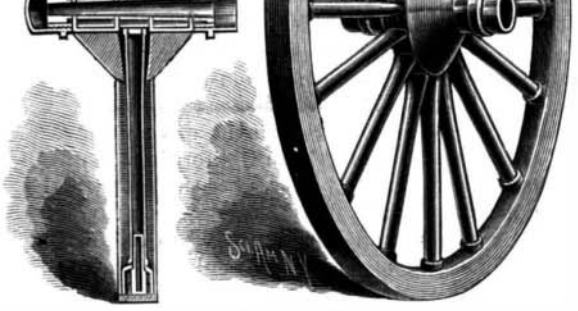
AN IMPROVED BAG FILLER AND HOLDER.

The accompanying illustration represents a device movable from place to place on wheels, to be used for filling bags with grain, etc., and of such construction that the grain may be shoveled up and loaded in the bag as shoveled. It has been patented by Mr. D. G. Stone, of Negaunee, Mich. The engraving shows the device in upright and in inclined position, the latter position facilitating the filling of the bag, an inclined face of the hopper constituting a shovel in contact with the ground or the floor on which the grain is placed. The foot portions of the rear standards are adapted to be utilized as handles, while the forward part of the frame is supported upon small wheels. Upon the standards is a table, with an opening at one side of its center surrounded by a hopper having an inclined front, a slideway within the hopper leading from the point where the inclination commences to the front side of the central opening of the hopper. There is a slide damper for closing this opening when desired. To the under side of the table, around the opening, is secured a band having downwardly projecting teeth, and beneath this band is hinged another having recesses adapted to receive the teeth, the edge of the bag being held between these bands, which are clamped in locked position by a latch. Upon the lower cross bars of the frame is pivoted a tilting platform, at or near the rear edge of which is a hook to which the lower end of the bag is attached when placed in position to be filled. Thus the bag may be filled through the hopper in the usual way when held in the upright position, or it may be held horizontally so that the hopper can be pushed forward into the grain, the shovel mouth of the hopper facilitating the inflow of the grain, and the device being tilted backward occasionally till the small wheels strike the floor with a jar, to throw the contents back from the mouth of the bag. This is repeated until sufficient grain has been taken up, when the frame is readily brought to upright position, through the operator bearing with his foot against the axle of the small wheels and taking hold of the rear standards midway of their length, and the bag released by lifting the spring latch, the tilting platform facilitating the ready removal of the bag. Upon an axle centrally on the front standards are large wheels, the construction being such that the filled bag may be easily conveyed at will from place to place.

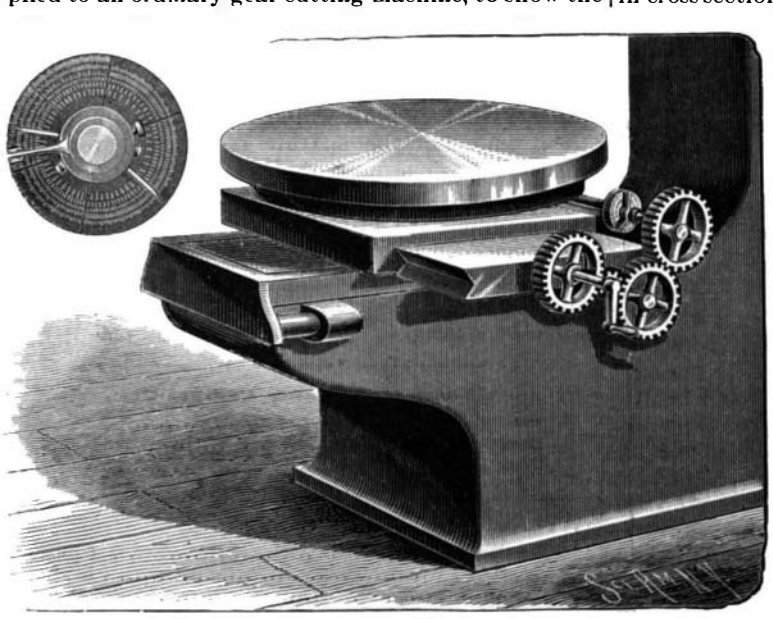


WILSON'S VEHICLE WHEEL.

For further information relative to this invention address the inventor as above.

AN INDEX PLATE FOR GEAR-CUTTING MACHINES.

An indicator attachment designed to be readily applied to an ordinary gear-cutting machine, to show the number of equal subdivisions into which the periphery of a disk is to be divided in cutting a gear wheel of any desired number of teeth, is illustrated herewith, and has been patented in the United States and Canada by Mr. Michael Schirk, of Plattsmouth, Neb. The small figure represents the face of the indicator plate, the larger view showing the device applied to a slotting machine. The plate is in the form of a disk adapted for rigid connection with the stationary parts of the frame of the machine. Centrally through the disk passes the turning shaft, surrounding which, and attached to the disk by a screw thread, is a flanged hub, in which the shaft freely revolves, there being adjustably carried on this hub a swiveling base-ring to which are adjustably secured radial markers. A sleeve, rigidly attached to the turning shaft by a set screw, carries a radial arm having on its outer end an adjustable pointer blade extending to the plane of the indicator plate. On the face of this plate are marked circular series of graduations, the graduations of the same length not continuing around the entire periphery of the plate, which is divided into six aliquot parts, forming sectors of the circle, the aliquot parts of one sector showing spacings for one size of tooth or number of teeth to a wheel, while those of the next sector are adapted for another size of tooth or number of teeth to a wheel. In this way a large number of graduations can be placed upon a single indicator plate, which is adapted to a wide range of use. To facilitate the work and avoid mistakes, a scale is provided showing the space to be left between the two markers for each set of graduations on the plate. The device is inexpensive to manufacture, wears little with use, and can be easily applied to a variety of machines, so as to be a convenience in even a small shop.



SCHIRK'S INDEX PLATE FOR GEAR-CUTTING MACHINES.

AN IMPROVED VEHICLE WHEEL.

The illustration represents a wheel constructed entirely of metal, with provision for an interior fluid circulation, whereby the expanding or contracting of the tire will be prevented. It is a patented invention of Mr. William S. Wilson, of Tombstone, Arizona. Fig. 1 is a vertical section through the wheel, its hub and box, and Fig. 2 is a transverse section through the box, illustrating the attachment thereto of the spokes. The hub box consists of an inner tapering section with a ring at each end, there being between the rings a longitudinal slot and apertures. The tapering section fits into a casing section, upon which is fitted a spoke sleeve, with a series of studs to receive the spokes, which are tubular, and preferably round at their outer and flattened at their inner ends. The felly is made of a single piece of metal bent upon itself to be U-shaped in cross section, and the outer end of each spoke is dished to fit the cylindrical inner or bottom wall of the felly, the inner end being flattened to fit the studs of the spoke sleeve. The spokes are held in position at the top by tubular tie rods, and in one side of the felly, at any convenient point, is an opening, ordinarily closed by a screw cap, into which sufficient oil and water are introduced to essentially fill the space within the felly and the tubular tie rods of the spoke. In winter, alcohol is substituted for the oil and water, and the liquid is designed to act as a heat distributer, preventing the expansion of the tire section by heat generated by the friction of a brake or the locking of the wheel while going down long mountain grades, the improvement being especially adapted for very heavy wagons.

THE law compels no one to do impossibilities.

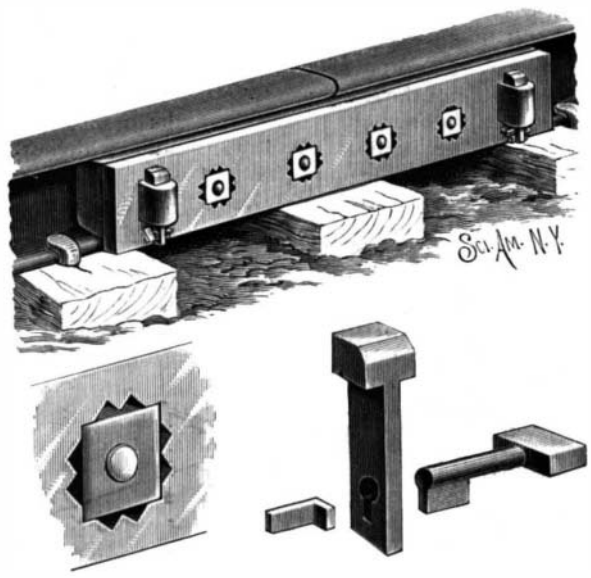
New Home of the Mechanical Engineers, New York.

The American Society of Mechanical Engineers has purchased for $60,000 the building hitherto owned by the New York Academy of Medicine, No. 12 West 31st Street. It is a fine four story building, 28 feet in width, with basement and cellar and an extension in the rear. A gallery around the hall is fitted with shelves for a library. As the building is larger than is needed at present by the Mechanical Engineers' Society for its own purposes, a portion of it has been leased to the American Institute of Electrical Engineers, and another portion to the Society of Amateur Photographers. It is the intention that the libraries of the Mechanical Engineers and of the Electrical Engineers will be placed together, so that each may be conveniently used by the members of both societies.

STONE'S BAG FILLER.

AN IMPROVED NUT LOCK.

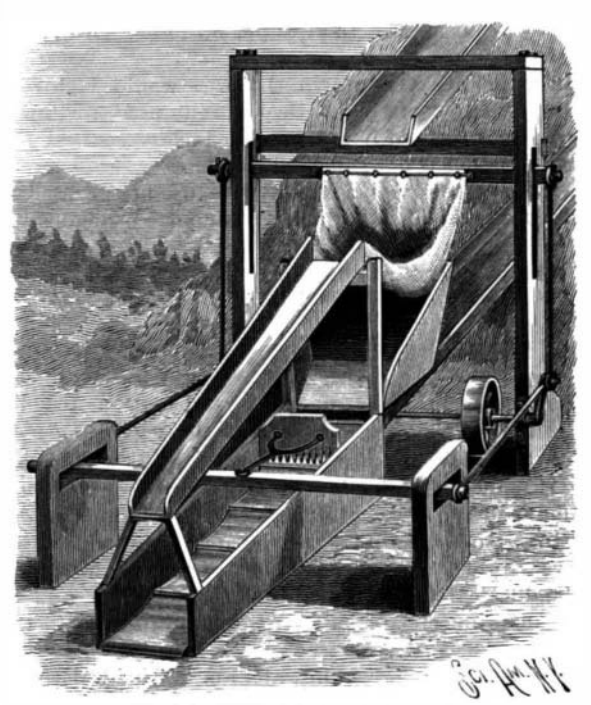
The invention illustrated herewith is designed to provide against all possible accidental displacement of the burrs or nuts employed in connection with a rail joint. It has been patented by Mr. Thomas C. Harris, of Rochester, Minn. The shanks of the bolts are passed through an inner fish-plate, and upon the outer side of the rails is a strip with outwardly extending tenons and apertures to receive the shanks of the bolts. To prevent the turning of the bolts on the outer ends of the nuts a locking plate is provided, in which the inner portions of the bolt apertures are circular, and their outer portions of star form, the ends of the locking plate being also apertured to receive the tenons of the strip which lies against the web of the rail. After the nuts have been turned approximately home, the locking plate is adjusted to position upon the tenons and the nuts further turned, and so that they will be brought into register with any set or series of recesses of the outer sections of the locking plate. To hold the locking plate in place, main keys are passed through apertures in the ends of the tenons, these keys being held from displacement by auxiliary keys, both shown in the small views, the latter keys being also held in place by a keeper.



HARRIS' NUT LOCK.

AN IMPROVED ORE CONCENTRATOR.

A machine for working pulverized ore-bearing rock, earth or sand, or tailings and similar material, is shown in the accompanying illustration, and has been patented by Mr. Edward Z. Kidd. The concentrating table consists of a series of sections of a pane of glass each, the upper surfaces being concaved, and the panes being



KIDD'S ORE CONCENTRATOR.

fitted with a water-tight joint into a frame, the construction of the latter varying with different forms of the table. The tables in their normal position are inclined, the combined sections representing essentially an inclined plane, while each table may be provided with a shaft or spindle for tilting it at will. A waste flume is held upon uprights above the table, and at the upper end of the table is a frame in which a beam is held to slide vertically, the extremities of the beam being connected by links with the crank arms of a rock shaft journaled near the base of the frame. At each side of the table is a support for a beam held to slide horizontally, motion being communicated thereto from the rock shaft, and from the center of this beam extends an arm carrying an agitating comb reciprocating over one or more of the upper sections of the table. These sections are made with a flat upper face, and above them is a fixed hopper, below which is a water chute, whereby a current of water may be turned upon the face of the concentrating table at any time. To the upper end of the waste flume is securely fastened one extremity of a flexible pan or hopper, the other extremity of which is detachably attached to the vertically reciprocating beam. This hopper may be made of rubber, heavy canvas, or rawhide, and above it is a chute for supplying to the hopper such a current of water as may be desired. The pulp, gravel, ground earth, etc., to be operated upon, having been placed in this upper hopper, under the stream of water, is rolled backward and forward with the alternate rise and fall of the hopper caused by the vertically sliding beam, the slums, light gravel, etc., passing off through the waste flume at every upward motion, the concentrates settling in the center of the pan. When the charge has been sufficiently washed, the upper end of the hopper is released from its attachment and the contents dumped into the fixed hopper below, where they are further cleaned and concentrated in passing over the glass sections in the presence of water, the material being also agitated at the upper end of the table by the comb.

For further information relative to this invention address Messrs. Romans & Kidd, Deadwood, South Dakota.

THE FIRE ALARM SYSTEM OF JERSEY CITY.

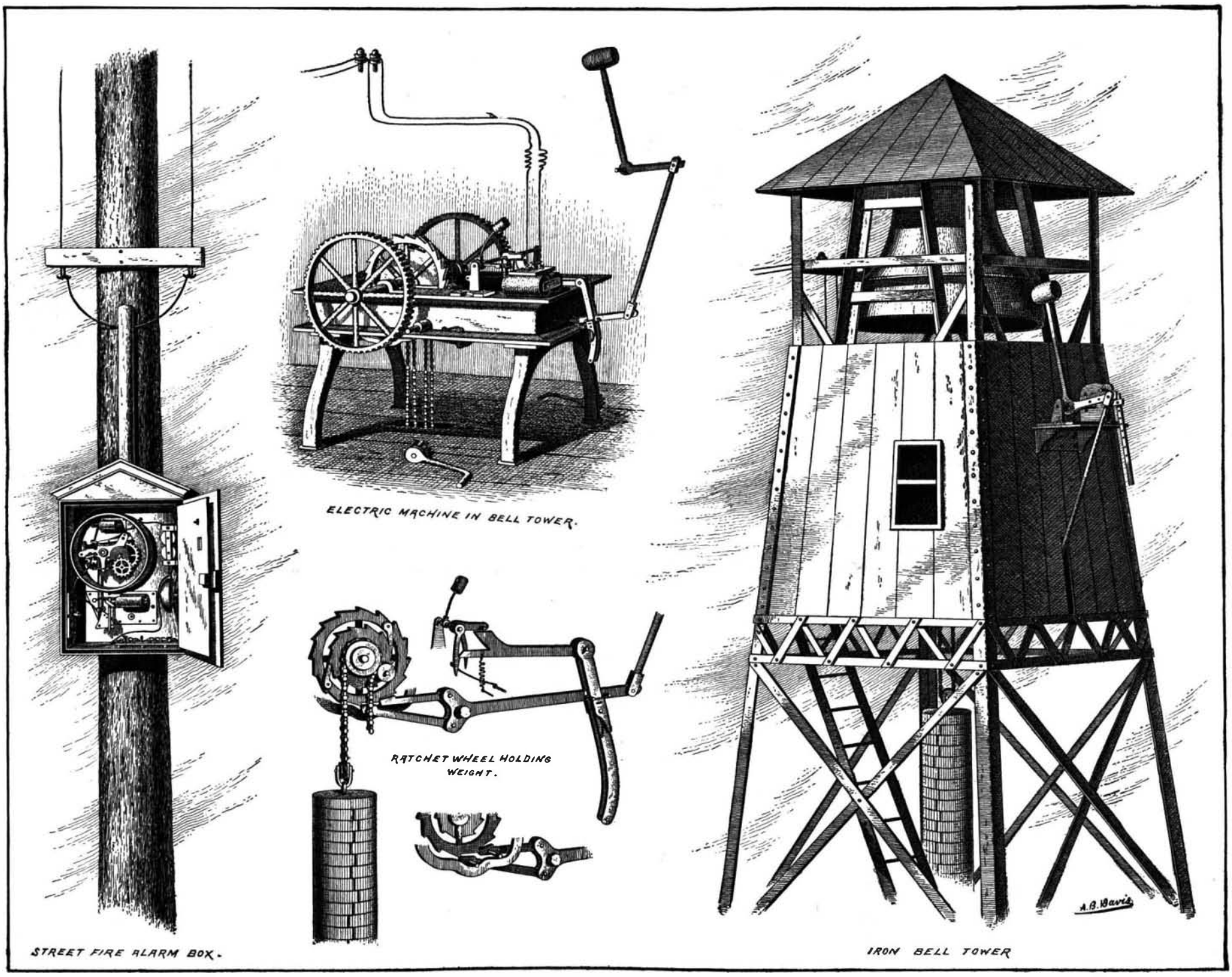
A feature has been introduced by the fire department of Jersey City into the fire alarm system of that city which distinguishes it from most of those with which we are familiar. It is a system that could be used with advantage, it would appear, in many of our towns where there is no paid force of firemen, but where the protection of property from fire depends upon volunteer fire service. The peculiarity of this system consists in ringing tower bells in different parts of the city by means of electric signals from alarm boxes located in conspicuous places in the public thoroughfares, similar in principle to those in use in this and other large cities. These alarm bells are rung automatically, in a manner that will be described later. The system is very ingenious and complete. There are four of these towers in Jersey City, from each of which every fire alarm is sounded, according to the number of the box whence it has been sent. These tower bells are rung in connection with the work of the fire department. In addition to the men on contract service in the engine houses, there are seven men on "call" attached to each engine and truck company. These men sleep at their homes, and answer the calls from the four tower bells, reporting for duty in obedience to their ringing. They receive a reduced salary of $75 per annum for their services.

The electric service also rings the gongs in all the engine houses of the city.

In the central electric station there are installed 340 cells, most of which are of the gravity type. These cells do all the work of the entire system. Twenty-five of the cells are devoted to ringing the bells in the tower. The others are divided up; some are for local work within the station; the majority are placed on nine circuits, including the engine house circuits and the alarm box circuits. These boxes are placed in various parts of the city upon the telegraph poles carrying the fire department wires.

The interior of a box is shown in the cut. The wires enter it and connect with a magnet whose armature is kept attracted as the circuit is kept normally closed. If a fire occurs, the box is opened and a handle is pulled down. This starts the mechanism. A metal drum is caused to rotate under a spring that presses on it. The circuit, including the magnet, is completed through this spring. A number of notches are cut in the periphery of the drum or disk. As it rotates, the spring drops down into these notches, and each time that it does so breaks the connection, thus opening the circuit. Each time that this occurs the bells in all the engine houses in the city ring, and the four bells in the towers ring the same alarm at a slower rate. The notches are cut differently for each box, so as to form by their combination and spacing a special signal.

When a box is rung, its "makes and breaks" are transmitted to the central electric station, where they actuate an automatic recorder and repeater. By one part or division of this apparatus the signal is recorded by holes punched in a strip of paper or "tape," and at the same time is repeated by relay action to all the engine houses. The same apparatus by its second division regulates the current to the four bell towers. Like the other circuits, the bell tower circuit is kept closed. If broken once, the bell rings once. The repeater therefore has to open the circuit once for each ring corresponding to the box number, and has also to space these properly to express the two digits that generally compose this number, such as two—four, three—six, etc. It has also to perform one additional function. The signals are sent out to the engine houses at the rate of a beat a second. This speed would not answer for the large bells, and the repeater sends out the signal at a slower rate for them. The tape is fed at speed regulated for one break per second, through that part of the apparatus which perforates it and sends out the signals to the engine houses. The engine house gongs are practically in synchronism with the alarm box actuating this part of the apparatus. Next the paper is fed through the part of the mechanism which operates the tower bells. The tape passes through this at one-half the former speed. A flat spring presses upon it and keeps the circuit closed as the paper holds it up in contact with a terminal. When a hole comes beneath it, its point drops into the hole and the circuit is broken for an instant and the bells ring once. This is repeated for each hole. Thus an autographic repetition at reduced speed of the en-



RINGING FIRE ALARM BY ELECTRICITY.