Destruction of our Elms.

The elm leaf worm has made its appearance again this year, destroying the foliage on the elms in our parks and on the highways in the vicinity of New York. The depredations of the larva of the imported elm leaf beetle have now become so great in the Eastern States that Mr. F. Bronncoke, of Westchester County, who seems to have made a study of the subject, thinks it is quite probable that all the European species of the elm, if not the American, will soon be destroyed. The beetles seem to prefer the European elms, but as soon as these are stripped of their leaves they go directly to the indigenous elms. All the remedies thus far tried or suggested are unsatisfactory, owing to the difficulty of application. On small trees the worms may be destroyed with kerosene emulsion, carbolic acid solutions, creosote, tar water, etc., but on very tall and large trees the cost of applying insecticides would be far more than the trees are worth. Furthermore, it is a waste of time for one man to apply remedies while his neighbor allows the beetles to breed unmolested, for these insects have wings and know how to use them when in search of food.

To Tan and Color Sheepskins with Wool on.

Tan in alum dissolved in water. Proportion: 1 pound alum to 1 gallon water. Then wash wool clean with plain soap. To color, use aniline of any shade you desire. Dissolve 1 pound aniline in 2 gallons water; strain before using; then float skin in a dye box, wool down. See that they lie flat, and let remain till color or shade you desire comes; then take out and run through clear cold water, and hang up in a hot room to dry. For plain white, wash the skins well, after tanning as described above. If not white enough, hang up in a small room and bleach with powdered sulphur. Set in a pail in center of room burning. Be careful to have no escape of the sulphur fumes, and have the room air tight.—*Shoe and Leather Reporter.*

AN IMPROVED WHEEL FENDER FOR CARRIAGES.

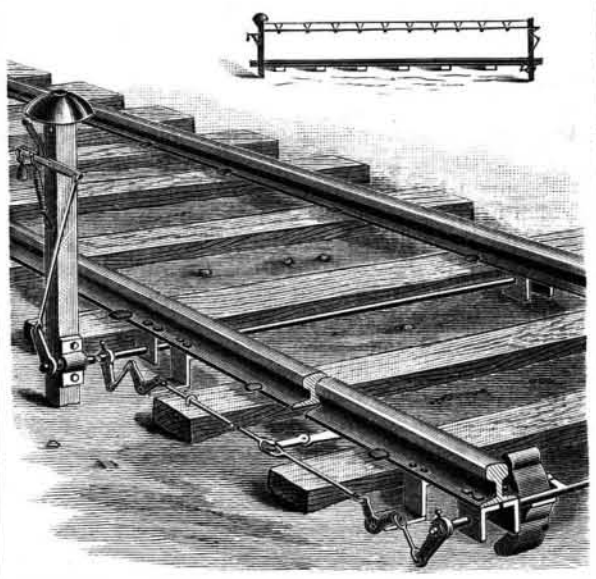
A wheel feeder and dress protector adapted for use on any kind of road vehicle, capable of being used as a fender upon the road and as a dress protector in mounting and dismounting, being easily placed in either position by a person seated in the vehicle, is illustrated herewith, and has been patented by Messrs. Arthur C. Rogers and Henry Stenz, of Faribault, Minn. In the upper end of a clip fastened on the axle is produced a compound recess consisting of a circular aperture, and a lower central intersecting aperture, in which is mounted a hub, from which extend arms or rods supporting a fender of the usual construction, a bar curved in conformity with the fender, and just below it, bracing and sustaining the arms extending from the hub. Upon the outer face of the disk-like hub, mounted in the clip fastened on the axle, is a central projection, of a form to admit of an easy and firm fit in the lower portion of the compound recess in the upper end of the clip. From the upper rear wall of the circular aperture in the hub projects a stop pin to limit the rearward throw of the device, and on the threaded lower ends of the clip is fastened a stop bar, with its forward free end turned up and bifurcated. The small views show in section the position of the parts when the device is used as a fender and as a dress protector. In the perspective view, the fender on the

ROGERS & STENZ'S WHEEL FENDER FOR CARRIAGES.

right hand wheel of the vehicle is in the usual position for travel on the road, the central projection in the outer face of the hub then fitting in the lower portion of the compound recess in the clip. The device is moved from this position to that of a dress protector, as shown on the left hand wheel, by slightly raising the hub in the clip, when it drops forward until the front arm supporting the fender engages the bifurcated end of the forwardly extending and upwardly curved stop bar, bringing the fender in position to act as a guard over that portion of the tire adjacent to the step.

AN IMPROVED RAILWAY CROSSING ALARM SIGNAL.

A simple and efficient device for automatically sounding an alarm as a railway train approaches a crossing is illustrated herewith, and has been patented by Messrs. George D. and Christian Rathmann, of Blair, Neb. A rock shaft is mounted transversely beneath the rails, upon brackets secured to their under sides, with one end of the shaft extending beyond the rails,



RATHMANNS' RAILWAY CROSSING ALARM SIGNAL.

to the side of the track, and carrying a lever arm connected to a pivotally supported bell crank lever, the latter being also in connection, by means of a wire suitably supported along the track, with a distant bell crank lever mounted in close proximity to a post carrying a gong, the bell crank lever being also connected with a hammer arranged to strike the gong. Just within the line of one of the rails, and in position to be struck by the flanges of the car wheels, a tripping dog is mounted upon the transverse rock shaft, the dog being normally held in nearly vertical position by a counterpoise, so that it will be turned downward and return again to position as each wheel of a train passes over it, thus operating the bell crank lever at the side of the track, and, through the wire stretched along to the post at the crossing, these impulses will be communicated to the hammer which strikes the gong, thus sounding an alarm at each approach of a train, the hammer being drawn back after each stroke by a suitably arranged spring or weight. The wire supported along the track may be carried by proper supports from posts placed at suitable distances apart, or it may be carried along the ties, or in a tube suitably arranged in connection therewith.

How to "Manage" Sewing Machines.

To the average manufacturer, whose business does not justify the keeping of an expensive expert, there is no piece of machinery that gives so much trouble and annoyance as the sewing machine. Very few men have patience enough to wrestle with one of them if it happens to be refractory. This ingenious and indispensable piece of mechanism, like most other things, is docile and tractable, however, when in the hands of one who understands it. Not long ago a Philadelphia merchant essayed to adjust his wife's sewing machine. After working a short time he became interested. He passed from that state of mind by regular stages to agitation, disgust, and to a towering rage. The result was a grand *denouement* with an ax and a succession of vigorous strokes.

Ths great trouble about amateur tinkering with a sewing machine is that too much is done. When any portion of the mechanism fails, it is usually for some trifling cause. Two or three little faults will make a combination calculated to prove intensely exasperating. The first endeavor then should be to find out just what is the matter. In this sort of doctoring, as in the science of medicine, the first, and by far the most difficult, thing is diagnosis. Having formed a reasonable theory of cause and effect, proceed with your remedy, and if a trial shows your judgment to have been defective, undo or replace the part altered before going any further. To begin with, one thing may be wrong which escapes your notice. Hence each time you make a change, the difficulty is in consequence multiplied. To become master of the art of repairing a sewing machine, it is requisite to understand the principles upon which the stitch is formed and the work fed. Little manual skill is needed. The parts are made by machinery, and are interchangeable, obviating the necessity for filing and fitting. Any observing and competent fore man or woman of a fitting or stitching room can learn to repair the modern sewing machine.

The breaking of silk or needles and the skipping of stitches can be remedied nine times out of ten in a few moments by turning a screw, or adjusting some part that has become displaced. If the needle is dull, or bent, or sharp in the eye, discard it at once and try again. If your machine breaks the silk, examine the broken end and determine whether it was cut or torn, also measure the end down from the take-up, so as to decide at what point in the revolution the trouble occurred. Turn the wheel slowly and watch the silk pass around the shuttle, and see that every part touched is smooth and clean. Many times a machine can be made to resume its good behavior by simply taking out needle and shuttle, giving it a thorough cleaning and oiling, without loosening or disturbing the adjustment, and then starting afresh. Of course, these machines occasionally defy for a time the best efforts of experts; but in very many cases they will readily yield to gentle treatment.

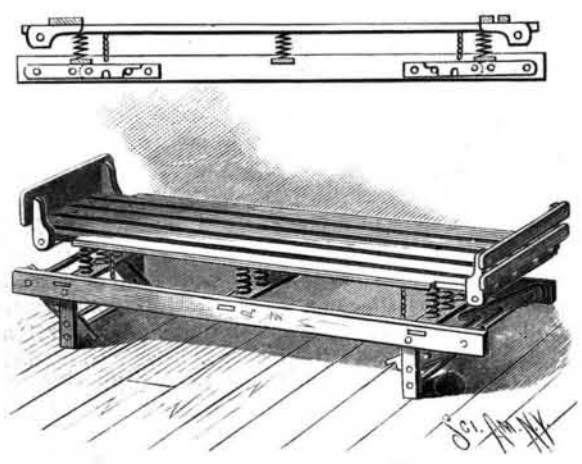
In the various fabrics on which a machine is used there is quite a diversity in the thickness and character of the work required. Frequently a machine working badly on one branch can be easily coaxed into performing valuable service in another. It is a good plan for every one having the care of sewing machines run by steam power to occasionally lubricate the points of greatest wear, such as the take-up cam, for instance, with heavy oil, meanwhile keeping each supplied with oil of lighter density for daily use. Wheel feed machines are always more expensive to keep in repair than the drop or step feeds, and hence should never be used when the latter will answer the purpose just as well.—*Shoe and Leather Reporter.*

Progress of the Ship Canal between Manchester and Liverpool.

An extraordinary meeting of the shareholders, for the purpose of approving a bill now before Parliament to authorize certain alterations in the plans of this work, was lately held. In the course of the proceedings it was stated that there were 56 steam excavators, 73 locomotives, 2,367 wagons, 50 steam cranes, 79 miles of temporary railroad, and 6,000 men employed. The excavations during the month of May amounted to 21,371 cubic yards of rock and 1,009,052 yards of soil. The bill provides for an alteration in the plans which gives 114 acres of water space, against 100 in the old scheme, the quay space being 152 acres, against 83, and the quay frontage 5⅛ miles and 4 miles respectively. There is thus a large increase in the accommodation provided, while the cost is reduced by £23,000. In the course of a few remarks, the contractor, Mr. Walker, said that he had 48,000,000 cubic yards of excavation to carry out, which would mean about 1,000,000 yards per month. This rate was now exceeded, and before the end of the summer he hoped to excavate 2,000,000 yards per month. The bill was unanimously approved, and the general tone of the meeting was a confident one.

AN IMPROVED FOLDING COT.

A cheap, strong, and simple folding cot, in which the slats are supported directly by the springs, and which, when folded, occupies but small space, has been patented by Mr. John C. Porter, of No. 181 First Avenue, New York City, and is illustrated herewith, in perspective and a sectional view of the cot when folded. The side pieces of the main frame are secured together by cross pieces, to which are attached the coiled springs which support the slats. Folding legs are pivoted to the under side of the side pieces near their ends, being secured together in pairs by rounds, notched holding arms, also pivoted to the side pieces,



PORTER'S FOLDING COT.

and held together in pairs in the same manner as the legs, being adapted to fold up between the side pieces with the legs, or, when the latter are turned down, to serve as stops and braces therefor. When the cot is folded, the legs and holding arms lie flat against its bottom, between the side pieces, but to arrange it for use, the legs and folding arms are pressed downward, and the notches in the latter placed in engagement with the rounds of the legs. The ends of the slats are also provided with folding head and foot pieces.

THE French government has organized a competitive exhibition of machines for decorticating ramie, to take place in August next at Paris, and 30,000 francs have been appropriated to defray expenses.

Microscopy.

The following is a list of the microscopical subjects exhibited at the reception recently given by the science department of the Brooklyn Institute:

Living desmids, by Edgar J. Wright. Desmids are microscopical plants living in fresh water. Their mode of propagation is by division, each half becoming a new plant. Skin of chameleon, by H. W. Calef. The chameleon is a kind of lizard, which sheds his skin every six months, when he rolls it up in a ball and swallows it. They are found in Florida, Egypt, and elsewhere. The skin is made up of minute scales, which overlap each other and reflect the light more beautifully according to the point of illumination. Mr. John Green showed the gizzard of a cricket, which gave some idea of how minutely and carefully the work of dissecting must be done to preserve and mount such an object. Professor A. K. Eaton presented a spectra microscope showing various spectra.

Exhibit No. 6 illustrates the use of the microscope in detecting food adulterations, specimens of pure baking powder and the adulterated article. This exhibit was by Charles J. Lawler. Professor W. Le C. Stevens presented a specimen of native copper, viewed binocularly with a Ross one and a half inch objective. Mr. George M. Mather, Anemia Mexicana, a variety of fern showing balloon-shaped pouches containing spores or seeds of the plant, also fossil insects in amber.

A. A. Hopkins showed crystals in glass. These crystals were accidentally produced in the process of glass manufacture, their nature is unknown, but they are very beautiful. Tumbling chips of selenite shown with polarized light by G. M. Hopkins were very curious and very beautiful.

Mr. Hopkins' exhibit of the circulation of blood through the tail of a gold fish attracted a great deal of attention, a crowd being around him during the whole time. A small live gold fish was put under the instrument, when the blood could be seen coursing through the veins of his tail like water running through a mill race. The microscope as an aid in finding parasites was illustrated by exhibit No. 13.

Trichina spiralis, which was dissected out of a human muscle, was shown by Mr. Joseph Ketchum. The same exhibitor showed a series of compound pendulum tracings on smoked glass, also a very beautiful series of crystals from the asparagus plant shown by polarized light. Dr. D. R. Brown showed blood corpuscles of amphiuma. Dr. William S. Torrey, section of kidney. Mr. P. S. Pretz, a louse. H. L. Brevoort, M.E., arranged diatoms. Theodore Gregg, elytron of a diamond beetle. W. H. Kent, naphthalene, a product of coal tar. It is one of the wonders of science that a specimen showing the most beautiful colors could be found in a substance like coal tar.

Exhibit No. 22 was butterfly scales and diatoms arranged as a vase, with fern and birds, by Henry E. Fincke; also, by same exhibitor, the feather of a humming bird, and an alkaloid obtained from the bark of a willow, displaying most beautiful colors. Mr. E. C. Chapman, minute shells from the bed of the ocean. These shells were inhabited by a jelly-like creature belonging to a lower order of animal life.

By Professor W. C. Peckham, platino-cyanide of magnesium crystals shown by polarized light, and internal hairs of yellow water lily. H. S. Woodman, specimens of pond life. George E. Ashby, tingis hyalina. Henry E. Fincke, a microphotograph representing Paul preaching at Athens. This subject to the naked eye is about as large as the head of a pin. Mr. Fincke also has a bouquet of flowers made of butterfly scales, and a specimen of arranged diatoms. H. Endemann, Ph.D., exhibited a microspectroscope. H. B. Baldwin, a very interesting and beautiful series of crystals found in butter. F. J. Wulling, transverse section of a stem of a plant. H. A. Tucker, Jr., M.D., saws of a saw fly. George B. Scott, group of polycystinæ. Z. T. Emery, M.D., section of pulp of a tooth. A. J. Watts, M.D., some very beautiful gold crystal.

No. 42 was rock section shown under polarized light, by J. W. Freckelton. Rev. J. L. Zabriskie showed the radula, or lingual ribbon, of the bonnet limpet. The radula is a thin flat band on the floor of the mouth of many mollusks, furnished with many transverse rows of sharp teeth, used in rasping the food. The radula of this species gives unusually brilliant colors by polarized light. F. D. Bailey, M.D., vertical section of the human scalp. Joseph H. Hunt, M.D., horizontal section of the human scalp. Thomas B. Briggs, section of graphic granite. This is a structural variety of aplite, a rock of limited occurrence, in which the quartz resembles Hebrew characters.

By James Walker, section of basalt from Palisades of New Jersey, shown by polarized light. Frank Healy, pollen on the anther of the marshmallow. By Dr. Herbert Fearn, M.D., transverse section of the stomach of a frog, also transverse section through the nail and finger of an infant. J. W. Martens, Jr., diaphragm of petiole of pickerel weed. Dr. H. N. Hoople, section of normal lung. By J. C. Cable, M.D., section of intestine of a cat. E. M. Woolley, M.D., injected muscle showing Trichina spiralis encysted within fibers. By Edgar S. Day, M.D., lining membrane retina of eye of a rat. Dr. W. D. Bancker, Jr., embryo of star fish, stained. Dr. Alexander Hutchins, section of kidney of cat. J. H. Gunning, M.D., longitudinal section of human bone. Dr. S. E. Stiles, M.D., skin from back of a dog, showing hair bulbs and director muscles of the hair. By Dr. Edward W. Victor, pollen on pistil of Colorado anemone. C. H. Taylor, pond life, showing a variety of living forms. Tobias New, foraminifera from River Nene, Cambridge, England, being minute chambered cells.

A feature of the exhibition was the drawings of microscopical objects and their explanation by Stephen Helm, F.R.M.S. The whole exhibition reflected great credit upon the microscopists of Brooklyn, and especially upon the microscopical section, the officers of which are as follows: George M. Hopkins, president; Joseph Ketchum, vice-president; George E. Ashby, secretary; Edward C. Chapman, treasurer; executive committee—John H. Hunt, M.D., George M. Mather, and Professor W. C. Peckham.

No one could look upon the large audience which crowded the Brooklyn Institute on this occasion and say that our people are not interested in scientific research. The success of this reception augurs well for the future progress of the new scientific department of the Institute.—*Brooklyn Eagle.*

Electric Night Signals for Use at Sea.

The system of signals by incandescent electric lights as recently adopted in the German and Italian navies was exhibited by Lieutenant W. H. Beehler, United States navy, on board the United States steamer Atlanta, at Annapolis, recently, during the graduating exercises.

The electric lamps are used in three lanterns twelve feet apart, hoisted at the masthead, and the lights are displayed by means of a switch box to open and close circuit through the combination of lights to make the desired signal. The lamps are arranged in pairs of one red and one white Edison lamp. Each of the three lanterns contains a pair of lamps, and no two lamps in the same lantern are displayed at the same time.

The switch box is a brass cylinder five inches in diameter and two inches high. Its upper surface is a dial with fourteen disks, one quarter of an inch in diameter. These disks are made of pieces of red and white glass arranged to show the same combination of signal lights displayed in the lanterns aloft. It has an index, and the knob in the center serves as a key, which, when raised, closes the circuit through the lamps aloft, corresponding to the combination covered by the index on the dial. When this knob is depressed, the lights aloft are immediately extinguished. The box has terminals to the dynamo machine, and six wires with a common return wire to the Edison lamps. It also has a receptacle for a small Edison lamp in the box to illuminate the red and white glass disks on the dial to be visible at night.

The fourteen combinations possible are as follows: White, 1. Red, 2. White—red, 3. Red—white, 4. White—white, 5. Red—red, 6. White—red—red, 7. Red—white—white, 8. White—white—red, 9. Red—red—white, 0. White—red—white, correct. Red—white—red—preparatory. White—white—white—answering. Red—red—red, interrogatory.

The system is readily adapted for the general naval signal book and telegraphic dictionary like the flag numerals of day signals. In order to make any signal, the message is first sought in the signal book and the number corresponding thereto is then signaled.

Records of the Fastest Atlantic Steamships.

The Cunard steamship Etruria was off Sandy Hook at noon on Saturday, June 2. The record had been beaten several times, not only by different vessels, but the Etruria had beaten her own record more than once. The Etruria left Queenstown just after lunch on Sunday, May 27, and was off Sandy Hook nearly two hours before lunch on Saturday, June 2. While the apparent interval of time was three hours less than six days between the two points, owing to the difference in time of four minutes to each degree of longitude she had crossed, she was actually six days one hour and fifty-five minutes between the two points, a span of 2,854 marine miles. Her average runs were 471 knots every twenty-four hours, but on one day, the day previous to her arrival off Sandy Hook, she made 503 knots. This was at the rate of 21 knots an hour, 2,124 feet each minute, and 35 feet each second, and for the entire run an average of 19 6-10 knots an hour. Previous to this last unprecedented trip of the Etruria she was the bearer of the champion pennant as the "Queen of the Ocean," but the pennant had alternated between the Alaska, the Arizona, the Aurania, the Oregon, the Umbria, and the Etruria. This, however, does not say that the steamers of the French and the North German Lloyd lines enumerated above are not equally fast, but as they sail between different ports their trips are not calculated in the comparison of the speeds between Queenstown and New York. For instance, the Aller, of the North German Lloyd, made the trip from New York to Southampton in September last in 7 days 4 hours and 25 minutes. This is equivalent to making the run to Queenstown in 6 days 9 hours and 49 minutes. The following is a table of the fastest transatlantic trips made and the vessels which made them:

EASTWARD.		d.	h.	m.	Year.
Etruria	N. Y. to Q'stown	6	4	36	1887
Umbria	N. Y. to Q'stown	6	7	10	1887
America	N. Y. to Q'stown	6	10		1884
Oregon	N. Y. to Q'stown	6	10	10	1886
City of Rome	N. Y. to Q'stown	6	18	30	1885
Alaska	N. Y. to Q'stown	6	18	37	1882
Arizona	N. Y. to Q'stown	7			1882
Servia	N. Y. to Q'stown	7	7	41	1882
City of Berlin	N. Y. to Q'stown	7	15	48	1875
Britannic	N. Y. to Q'stown	7	20	9	1873
Aller	N. Y. to S'thampton	7	4	25	1887
Lahn	N. Y. to S'thampton	7	7	35	1888
Trave	N. Y. to S'thampton	7	9	15	1887
La Bourgogne	N. Y. to Havre	7	13	34	1886
WESTWARD.					
Etruria	Q'stown to N. Y.	6	1	55	1888
Umbria	Q'stown to N. Y.	6	4	12	1887
Alaska	Q'stown to N. Y.	6	21	38	1883
Britannic	Q'stown to N. Y.	7	10	53	1887
City of Berlin	Q'stown to N. Y.	7	18	2	1875
Gallia	Q'stown to N. Y.	7	18	2	1882
Lahn	S'thampton to N. Y.	7	9	45	1888
Trave	S'thampton to N. Y.	7	13	30	1888
Aller	S'thampton to N. Y.	7	14	35	1887
La Bourgogne	Havre to N. Y.	7	12	..	1886

Vegetable Silk.

The *Moniteur de la Teinture* says: The vegetable fibers, to whichever class they may belong, are first of all treated for four hours in a bath of caustic soda at 12° B., the temperature being kept at 175° F., by which treatment the gums and resins are quite destroyed, leaving the fibers of a slightly yellow color, which is easily removed by a lukewarm (85°) solution of sulphuric acid at 60° B. The material is next well washed until it does not redden litmus paper, and is then subjected to a solution of chloride sodium at 7° B. The bleaching process being now completed, the fibers are dried, and are next placed in a bath of glucose or sugar at 8° B., for four or five hours, after which they are again dried, and then placed in a mixture of sulphuric and nitric acids, which will change the sugar into nitrosaccharose and the cellulose into trinitro-cellulose. This treatment should be followed by extraction, then by a fresh soap bath and by another rinsing. Next, the material should be placed in a bath of sumac at 85°, or of some other material that will impregnate the fibers with tannin, and this is to be followed by a cold solution of double tartrate of antimony and potash, which solution should contain about 30 per cent of the weight of the material. The fibers prepared in this way can be used either mixed with some other fiber or alone, but if they are mixed, they should be softened with either glycerine or olive oil.

A Proposed "Three Americas" Exhibition in 1892.

The chairman of the House Committee on Foreign Affairs in Congress has been authorized to report a bill providing for a permanent exposition of the Three Americas, in honor of the 400th anniversary of the discovery of America, under the joint auspices of the forty-six States and Territories and the sixteen independent nations of the American continent.

The bill provides that space for the exposition be assigned, under the direction of the President, in some unoccupied governmental reservation in Washington, as follows: 1. Space for a permanent State and Territorial building for a permanent exhibit of the representative history, resources, arts, and industries of the forty-six States and Territories of the United States, to be available whenever the States and Territories, or a majority thereof, shall make the necessary appropriations for the expenses of building and exhibit. 2. Space for a permanent Three Americas building for a similar permanent exhibit of the fifteen Spanish-American republics, the empire of Brazil, the dominion of Canada, and the various colonies of North, Central and South America, the space to be available whenever such nations and colonies, or a majority thereof, shall make the necessary appropriations for the expenses of building and exhibit. 3. A suitable site for a statue of Christopher Columbus, to be available whenever the necessary funds are provided for the expenses of the proposed statue.

The Tehuantepec Ship Railway.

The directors of the company formed under the leadership of Captain Eads to construct a ship railway across the Isthmus of Tehuantepec, Mexico, between the Mexican Gulf and the Pacific Ocean, met on June 9, in Jersey City, and gave the contract for the construction of the road to the Atlantic and Pacific Railway Company. The work is to be completed in five years. William Williams and Colonel John Andrews, of Pittsburg, were authorized to negotiate the bonds in America and Europe. The Mexican government has made liberal concessions. Vessels will be lifted in cradles and drawn on the track by steam engines. This ship railway may yet be in successful operation before the De Lesseps canal is completed.