

60 miles per hour has been made; the entire distance of 9.3 miles being covered in ten minutes.

The electric motor compressed air brake (Westinghouse type) has given excellent satisfaction. With regard to the third-rail transmission, it is stated that the contact shoes have proved satisfactory, though they have occasionally been carried away by the approach blocks at grade crossings. The system of insulation adopted has also given good results, as shown by the fact that when the ties have been two inches under water, as has frequently happened, it has been possible to operate the road without the slightest difficulty, the electrical output at such times, as recorded by the wattmeter, being normal. The bonding of the service rails with four copper leaf bonds, having a combined conductivity equal to that of the rail, has shown on careful test that the joints have slightly greater conductivity than the rails themselves.

The dangers of the third rail have proved to be lighter than anticipated, if, indeed, they can be stated to exist. People have stepped from the ground to the third rail without feeling the current. Many employes have at times received, through carelessness, the heaviest shock possible with little inconvenience, and those who are highly susceptible to electric shock have recovered fully in a few minutes after receiving the current.

On the score of economy of operation, it is difficult to give comparative figures, for the reason that the company is burning "sparks" (half consumed coal from the locomotives) in the boiler furnaces of the power house. At the Berlin power station, which is not being worked at anything like its full capacity, the cost of fuel, with the use of coal, has been nine mills per horse power hour, or twelve mills per kilowatt hour. When sparks are used the cost is three mills per horse power hour, or four mills per kilowatt hour.

STILL ANOTHER DODGE TO DEFRAUD PATENTEES.

The allurement held out to patentees by the many so-called "Patent Brokers" to put inventions in their hands for sale are now pretty well known, and it is only the unwary, unfamiliar with their many ingenious methods, that suffer loss.

Our attention has been called to a dodge which for plausibility and smallness of expected results is somewhat remarkable. The usual typewritten form is avoided, but instead a letter in the handwriting of the broker is sent to the patentee, assuring him that he has parties anxiously waiting to purchase the patent at the price the patentee asks, but, like every prudent purchaser of real estate, will not pay over the money until an abstract of the title of the patent is furnished. He (the broker) must have this abstract of title before his party will be prepared to close the bargain, and the patentee is recommended to employ some confederate in the same or some other place to secure the abstract, as he (the broker) has nothing to do with the soliciting of patents. The patentee generally has not sold any part of the patent and his title is good, but, being confused by the statement presented and attracted by the prospect of a quick sale, writes to the confederate for terms to secure the abstract of title.

The latter replies, quoting a stiff fee, and, if the remittance comes from the patentee, secures the abstract and sends it to him. The patentee then forwards the abstract to the patent broker and asks for a prompt closing up of the business, but either fails to get a reply or, if he does, one at least that is evasive. In the meantime the confederate divides the profit in the transaction, perhaps four dollars, with the patent broker who wrote the first letter. If, however, the patentee secures his own abstract of title and sends it to the patent broker, the latter replies that his prospective buyer became tired of waiting and went home, but had telegraphed him to come to his place, if all was straight, and close the sale. The broker also informs the patentee that he will be glad to visit the prospective purchaser if he (the patentee) will remit a sum (naming it) sufficient to cover his railroad fare, or instead of the money he may send a railroad ticket, which of course the patent broker could sell and secure the money therefor. Thus the patentee pays well to secure the abstract and at the same time is chagrined to find the supposed sale on which the abstract is based is bogus. Abstracts of title can be readily secured at small expense, either by the patentee himself or a reliable attorney.

Another form of fraud comes from an alleged finance company in London, who are acquainted with many large English manufacturers contemplating the purchase of factory sites in the United States in consequence of the new tariff. Numerous inquiries are made concerning rights to manufacture under American patents, and the American patentee is asked what is the lowest figure he will take for his invention.

Before the patent can be placed, a legal investigation into its scope, validity, etc., will be necessary, for which a moderate fee is called for and asked to be remitted without delay, and a commission will also be deducted, should success attend a sale. Unless the terms proposed are fully complied with, the American patentee is

requested not to reply. Here, as in the other case mentioned, the prospect for effecting a sale of the patent is the chief incentive set forth for the patentee to comply, and we imagine by many the motive will be easily discerned. It is to be hoped the exposition of these fraudulent schemes will result in their limitation and prevent many would-be patentees from being defrauded.

POST OFFICE FRAUD ORDER ISSUED AGAINST WEDDERBURN & COMPANY.

A fraud order has just been issued by the Post Office Department against John Wedderburn, John Wedderburn & Company and the National Recorder. An order of this kind deprives the parties against whom it is directed of all use of the United States mails. Hence all mail received for the parties mentioned at the Washington post office will be marked indicating that the business of these attorneys is fraudulent and will be returned to the senders. Money orders sent to the firm or the paper will be similarly dealt with.

It was stated at the conclusion of Assistant Commissioner Greeley's report on the Wedderburn case that the fact that the United States mail was being used by the respondent to promote schemes of fraud was called to the attention of the Post Office many months before the investigation. The report says, "The matter was placed in the hands of an official of that department who, for some reason, failed to do his duty. He has since, I am informed, been dismissed, and criminal proceedings against him for misconduct in office are pending."

About three weeks ago Gen. Tyner, Assistant Attorney-General for the Post Office Department, commenced an investigation in which he departed from the usual course in such cases by granting attorneys for Wedderburn & Company an extended hearing. The case was placed before the Postmaster-General, who, after careful consideration, decided that the fraud order should be issued.

The United States statutes under whose authority this action has been taken forbid the use of the mails by any persons conducting "schemes devised for the purpose of obtaining money or property under false pretenses," etc., and the Postmaster-General has authority to issue fraud orders "upon evidence satisfactory to him."

JAMES E. SIMPSON

Mr. James E. Simpson died October 27, at Fall River, Massachusetts. Mr. Simpson is very widely known on both the Atlantic and Pacific coasts of the United States, among ship builders, ship owners and shipping merchants, he being the patentee and originator of timber graving docks. Mr. Simpson was born July 13, 1813, and was therefore in his eighty-fifth year. The earlier portion of his life was devoted to the building and repairing of vessels, and while so engaged the idea of timber graving docks was conceived by him, and with the courage and energy which characterize the man, he carried out successfully the Simpson system of timber dry dock construction, which system has gained a world-wide reputation. Our Atlantic coast is dotted with these monuments of his skill, and there are also docks of his construction in the British possessions northeast of our own territory. The United States government, as well as the Colonial government of Newfoundland, have, from time to time, commissioned him to build dry docks for public uses.

The Commissioner of Patents, Hon. Benjamin Butterworth, was suddenly subjected to a severe attack of pneumonia the first part of last week, while he was stopping at the Hollenden Hotel, Cleveland, O. For two or three days his life was almost despaired of, and his family and near friends were called to his bedside. The latter part of the week, however, his condition greatly improved, and the advice as we go to press are to the effect that he will probably recover. This, it is to be hoped, will be speedily followed by his early restoration to complete health, as the Patent Office could ill afford at this time to be deprived of his services.

WHILE the pioneer work of exploration has been to a great extent accomplished in Africa, and the lines have been run in all directions, says the Popular Science Monthly, Mr. Scott Keltie speaks of the broad meshes between these lines as still needing to be filled in; and one or two regions yet remain that afford scope for the adventurous pioneer. One region of considerable extent, still practically unknown, is south of Abyssinia, and west and northwest of Lake Rudolf, on to the upper Nile. Another extensive area is in the western Sahara. All over the continent are regions that will repay special investigation. Even in northern Africa, an English traveler, Mr. Cowper, has found, not far from the Tripoli coast, miles of magnificent ruins, and much to correct on our maps; and but little is known of the interior of Morocco and the Atlas Mountains.

THE AMERICAN BEET SUGAR INDUSTRY.

In the struggle to gain a foothold in the agricultural economy of this country the history of the sugar beet has simply repeated itself. Europe scoffed at the idea of extracting palatable sugar from such a common garden vegetable when in 1747 one Marggraf, a member of the Berlin Academy of Sciences, announced that, after experimenting with various plants, he found the sugar beet richest of all in saccharine matter, his analyses showing a content of six per cent. Her scoffing availed, Marggraf could not secure the aid necessary to the pursuit of his investigations and was consequently obliged to abandon his project. Half a century later a pupil of his, Acharot by name, who had followed up his master's theories, obtained such excellent results that in 1799 he called the attention of the French Institute to the possibilities of this new factor in agriculture. That body heard him willingly and found the discovery worthy of its profound attention. Later on the great Napoleon became interested in the subject, foresaw the value of the sugar beet to France and in 1811 issued an imperial decree in its behalf. When he was overthrown, the industry—for such it became under his fostering care—almost went down with him, only one factory surviving the general disaster, but it gradually recovered until at length France had hundreds of plants. Germany in the meantime had awakened to the fact that it was neglecting a matter of vital interest to the nation. The industry soon made rapid strides there, and to-day sugar factories dot the landscape all over the country. Austria-Hungary, Russia, the Netherlands and even Scandinavia followed the lead, and while in some of these countries the development has not been very great, whatever headway that has been made has been gained only after tedious difficulties in overcoming prejudice.

So it was in this country that the industry has become established here only after repeated setbacks, shipwrecks being strewn along its path for half a century. As far back as 1830, or about the time that it really obtained a permanent footing in France, the manufacture of sugar from beets was attempted near Philadelphia, with most disastrous results. Eight years later another experiment was made at Northampton, Massachusetts, but with no better outcome. Then interest lagged for twenty-five years or so, when a factory was put up at Chatsworth, Illinois. It was run unprofitably for a few seasons and then removed to Freeport, in the same State. Here again failure was encountered and a part of the machinery was taken to Black Hawk, Wisconsin. Meanwhile experiments had been made at Fond du Lac which attracted the attention of capitalists, with the result that the field of pioneer work was transferred to California, where at length—in Alvarado—the first successful beet sugar plant in this country was established. Later on a second one was built at Watsonville, near San Francisco, so that at the beginning of 1890 two factories were permanently located. In the fall of the same year the plant at Grand Island, Nebraska, began operations, and, responding to the provision for two cents a pound bounty on refined sugar in the McKinley act of October, 1890, three more plants were built the following year—one at Lehi, Utah, one at Norfolk, Nebraska, and one at Chino, California. Under the same act a factory also went up at Staunton, Virginia, which, however, was not long after destroyed by fire. A change of administration, followed by the repeal of the bounty in August, 1894, stopped further progress in the industry until 1896, when a plant located in Berthierville, Canada, was removed to Eddy, New Mexico, and operated there. Another one was also built at Menominee Falls, Wisconsin, but, not being completed in time to work the crop, the company erecting it failed. The past summer the second of the Canadian factories was removed from Farnham to Rome, New York, and will begin its first campaign there this fall. These two Canadian factories, by the way, were omitted from particular mention because they were not located in the United States. Their aggregate output for the past four years has been only 1,400 tons—a mere bagatelle. A new plant has also been installed this year at Los Alamitos, California, and within the past few years both the Watsonville and Chino factories have been enlarged to double their original capacity.

This fall, therefore, we shall have in operation nine beet sugar plants whose daily capacities in tons of beets per day of twenty-four hours each are approximately as follows:

Watsonville, Cal.	1,000
Chino, Cal.	850
Alvarado, Cal.	400
Los Alamitos, Cal.	350
Lehi, Utah	400
Grand Island, Neb.	400
Norfolk, Neb.	400
Eddy, N. M.	200
Rome, N. Y.	200
Total	4,200

Last year the seven of these plants that were then in operation produced about 40,000 tons of sugar. What the output of this season will be can only be estimated roughly at this date, but it ought to be between 45,000 and 50,000 tons.

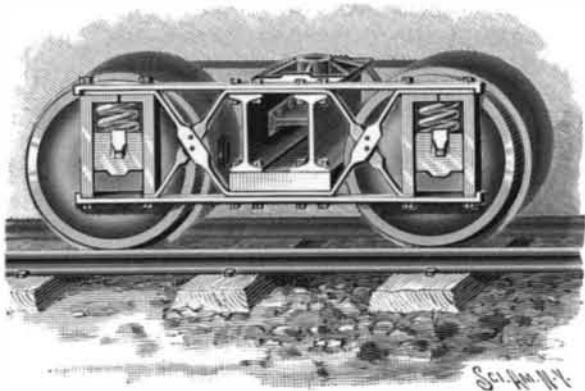
(To be continued.)

The New York Public Library Award.

The jury of award has decided unanimously that the design of Carrère & Hastings, of New York, shall be the one used in building the new Public Library building on the site of the old reservoir. This is the result of the second competition, in which twelve architects took part. The second choice of the jury was the design of Howard & Cauldwell, and the third, McKim, Mead & White. The work of preparing the plans for the building has been going on for more than a year and two competitions were held, both of which were conducted with the greatest care and fairness. Eighty architects competed in the first competition, and twelve of them were given prizes. Six of these prize winners were selected and asked by the committee to compete with six architects, with the result given above. It is said the building will cost \$1,700,000.

AN IMPROVED CAR TRUCK.

The illustration represents a car truck of simple construction in which the journal boxes are provided with sectional guides, so supported that any pair of wheels may be quickly and conveniently removed or replaced as may be necessary. The improvement has been patented by Henry Weston (address in care of John S. Rockwell, Erie County Savings Bank Building, Buffalo, N. Y.) The side frames of the truck, as will be seen by the engraving, are so braced as to be exceedingly strong, while the construction is very simple. The upper portions of the journal box guides, and also the spring seats, are made in two parts, the sections of the guide boxes

**WESTON'S CAR TRUCK.**

being of any approved construction and the vertical legs of the guides being provided with slideways on their inner faces to receive the boxes.

**The International Geological Excursionists.
DEATH OF ONE WHILE ASCENDING GREAT ARARAT.**

Mr. E. O. Hovey, who was one of the party on the Caucasus excursion, thus describes one of the sad features that occurred to mar the pleasure of the excursionists.

In view of the widespread report of the death of one of the party on Great Ararat, it may be well to give a brief outline of the ascent of the mountain and the circumstances of his loss. The party of twenty-eight took carriages to Aralykh and thence went on horseback the next day to Soudar-Boulagh, the Cossack camp on the saddle between the two peaks, arriving in the middle of the afternoon. Only the ascent of Little Ararat (13,000 feet) was contemplated by our leader, and no preparations were made for the ascent of Great Ararat (17,000 feet). Eight men, however, thought they would attempt the higher mountain, in spite of insufficient equipment and time, and they started out in two parties. One of them, consisting of E. Stoeber, of Wladikavkaz, Prof. Oebeling, of Berlin, and Dr. Oswald, of Strassburg, got away earlier than the others and spent the night with their Cossacks well up on the mountain slope. The second day an early start was made, and Stoeber, who, on account of his knowledge of Russian, was the organizer of the little party, pressed on ahead of the other men, who were more experienced mountaineers, and was soon out of sight. Members of the other party of five saw him at an elevation of about 15,000 feet, but he had gone before they reached the spot where he had stood, and receiving no response to their shouts, they supposed he had descended, and they came down the mountain without attaining the top. Oebeling and Oswald reached the summit late in the afternoon without seeing anything more of Stoeber. They came down the mountain as far as they could before dark, but were obliged to spend a severe night in the snow and reached the Cossack camp again some hours after the main party (who in the meantime had made a very successful ascent of Little Ararat) had departed for Aralykh. The two belated ones understood, from what the Cossacks said, that Stoeber had returned and gone on with the others, so they journeyed leisurely along, overtaking the main party at Erivan the next day. Then for the first time it became known that Stoeber was not with us, and that he must have been on the mountain for three nights. Telegrams were sent to Aralykh at once, and Cossacks sent out on the search, and the next day Stoeber's body was found, after it had lain on the mountain four days and

nights. He had slipped and broken his left leg just above the ankle. He must have fainted from the shock, and have frozen to death without recovering consciousness, for his leg was not drawn up, his hands were not clinched, and he had made no effort to get his brandy flask, to make any farewell note of his condition, or to move from where he had fallen. His death must be put down to his own recklessness in pushing on alone on such an expedition. He was a young man, an apothecary having a dilettant interest in geology.

A SIMPLE CAMERA.

The popularity of photography is due not less to the simplification of the camera than to the invention of the dry plate. The perfection of the dry plate opened photography to all who could afford it, but the invention of simple and inexpensive cameras rendered picture making practical for every one.

We give exterior and interior views of a camera designed to suit the requirements of a large number of amateur photographers who desire a low priced instrument which is simple, easily managed and which will take a picture of fair size and quality.

This camera, which is known as the "Ray" camera, is made by Mutschler, Robertson & Company, of 175 West Main Street, Rochester, N. Y. The front of the camera, which is removable, is provided with an opening near the center opposite the lens inserted in the partition closing the front of the box. There is also a small opening in the front piece near the top in which is placed the finder lens, the reflector and ground glass of the finder being fixed in the body of the camera. The shutter is the acme of simplicity. A metal disk is mounted on a spindle extending through the camera front, and provided with a milled head by which the shutter may be set. An eccentric pin projecting from the disk near the spindle receives the loop on one end of the coil spring, the other end of which is attached to a screw inserted in the front board. The disk has an oblong opening through which the plate is exposed as the shutter turns, two lugs extend from the face of the disk at its periphery, and a stop pin projects from the disk near one of the lugs. The detent which is pivoted to the front has a double-acting spring consisting of a straight piece of spring wire extending through a loop which projects from the front. The inner end of the detent extends toward the disk in position to engage the lugs or the stop pin. A check spring secured to the front board bears lightly upon the shutter and serves as a stop to prevent the recoil and reopening of the shutter.

The shutter is set by turning the disk by means of the milled head until the spring is extended and passes the center of the disk, and one of the lugs rests against the detent. The rotation of the shutter is always in the same direction, so that the disk acts as a safety shutter of the most efficient kind. In the outer surface of the front board is inserted an adjustable stop by which the aperture may be varied to suit different kinds of work. The end of the detent extends through the side of the camera, where it may be easily operated for an instantaneous or time exposure.

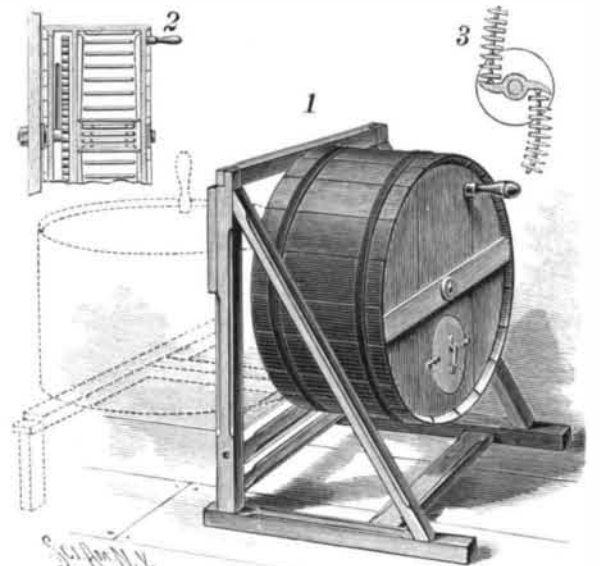
The rear end of the camera box has a space for plate holders. The plate holder is very light, simple and inexpensive. It is made of thin sheet iron, the parts being ribbed to render them rigid and connected together by folding or seaming, making a very compact light-tight holder. The slide is made of hard rubber and provided with a brass binding having an upwardly projecting loop for convenience in handling. The holder is provided with a fastener to prevent the accidental movement of the slide and is furnished with an efficient light stop for preventing the entrance of light as the slide is withdrawn.

The holder is furnished with a spring which holds the plate down in the channel at the bottom, so that it cannot accidentally become detached and fall out of the holder. Plates can be very easily inserted and removed. When the holder is inserted in the camera it is automatically locked, so that there is no danger of admitting light when the slide is withdrawn. Two such holders are furnished with the camera, and there is sufficient room for four additional holders. The holders are so light and compact that an additional half dozen or dozen can be readily carried in the pocket. The camera is provided with a suitable handle, and is furnished with a socket for receiving the screw of a tripod.

THE Havana floating dry dock, illustrated in our issue for October 16, 1897, reached Havana on November 7, after a successful voyage.

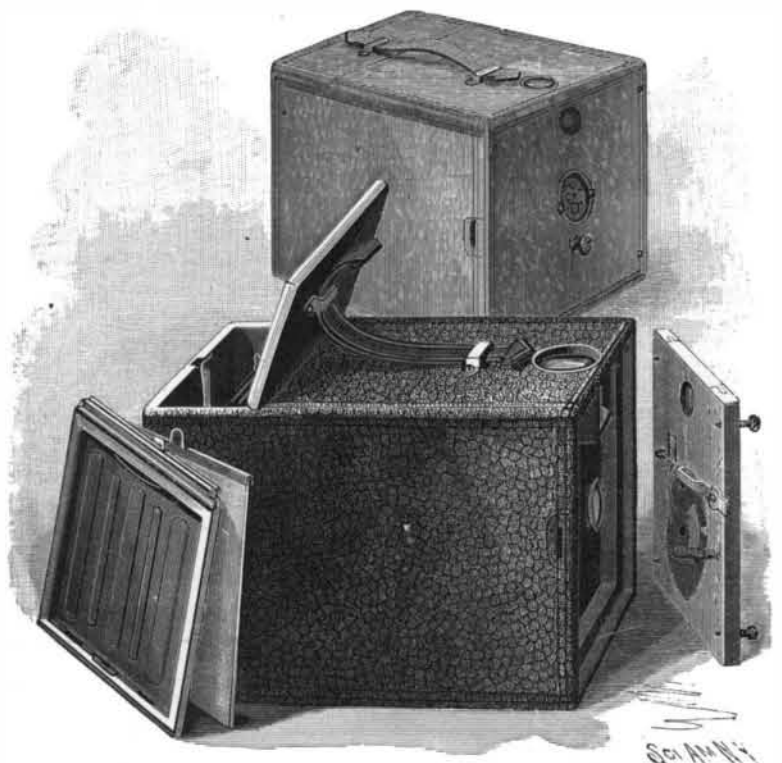
AN IMPROVED WASHING MACHINE.

The accompanying illustration represents a washing machine which is claimed to work very easily, and in which the washing of clothes is said to be accomplished very quickly and efficiently, being greatly facilitated

**PITZLER'S WASHING MACHINE.**

by the action of the beaters inside the drum. The improvement has been patented by Fred R. C. Pitzler, Lester Prairie, Minn. The drum of the machine is adapted to be turned over to horizontal position when the soapy water and clothes are to be placed in it, as indicated by the dotted lines in Fig. 1, Fig. 2 showing a section through the drum, and Fig. 3 representing the cylinder shaft with the attached beaters. Pivoted low down in the uprights of the framework is a cross bar joined at its center by a vertical bar with the top cross bar, the vertical bar and the two cross bars forming supports for the drum and allowing it to be swung to horizontal position, in which it is supported by posts hinged to the ends of the top cross bar, which then swing down into supporting position, as indicated by the dotted lines. The central shaft is fixed to the vertical bar, and does not rotate, but the drum is mounted to rotate on a sleeve which turns on the shaft, and the drum has a small inner watertight section containing gear wheels by which are operated beaters attached to the sleeve as the drum is rotated by the handle at one side, the sleeve being rotated by the gearing much more rapidly than the drum. The drum has on its inner periphery a series of longitudinal ribs, and the heads of the drum are also provided with radial ribs, there being in the outer head a filling opening through which the clothes are inserted. The beaters are attached, by means of cords or chains, to longitudinal flanges on the sleeve, and as the latter rotates the beaters are thrown outward by centrifugal force, striking the clothes and causing them to receive at the same time a rapid pounding and rubbing.

THE following telegram, dated October 18, has been received by the Royal Society from the Royal Geographical Society of Australasia relating to the experimental boring now in progress in the coral island of Funafuti: "September 16. 643 feet. Last 120 feet, coral reef rock. Still boring. Wrong machinery last year."

**THE RAY HAND CAMERA.**