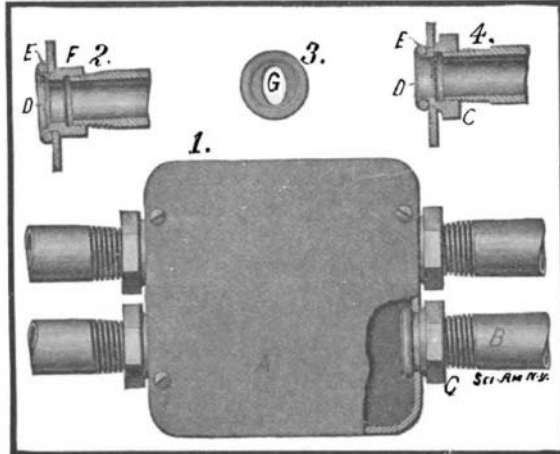


**COMBINED NUT LOCK AND BUSHING FOR CONNECTION BOXES.**

The invention which we illustrate herewith shows an improved method of connecting the ends of pipes to connection boxes, such as are used in electric wiring. The pipes are connected in such manner as to

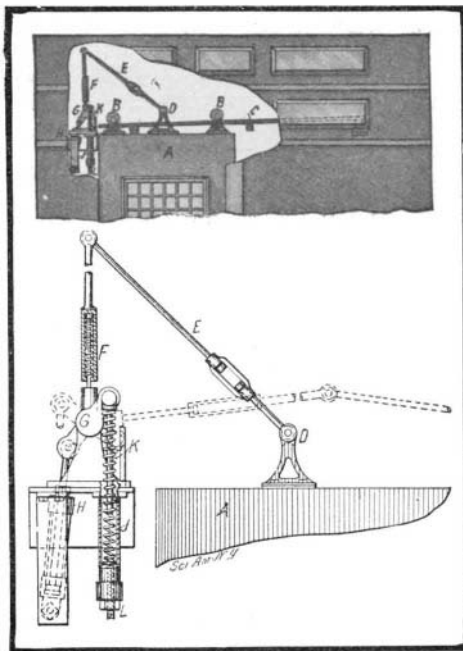


**COMBINED NUT LOCK AND BUSHING FOR CONNECTION BOXES.**

permit of rotation and at the same time to insure good electrical contact, in case it be desired to use the pipe as a return for any stray electric currents. The method of attaching the pipe to the box consists in the use of a device such as illustrated at C. This comprises a hexagonal member, interiorly threaded to receive the threaded end of a pipe B. The hexagonal member is formed with a tubular extension, adapted to fit in an opening in the wall of a connection box A. An annular flange D is formed on the end of this extension. The device is made fast to the box by placing a ring over the flange, and bending the latter back against the ring. By applying a wrench to the hexagonal part, the device may be rotated and threaded onto the pipe. Fig. 2 shows a slight modification, consisting of a tubular member F, in place of the hexagonal member C. An oval opening is formed in this member, as indicated at G in Fig. 3, so that when it is desired to connect or disconnect the pipe, the member F may be rotated by inserting a screw driver or any flat tool in the oval aperture. The rounded inner edge of the connection prevents wearing or cutting of the conductors which pass through the pipe. A patent on this device has been granted to Mr. J. S. Ritter and Dr. George F. Hummel, Ninth and Linden Streets, Allentown, Pa.

**DOOR CHECK AND CLOSER.**

In the operation of automatic elevators, which are usually controlled by means of push buttons on the different floors, it is essential that the doors be closed after leaving the elevator, as otherwise the circuit is left open, and it is impossible for any one on another floor to bring the elevator to him. In order to in-



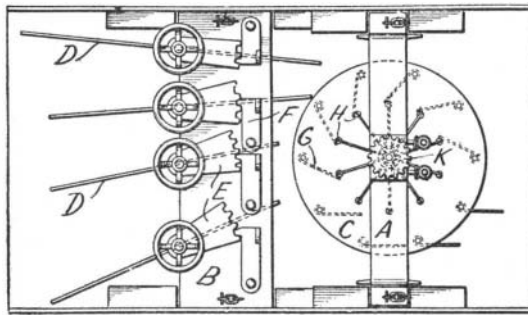
**DOOR CHECK AND CLOSER.**

sure the proper closing of the door, the mechanism illustrated in the accompanying engraving has been devised. The door of the elevator shaft is indicated at A, suspended from rollers B, which travel on an inclined track C. At one side is the closing mechanism, which is connected to the door A by means of a toggle lever E. In order to reduce the dimensions of this

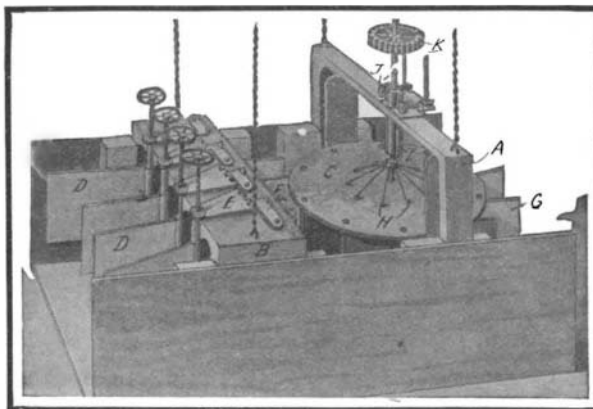
lever, one of the toggle members is made to telescope, as indicated at F, a spring serving to hold the member in its telescoped position. When the door is open, the toggle lever assumes the position illustrated by dotted lines. In swinging to this extended position, the two cranks G, which are fixed to the telescoping member of the lever, are swung on their axis, one of the cranks depressing a spring-pressed plunger in the cylinder J, and the other crank lifting a plunger in an oil cylinder H. The plunger in the latter cylinder is provided with a valve, which permits the oil in the cylinder H to flow freely through perforations in the plunger when the latter is lifted. On releasing the door A, the spring K serves to return the toggle lever to its normal position, drawing the door closed, while the oil in the cylinder H retards the plunger and cushions the movement to prevent concussion of the door when closing. This construction insures the closing of the door at all times, except when it is held open by the operator of the elevator. The mechanism is also applicable to any other type of elevator system, in which it is desired to insure positive closing of the doors without noise. The inventor of this elevator door closer is Mr. Joseph Fairhall, Jr., Danville, Ill.

**WATER CURRENT MOTOR.**

Pictured in the accompanying engraving is a water motor such as is used in streams and rivers for developing power. The motor is of the type provided with movable wings and it is furnished with means for controlling the position of the wings so as to enable the stopping or reversal of the wheel to be effected readily. The mechanism is carried in a flume which is lowered into the moving water. On the up-



**Plan view of the water-current motor.**



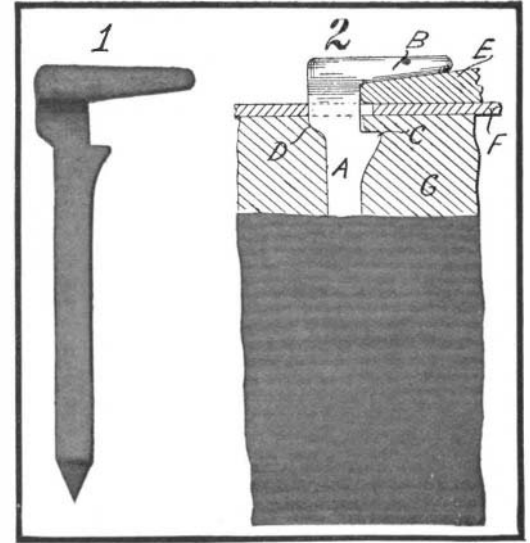
**WATER CURRENT MOTOR.**

position to direct the water against the vanes of the water wheel. The water wheel is supported in a frame A, which is suspended in such manner that it may be raised or lowered at will. Similarly, the wings are carried in a suspended frame B. The wings D are mounted on vertical shafts, provided with hand wheels at their upper ends. Secured to each shaft is a toothed sector E, the teeth of which are adapted to be engaged by dogs F. In this way they may be locked at any desired angle, so as to throw the water to one side or the other of the wheel C, depending upon the direction of rotation desired. The blades G of the wheel C, are pivoted at their outer ends, while their inner ends are free to swing against the stop pins H. The stop pins H are connected to a sleeve which is adapted to slide on the shaft of the motor wheel. This sleeve carries a rack I, engaged by pinions J, which may be operated by any suitable mechanism to lift the sleeve and raise the pins H out of engagement with the blades G. Thus, when it is desired to stop the wheel, it is merely necessary to raise the pins, permitting the vanes to swing free with the current. To reverse the wheel it is first stopped by withdrawing the pins, then the wings D are set to the proper angle, after which the pins are lowered once more and the wheel is turned by any suitable mechanism acting on the gear K, until the blades catch the current. The inventor of this improved water current motor is Mr. Asahel A. Porter, 329 North Willow Street, Waterbury, Conn.

**IMPROVED RAILWAY SPIKE.**

The railroad spike illustrated in the accompanying engraving is of such a design as to prevent it from working out of the cross-tie when in use. It is provided with an inclined shoulder which, when the spike

is driven into the wood, forces it inward, or toward the rail. A second shoulder or projection on the inner side of the spike is thus made to bite into the wood, and securely hold the spike in place. In the illustration the head of the spike A is indicated at B. The head is flat and its lower face is inclined so that it will fit snugly over the lower flange of the rail. The inclined shoulder, referred to above, is indicated

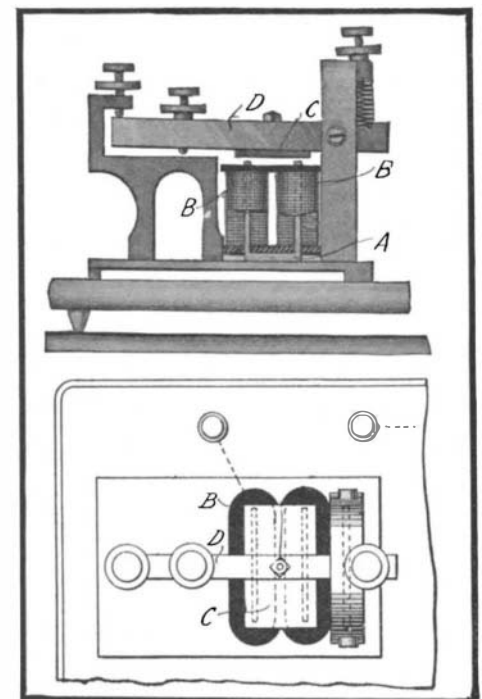


**IMPROVED RAIL SPIKE.**

at D, while on the opposite side is the projection C. The spike is designed to take advantage of the resilience of the wood of the tie G. It is started with its inner face about an eighth of an inch from the edge of the rail flange E. When the shoulder C engages the rail flange, the head of the spike springs back, permitting it to pass, and when the inclined shoulder D engages the tie plate F, the upper end of the spike is forced against the flange and the projection C is made to bite into the tie. If, in use, the spike works upward, the shoulder C will engage the under side of the rail flange, or the plate F, and thus be held in the tie. The result would be that while not giving perfect service in holding down the rail, the spike would at least keep the track from spreading. A patent on this railway spike is controlled by Mr. M. Sylvia, box 320, Goldfield, Nev.

**AN IMPROVED TELEGRAPH SOUNDER.**

A recent invention, which we illustrate herewith, provides an improved form of electro-magnet and armature, particularly adapted for use in telegraph sounders, to increase the sound produced by the apparatus. The sounder is mounted on a metal base supported only at the ends, so that it will act in the capacity of a sounding board. The core of the magnet consists of a flat plate bent to U-shape. Mounted on the two legs of this core are flat spools B, as indicated in the plan view. The armature lever D is provided with a broad armature plate C, adapted to be operated by the electro-magnets in the usual way. By using flat coils instead of the usual round coils, the poles of the magnet can be brought much closer together than usual, providing a much shorter path for the magnetic lines of force through the armature C.



**AN IMPROVED TELEGRAPH SOUNDER.**

In this way a louder sound is produced with the same battery, or if desired, the battery power can be cut down, for the sounder will make loud and sharp clicks with considerably reduced current. This type of magnet, while particularly designed for use in a sounder, should also be found useful in relays, electric bells, and various other forms of apparatus in which a mag-

net is employed. The inventor of this magnet is Mr. Lee Kiblinger, of Jackson, La.

#### REPORT OF THE COMMISSIONER OF PATENTS.

The recently issued report of the Commissioner of Patents is a record of prosperity and industry that cannot but redound to the credit of the Patent Office. Summarizing the statistics which the Commissioner presents, we learn that there were received in the last fiscal year, ending June 30, 1908, 58,527 applications for mechanical patents, 1,091 applications for designs, 207 applications for reissues, 2,036 caveats, 7,467 applications for trade-marks, 810 applications for labels, and 339 applications for prints. There were 34,902 patents granted, including reissues and designs, and 6,135 trade-marks, 636 labels, and 279 prints were registered. The number of patents that expired was 24,270. The number of allowed applications which were by operation of law forfeited for non-payment of the final fees was 6,520. The total receipts of the office were \$1,874,180.75; the total expenditures were \$1,608,292.01, and the net surplus of receipts over expenditures, being the amount turned into the treasury, was \$265,888.74.

The net surplus for the fiscal year ending June 30, 1907, was \$275,103.19, and for the past fiscal year \$265,888.74, so that the surplus is less by \$9,214.45. The number of patents, trade-marks, labels, and prints patented and registered in the fiscal year 1907 was 44,121, and in 1908, 41,952, which shows a falling off of 2,169. The cost of printing same in the fiscal year 1907 was \$271,178.48, and for the fiscal year ending June 30, 1908, \$314,528.86.

Although the number of patents issued was less by 2,169, the cost of printing the same was \$43,354.38 more than in 1907. This is accounted for by the fact that the charges for printing made by the government printer were, during a portion of the past fiscal year, much greater than in previous years.

The falling off in the number of patents, trade-marks, labels, and prints registered and issued from 44,121 in 1907 to 41,952 in 1908 is accounted for by the fact that the number of registrations of trade-marks is gradually diminishing. In 1905, 10,408 trade-marks were registered under the new law; in 1907, 8,798, and in 1908, 6,135, which latter number will probably be about the normal number hereafter issued. The trade-marks registered are less this year by 2,663 than the previous year. Labels are less by 24 and prints by 46. There was an increase in the number of mechanical patents granted of 339. There were 66,795 applications for patents, trade-marks, labels, and prints filed in 1907 and 68,441 in 1908, an increase of 1,646 over the previous year. It will thus be seen that the volume of business from all sources is about the same as that during the fiscal year 1907.

Once more the Commissioner emphasizes the immediate necessities of the Patent Office. The volume of work is growing so uniformly from year to year, it calls for additional space. Further rooms must be provided for the examining and other divisions of the office. For the scientific library, which is much crowded, shelving space and additional steel stacks are required.

The net surplus of all years of receipts over expenditures which have been covered into the Treasury up to June 30, 1908, shows a grand total of \$6,972,070.38. Nearly this whole sum has been paid by the inventors of the country; and inasmuch as they have paid the total expenses for the maintenance of the Patent Office, it is but fair to say that they are entitled to have a suitable building provided in which their business can be transacted in a prompt and efficient manner. The cost of this building and ground could be entirely paid for out of this surplus.

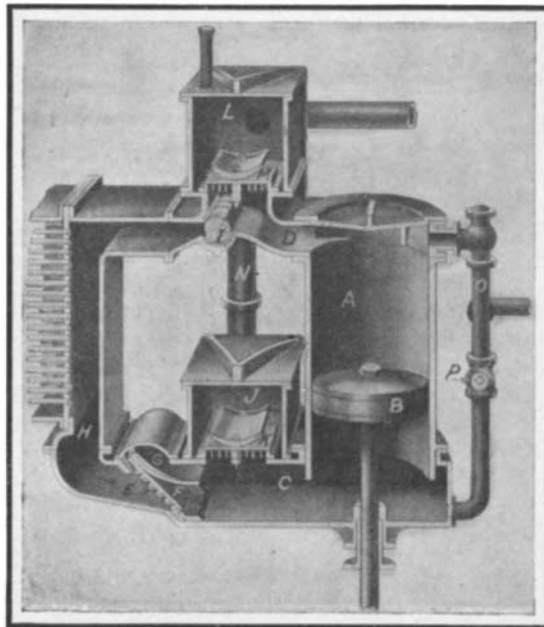
The Commissioner's former recommendations for increase of force and salaries is reiterated. Congress granted in part only the similar requests made last year. The following recommendations are made:

The salary of the Commissioner of Patents should be raised from \$5,000 to \$6,000 per annum, an increase of \$1,000; the salary of the assistant commissioner should be increased from \$3,500 to \$5,000, an increase of \$1,500, and he should be known in the future as first assistant commissioner; and an additional assistant commissioner at a salary of \$4,500 per annum should be provided. The business of the office has increased enormously since these offices were created and the time of the commissioner and assistant commissioner is now mainly occupied in hearing cases on appeal and other judicial duties.

The Commissioner also advises that the salaries of the board of examiners in chief, the next lower judicial tribunal of the office, be increased from \$3,000 to \$4,500 each, which would call for an additional appropriation for this board of three members of \$4,500; that the salary of the examiner of interferences, a court of first instance in this bureau, be increased from \$2,700 to \$4,000, as his duties, like the others above mentioned, are judicial. It is also asked that the salaries of the two law examiners be increased from \$2,750 to \$3,000, which will be a total increase

of \$500; that a chief of classifications be created at a salary of \$3,600. This work calls for a man who must have had both legal and technical training; also that the salary of the examiner of trade-marks and designs be increased from \$2,700 to \$3,600, an increase of \$900. The Commissioner advises that the salary of the forty-two principal examiners in the office be increased from \$2,700 to \$3,000, and an increase of ten fourth assistant examiners at \$1,500, an increase of \$15,000.

The work of the office has been and still is very



AN IMPROVED AIR PUMP.

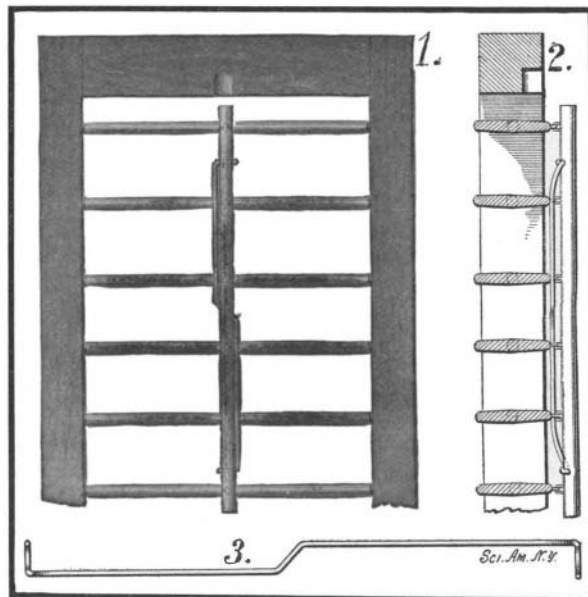
much in arrears, but with the additional force allowed by Congress and available July 1 it will be possible after the new examiners have had a few months' experience to bring the work practically up to date in all the examining divisions of the office, probably by December 31, 1908.

The legislative, executive, and judicial appropriation act, which became effective July 1, embraces a provision in relation to the disposition of model records, which has been commented upon more than once in these columns. The act provides that those models which are of possible benefit to patentees or of historical value, shall be cared for in the New National Museum Building, the remainder to be disposed of by sale, gift, or otherwise.

Under this authority some of the models have been placed in the Smithsonian Institution; 4,000 unapplied models have been sold, and the balance, which were deemed necessary to retain as records for office and court use, are being boxed, labeled, and catalogued, and stored temporarily in the basement of the Department of the Interior building until the completion of the new building of the Smithsonian Institution, where the law directs they shall be finally deposited.

#### A NEW SHUTTER ATTACHMENT.

The accompanying engraving illustrates a simple device which may be applied to shutters, so as to hold the slats in open or closed position, or at any angle desired, and to prevent them from rattling. The de-



A NEW SHUTTER ATTACHMENT.

vice consists of a spring member, which is placed between the slats of the shutter and the slat rod, to frictionally engage the slats and rod and hold them securely at any position. The spring member, referred to consists of a wire rod, which is bent at the center so as to form two offset sections, which lie at opposite sides of the slat rod and bear against the slats. The ends of the wires are bent to conform to

the shape of the slat rod, so that they can be seated thereon. The two sections are bowed slightly, so that when placed between a rod and the slats, they will exert a pressure which will hold the members in set position. The spring rod can be applied very quickly to any shutter, and owing to its resilient engagement of the slat and rod, will prevent the shutter from rattling in a wind. Mr. John L. McCaleb, of Carrizo Springs, Texas, has recently received a patent on this simple shutter attachment.

#### AN IMPROVED AIR PUMP.

The air pump illustrated in the accompanying engraving is especially designed for use with steam condensing apparatus for all types of steam engines and vacuum pans, and is arranged to produce a very high vacuum. The pump is of the double acting type, one end exhausting the gas and air from the condenser while the other withdraws liquid from the lower portion of the condenser, and the construction is such that water is injected into the air end of the pump to insure the complete expulsion of the gases and air and seal the piston. The engraving illustrates the pump in section as applied to a surface condenser of the tube type. The pump cylinder is indicated at A, and operating therein is a piston B. The cylinder A communicates at its lower end with a passageway C, and at its upper end with a passageway D. At one end of the passageway C is a grated opening E over which a flexible flap valve F is fitted. A guard G is arranged above the flap to limit its outward movement. Through the opening E the passageway C communicates with a passageway H which in turn communicates with the tubes of the condenser. The passageway H also communicates with the passageway D by way of the semi-rotative valve I. Above the passageway C is a chamber J communicating therewith through a grated opening which is fitted with a flap valve K. Similarly, the passageway D communicates with a chamber L through a grated opening which is fitted with a flap valve M. In operation, when the piston D moves downward, the valve I is open and the gases and air from the condenser are drawn therethrough and into the passageway D. At the same time the water in the passageway C is forced past the valve K into the chamber J and thence is discharged by way of a pipe N. A portion of the water passes through the pipe O and into the upper end of the cylinder A. On the return stroke of the piston, the valve I is closed and the gases and air are forced into the chamber L and out of the discharge pipe. The valve P in the pipe O is arranged to permit sufficient flow of water into the upper end of the cylinder on the down stroke of the piston so that on the return stroke of the piston it will completely fill the passageway D, overflowing into the chamber L, thus forcing all of the gases and air out of the passageway D and water-sealing the valve M on the next down stroke of the piston. The inventor of this improved air pump is Mr. Charles A. Hague, of 52 Broadway, New York, N. Y.

#### Artificial India Rubber.

1. Heat together 6 pounds of gelatine and 6 pounds of glycerine, until they form a viscous mass. Then add 1 pint of linseed oil and continue to heat until the mixture becomes homogeneous. Next add 2½ ounces of formaldehyde or, preferably, of trioxymethylene in powder, previously well mixed with half as much manganese dioxide. Heat until all is dissolved, then pour into molds and allow to cool.

2. The process is the same as above, except that the oil is mixed with 1/10 its weight of sulphur before it is added to the mixture, and that the manganese dioxide may be omitted. The casting, after it has cooled and hardened, is removed from the mold and heated to 300 deg. F. for an hour, in order to enable the sulphur to act thoroughly on the oil. In this way articles of imitation vulcanized rubber can be made.

3. This process differs from the last by the incorporation of 8 per cent of tar, in addition to the 10 per cent of sulphur, with the oil. The toughness of the product may be increased, without affecting its compressibility, by mixing with the mass, while it is still in a viscous state, short fibers of wool, cotton, etc. It is then vulcanized as in process No. 2.

A novel mode of warfare against the mosquito, but one that is proving highly successful, is being carried on in the city of Tampa, Fla. There are many rain-water tanks and cisterns throughout the city for supplying water for lavatory and various other purposes, and these are favorite breeding places for mosquitoes. The warfare against the annoying pest consists in stocking these reservoirs with small fish to feed on the mosquito larvæ. This method has been tried in one place and another in Florida, and has proved successful in every case. The fish eat the larvæ greedily, keeping the water clear of them, and live for years, even in tanks that are covered, and their living place one of darkness.