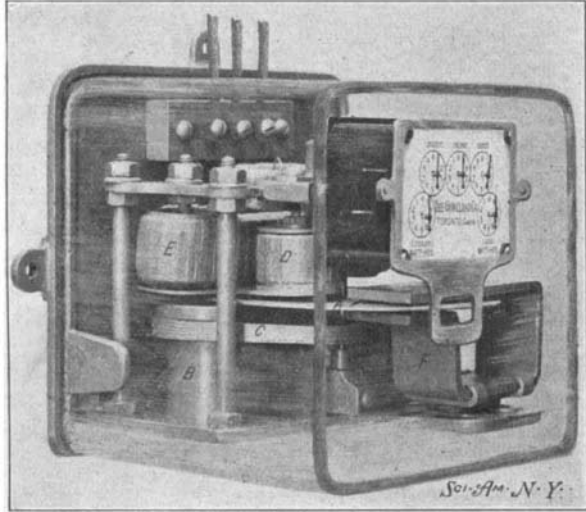


background of the show window will be illuminated at intervals by automatic means acting upon an electric lamp, so that shoppers who stop at the window to gaze at their reflection in the mirror will be surprised to have their images suddenly disappear, and see in their stead the latest thing in Paris fashions or the like.

NEW PREPAYMENT METER.

During the last few years there has been a remarkable development in various devices of a prepayment type. We have had with us for some time now the

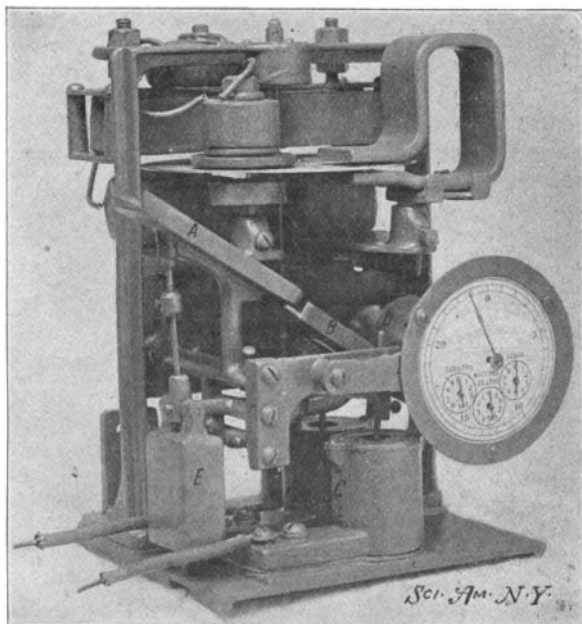


RECORDING WATT-METER WITH NOVEL INDUCTION MOTOR.

prepayment gas meter, which has met with phenomenal success.

We illustrate herewith a prepayment electric watt-meter, designed to cover the entire field where electricity is used for light and power. This meter is of novel design; it is strictly automatic in its action, there being no switches, handles, or other mechanism to operate. All that the person desirous of purchasing light has to do, is to place a coin of the denomination for which the machine is constructed in the receptacle provided for that purpose, and it will deliver the gas paid for automatically and with absolute accuracy, as required. On the front of the machine are the recording dials. The large hand shows at a glance the amount of electric light or power to the consumer's credit at all times. The smaller hands indicate the watt-hours consumed, as in an ordinary meter. There are many points in this meter that will appeal to the practical electrician. The absence of delicate construction and the simplicity of mechanism insure durability. The moving elements are mounted upon ball bearings. The prepayment device of this meter operates entirely by gravity, thereby entailing no cost to the seller or purchaser of the light for the operation of the prepayment mechanism.

The prepayment mechanism will be readily understood by reference to the illustration. The coin is placed in slide *A*, and travels down by gravity on to the supplemental slide *B*. The latter is supported on the end of a lever, and is normally held in the position illustrated by the counterweight *E*. The additional weight of the coin, however, depresses the slide *B*, forcing the pins attached thereto into the cups *C*, which are filled with mercury. The motor is thereby connected with the electric circuit. At the same time a stop pin on the slide *B* is moved out of engagement with a notch in a disk *D*, permitting the mechanism to start up. The disk is directly connected with



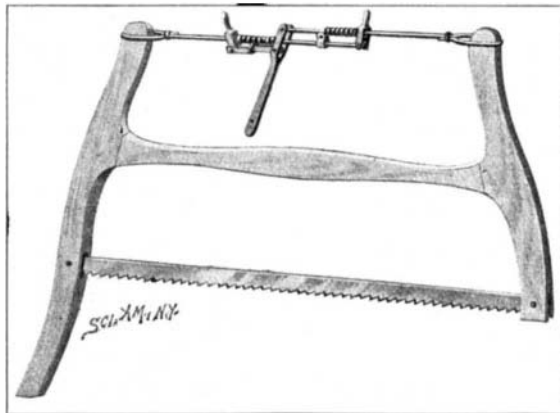
NEW PREPAYMENT WATT-METER.

the large hand referred to above. The train of gearing which connects this disk with the motor is so arranged as to permit the disk to make but one complete rotation while the motor makes the full number of turns paid for by the coin. The stop pin then engages the notch in the disk, permitting the slide *B* to rise, breaking the electric connection and bringing the parts to rest.

A novel form of induction motor is used in connection with this meter, which adapts it for use on alternating current circuits. The motor is best shown in our illustration of the recording wattmeter. An aluminium disk *A* is mounted on a vertical spindle which has worm and gear connection with the indicator clockwork of the meter. Below this disk is an electromagnet *B*, made of thin iron sheets and divided by a copper plate. The magnet is energized by a coil on one pole, the other pole being provided with a tongue-shaped flux-plate *C*, composed of copper laminæ. This flux-plate, it will be observed, lies parallel with the under surface of the aluminium disk and follows its periphery for a short distance. Mr. G. L. Gowlland, the inventor of the motor, has discovered that this non-magnetic pole-piece increases greatly the rotative effect on the disk. This effect is still further increased by a solenoid *D*, lying above the disk and over the end of flux-plate *C*. The coil is supported on a plate of copper projecting from the copper core of a large solenoid *E*. This plate constitutes a second flux-plate. The usual starting coil lies above the solenoid *E*. The magnet coils on being energized by the alternating current produce eddy currents in the copper flux-plates. These eddy currents creep toward the ends of the flux-plates, and acting indirectly on the aluminium disk, cause it to rotate. The sensitiveness of the instrument can be governed by adjusting the movable pole-piece of the solenoid *D* toward or from the disk. A permanent magnet *F* is used to produce a damping effect upon the disk, in order to prevent it from continuing its rotation by reason of its momentum when the current has been cut off. The patents for the prepayment mechanism and the induction motor are owned by the Gowlland Company, of Toronto, Canada.

A DURABLE SAW-TIGHTENER.

Having experienced considerable annoyance with the ordinary type of saw-tightener for bucksaws, by

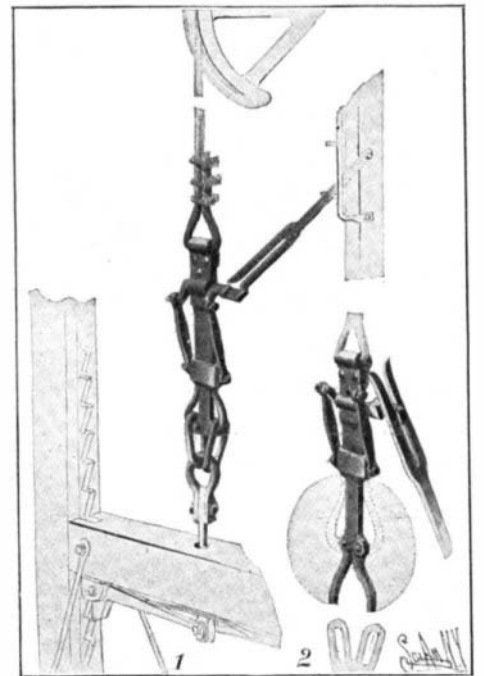


A DURABLE SAW-TIGHTENER.

reason of its liability to wear out in a single winter of steady work, Messrs. A. H. South and J. C. Bostwick, of Orson, Iowa, recently directed their attention to the invention of a new device for tightening saw blades which would be very simple and durable. This they have succeeded in doing, as shown in the accompanying illustration. Their invention also embodies other important improvements which will be readily apparent from the following description of the construction. The tension rods extending from the upper ends of the saw frame overlap each other, but lie in different horizontal planes, being properly spaced apart at the center by a clip secured to the lower rod. A bifurcated lever hinged to the end of the upper rod is provided with an arm connecting with a sliding block on the lower tension rod. The block on the upper rod is hinged at its lower end to the lower rod. These blocks have apertures through which the rod extends, but the apertures are larger than the diameter of the rods so that the blocks may be swung out of the vertical to bind the rods. Now, by moving the lever back and forth the rods may be drawn inward toward each other with a ratchet movement, first one and then the other block gripping the rods to prevent them from slipping apart. When it is desired to loosen the saw blade the sliding blocks may be fed inward toward each other by gripping the handles formed on them, thus permitting the rods to move apart. The springs, it will be observed, tend to retain the parts of the device in frictional locking engagement when it is desired to have the same remain stationary, as when the saw is in use.

CAGE AND CABLE RELEASE.

A patent recently granted to Mr. Robert Le Roy, of Park City, Utah, covers the invention of an improved device for automatically releasing a cage in a gallows frame from the cable should the cage be moved too close to the sheave or above the desired point for discharging loaded cars raised from a mine. The releasing device is very simple in construction, and is not liable to get out of order. It comprises a body portion attached at its upper end to the cable, and provided at its lower end with a pair of keeper arms hinged thereto. The keeper arms pass through links attached to the draw-

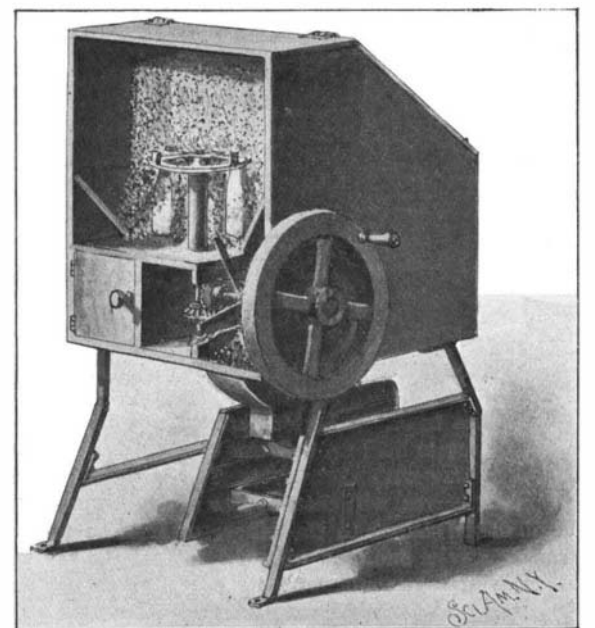


AUTOMATIC RELEASE FOR MINE CAGES.

rod of the cage, and their free ends are swung up and held against the body portion by a locking slide movable thereon. The locking slide is connected by links with a crank-shaft mounted at the upper end of the device, and from this crank-shaft a flattened piece projects, in such position as to be engaged by a forked lever, hinged to the gallows frame. This lever is placed at the point at which it is desired to stop the cage. Should the cage move above this point, the crank-shaft will be rotated by reason of its connection with the forked lever, and the locking slide will thus be drawn upward, releasing the keeper arms and permitting them to swing to the position illustrated at the right. The cage is thus released from its cable, and comes to a standstill, the ordinary safety catches being brought into action to prevent it from falling.

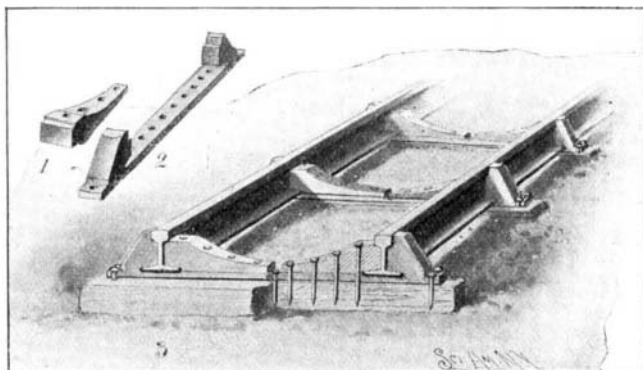
SUGAR CABINET.

In retail grocery establishments the cabinet illustrated herewith will be found very useful for holding sugar or other granular material. By its means a barrel of sugar may be stored in a closed receptacle and kept from exposure to dust and dirt of the store. At the same time the sugar may be readily dispensed in small quantities, and conveniently and quickly delivered to the purchaser. The cabinet comprises an upper compartment, in which the sugar is stored, and means for feeding the sugar out of this compartment through a lower compartment into any receptacle placed thereunder. The feeding mechanism consists of an agitator or wheel supported on a vertical shaft and rotated by suitable gearing connection with the hand-wheel at



CONVENIENT SUGAR CABINET.

the side of the cabinet. The wheel is provided with blades projecting upward from the periphery and downward from the radial arms or spokes. These blades serve to pass through the sugar, loosening it and, particularly when the quantity in the cabinet is nearly exhausted, carrying it to the opening in the bottom of the compartment. Directly below this opening is the horizontal shaft of the hand-wheel, which is provided with radial arms designed to further break up the sugar. The discharge spout of the lower compartment is normally closed by a slide or gate. In operation the bag or other receptacle for the sugar is placed on a rest which may be supported on



AN IMPROVED RAIL FASTENING.

any of the horizontal guides shown according to the height of the bag used. Now, on opening the gate on the discharge spout, the sugar will pour out into the bag unless packed or caked too tightly, when the hand-wheel may be turned to loosen it. In case too little or too much has been drawn out, the sugar can be taken from or put back into a small compartment, which is shown in our illustration as closed by a small door at the left. To fill the cabinet it is tipped on the hand-wheel shaft as an axis until the opening, which is diagonally placed, lies horizontal, when the upper compartment can be entirely filled. Mr. Michael R. Maher, of 69 Linden Avenue, Zanesville, Ohio, is the inventor of this cabinet.

A PECULIAR TOY HOOP.

A recent invention affords an apt illustration of the saying that there is always room for improvement. One would never think that the ordinary toy hoop could offer any field for invention, yet Mr. William E. Veideman, of 383 West 125th Street, New York, has by a simple alteration in its design constructed a hoop which presents many very surprising optical illusions and should consequently become a great source of amusement and interest to the children. The new hoop differs from the ordinary form of the toy in that it is formed of a flat band with lateral corrugations or waves, that is, with the waves lying flat on the surface of an imaginary cylinder. When the hoop is rolled along the ground it seems to follow a sinuous course suggesting the motion of a snake. In order to show this movement to the best advantage the waves are made very long and quite narrow, the width of the hoop from crest to trough of the waves being about two inches. The hoop rolls longer than the ordinary toy hoop because this wave-like formation gives it a tread which is several times larger than the actual



HOOP WITH WAVE-LIKE FORMATION.

width of the band. A curious optical illusion appears when the toy is held up between two persons with its axis on a line with their eyes. The hoop, if formed with eight waves, will then appear square to one man and diamond-shaped to the other; or if it be formed with six waves, one man will declare that the toy has the form of a triangle, with its base line at the top, while the other will be equally certain that the base line is at the bottom. These peculiar forms are due to perspective which throws the nearest portions of

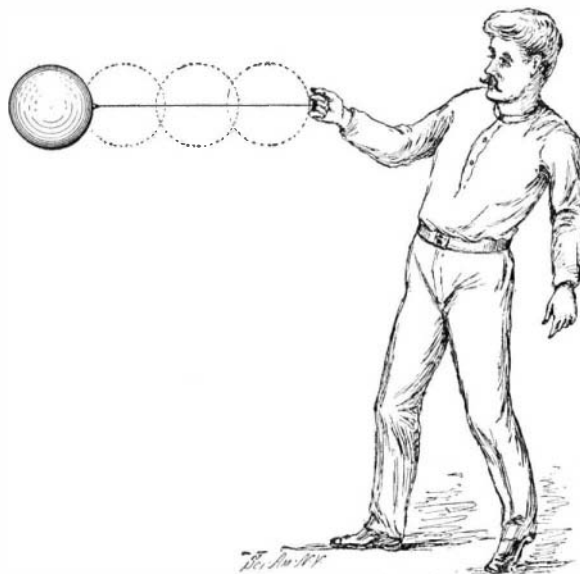
the hoop out radially, while those parts which are furthest removed appear to be drawn closer to the center. The children will find great amusement when rolling the hoop upon a sandy surface, for by its use they can form many artistic and curious designs in the sand.

RAIL FASTENING.

The invention illustrated herewith provides improved means for connecting railway rails to cross-ties. The fastening is very strong, being particularly adapted to withstand the great strain imposed on the outer rail at a curve, and prevents spreading or displacement of the rail. Mr. Robert G. Musgrove, of Jackson, Miss., is the inventor of this device. The fastening comprises a tie-bar shown in Fig. 2 and a pair of rail blocks of the form illustrated in Fig. 1. It will be observed by reference to Fig. 3 that the tie-block extends to opposite sides of the track and is provided with abutments shaped to fit the outer sides of the rails, the top of the abutment lying flush with the tread of the rail. The rail-blocks are shaped to fit snugly against the inner sides of the rails, with their upper surfaces lying below the rail-heads, so as not to interfere with the car-wheel flanges. The tie-bars and rail-blocks are securely fastened together and also to the tie by long spikes, as shown in section in Fig. 3. Aside from this, the tie-bar is individually secured by a spike at the center and three at each end. It will be observed that this form of fastening renders unnecessary the employment of fish-plates and similar devices, and the fastening, furthermore, embodies no parts such as are liable to work loose under shocks and jars to which railway rails are ordinarily subjected.

A VEST POCKET PUNCHING BAG.

A convenient and very efficient little exerciser has recently been invented which is calculated to develop those muscles which are used in boxing. The device consists of a thin rubber bag with an elastic cord at-



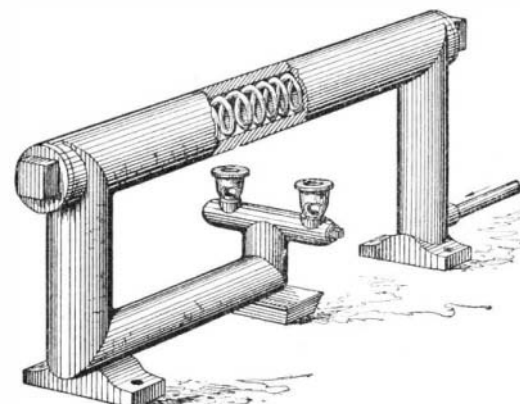
VEST POCKET PUNCHING BAG.

tached thereto and may be readily folded up and carried in one's vest pocket. When it is desired to use the exerciser the bag is blown up to a diameter of about eight inches. The free end of the cord is then grasped in the hand and the device is used as shown in our illustration. The bag on being punched out with the fist, stretches the cord until its momentum is overcome, when it bounces back toward the operator, who endeavors to punch the bag again. Considerable skill is required to successfully punch the elusive little device, and in acquiring that skill one also becomes very alert and accurate, while at the same time his muscles are well developed. After learning to operate the device with one fist a man may practise using both fists. To vary the speed of the exercise the cord may be shortened or lengthened, the short cord resulting in a quicker return and *vice versa*. The punching bag is made by the M. Lindsay Rubber Works, of 298 Broadway, New York city.

AN IMPROVED OIL BURNER.

A neat little burner adapted to burn mixed oil and air is shown in the accompanying illustration. It is the invention of Mr. Milton C. Henley, 1394 Lexington Avenue, New York, N. Y. The burner is noted for its simplicity of construction and the arrangement whereby the gas may be quickly generated to form a very hot flame. The device will be found very useful in furnaces, stoves, ranges, and the like. Owing to its compact form, it will also be found applicable as a foot-warmer in automobiles or any other vehicle carrying a supply of oil. As illustrated, it comprises four tube sections connected to form a quadrangle, the lower horizontal tube, however, ending midway of the upright members in a pair of Bunsen burner tips. The

flames from these tips are adapted to envelop the upper horizontal tube, vaporizing the liquid oil as it passes therethrough, so that it arrives at the burner as a heated gas ready for rapid combustion. The longitudinal bore of the upper horizontal member of the device may be opened at either end, for cleaning or other purposes, by the removal of screw plugs. Within this bore a coiled spring is located, which is compressed by the screw plugs, so that on removal of a plug the coil will spring outward and can then be easily grasped and withdrawn. The purpose of the spring is to enlarge the heat-carrying capacity or area of the chamber. The spring will also, when with-



A SIMPLE OIL BURNER.

drawn from the tube, assist in removing any impurities deposited by the oil on the walls of the chamber.

Brief Notes Concerning Patents.

William H. Noyes, formerly a member of the Legislature of the State of Minnesota and a well-known newspaper man, has abandoned both politics and journalism in order to devote his time to the promotion of an invention for which, he says, he sees a great future. This invention is his own, and consists of a means of locking a locomotive when at rest, so that no one except the person holding the secret can start the engine. Mr. Noyes formerly lived at Duluth, but he has recently taken up his residence at St. Paul, where he will engage in his new business.

Howard H. Tunis, an engineer of Baltimore, Md., is the inventor of a monorail system which will in all probability be exploited by the erection of an experimental line between Washington and Baltimore; and if this programme should be adhered to, the inventor expects to carry passengers from one city to the other at the rate of five cents each and make money by it. He has been for some time experimenting with the monorail, and has built a model line on a farm near the city. This was large enough to carry a number of passengers, and by its operation he acquired many ideas for improvements, and a small model of the perfected line was recently displayed in Baltimore to a number of gentlemen who have become interested. A company has been formed for the purpose of promoting the invention.

William Lloyd Wise, M. P., a magistrate and deputy lieutenant of the county of Essex, England, has been recently visiting this country, and stopped at Washington quite a long time for the purpose of making a close examination into the American system of patents. He says that he intends to introduce a bill into Parliament upon his return, making some radical changes in the manner of granting patents in that country, which are based on his observations of the systems of a number of different countries which he has visited. He said, "I propose not to attempt to decide beforehand whether a patent will be valid either for lack of utility or novelty of subject-matter. The applicant will take his patent at his own risk, leaving the courts to decide the question of its validity, if ever questioned."

We have heard of many novel uses to which the overhead carrier system has been put, but probably the most ingenious of them all is that of a St. Louis hardware merchant who moved the greater part of his stock from one store to another, which was located on the other side of the street, almost directly opposite. A steel cable 1½ inches thick and tested for 600 pounds, was thrown across the street from the window of one establishment to the other, a span of 81 feet. On this there was strung a steel box, and as the goods were taken from the shelves in one establishment, they were placed in boxes and marked. These were loaded in the cage. Gravity carried the load across the street, and the box was brought back by the aid of a hand windlass. The steel box made a round trip every minute and the daily average was 500 per day. The average load was 300 pounds. In this manner all the shelf goods were handled, and the operation was performed without the slightest confusion, the goods practically going direct from their place in the old store to their permanent location in the new establishment.