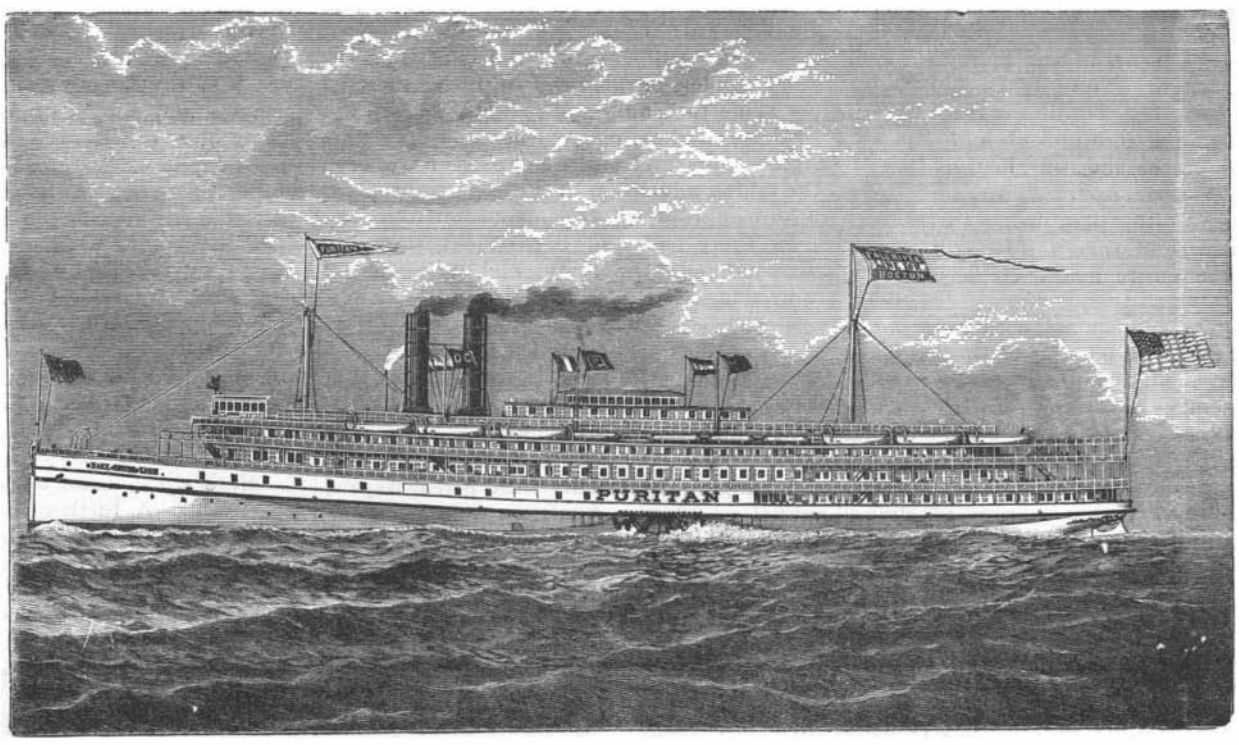
THE FALL RIVER STEAMER PURITAN.

The Fall River line has no significance in its title relating to the city of Fall River, but takes the name simply for the reason that that port is the eastern terminus of the water route connected with the enterprise. The line itself is made up of 181 miles of water route—from New York to Fall River—and 49 miles of railroad, the Old Colony Railroad from Fall River to Boston, in all 230 miles of route, embracing in its direct ministrations the cities of New York, Newport, and Boston as terminal points.

The Puritan is the most successful achievement of the Fall River line and is the largest and finest vessel of the fleet.

The model and general plans of the Puritan were designed by Mr. George Pierce, Supervisor of Steamers of the Old Colony Steamboat Company; the details of steel hull, etc., by Mr. Edward Faron, of the Delaware River Ship and Engine Building Company; and the hull was built at Chester, Pa.



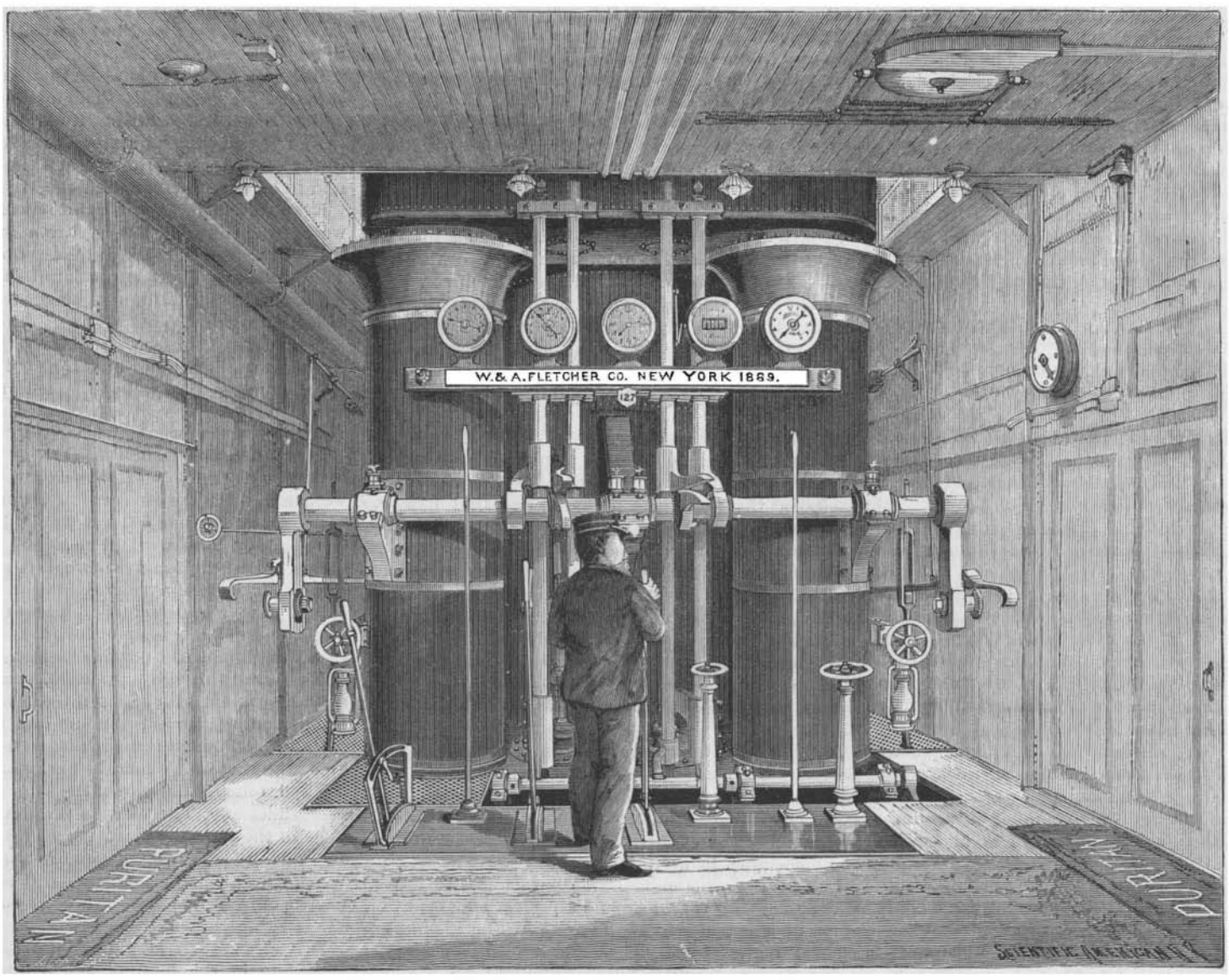
THE STEAMER PURITAN.

Her principal dimensions are as follows: Length over all, 420 feet; length on the water line, 404 feet; width of hull, 52 feet; extreme breadth over guards, 91 feet; depth of hull amidships, 21 feet 4 inches; height of dome from base line, 63 feet; whole depth, from base line to top of house over the engine, 70 feet. Her total displacement, ready for a trip, is 4,150 tons, and her gross tonnage is 4,650 tons.

The Puritan is fireproof and unsinkable. She has a double hull, is divided into 59 water-tight compartments, 52 between the hulls and 7 athwartship bulkheads. In the fastenings of her steel hulls and compartments, there have been used 700,000 rivets, and she has upward of 30 miles of steel angle bar. Her decks are of steel, wood covered. Her masts are of steel, and hollow, to serve as ventilators, and are 22 inches in diameter. Her paddle wheels are incased in steel.

Steel, as a building material, has lately superseded iron in the naval world, and so it is that, in keeping with the progress of the age, the Puritan's hull is made of mild steel, which metal, weight for weight, is some 20 per cent stronger than iron, with 25 per cent reduction of weight, according to the best government tests.

Her wheels are of steel, and are 35 feet in diameter outside the buckets. The buckets are 14 feet long and 5 feet wide, each bucket of steel ⅞ inch thick, and weighing 2,800 pounds, without rocking arms and brackets attached. The total weight of each wheel is 100 tons. The two together are in the nature of enormous fly wheels for the machinery. The wheels are of the kind known as feathering, and the engine will drive them at the rate of 24 revolutions a minute. Her rudder is 14 feet 6 inches fore and aft, average height 13 feet, whole length of stock 18 feet. It is made of steel, filled with wood between the plates, and weighs nearly 30,000 pounds.



IN THE ENGINE ROOM OF THE PURITAN.

Of her machinery, boilers, etc., Messrs. W. & A. Fletcher & Co. (North River Iron Works) were the builders, and they were also the contractors for the building and completion of the ship in every part.

The Puritan has a compound, vertical beam, surface-condensing engine of 7,500 horse power. The high pressure cylinder is 75 inches in diameter and 9 feet stroke of piston. The low pressure cylinder is 110 inches in diameter and 14 feet stroke of piston. A horse and wagon could be driven through this cylinder, if laid on its side. The surface condenser has 15,000 square feet of cooling surface, and weighs 53 tons. Of condenser tubes of brass there are 14½ miles in the Puritan. Her working beam is the largest ever made, being 34 feet in length from center to center, 17 feet wide, and weighing 42 tons. When it is considered that the section of beam strap measures 9½ by 11¼ inches, one may get an idea of the enormous strain and the strength of resistance of this beam. The main center of the beam is 19 inches in diameter in main bearing. The shafts are 27 inches in diameter in main bearing, 30 inches in gunwale bearing, and are the largest ever made in this country. They weigh 40 tons each. The cranks weigh 9 tons each. The crank pin is enormous, the bearing being 19 inches in diameter and 22 inches long.

The gallows frame is of heavy steel plate, and by its angles easily supports the enormous working beam.

She has eight steel boilers of the Redfield return tubular type, and the maximum working pressure is 110 pounds to the square inch. Six of these boilers are 18 feet 1 inch in width and 15 feet 2 inches long; the other two are 10 feet wide and 14 feet long. Each of the wide boilers has two shells; the narrow boilers have one each, 7 feet 8 inches in diameter. The boilers contain 850 square feet of grate surface and 26,000 square feet of heating surface. The products of combustion pass through two superheaters, 8 feet 10 inches inside diameter and 12 feet 4 inches outside diameter, by 12 feet high; thence into two smokestacks, the top of each being 101 feet and 1 inch from the keel. The fire room is 78 by 12½ feet. There is a donkey boiler on the main deck for auxiliary purposes. Her steam steering apparatus has an engine of two cylinders, each 24 inches in diameter, 18 inch stroke. This engine alone is powerful enough for a big tug boat.

There are two centrifugal circulating pumps, each capable of throwing 10,000 gallons per minute. Besides these there are three other large pumps, with a combined capacity of 2,000 gallons per minute. Novel features are the three steam capstans, one forward and one on each quarter, used in docking the boat. Each capstan has a double cylinder engine, each cylinder 12 inches in diameter and 14 inch stroke. She has two Sturtevant blowers, furnishing fresh air for the fire room, each capable of 50,000 feet per minute. She burns about 120 tons of coal on the trip from New York to Fall River and back.

On the main deck the Puritan has an after cabin 82 by 53 feet, with aft is a ladies' private cabin, 42 by 27 feet. The dimensions of the social hall, or quarter deck, are 58 by 24 feet. The usual office rooms, barber shop and toilet, small baggage and coat rooms, etc., are arranged on this deck floor space 72 by 24 feet. Still further

in the most satisfactory manner. The freight deck contains about 80,000 cubic feet of space.

The forward cabin of the saloon deck is 76 by 22 feet, and the main saloon is 128 by 28 feet in measurement. The deck room forward, outside of the saloon, is 48 by 32 feet, and the deck room aft is 44 by 40 feet. The saloon or music room aft, on the gallery deck, is 64 by 24 feet, and the deck room outside is 48 by 36 feet. The continuous promenade outside the paddle boxes is afforded also on the gallery deck.

The dining saloon is 108 feet 4 inches in length, by 30 feet in width and 12 feet in height. The kitchen and pantry is 52 feet long by 20 feet wide. The dining room shows no racks or fixtures running fore and aft amidships, as in other steamers of the line, but, instead, arched spaces at regular intervals on each side contain elaborately finished sideboards, the plan being two sections of berths (concealed), and then a sideboard archway, alternating for the entire length on both sides of the saloon.

From stem to stern, and in every nook and corner of this ship, the electric wire is to be found. In all there are 12 miles of this wire, and including annunciators, fire alarms, etc., there are 20 miles of wire on the ship, and 12,000 feet of steam pipes. There are capacious gangways, grand and imposing staircases, heavy with brass and mahogany, lofty cornices and ceilings supported by tasteful pilasters, the tapering columns of which, in relief, flank exquisitely tinted paneling throughout the length of her grand and minor saloons. And over all this artistic work and exuberant coloring the incandescent electric light sheds its soft rays.

The electric light plant of the Puritan is very perfect. The system used is the Edison incandescent lighting, and it is furnished by the Edison United Manufacturing Company. The currents are generated by four dynamos of special type and construction, each having a capacity of 400 lights, or a total of 1,600 lights as a safety load, but capable of maintaining 1,850 lights if required. The dynamos are located in the forward part of the boat, under the officers' cabin. They are connected in pairs, the motor being supplied by two of Armington & Sims special double engines, of 50 horse power each, two of the dynamos being connected with each engine, and the two connected with each other by direct shafts, so that one or both dynamos can be used at will.

In connection with the electric apparatus is a most complete fire alarm system, with which, indeed, all the vessels of the Old Colony Steamboat Company are now equipped. The alarm relied upon is by thermostats. One of these thermostats is placed in every room, and at every point where there is the least danger to be apprehended from fire—an automatic fire watchman, at all times alert and ready for action. The Puritan is also fitted with watchmen's clocks. The clock placed in the captain's office indicates the hour and minute throughout each day of the year at which the 20 clock stations of the ship are visited by the watchmen. The connection between each station and the clock in the office is by electric wire, and the circuit is closed and registry made by the use of a simple key carried by the watchman. Thus any failure of duty by the watchman, through neglect, sleep, indifference, or for any reason, is revealed completely by the tell-tale clock in the office.

For fire fighting, the Puritan is equipped with the most thorough and complete apparatus, including steam and hand pumps, extinguishers, tools, etc. There are 50 connections to the steam pumps in different parts of the boat for fire purposes exclusively. She has three hand pumps, and these are of unusual size. She has eight Harkness fire extinguishers, and carries 175 fire pails and 36 axes, distributed through the ship at convenient points.

The life saving service and appliances of the Puritan are also of the best approved establishment and effectiveness.

As an adjunct of the life saving service, and for use in case the whole ship's company should be threatened, the Puritan carries a dozen 26 foot life boats, 12 life rafts and 1,400 life preservers. With all these provisions against disaster by fire or water, the claim that this ship affords the element of safety in traveling may fairly be made in her behalf.

The general style of the ornamental and decorative finish is that of the Italian Renaissance, the work raised and largely carved in wood, designs in white and gold, with liberal use of soft rich tints blending in the finest harmony, all ornaments pure and classic and no shams allowed. The raised work, consisting of garlands, friezes, scroll work, etc., is applied to ceiling, wall, door, or partition, to form the proper adjustments in relief.

Some idea of the immense amount of finish in the different departments may be obtained when it is understood that in the gilding alone, 185,000 gold leaves, each 3⅜ inches square, were used. In painting the ship, nearly 100,000 pounds of lead were expended.

The Puritan has in all 364 staterooms. These are in double tiers for the entire length of the main saloon and gallery decks, and upon the main deck there are 139 rooms. On the gallery deck there are 152 rooms, and for considerable area on this deck the staterooms are in treble tiers. This is made possible as the top of the wheels reaches only to the base of the gallery deck, thirty additional staterooms on either side being thus secured.

The sanitary arrangements of the Puritan are in accordance with the latest and most improved provision applied in the finest and most costly edifices on land, and are as near perfection as scientific discovery and invention have yet attained.

And let no one suppose that the efforts of the designers and builders of this great ship were directed with a view alone to beauty and magnificence. First of all the safety, comfort, convenience and accommodation of passengers and ship's company have been studied, the taking advantage of all opportunities for attractive and appropriate ornamentation following in order. In every part and department, provision matches demand, and the useful and beautiful are found side by side.

American Society of Civil Engineers.

The fortieth annual meeting of this society was held in this city on January 21 and 22. Some two hundred members, including most of the distinguished engineers of the vicinity, attended the sessions. At the first day's meeting, in the Twenty-third Street Baptist church, annual reports of committees were read, officers were elected, and general business was transacted during the first sitting. The treasurer's report showed receipts of $36,654.39, and disbursements of $34,089.03. The Norman gold medal was awarded to John R. Freeman, of Boston, Mass., for his paper on "Experiments relating to the Hydraulics of Fire Streams." The Rowland prize of $50 was awarded to O. Chanute, John F. Wallace, and W. H. Breithaupte, joint authors of a paper on "The Sibley Bridge."

"The following officers were elected: President, Octave Chanute; vice-presidents, Alphonse Fteley and Charles Hermany; secretary and librarian, Francis Collingwood; treasurer, John Bogart; directors, Chas. B. Brush, Rudolph Hering, Clemens Herschel, Edward P. North, S. Whitney.

"At the evening session the following committees gave their reports: On Compressing Cements and Settlement of Masonry, Uniform Methods of Testing Materials Used in Metallic Structures, Standard Rail Sections, Domestic Water Supply, Uniform Standard Time, Units of Measurement, International Engineering Congress, and Failure of South Fork Dam. A stereopticon description of the progress of the work of the Chignecto Ship Railway was given by John F. O'Rourke, of Amherst, N. S."

The next day, January 22, was devoted to the inspection of various places of interest in this city, Brooklyn and Jersey City. In the evening a reception was held in the rooms of the society, 127 East Twenty-third Street. The society has adopted the 24 hour notation of time. Its announcements of time include, therefore, such hours as 18 o'clock, 15 o'clock, and the like.

Horse Notes.

Senator Stanford received a dispatch from his California agent recently, announcing the death from rheumatism of his famous stallion Electioneer, probably the most valuable stallion in the world.

Just what his value was, says the *Amesbury Vehicle*, it would be hard to determine, as no price has been put on him for twelve years. He has earned as much as $40,000 in a year, though, and it would be safe to estimate his value at $200,000.

Electioneer was foaled in 1868, and was bred by Charles Backman, of Stony Ford, N. Y. Senator Stanford bought him of Backman twelve years ago for $25,000, at that time the highest price that had ever been paid for a stallion.

Since he came into Senator Stanford's possession, Electioneer's colts have sold at prices ranging from $3,500 to $18,000. Electric Bell sold at the latter figure before he was a year old.

Bell Boy had the most remarkable career of any of Electioneer's get. Senator Stockbridge took a fancy to him, and bought him from Senator Stanford for $5,000. He sold him for $35,000, and he was afterward sold for $51,000.

An extraordinary horse has recently been brought to Boston. He is a beautiful golden chestnut, with light mane and tail, white hind feet, and white face. He is seven years old, weighs 1,435 pounds, stands 16 hands high, and is three-fourths Clyde, one-eighth French, and one-eighth Printer.

Linus—that's his name—was born in Marion, Ore., May 20, 1883, and is considered a perfect and beautiful animal. The fact that at the present time his foretop is 8 feet, mane 8 feet 8 inches, and tail 12 feet 3 inches in length, is certainly wonderful, and makes him an extraordinary attraction.

No particular care or attention was given the horse until he was five years old, when his foretop, mane, and tail had increased so much in length that they reached the ground. At this time his owners commenced to put them in braids and bag them up. Some four months after it was braided the hair was loosened and found to have grown seven inches. On account of such rapid growth, the owners commenced to cultivate it, and it grew rapidly, and at the present time has reached the length mentioned above.

In the last twelve months the mane has grown 14 inches and the tail 16 inches, and both are still growing.

The horse commenced to attract considerable attention and the owners, the Rutherford Brothers, extensive Oregon cattle dealers, were induced to place him on exhibition in the town of Marion, Ore. Realizing, however, that the horse was peculiarly adapted for show purposes, and not having any knowledge of this particular line of business, they offered him for sale. Photographs of the horse were sent East, and a copy happening to attract the attention of C. H. Eaton, of the Eaton stock farm, of Lexington, that gentleman made up his mind to investigate.

The result was that Mr. H. W. Eaton made a journey to Marion. One sight of the wonderful equine convinced him of future possibilities, and in behalf of Eaton Brothers he made an immediate purchase of the longest haired (mane, tail, and foretop) horse in the known world. The price paid was $30,000 cash.

The horse was taken aboard the cars for Boston, and while in transit a stop was made at Albuquerque, N. M. Here a syndicate offered $50,000 for him, which was refused. A further inducement, in the shape of $1,000 for a three days' exhibition, was offered. This was also refused, and the trip to Boston was continued and finished after a journey of twenty-seven days.

The present owners of the wonder, the Eaton Brothers, are both horsemen, and are well known to all owners of thoroughbred stock throughout the United States. They have stock farms at Calais, Me., and Lexington, Mass.

At the Bottom of the Sea.

At the depth of about 3,500 feet waves are not felt. The temperature is the same, varying only a trifle from the ice of the north pole to the burning sun of the equator. A mile down the water has a pressure of over a ton to the square inch. If a box six feet wide were filled with sea water and allowed to evaporate under the sun, there would be two inches of salt left on the bottom. Taking the average depth of the ocean to be three miles, there would be a layer of pure salt 230 feet thick on the bed of the Atlantic. The water is colder at the bottom than at the surface. In many bays on the coast of Norway the water often freezes at the bottom before it does above.

Waves are very deceptive. To look at them in a storm one would think the water traveled. The water stays in the same place, but the motion goes on. Sometimes in storms these waves are forty feet high and travel fifty miles an hour—more than twice as fast as the swiftest steamship. The distance from valley to valley is generally fifteen times the height, hence a wave five feet high will extend over seventy-five feet of water. The force of the sea dashing on Bell Rock is said to be seventeen tons for each square rod.

Evaporation is a wonderful power in drawing the water from the sea. Every year a layer of the entire sea, fourteen feet thick, is taken up into the clouds. The winds bear their burdens into the land, and the water comes down in rain upon the fields, to flow back at last through rivers.

The depth of the sea presents an interesting problem. If the Atlantic were lowered for 6,564 feet, the distance from shore to shore would be half as great, or 1,500 miles. If lowered a little more than three miles, say 19,680 feet, there would be a road of dry land from Newfoundland to Ireland.

This is the plan on which the great Atlantic cables were laid. The Mediterranean is comparatively shallow. A drying up of 660 feet would leave three different seas, and Africa would be joined with Italy.

The British Channel is more like a pond, which accounts for its choppy waves. It has been found difficult to get the correct soundings of the Atlantic. A midshipman of the navy overcame the difficulty, and a shot weighing thirty pounds carried down the line. A hole is bored through the sinker, through which a rod of iron is passed, moving easily back and forth. In the end of the bar a cup is dug out and the inside coated with lard. The bar is made fast to the line and a sling holds the shot on. When the bar, which extends below the ball, touches the earth, the sling unhooks and the shot slides off. The lard in the end of the bar holds some of the sand, or whatever may be on the bottom, and a drop shuts over the cup to keep the sand in. When the ground is reached a shock is felt, as if an electric current had passed through the line.—*Ocean.*

THE *Electric Review* thinks it a poor place for the telephone in the land of the Arabs. They have no "hello" in their language. The nearest they can come to it is to throw a stone and hit a man in the back, and then ask him, as he turns around: "Does it please heaven to give you good health this morning?" There are some unscientific people who say they would prefer the stone in the back to a wrestle with the telephone on some exasperating occasions.

The American Slate Industry.

The superintendent of the census has lately published the report of William C. Day, prepared under direction of Dr. David T. Day, on the slate industry, from which it appears the total value of all slate produced in the United States in 1889 is $3,444,863. Of this amount, $2,775,271 is the value of 828,990 squares of roofing slate, and $669,592 is the value of slate for all other purposes besides roofing.

As compared with the census report of 1880, the slate product of 1889 is nearly twice as great in number of squares and in value.

Twelve States at present produce slate. A line drawn on the map from Piscataquis County, Maine, to Polk County, Georgia, and approximately following the coast outline, passes through all the important slate-producing localities. According to amount and value of product, the most important States are, in the order named, Pennsylvania, Vermont, Maine, New York, Maryland, and Virginia. In the remaining six States productive operations are of limited extent, and in the case of Arkansas, California, and Utah, of very recent date.

The twelve States referred to do not include all those in which merchantable slate is known to exist, since discoveries promising good results for the future have been made in a number of other States, among which may be specially mentioned Tennessee, where operations of production are beginning.

The Bangor region, which is entirely within Northampton County, Pennsylvania, is the most important. This region includes quarries at Bangor, East Bangor, and Mount Bethel, Pennsylvania.

The Northampton Hard Vein region is specially distinguished on account of the extreme hardness of the slate as compared with that produced in other regions of the State. This region includes the following localities: Chapman's Quarries, Belfast, Edelman, Seemsville, and Treichlers, all in Northampton County.

The Vermont and New York region includes an extensive slate formation occupying a part of the old Champlain Valley, lying between the western base of the Green Mountains of Vermont and the southern trend of the Adirondacks in New York. The area in which slate is actually produced at present is confined to a narrow strip in Washington County, New York, and a somewhat wider one lying next to it in Rutland County, Vermont. It extends from Castleton, Vermont, on the north, to Salem, New York, on the south, a distance of 35 or 40 miles, and has a maximum width of six miles, but the average is not more than a mile and a half. With the exception of red slate, the production of which is at present limited to Washington County, New York, the general character of the slate in Vermont and New York is the same.

The slate quarrymen of the country, and to a considerable extent the firms operating the quarries, are either Welsh or of Welsh descent, many of them having learned the methods of quarrying slate in the celebrated quarries of Wales.

The quarries are operated on an average of about 220 days in the year. The idle days are the result of rainy weather and holidays. The first day of every month is regarded as a holiday by the Welsh quarrymen, and no work is ever done by them on Saturday afternoons.

The average wages for the entire country paid to foremen or overseers is $2.48 per day; for quarrymen and millmen, $1.56; for mechanics, $1.64; for laborers, $1.27; and for boys, $0.76.

Sand on the Columbia River.

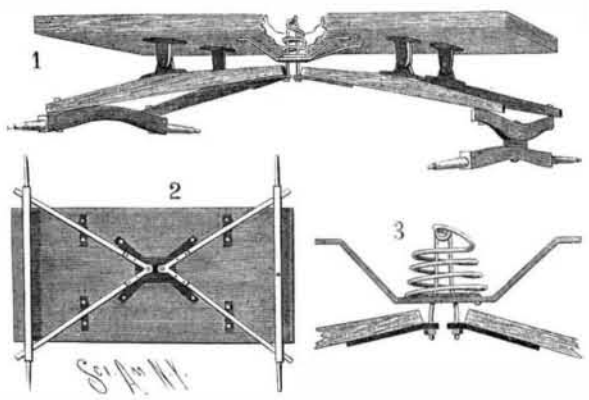
Sandstorms along the upper Columbia have long been a great source of annoyance and expense to the company operating the railroad through that section, trains frequently being delayed a day or more, at a time, from sand blown on the track. Heretofore no systematic effort has been made to get rid of the sand. A large gang of Chinese has been employed for years at an expense of about $18,000 a year, to simply shovel sand off the track, and pile it up on the other side in a most convenient place for being blown back again. In some places the sand was from eighteen to twenty feet high on each side of the track, the accumulation of years, and much of it has been shoveled over hundreds of times.

A scheme has been adopted for the removal of the sand by sluicing it into the river by means of water supplied by a force pump on the river, near which the road runs for a long distance. The scheme bids fair to prove a great success, as with a comparatively small pump the sand is washed into the river for four cents a cubic yard, and a larger pump is being sent to the front, by which it is expected that the sand can be moved for three cents a yard.—*Pacific Lumberman.*

ONE of the latest inventions in connection with the electric light is a silent cab call. Several clubs and hotels in London have already been supplied with this useful commodity. Two lamps are suspended outside the building, one red and the other green, and by pressing a knob in the entrance hall one or other of the lamps can be lit at will. The red light calls a four-wheeler, and the green a hansom.

AN IMPROVED CARRIAGE SPRING.

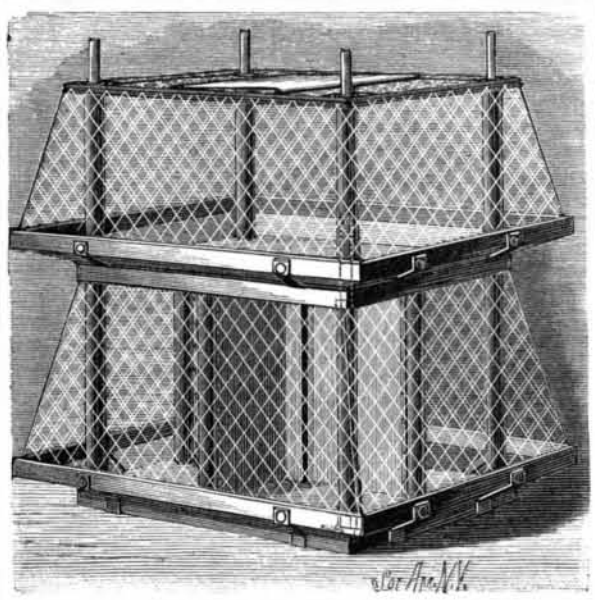
The construction shown in the illustration is very light, while with it the body settles evenly without regard to the placing of the load, does not tip when one gets in and out, and may be made of full width. It has been patented by Mr. Alfred Conner, of Exeter, N. H. Pivoted on the under side of the platform are four bearing arms or levers, whose outer ends are connected to the axles, and whose inner ends come together centrally under a spider-like supporting frame attached to the under side of the platform, as shown in Figs. 1 and 3, a conical spiral spring between the body and frame here connecting the inner ends of the bearing arms with the body. Any other suitable form of spring may be used instead of the one shown in the illustration. Fig. 2 is a bottom plan view showing the application of the invention. A vehicle in which this construction is followed is not liable to get out of order, and is designed to afford easy riding and obviate all rocking motion, while any tendency to upset in turning corners is materially lessened. With a heavy person on one end of the seat and a light one on the other, there will be no tipping of the seat to one side, the arrangement of the spring and bearing arms causing the body to settle evenly.



CONNER'S "CLIMAX" CARRIAGE SPRING AND HANGING APPARATUS.

A CRATE FOR SHIPPING AND EXHIBITING POULTRY, ETC.

A crate especially designed to safely carry and advantageously exhibit poultry, etc., and which may also be used for the conveyance of perishable articles generally, while, when not in use, it may be knocked down and packed in small compass, for storage and transportation, is shown in the accompanying illustration. It has been patented by Mr. Henry M. Bickel, of Larned, Kansas. The crate is made with opposite flat sides and beveled end sides, covered by wire netting, and has a detachable floor, on the outer edges of which are straps by which the floor may be connected with buttons on side strips. At the corners of the floor are beveled perforations, adjacent to which are hinged vertical posts, extending downward through the floor and upward through the ceiling of the crate, the upper ends of the posts being reduced in size, thus forming shoulders to support the ceiling, and means for connecting with supporting posts above, whereby any number of similar crates may be thus superimposed on each other, our illustration representing a double crate. The top of the lower crate has centrally sliding doors moving in slideways, and the top of the upper crate has a swinging door held closed by a suitable catch, whereby fowls, etc., may be conveniently placed and confined in the crate. Detachable posts are used in connection with the upper crates, and the floor of the bottom crate has a removable central post, which, with other posts near the edges of the floor, is adapted to support partitions of cloth or webbing, whereby the crate may be divided into such number of compartments as desired. The webs pass through slots in the center post, so that they may be easily regulated or moved. A detachable floor is also provided, of cloth or other flexible material, a strengthening rod or rib extending around its outer edge, adapted to fit within the side strips of the crates, this floor also having straps adapted to connect with buttons on the side strips. The crate shown, instead of being double, may be put together to afford one large interior compartment, with no dividing floor, the bevels from the top and bottom edges then giving a larger central horizontal portion. The network sides may also be made in globe form, the posts, supports, and side strips provided for in the construction admitting of application in the making of various shaped crates, as well as facilitating the nesting of them in such way as may be deemed desirable.



BICKEL'S KNOCKDOWN CRATE.

Stimulants for Pot Plants.

The successful florist has more faith in giving stimulants when the plants really need them than in keeping the roots buried in soil made rich and almost offensive by strong manure. When roots are few and the plants are almost at rest, the purer the soil and the less stimulant the plants receive, the better will they thrive when their roots come to draw up larger supplies of nourishment.

Moisture is needed to soften the soil and to allow the roots to extract nourishment from it, but when all the virtue is out of the earth and the plants begin to show signs of distress, all the watering in the world will not give vigor to the exhausted functions, but let a portion of guano or any well prepared manure be mixed with the water sufficient to color it, and let this be repeated at every watering instead of giving a much stronger dose at longer intervals, the result will be most satisfactory. The beneficial results obtained from manure water when judiciously applied to flowering and fruiting plants have long been recognized by cultivators, and its use is now becoming more general.

A valuable liquid is made by using ammonia, putting about one teaspoonful to two quarts water when watering the plants.

Plants require about the same treatment except in the matter of food. Ivies may be given plenty of warm water, but should not be stimulated with liquid manure.

Callas will bear stimulating to almost any degree. Give them an abundance of stable manure and warm water. Commercial fertilizers are of no value in creating blossom stocks.

Give your pinks a little lime water, but never stimulate them with guano or anything of the sort.

Give roses a little powdered charcoal or weak soot tea. If flowers do not mature well, they may be made to by placing a layer of powdered charcoal half an inch deep on the earth in the pot.

Commercial fertilizers or plant food should not be applied oftener than once in two weeks. Stir up the soil around the edge of the pot and sprinkle in a small tablespoonful of the fertilizer, watering the soil slightly immediately after.

All stimulants should be applied with care. Begonias are particularly sensitive to them, and they should be used but seldom on geraniums; but to roses, fuchsias, carnations, heliotropes, and others they may be given with more safety.—*American Rural Home.*

Telegraph Statistics.

The following comparative figures may be of interest:

Country.	Miles of Telegraph Wire.	Messages per Annum.	Messages per Annum per Mile of Wire erected.
United States	776,500	56,000,000	72
France	220,890	30,050,000	136
England	180,000	50,000,000	277
Russia	170,500	10,280,780	60
Australia	105,300	12,000,000	114
Canada	58,500	4,027,581	69
Italy	19,500	7,000,000	360
Japan	16,500	5,000,000	303
New Zealand	11,375	1,835,394	161

Dentists' Moulding Wax.

Dr. P. David communicates to the *Journal de Pharmacie et de Chimie* an analysis of the composition known as "Godiva," or "Stent." Upon this he bases the following formula:

	Parts.
Stearin	25
Half-soft copal	25
Talc	50
Carmine	05
Oil of rose geranium	2 drops to the ounce

Melt the resin by the heat of a sand bath, and when slightly cooled add the stearin, stirring constantly. When this has melted add the other ingredients, previously intimately mixed, and stir so that a homogeneous product may be obtained.

The adhesiveness of the composition may be increased or diminished by modification of the amount of copal. A more thorough blending of the color may be insured by dissolving the carmine in a little potash solution before mixing with the chalk.

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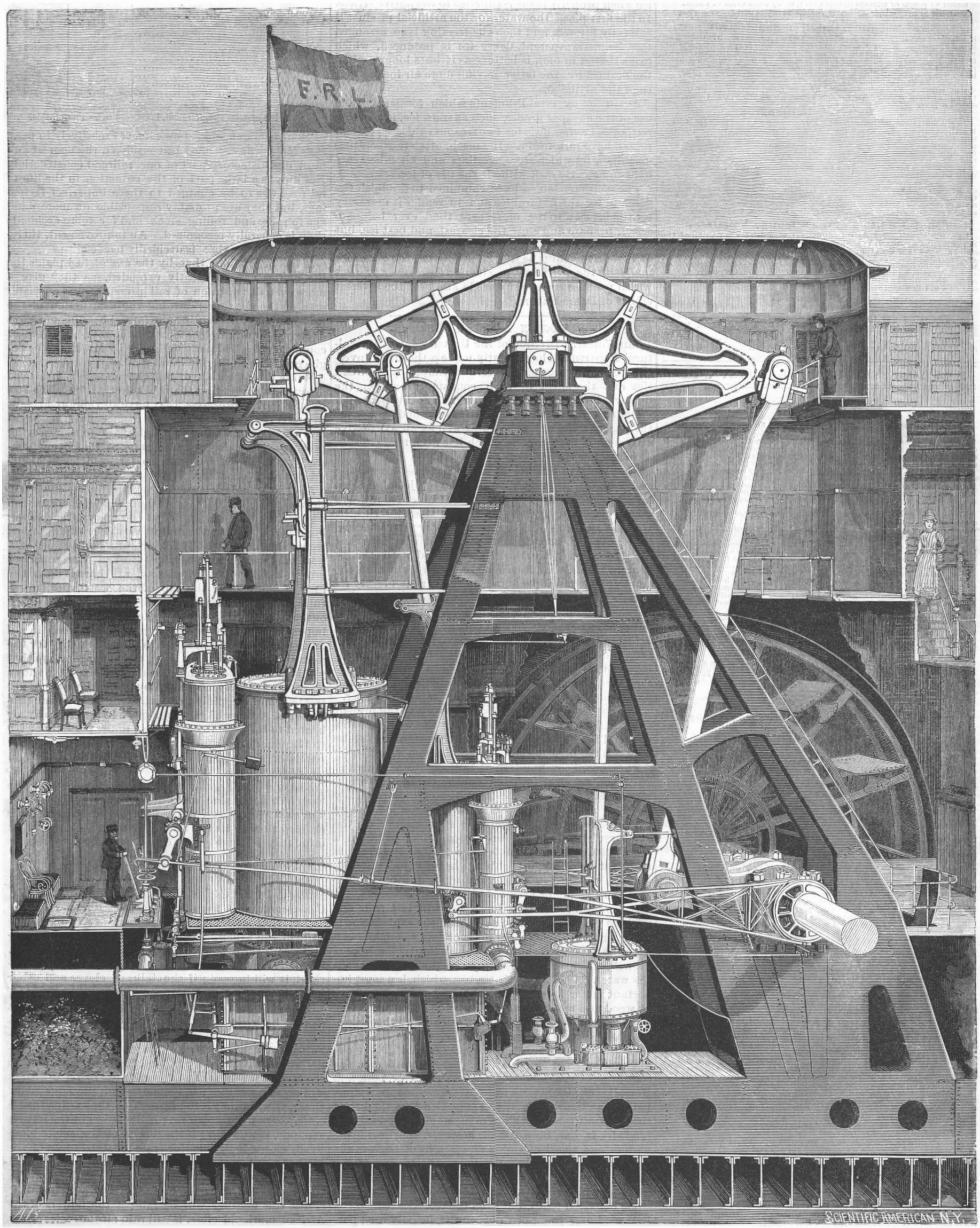

COMPOUND ENGINES OF THE FALL RIVER STEAMER PURITAN—7,500 HORSE POWER.—[See page 87.]