of Cody formed the Stampede Association, for the purpose of amusing the tourists and providing the community with a reasonably safe and sane Independence Day celebration. The Stampedes, held annually, are designed to typify the life of the West and the work of the cowboy. Prizes are given for exhibitions of skill, daring and speed.

The eleventh annual Stampede, held this year, was declared to be (as all good annual events are) the best ever. More former champions competed in the riding, "bulldogging" and roping contests than ever before; competition was keen, the sportsmanship fine and weather conditions as nearly ideal as weather conditions ever are.

The rules and regulations of the Stampede are simple. The horses in the races are owned and raised in this country. The steers, wild horses, bucking bronchos and calves are picked by the committee. Twelve hundred dollars was distributed each day in prizes; the Denver *Post* gave a loving cup to the winner of the Dude Ranchers' Derby and a hat manufacturer gave a loving cup to the winner of the relay race. The champion rider received $350 and a

trip to the Cheyenne Frontier Days show with all expenses paid.

All the events were interesting but spectators were attracted particularly by the relay race, Roman race, umbrella race, wild horse race, wild cow milking contest, wild steer and bucking broncho riding, the bulldogging of steers and the roping of calves. Something was going on every minute.

The relay race covers a mile and a half, and each man rides three horses, one for each half mile. Each rider reports at the starting point with a helper and three horses, all with bridles but only one of them saddled. The helper's job is to hold the two horses not being ridden. The starting signal is given and they are off. At the end of a half mile the riders are back at the starting point. They must leap off, tear the saddle from the back of the horse just ridden, throw it on one of the spare horses, cinch it, jump on and ride another half mile. The same procedure is followed at the end of the second lap and the man ahead at the end of the third lap is the winner. The horses become very excited and jump around; the men hurry and in changing saddles often find that the old maxim about haste being productive of waste still holds good.

The Roman race, while not so exciting, is pretty to watch: Each man rides two horses, keeping one foot on the back of each horse. This requires skill and carefully trained horses. The Indian relay race is similar to the ordinary relay race except that the Indians use no saddles. They are very clever and ride as if they were part of the horse.

The excitement of the umbrella race depends largely on the fact that the average cow pony is not used to having a large Japanese umbrella opened under his nose. The cowboys line up at the start, standing beside their ponies, and each is given one of the umbrellas. At the signal, each man opens his umbrella, mounts his horse and races the half mile. The cow ponies usually act like a bunch of old maids with a mouse loose among them and of course the man with the best control over his pony usually wins.

From time to time attention is centered on the "chutes," rough stockades where the animals are forced into a narrow enclosure, too small for much kicking and not large enough to turn around in. The cowboys, working from the top and through the bars on each side, can saddle the bronchos and wild horses. The latter are caught on the open range and since they have never been ridden they are prone to resent the placing of anything on their backs.

The wild steers are likewise unacquainted with

These Are the Cowboys' Training Grounds

man and seemingly possessed of no particular desire to be acquainted. The cowboy ties a rope around the horse or steer, just back of the front legs, then climbs on its back and grabs the rope. When the door to the chute is opened the animal comes out and tries to get rid of his load. The remarkable fact is that many of the boys can ride these animals, who seem to be living pieces of bone and rubber. The hard part, of course, is to get off gracefully after you have ridden all you want to.

Milking the wild cows is no safety first contest either. A bunch of wild cows and their calves are brought in, the calves being separated, which makes the cows feel particularly good. The cows are driven out into the arena and at the signal about twenty cowboys on horses and twenty on foot, with milk bottles in their left hands, start for the cows. The men on the horses have to rope and throw the cows and then it is up to the men on foot to milk enough into their bottles so that when they get to the judges' stand they can pour some out before them. One can get a faint idea of this event by imagining forty cows going in all directions, cowboys on horseback pursuing them hotly and cowboys on foot trying to get in and get a few squirts of milk without getting their heads kicked off. It generally takes less than a minute before most of the boys come dashing out of the dust, holding bottles with milk in them.

Nor does bulldogging a steer have anything in common with drinking pink tea. This takes a good rider with plenty of nerve and a good set of muscles. The steer is put into the chute and when the door is thrown open, he starts out on a dead run. The cowboy, on a horse, awaits the starting signal, which is given when the steer is about fifty feet from the door of the chute. The cowboy starts in pursuit and brings his horse alongside the steer. Just as he is passing by, the cowboy slips from his saddle to the ground, grabbing the steer by the horns. The man's weight on the steer's neck lowers his head and quickly brings him to a stop. Then the cowboy, using his weight on the horns of the steer, twists the steer's neck until the steer flops over on his back and is down.

In the wild horse race, skill and courage must also be combined or severe injuries will result. Ten wild horses are turned loose in a corral and each boy goes in and ropes the one he wants to ride. Roping the horses isn't hard; it's what to do next that is the question. The horses rear and buck, throw themselves on their backs and try to climb the high fences, screaming and kicking all the while. After a time they are tired enough to be held by the rope

So to Speak, the Descent of Man

The Calf is Finally the Loser

The Roman Race, For Experts Only

One of Cody's Horsemen off for a Sprint

and an ear, which they just love.

The horses are then brought out on the track and one man holds a horse while the other saddles it and rides. It is like trying to take your hook out of an eel. After a while some of the horses weaken and are saddled, then they start bucking and jumping and to get them to go around the half-mile track without any means of guiding them except with your hat is no easy job. The first day this year a man had the race cinched. He was about one hundred feet from the finish, with no competition in sight and going good, when a clown on a donkey came riding along. That horse just turned around and left for good.

Cody Has Additional Attractions

Roping calves seems an innocent sport and not hard to do but it is surprising to see how fast the calves can run and how they can dodge and wiggle. A calf is put in the chute with a man while the roper is outside on a horse. The door is opened and out comes Mr. Calf on the jump, a cowboy holding onto his tail with one hand and paddling him with a light board in the other. Very soon the "starting committee" lets go and when the calf has a hundred-foot start the cowboy is off. He must rope the calf, get off his horse and tie up the calf in a prescribed manner, all in less than thirty seconds in order to stand a chance of winning the prize money. The calves don't know exactly what it is all about but don't waste much time in trying to find out.

The biggest feature of the Stampede is the bronco-busting or saddle-bucking contest. The prizes are the biggest and the feat requires all the qualities mentioned above, plus endurance and a never-say-die spirit. The horses used in this contest are not wild horses but are bad ones; horses that could not be broken but which are kept for the different Wild West exhibitions given around the country. These horses have been in the game for some time and know all the tricks for getting rid of their riders. They all have names —"Bootlegger," "Butterfly," "Rocking Chair," "Jesse James," each with a past and proud of it. The horse is forced into a chute and after much maneuvering the big cowboy saddle is put on and the cinch tightened. Then the rider slowly lowers himself into the saddle, takes hold of the rope or the halter and the gate is opened. Out they come; the horse jumping and bucking, coming down stiff-legged, going sideways and once in a while, if very annoyed, throwing himself over backward. The judges allow the horse about twenty jumps, then fire a revolver and a cowboy rides alongside and picks the rider off—maybe. Several of the men get off without ceremony before the twenty jumps are up. One man was knocked senseless in the chute when the horse reared up and hit the rider's head on a post. This man, Ned Bailey, when he regained consciousness, insisted that the same horse be put in the chute and saddled, and then he

The Indians Lend a Colorful Note (Above) to the Cody Stampede

★

Finalists in Saddle-Bucking Contest (Left): Winner Third from Left

The Dude Ranch, Newest Delight of Outdoor America

rode him, raging and snorting defiantly, to a finish.

The last day the seven best riders of the first two days ride to see who is to be named champion. Eddie Rosenberry, from Meteetse, won this year.

More entranced by these he-man proceedings than any of the natives are the dude ranchers, who journey each year in increasing numbers to our section of the country, commendably bent on inhaling lots of fresh air and staying upright on such horses as they elect to ride.

No mention of the Stampede and the customs and traditions it seeks to cherish would be complete without some reference to this newest delight of outdoor Americans, the dude ranch. It has not been so many years since certain of our Western states were pretty generally typified by the vigorous, heavily-tanned, frequently blasphemous individual in boots, spurs and a ten-gallon hat, who was more at home in a saddle than in a chair, and who led a dauntless, carefree life curiously his own. The type is fading, and some of the romance goes with him, but it is that spirit of adventure which must have raged in the hearts of the cowboys which draws the stranger to our gates.

The dude ranch, in the olden days, was a place to which an affluent Westerner invited friends, and was actually a private enterprise, in legal parlance, not for profit. How completely that phraseology described it the ranch owner was soon to discover, for people enjoyed themselves so heartily, and accepted their host's remark about the latch-string always being out so thoroughly at its face value, that the ranch owner found his place perennially filled with guests whether he wanted them or not. One, more commercial than his fellows and probably much more harassed, struck upon the happy notion of charging regular rates at his establishment. The guests cheerfully contributed.

The idea took hold quickly, and today the dude ranch attracts countless thousands of visitors from all over the country. The term "dude," once contemptuously applied, has taken on a pleasanter and more respectful significance. For the dude ranchers, generally speaking, grasp the fundamentals of horsemanship with laudable ease, and it is not hard to accept the warm hospitality one finds all through the West.

To the dude ranchers, and to the visitor seeing the affair for the first time (or for the second or third, as far as that goes), the Stampede is a stirring memento of the old West, and it awakens within them the realization that it's a great country, after all. Which, of course, it is.

And so the Stampede ends—dirty, tired and bruised cowboys, some happy, some thinking of next year, but all bent on having a good time that night at the big dance at Wolfville. Nowhere in the United States will you find better men than these Wyoming cowboys; men in every sense of the word.

Down But Never Completely Out

DOWN ON T

The Gasoline Engine I
culture of Much of its

A Sturdy Tractor and Three Men Make Short Work of Cutting Down This Field of Flax

PHOTOS BY EWING GALLOWAY

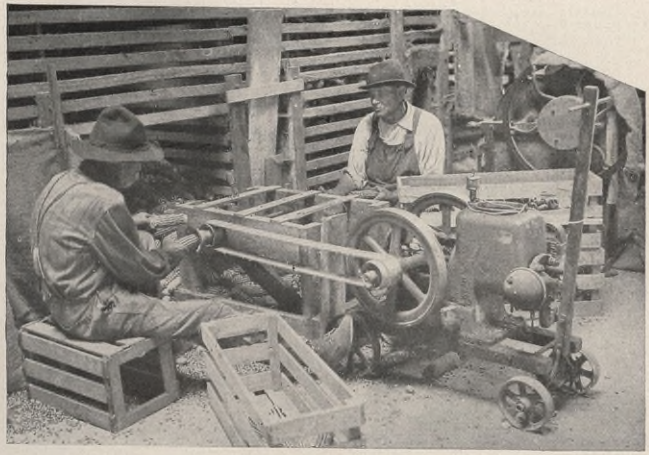
★

(Above) What Would Grandfather Have Said if Told that Future Farmers Would Plow Sitting Down?

(Below) Modern Team Work on the Farm—Plowing, Harrowing and Drilling All at Once

THE FARM

ne Has Relieved Agri-
ts Former Drudgery



Shelling the Tips and Butts of Seed Corn in the Proverbial Twinkling—Thanks to Gasoline

★

(Above) Initial Stage in Making a Famous American Beverage: Crushing Apples to Make Sweet Cider

(Below) Stocking up the Silos for the Winter—Note Power Unit in Operation at Right

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FRIENDS AND FORMER ASSOCIATES OF MR. AMOS L. BEATY EXPRESS THEIR HEARTFELT SYMPATHY IN THE RECENT TRAGIC DEATH OF MRS. BEATY IN FRANCE.

Captain Hawks

Once again Captain Frank M. Hawks, Superintendent of The Texas Company's Aviation Division, is in possession of the east-west and west-east transcontinental airplane speed records. The detailed story of his latest achievement is recounted elsewhere in this issue of THE TEXACO STAR.

One of the purposes of this flight was to demonstrate the practicability of a fast air express service across the continent. This, we believe, the flight helped to demonstrate.

At the same time, this flight and previous flights in which Captain Hawks has acquitted himself so creditably demonstrated the superiority of TEXACO products in the field of aviation. To the development of these products The Texas Company has given painstaking attention over a long period of time, with the view of bringing to the aviation industry oils and gasolines as nearly perfect as scientific study and research permit.

That is the Company's message. Captain Hawks has written it across the sky.

Unit Operation

Executives of thirty-eight major oil producing companies in the United States, as members of the General Committee on Unit Operation of the American Petroleum Institute, have signed the following resolution:

"Resolved: That unit operation of oil pools is in the interest of conservation, prevention of waste, and economical operation, and it is commended to the industry as a desirable principle to be followed.

"The members of the committee as executives of producing companies will undertake to apply the principle in their own operations wherever practicable."

The above resolution was subscribed to by The Texas Company.

Enterprise

A contemporary newspaper editor complains that modern business has taken all the thrill out of individual accomplishment. "Any group of college men," he says, "could take over the management of a large corporation within a few days."

This statement is true as far as it goes. Large corporations nowadays are so well organized that they seem almost to run by themselves. The fault lies in mistaking the natural momentum of a large and smoothly running machine for self-generated power. No business, however large, could run very long by itself.

There is every bit as much chance for enterprise and initiative today as there ever was. There is always a shortage of men who can take over the really big jobs, always a call for men with outstanding initiative, personality and loyalty, for men who can apply themselves unselfishly to the task at hand. Anyone who says that individual ambition has no chance in the modern world should study the oft-mentioned case of the man who resigned from the United States Patent Office with the statement that everything possible had been invented and that before long he would be out of a job anyway.

That incident took place just about one hundred years ago.

A Good Sign

During the months following the stock market breaks of October and November employe stock subscription plans not only suffered no setbacks but, according to the National Industrial Conference Board, "emerged from the test strengthened and enjoying increased confidence on the part of employe stock owners." New offerings of stock to employes since the crash have met with a ready response; in one case an offering of 75,000 shares by a large company was over-subscribed by more than fifty per cent.

Most of these employe stock subscription plans provide for the sale of stock to employes at a rate much lower than the market price. As a result, during the crash only nineteen companies saw the market price of their stock drop below the price to employes and in only eleven cases did this drop amount to as much as ten per cent or continue for more than a week.

The fact that large blocks of stock in major industries are owned by the workers themselves should be an encouraging sign not only to the managers of business enterprises but to the investing public.

This young man is engaged, with more earnestness than accuracy, in fulfilling the lubricating requirements of his velocipede with TEXACO Golden Motor Oil. While this is not strictly according to the accepted method of application, it is even more interesting to speculate on what father will say when he misses the Handy-Grip can from the garage shelf.

One afternoon last month a group from the New York Offices of the Company went to Curtiss Airport at Valley Stream, Long Island, to witness the official christening of the *Texaco Number 13*. A crowd of about two hundred stood at a respectful distance as Mrs. Frank Hawks wielded the bouquet and bottle, assisted by Mr. J. H. Lapham and Mr. W. S. S. Rodgers.

A little while later Hawks took the plane up for a trial spin and necks were craned at agonizing angles to watch the little machine go through her paces; climbing, soaring, banking, rushing overhead at two hundred miles an hour and finally gliding back to earth with the ease and grace of a toy balloon.

You can list among the coming attractions in these pages a history of The Texas Company in serial form, including a complete history of each department, and a special issue of THE STAR devoted to the city of Port Arthur, Texas. We would welcome a suggestion from you as to what you would like to see in this publication.

Speaking of breaking records, as we have done rather fully this month, we are pleased to announce that Cecil Hawley, director of TEXACO National Road Reports, has just lowered the time for crossing the country by automobile, and has eclipsed the record of "Cannon Ball" Baker. We will present the facts in our next issue.

Station of the Texas Power & Light Company at Trinidad, Texas

Power—The Modern Genie

Aladdin, If He Were Alive Today, Would Rub His Eyes Instead Of His Lamp

By F. R. SPLAWN

Superintendent, Lubricating Sales, Southern Territory

THE evolution of the electric lighting and power industry is a subject of such magnitude that proper treatment of the story must be left to specialists. Nevertheless the field is so large and the industry so ramified that even inexpert hands may hope to draw an interesting outline.

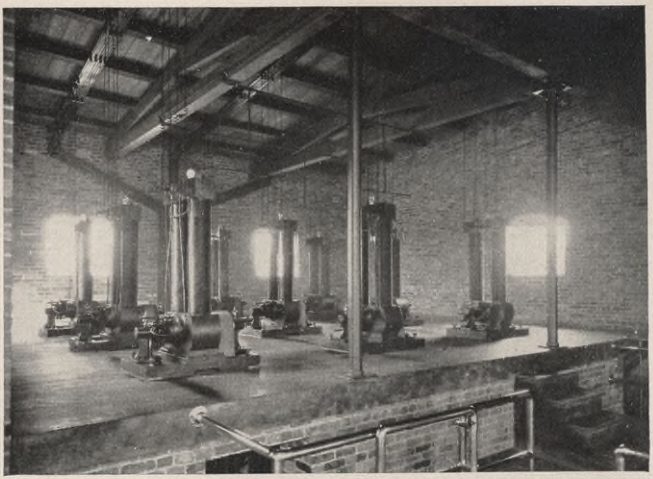
Edison's Menlo Park Workshop, Now at Dearborn

Up to a little more than fifty years ago, the only known source of electrical energy was the Voltaic battery. It was in 1881 that considerable comment was occasioned by the storage battery produced in Paris by Camille Faure and carried to a scientific meeting in Glasgow by Sir William Thompson (later Lord Kelvin) the famous physicist.

Literature on the dynamo as a producer of electricity made its appearance in the seventies and in 1878 a form of arc light was exhibited in Paris by its inventor, the distinguished Russian Engineer Jablochkoff, who called it "the Jablochkoff Candle."

The first electric light service was that of Charles F. Brush, of Cleveland, and others, who in 1879 engaged in the series arc-light business.

Incandescent lighting was first discussed by the newspapers in 1878 and the discussion was followed



Early Dynamos, Now in the Ford Collection of Edisonia

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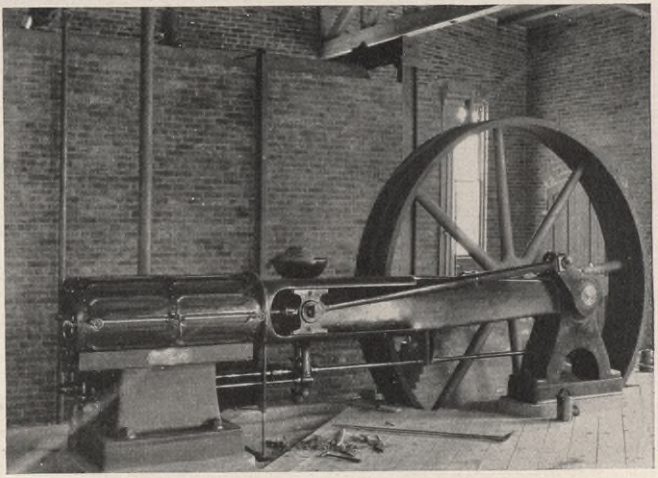
Type of Engine Used in the Early Days of Electric Lighting



by a drastic drop in the price of gas company securities throughout the world.

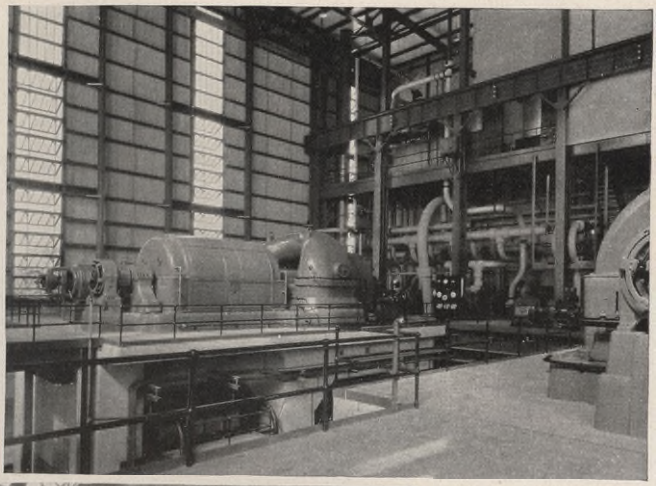
It was not until 1879 that Thomas A. Edison's experimental paper carbon lamp was exhibited at Menlo Park, New Jersey. A year later these paper carbon lamps were shown outside of the laboratory, the exhibition in London, England, attracting special attention.

Although in 1881 there had been installed at Menlo Park a complete system for illuminating the fields around the laboratory as well as the laboratory itself and the houses of Mr. Edison and his assistants, only a comparatively few people had any faith in the commercial value of Edison's work. Power for this first lighting system was obtained partly from a direct connected dynamo of Mr. Edison's design and an engine, very popular at that time, known as the Porter-Allen engine. This engine operated at between five hundred and six hundred revolutions a minute and turned up about sixty horsepower.

The same year (1881) witnessed the first demonstration of a direct-connected dynamo outside of Menlo Park. This was at the Paris Electrical Congress, and its exhibition drew the attention of scientific men the world over. It is also of interest to note that the electric terms "ohm," "volt" and "ampere" were first authoritatively defined at this congress.

In 1892 the first central stations for incandescent lighting were established—one at Appleton, Wisconsin, and the other at New York City. While one naturally would assume that the former plant must have been small, it is interesting to learn that even the New York station served a territory only about a mile square.

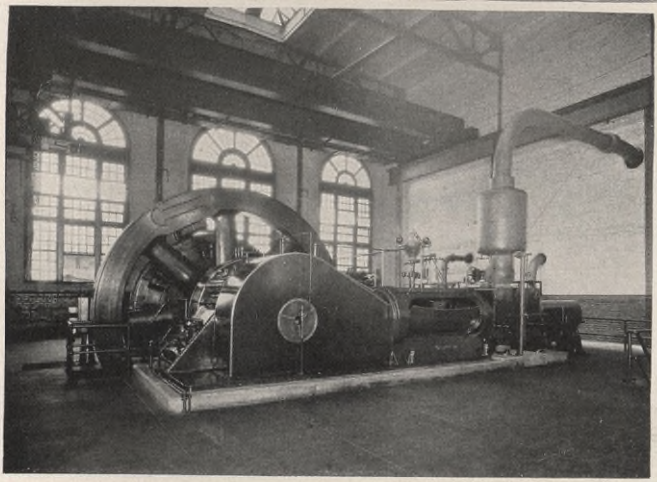
Electricity was first used in connection with transportation only on an exhibition scale—the miniature railway at the Berlin Exposition of 1879 being the first on record. Two years later a com-



27,000-hp Steam Turbo-Generator, Texas Power and Light Co.

★

Interior of Jacksonville (Fla.) Traction Company's Plant



mercial electrical railway a mile and a half long was put into operation near Berlin.

At about the same time Mr. Edison constructed about a mile of electric railway at Menlo Park, purely an experimental proposition, and succeeded in attaining on it a speed in excess of forty miles an hour. More than five thousand people rode on this experimental line.

The Chicago World's Fair in 1893 saw the most comprehensive electrical display attempted up to that time. While the fair was not intended to be principally an electrical show, nevertheless no other feature attracted any more attention. Power was generated by direct-connected dynamos, using engines of the marine type.

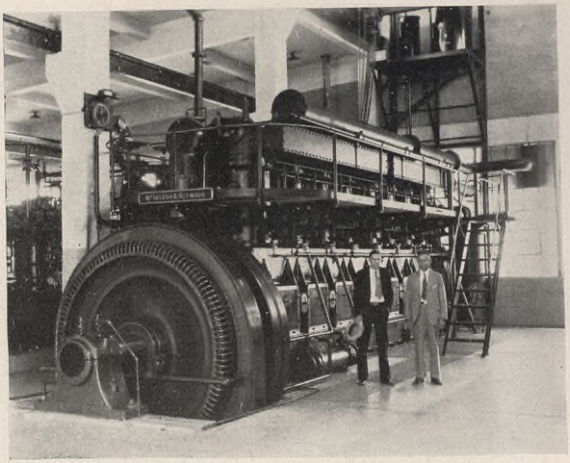
By this time Mr. Edison had worked out his three-wire system, by which improvement the amount of copper needed to install the direct-current system was reduced approximately forty per cent.

Another powerful factor in aiding the development of the industry was the work of the famous electrical engineer, Nikola Tesla, whose polyphase-current patents, first brought to the attention of the electrical world in 1888, form the basis of the alternating dynamos and motors in use today. Too much cannot be said of Tesla's contribution to this branch of the industry.

By 1895 the industry had witnessed the introduction on a large scale of slow speed generators, directly connected to reciprocating engines. The efficiency of those made possible enormous savings in central station operating expenses. Further technical advances made feasible the use of high-tension alternating transmission lines, operating sub-stations in which rotary or stationary transformers were installed, depending on whether they were intended to distribute direct or alternating current.

Up to this time, about seventy per cent of the

electricity produced was used for lighting and at the 1897 meeting of the National Electric Light Association, a prominent member wanted to know what would become of the industry if a new lighting medium were discovered.



600-KW Engine in Denton (Texas) Municipal Utilities Plant

As time went on, the power side of the industry received an increasing amount of attention, until, at this writing, it is safe to say that but for the manufacturing economies effected by the wholesale distribution of electricity for power purposes, electric lighting would be too expensive for a considerable portion of our population.

At the turn of the century, the electrical industry found itself in a position to make real advances. The groundwork had been laid, basic technical problems had been solved and the great minds of the industry could set themselves to the large-scale application of principles which had been shown to be both practical and desirable by the pioneers.

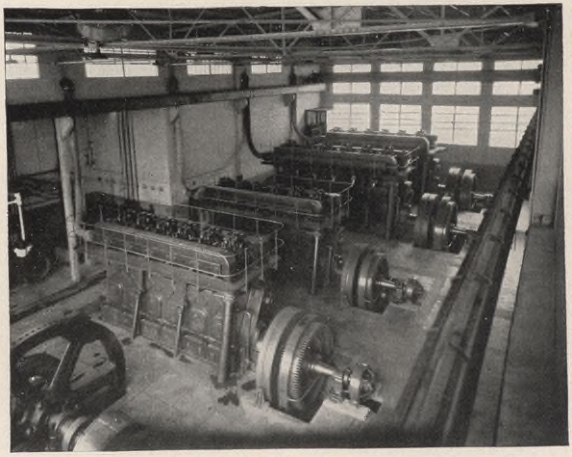
There followed a period of intense development and unparalled efficiency. Economies of operation resulting from the combination of high-efficiency, direct-connected dynamo engines, high tension transmission lines and sub-stations, brought about the closing of small generating stations and the mass production at central stations of electrical energy in capacities far beyond even the fondest dreams of the early leaders of the industry.

Reciprocating engines reached the limit of their power at around five thousand horsepower and the demands of the industry called for prime movers that could produce in excess of this figure. This resulted in the development of the steam turbo-generator, which, as far back as 1910, was operated in units of twenty thousand horsepower and upward and which today is designed for even greater output.

The latest advance along this line is the use of direct-connected Diesel engines. Probably no phase of central station operation is receiving so much attention as the comparison of operating efficiency between the Diesel-connected generator and the steam turbo-generator.

Some idea of the size and growth of the electrical industry may be gained from the fact that in 1907 the revenue from central stations was $169,600,000 and in 1929, $2,107,000,000. Energy generated rose from 5,362,000,000 kilowatt-hours in 1907 to 92,737,000,000 kilowatt-hours in 1929. In 1929 a number of states produced as many kilowatt-hours as were produced by the entire United States 22 years

Texas-Louisiana Power Co. Plant at Silver City, New Mexico



earlier. That the industry is growing at a rapid rate is evidenced by the fact that in 1922 the total kilowatt-hours sold in the United States was 41,964,000,000 and in 1927 the figure had risen to 79,011,000,000, an increase of almost twenty per cent a year.

More than fifty thousand miles of railways are now electrified and the total number of car miles operated by electricity exceeds 2,250,000,000. At the close of 1929 the investment in the electric light and power industry totaled $23,950,000,000.

The enormous size of the electric power industry is indicated by the fact that approximately 77 and one-half per cent of the total horsepower consumed in the industrial plants of this country is electrical —the estimated figures being 31,000,000 horsepower electrical and 9,000,000 non-electrical.

In 1929, the light and power companies in the United States had a total of approximately 24,250,000 customers, who consumed some 92,000,000,000 kilowatt-hours of electrical energy, giving the companies a gross revenue of $2,107,000,000 yearly.

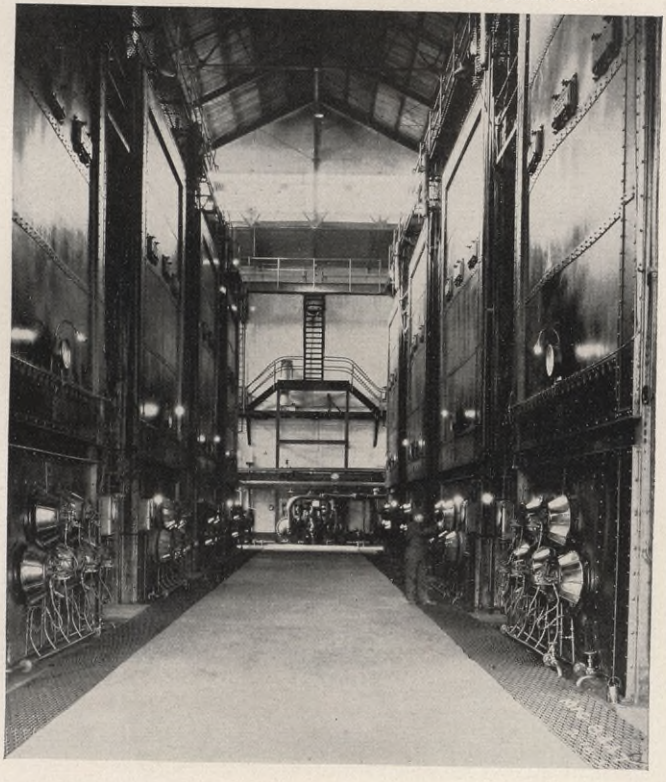
In 1929 more than 44,000,000 short tons of coal were used to generate electricity and more than 10,000,000 barrels of fuel oil were used for the same purpose. This is a staggering amount of fuel but in addition the industry consumed natural gas to the extent of over 112,000,000,000 cubic feet.

Efficiency, as one might expect, has kept pace with growth; in 1929 the investment per customer totaled $458, while in 1912 it was $597. During the same period, investment per unit of generating capacity had decreased from $373 to $325, while revenue per customer increased from $79 to $87.

The fact that the 1930 budget for public utilities totals approximately $913,000,000, a new high record, indicates the confident attitude with which they view the future. It is also an assurance of the continued radiation from strategically located points of "high lines" bringing to towns and rural communities the greatest work saver in existence today.

The transition from (*Continued on Last Page*)

Boiler Room in the Central Power Station at Our Port Arthur Works



Railway Progress in Australia

Standard Track Widths Sought by Commonwealth Government

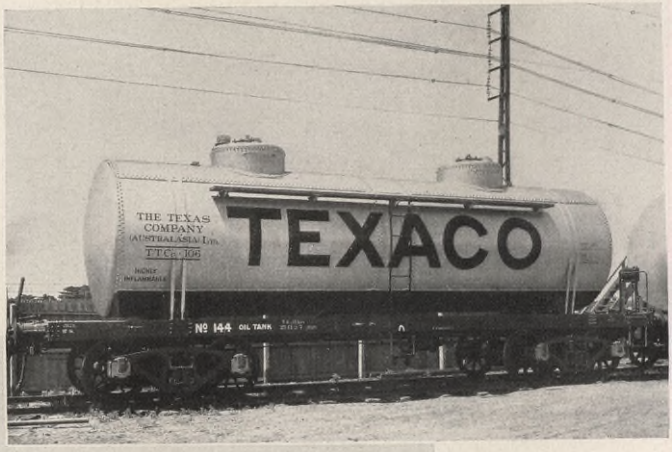
By C. S. ATWELL

AUSTRALIA'S most serious railway problem, that of the different track widths on railroads throughout the Commonwealth, is being gradually overcome and within a few years many improvements will be effected. By 1931 there will be a standard gauge road between the capital cities of Sydney and Brisbane, eliminating the necessity of transferring freight and passengers at Wallangara and reducing by one hundred miles the distance by rail between these two points. This work will cost in the neighborhood of twenty million dollars.

At the present time there are three different track widths or gauges in the Commonwealth. In Victoria and South Australia there are 5766 miles built on a gauge of five feet, three inches; 6766 miles of road in New South Wales and on the Commonwealth Railways are laid four feet, eight and one-half inches wide, while 12,189 miles in Queensland, New South Wales, South and West Australia and on the Commonwealth Railways are only three feet, six inches wide.

In 1921 the Royal Commission of Australia submitted a plan for connecting the various capital cities of the Commonwealth by railways built on a standard gauge of four feet, eight and one-half inches. The plan also provided for altering the broad gauge railways of Victoria and South Australia. This work, it was estimated, would cost $105,000,000, one-fifth of which would be borne by the Commonwealth and the remainder by the mainland states on a population basis.

In addition to the work already under way, the Commonwealth has entered into an agreement with South Australia regarding a standard gauge railway from Port Augusta to Adelaide by way of Red Hill. This agreement has been ratified by both Federal



This Type of TEXACO *Tank Car is Used on Australian Railways*

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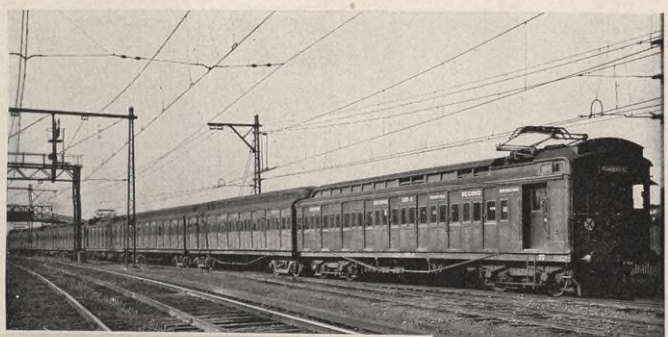
The Sydney-Brisbane Express Runs on a 3 ft., 6 in. Gauge



Victorian Railways Electric Train Operating in Melbourne

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One of the Victorian Government's Sixty-Car Wheat Trains

Having recently travelled over some 70,000 miles of railways in Australia, inspecting ocean terminals that The Texas Company (Australasia) Limited has erected in the cities of Brisbane, Newcastle, Sydney, Melbourne, Adelaide and Fremantle, I am fairly familiar with the difficulties encountered in shipping freight and State Parliaments. The Parliament of Western Australia also recently resolved in both houses "that in the opinion of this House the time has arrived when the Federal policy of extending the standard gauge railway be consummated in Western Australia." To date nothing has been done by the States of South Australia or Victoria with respect to changing their present broad-gauge lines.

Australia's railway gauge problem is of importance to The Texas Company (Australasia) Limited because they have a number of new tank cars assigned to each of the ocean terminals in Australia's capital cities. These tank cars are used for transferring TEXACO products to various bulk depots throughout the Commonwealth. As railway gauges are changed, it will be necessary to change tank cars to correspond. This is a big item that the governments are encountering in changing the gauge and it is becoming a more expensive one every year, due to the large increase in rolling stock necessary to take care of the rapidly growing business and population.

over those roads. In America, merchandise can be sealed in a car and shipped from coast to coast or from north to south without transhipment. In Australia, on the other hand, commodities are hauled a certain distance and then transferred to another train. Tropical fruits from Queensland are shipped in large quanities to the southern states and Victorian consignments have to be transhipped at Wallangara and again at Albury. This causes delay and damage, but serious as is this loss through agents' charges, transhipment fees and damage, the detention of the cars themselves at each point of shipment is an even greater evil. Whether business is brisk in one state and slack in another, whether one state's railways are pressed to the maximum while another state has rolling stock which is idle, there can be no interchange of cars except on the broad gauge lines of Victoria and South Australia.

The different gauges do not affect passenger traffic as much as one would suppose. Each state has fast scheduled express trains which are seldom late and little trouble or loss of time is encountered.

Iron Was Mined in Colonial Days

By H. E. ENNIS

IN the midst of the farming centers of Lancaster and Lebanon Counties in the State of Pennsylvania, is the Cornwall Ore Banks, one of the oldest iron ore deposits in the United States. It is located about seven miles from the town of Lebanon and at the present time is owned and operated by the Bethlehem Steel Company.

It is not known when or by whom these large and celebrated deposits of manganized ore were first discovered and their value recognized, but the land itself was included in the original Grant of Charter or Letters Patent to William Penn by Charles II of England. The charter is dated March 4, 1681.

The first owners, Joseph Turner and William Allen, if aware of the ore deposits, did nothing about working them, and in 1734 they sold the land to Peter Grubb. This is particularly interesting since both Turner and Allen were iron masters and members of the company that built and operated the Durham Furnaces in Bucks County, Pa., in 1727.

Peter Grubb, second owner of the mine, was one of the most famous iron masters of Colonial times. His ancestral home was in Cornwall, England, and when he started mining ore and building a furnace on his new property he gave it the name of Cornwall. The first blast furnace was erected in 1742 and Grubb continued to operate the furnace and mine until his death in 1754. His sons, Curtis and Peter Grubb, carried on until 1798 when they sold the bulk of their holdings to Robert Coleman, retaining only a small share themselves.

During the Revolutionary War, while under the ownership of Curtis and Robert Coleman, both colonels in the Continental army, the old mine produced ore which was worked into ammunition for the use of American troops against the British.

The early mining methods were quite primitive; up to the time of the construction of the North Lebanon Railway (now the Cornwall Railroad) in 1856, all the ore removed from the mine was hauled by wagons to the various furnaces which dotted the surrounding countryside. Some of the ore was shipped by water over the old Union Canal to points east and west.

The Cornwall Ore Banks

Acrelius, in his "History of New Swedeland," written in 1756, makes the following reference to the Cornwall or Grubb Iron Works: "The mine is rich and abundant, forty feet deep and under the earth's surface is somewhat mixed with sulfur and copper. Peter Grubb discovered the deposits and operates a furnace which makes 24 tons of iron per week and keeps six forges busy. Pig iron is carried to the Susquehanna River, thence to Maryland and finally to England. Bar iron is sold mostly in the county and interior towns and the remainder in Philadelphia."

The mine continued in the possession of the Coleman family until 1915, when it was purchased by the Bethlehem Steel Company.

Within the past six years, several deep shafts have been sunk into the heart of the rich deposits. One of these shafts, Number Three, has a vertical depth of 550 feet and a slope of more than 1300 feet. Large ore cars are drawn to the surface by means of a huge windlass and wire cables.

The two wire cables are each 2200 feet long and an inch and a quarter in diameter. These cables are continuously lubricated with TEXACO Crater Compound and thanks to this efficient preservative they need renewing only once every two years. There is no doubt in the minds of those interested that the cables would have to be renewed much oftener if TEXACO Crater Compound were not used.

Lubrication of the cables is effected by means of a box placed at the top of the slope and on an angle of thirty degrees, to conform with the angle of the slope. This box is filled with TEXACO Crater Compound about once every six weeks or two months. Rags are placed around the holes at each end of the box, and as the cable is drawn backward and forward through the box it is thoroughly smeared with the lubricant. Anyone watching the operation is immediately impressed with the efficiency of this method.

Under normal conditions about nine hundred tons a day are produced from the shaft and about 3500 tons from the pit, or surface of the deposit.

Cuba's Lovely Capitol Building Skillfully Illuminated by Night

Globe-Trotting with TEXACO

XIII—CUBA

By A. J. COLLETT

General Manager, The Texas Company (West Indies) Ltd.

THE Island of Cuba, known as "The Pearl of the Antilles," was discovered by Columbus in 1492 and was under the control of the Spanish Government until January 1, 1899. On the night of February 15, 1898, the United States battleship *Maine* was blown up in Havana Harbor. War with Spain was then declared by the United States, and Colonel Theodore Roosevelt, later President of the United States, made his famous ride up San Juan Hill with his Rough Riders. The American occupation began when Spanish authority ceased on January 1, 1899, and General John R. Brookes, U. S. A., was appointed Military Governor.

In 1899 General Leonard Wood, U. S. A., who had been Military Governor at Santiago de Cuba, was appointed Governor-General of Cuba and served until May 1902. Great progress was made in the Island during the time General Wood was Governor-General and to show their gratitude for what he did, the Cuban Government has granted a pension to his widow. The Cuban Government also erected the Maine Monument in Havana as a memorial to the United States sailors who lost their lives there. Governor-General Wood acted as Military Governor until the first Cuban President, Don Tomas Estrada Palma took over the administration of the island's affairs on May 20, 1902.

The late William Howard Taft was appointed provisional governor in Cuba during the second American intervention in 1906, so that the early history of the Republic of Cuba is closely connected with some of the best-known men of the United States.

In 1909 the American troops were again withdrawn and General José Miguel Gomez took over the administration of Cuba as President. Since that date Cuba has functioned as an independent republic and has come to be regarded as such by

Maine Monument in Havana Erected to Memory of American Sailors

civilized nations throughout the entire world.

The Island of Cuba is approximately 760 miles long and about sixty miles wide with an area of 45,881 square miles, which makes it a trifle larger than the State of Pennsylvania. Cuba has approximately two thousand miles of sea coast, indented with many fine deep-water harbors and bays.

More merchandise enters and leaves the Port of Havana than any other port in the Western Hemisphere, with the single exception of New York.

At the present time there are approximately ten thousand citizens of the United States in Cuba, of whom about six thousand are residents of Havana.

Transportation facilities from the United States to Cuba are excellent, and in making a trip to Cuba one has the choice of three modes of transportation —airplane, railroad or steamer. Many tourists are now bringing over their automobiles on the ferries operating between Key West and Havana.

Freight cars, loaded with merchandise from the United States, have for a long time been carried on ferry boats from Key West, Florida to Havana. During the past year, however, a through freight service from the United States by way of New

Portion of Cuba's New Central Highway, Between Havana and Madruga

Orleans to Havana has been established, and a "Seatrain" now operates from New Orleans to Havana. Freight cars are loaded in this Seatrain at New Orleans, unloaded in Havana and shipped to various points in Cuba.

The language of Cuba is Spanish or, as the Spaniards prefer to call it, *Castillano*, and according to the laws, companies' accounts and books have to be kept in Spanish, although most of the better-class Cubans speak English, as a large percentage of the younger Cubans have been educated in colleges and universities in the United States.

Cuba purchases from the United States nearly $300,000,000 worth of manufactured goods a year. Seventy-five per cent of Cuba's imports come from the United States and about seventy per cent of her exports go to the United States.

The present-day Cuban is rapidly adopting American customs, wears American clothes, uses American furniture, sends his children to American colleges and spends some of his vacations in the United States. The Cuban women, like most women of the Spanish race, are noted for their beauty, vivacity and charm. They are rapidly taking up various forms of athletics, play tennis and golf, go horse-back riding and drive their own automobiles.

The tourist trade to Cuba is assuming large proportions. During the 1928-1929 season nearly 150,000 people from other countries visited the Island.

Cuba is essentially a farming country, the main crops being sugar, tobacco, grapefruit, pineapples, coffee and such vegetables as tomatoes and green peppers.

The sugar industry is the main industry in Cuba, and Cuba has been called a one-crop country because her prosperity depends so much on the sugar crop. Cuba produces in the neighborhood of 5,000,000 tons of sugar annually, which is approximately one-quarter of the world's production. The cane is generally grown by "colonos," or farmers, who deliver it to the sugar central or mill on a seasonal contract, the sugar centrals being generally owned by large companies.

The Prado, Havana, a Popular Promenade for Citizens and Visitors Alike

In some cases the "colono" is paid cash for the cane, but usually he receives a certain number of pounds of raw sugar for each one hundred pounds of cane he delivers to the central. Good lands produce an average of forty tons of cane to the acre. From these forty tons, the mill extracts about four and three-quarter tons of sugar, and gives the grower about half of it, keeps approximately 240 gallons of molasses and burns the *bagasse*, or refuse from the cane, in its boiler plant. The grinding season usually begins in December or January when the cane is ripe and ends in April or May when the Spring rains cut off the supply of cane by making

the roads impassable. During the season a large mill can produce 600,000 bags of raw sugar weighing 325 pounds each. The largest sugar mills in Cuba are Centrals "Delicias," "Chaparra," "Vertientes" and "Preston," the last of which produced more than one million bags of sugar during the 1928-1929 grinding season, a not inconsiderable output.

New Industrial School "President Machado"

Tobacco raising is another of Cuba's large industries and Cuba produces the finest tobacco in the world. The value of the annual crop is about $70,000,000, more than half of which is exported. About 60,000,000 bales, of approximately 140 pounds each, are produced.

Tobacco plantations or patches are called "Vegas." The best Cuban tobacco comes from the Vuelta Abajo, a region around Pinar del Rio City. When light, silky leaves are wanted, the plants are grown under palms or other trees with a framework of leaves or canopy of coarse muslin or cheese cloth to protect them from the direct sun and to keep out insects. Cigar making is one of the greatest industries of Cuba, and the majority of these cigars are made by hand. A skillful operator can roll four hundred cigars a day. While at work, the men are addressed by a professional reader, who sits on a raised platform and lectures to them or reads aloud from late novels or newspapers.

The pineapple or "pina" is indigenous to Cuba. More than one million crates are shipped each year to the United States and the production is increasing still. Pinar del Rio Province is famous for its "pinas," while those of the Isle of Pines are of notable excellence and sometimes weigh as much as ten to fourteen pounds each. The plant is low and ragged, with thorny, swordlike, reddish-green leaves. Each plant, producing one "pina," possesses great vitality and will grow in poor soil.

Harvesting a Few Acres of Pineapples

A large amount of "Jenequen" is grown in Cuba, from which most of the rope used in Cuba is manufactured. The raising of cattle and horses is also becoming an important industry.

As Cuba has suffered from being principally an agricultural country, and in the main a one-crop country, great efforts are being put forth by the Cuban Government, under the direction of President Gerardo Machado, to establish industries throughout the Island. In this connection, President Machado has established an industrial school to teach the Cubans various trades and to educate them along industrial lines. This school is very well equipped and should prove very valuable to Cuba in the future.

In October 1926, the building of an elaborate central highway system was started. This highway will extend practically the whole length of the island, from the city of Pinar del Rio in the west end, to the city of Santiago de Cuba in the east end, a distance of approximately 705 miles. As its name indicates, this highway passes through the center of the island but touches the ports of Havana, Matanzas and Santiago de Cuba and the interior towns of Pinar del Rio, Artemisa, Guanajay, Madruga, Santa Clara, Camaguey, Holguin, Bayamo and Palma Soriano.

By December 1929, concrete had been laid on sixty per cent of the Central Highway and the asphalt covering was completed on about 47 per cent. The Central Highway has already been opened between Havana and Artemisa and Havana and Matanzas, and was completed from Havana to Santa Clara by May 20, 1930.

Havana, capital of the Republic of Cuba, known as the

(Top) Our Bulk Fuel Oil Terminal, Matanzas

(Right) Morro Castle in Havana Harbor

"Paris of the Western Hemisphere" and the "Monte Carlo of America," is one of the gayest cities of the New World. Havana is a combination of the mediæval and the modern. The narrow, winding streets of yesterday contrast with the broad, well-paved avenues traversed by modern motor cars.

The old city is grouped around the Plaza de Armas in ancient Spanish fashion. El Templet is on the site where Diègo de Valasco founded Havana in 1519, nearly a century before the Pilgrims landed at Plymouth Rock. Nearby is the Columbus Cathedral which for a time held the remains of Christopher Columbus. From this old section of the city it is but a short walk to the fashionable Prado where the Cubans promenade, or to the Malecon, the driveway along the sea.

The world-famous Morro Castle stands at the entrance of Havana Harbor. This ancient, walled fortress, located on a bold, jutting hill at the point of Havana Harbor, was constructed in 1585. It required twelve years to build and was practically impregnable in its day but is of very little value today. Towering above Morro Castle is the great lighthouse, built in 1844 by the then Governor-General O'Donnell.

Havana, with a population of about 581,000, has many beautiful buildings and several very pretty parks and drives. The National Capitol building, recently completed by the Cuban Government at a cost of approximately $16,000,000, compares favorably with the capitol buildings of other countries. Fraternity Park, dedicated during the Pan-American Conference, is one of the newest parks in Havana. In this park the Peace Tree was planted in soil made up of earth from each of the Pan-American countries.

During the winter season, Havana affords a great variety of amusements to the tourist. There are races at Oriental Park, where the famous Havana Jockey Club is located. At the Casino, the Cuban Monte Carlo, a cosmopolitan crowd may be seen gaming or dancing nightly. At the Jai Alai, famous Spanish players appear nightly in that game of tremendous speed and skill. Marianao Beach, known as the Playa, affords excellent swimming.

Havana is one of the cleanest cities in the world, and sanitary conditions in Cuba are maintained on a very high plane. The Department of Public Works of Cuba has purchased a large number of five-ton trucks for collecting garbage. A special body has been designed for these trucks so that garbage collection in Havana is very efficiently and economically handled.

Havana has one of the *(Continued on Last Page)*

OUR WHO'S WHO

P. BEALL intended his article on the Cody Stampede for TEXACO TOPICS but we liked it so well that we stole it from the editor's desk when he wasn't looking. Mr. Beall was born in Washington, D. C., and spent his early life in an army post on the Texas border. He graduated from Rensselaer Polytechnic Institute and spent seven years in railroad construction work. In 1916 he joined The Texas Company at Providence, Rhode Island, and left shortly to spend sixteen months with the Rainbow Division overseas. In 1922 he was transferred to Port Arthur Works as Chief Draftsman and in 1926 was made Assistant Chief Engineer at Casper Works. In July, 1928, he became Superintendent of our Cody Works.

H. E. ENNIS, whose article on America's oldest iron mine appears in this issue, is a native of Philadelphia. He was educated at Lambertville (N. J.) High School and Swarthmore College and spent his first five years out of college in South America and the West Indies as a representative of the West India Oil Company. At the close of the World War he entered the real estate business, left to become a lubricating oil salesman for the Crew Levick Company and joined The Texas Company in March 1927 as industrial oil salesman at Philadelphia. He was later transferred to Reading, Pennsylvania. Mr. Ennis is married and has two children.

BEHIND THE SCENES

(Continued from page 10)

animals. During the past decade agriculture has been entering a new power stage, and with the increased pulling effort that gasoline tractors provide, new and more powerful farm machinery is made possible.

The International Harvester Company is proud of the work it has done to help the farmer to become more efficient. Ninety-three full-line branch houses, located in various parts of the country, supply 15,000 dealers and serve as links between them and the company's factories. There are also 146 motor truck branches. Each branch house carries emergency stocks of machines and replacement parts.

MR. HAWKS DROPS IN

(Continued from page 3)

pencils scrawled busily as he mumbled replies to their questions between layers of ham and lettuce.

"Picked up the sun at Flagstaff, Arizona . . . moonlight when I started . . . beautiful night . . . little rain at St. Louis but nothing to amount to much . . . didn't have her wide open at any time during the trip . . . must have averaged about two hundred and eight . . . a good tail wind from Wichita on . . . anybody got some water? . . . Wright Whirlwind motor . . . I'd like a drink of water . . . Hello, Casey, . . . Thanks. . . . Gosh. I'm hungry! . . . no, didn't get out of the plane at all."

One by one the inquisitors departed; some scurrying into telephone booths, others heading for automobiles. Hawks, his mouth full of chocolate bar, was bundled into an automobile and, preceeded by a corps of motorcycle police, headed back for New York and a radio engagement.

On the field a tiny, red and white monoplane, bearing on its sides the legend, "*Texaco No. 13*" and streaked with oil and dirt, was slowly wheeled into the shelter of a hangar.

A man in a yellow uniform walked down the runway and addressed the crowd.

"Take an airplane ride," he urged. "Passenger planes will take you up for a nice, safe flight. Take an airplane ride. Two dollars and a half."—*P. C. H.*

POWER

(Continued from page 23)

reciprocating engines in units of two and three thousand horsepower to giant steam turbo-generators of fifty thousand horsepower and upward and to Diesel-connected installations has, of course, made necessary the production of special lubricants adapted to these uses.

As a matter of fact, advanced petroleum refining technique contributed vitally to the building of more efficient units for the generation of electric power. Were it not for lubricants capable of withstanding high pressures, temperatures and speeds and separating rapidly from moisture without the formation of emulsions and satisfactorily meeting other conditions, it would not be possible to operate the large, heavy-duty type of steam turbines and Diesel engines that produce electrical current at a figure low enough to facilitate its distribution to millions of homes and factories throughout the country.

The manufacture of lubricants for power plant use has always received the studious attention of The Texas Company. TEXACO products found favor in the days when a five thousand kilowatt-hour plant was one of respectable size, just as they are finding favor now.

The uniform high quality of TEXACO lubricants and the efficient service of The Texas Company's lubrication engineers, has enabled us to supply lubricants to many of the largest power plants in this country.

GLOBE-TROTTING

(Continued from page 31)

best-trained police forces in the world, consisting of about two thousand men.

The Texas Company (South America) Limited, was organized in 1915, and operated in Cuba until 1919, when its interests were taken over by The Texas Company (West Indies) Limited, a Cuban corporation. This company has operated throughout Cuba ever since, with its main offices in Havana.

The Texas Company (West Indies) Limited, has four fuel oil stations in Cuba, two lubricating oil warehouses and seven agencies located at the principal ports of the Island.

Fuel oil has been extensively used in Cuba, as the locomotives on all railroads are operated by fuel oil. All the main power houses, including those at the sugar centrals, formerly used fuel oil, but the power houses of most of the sugar estates have now been modernized so that they burn only *bagasse* or the refuse from the cane in their power houses. They, however, still operate their locomotives on fuel oil. This, of course, has considerably reduced the consumption of fuel oil in Cuba.

Large amounts of lubricating oils are used in the sugar mills in Cuba and the consumption of motor oils is increasing with the construction of new roads.

The system of selling gasoline and lubricating oils at service stations has not as yet been adopted in Cuba to any extent. Most motor products are sold at garages which also market tires and other accessories.

We have marketed a considerable quantity of TEXACO Asphalt in Cuba, and many of the streets in the suburbs of Havana are paved with TEXACO Asphalt Macadam, which has given very good service.

PRINTED IN U. S. A.

VARIATION ON AN EARLY AMERICAN THEME: ADAPTED FROM THE ARCHITECTURE OF THE INDIAN IS THIS TEXACO SUPER-SERVICE STATION NEAR BAKERSFIELD, CALIFORNIA

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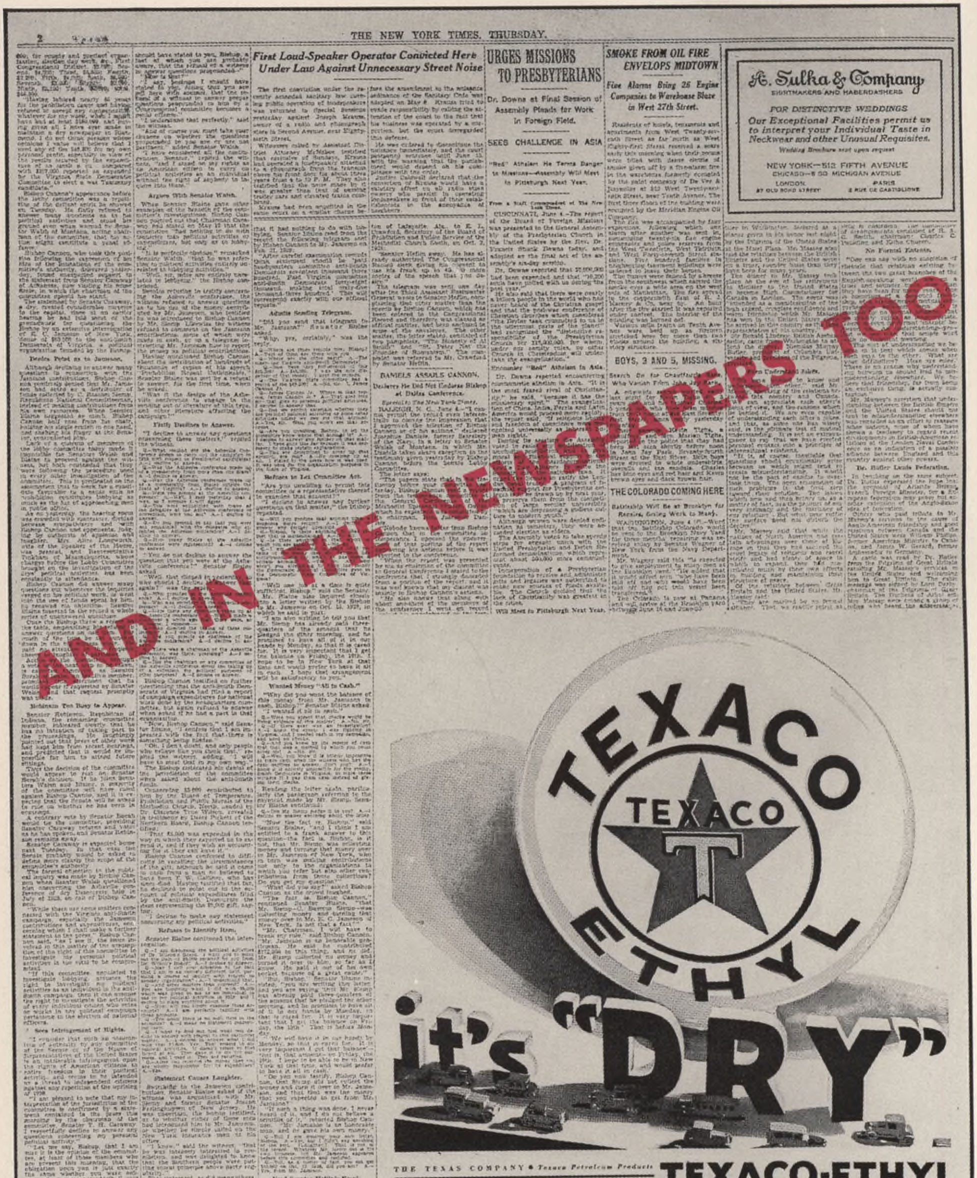

THE NEW YORK TIMES, THURSDAY.
First Loud-Speaker Operator Convicted Here Under Law Against Unnecessary Street Noise
URGES MISSIONS TO PRESBYTERIANS
Dr. Downs at Final Session of Assembly Pleads for Work In Foreign Field.
SEES CHALLENGE IN ASIA
"Red" Atheism He Terms Danger to Missions—Assembly Will Meet in Pittsburgh Next Year.
SMOKE FROM OIL FIRE ENVELOPS MIDTOWN
Five Alarms Bring 26 Engine Companies to Warehouse Blaze in West 27th Street.
A. Sulka & Company
SHIRTMAKERS AND HABERDASHERS
FOR DISTINCTIVE WEDDINGS
Our Exceptional Facilities permit us to interpret your Individual Taste in Neckwear and other Unusual Requisites.
NEW YORK—512 FIFTH AVENUE
CHICAGO—5 SO. MICHIGAN AVENUE
LONDON
PARIS
BOYS, 3 AND 5, MISSING.
THE COLORADO COMING HERE
DANIELS ASSAILS CANNON.
AND IN THE NEWSPAPERS TOO
TEXACO
TEXACO
ETHYL
it's "DRY"
THE TEXAS COMPANY • Texaco Petroleum Products
TEXACO the original "DRY" GAS + ETHYL nationally famous ANTI-KNOCK COMPOUND = TEXACO-ETHYL
THE "DRY" ANTI-KNOCK GASOLINE