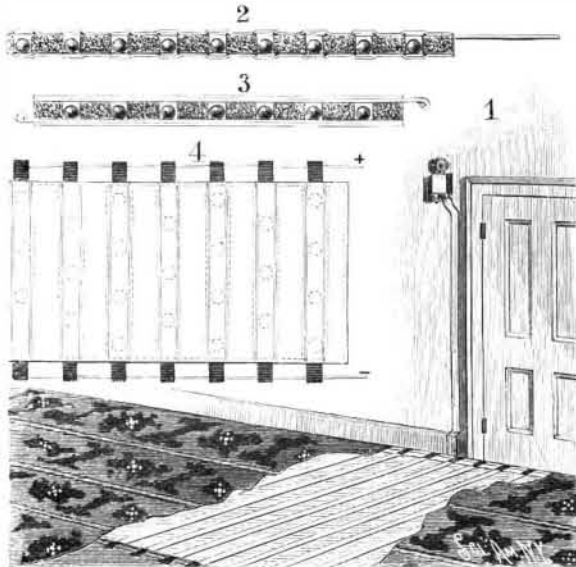


**AN ELECTRICAL ALARM-MATTING.**

A novel burglar-alarm has been invented and patented by Arthur DeF. Risley, of Richfield Spa, N. Y., which consists of a simple and inexpensive electrical matting placed under the carpet of a room.

Fig. 1 shows a portion of a room with the matting in place; Fig. 2 is a longitudinal section of the matting;



**RISLEY'S ELECTRICAL ALARM-MATTING.**

Fig. 3 a transverse section; and Fig. 4 is a top plan view.

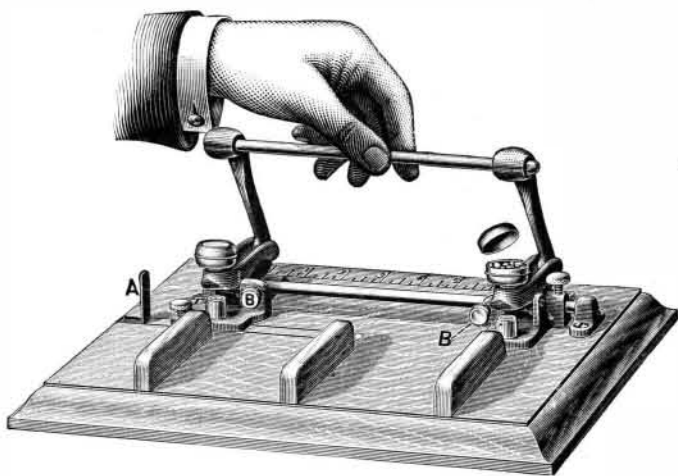
The matting consists of an elastic non-conducting fabric which, as shown in Figs. 2 and 3, is provided with a series of aligned orifices. On both the upper and lower sides of the orifices conducting-strips are arranged, which are connected, as illustrated in Figs. 3 and 4, with the terminal conductors of an electric alarm circuit. Within each of the pockets formed by the orifices and conducting strips, a shot is placed.

When the matting is in use, the shot will rest upon the lower conducting strips, but will be held out of contact with the upper conducting strip by reason of the thickness of the elastic non-conducting fabric. If the matting be stepped upon so as to compress the elastic fabric, one of the upper conducting strips will be brought into electrical contact with a shot, thereby closing the circuit and sounding the alarm. As soon as the pressure is removed the elastic fabric will raise the upper conducting strip out of contact with the lower conducting strip, thus breaking the circuit.

The invention, it will be observed, provides no springs to return the upper strips to their normal positions; for such springs are apt to bend and produce a constant contact. The matting can be made of the same thickness as the paper matting ordinarily placed under carpets. When, therefore, a section of paper matting is removed, and the alarm matting substituted therefor, no trace of the change can be observed in the carpet.

**AN ADJUSTABLE PAPER-PUNCH.**

Finding a considerable call, in connection with their post-binders and order-holders, for a device which would punch two holes at once, in order sheets, corre-



**AN ADJUSTABLE PAPER-PUNCH.**

spondence, or forms of all sorts, for which the post-binders are used, the Samuel C. Tatum Company, Cincinnati, O., have just got out a punch or file perforator as shown herewith.

It will be seen that it consists of two levers, which are coupled together so as to punch the two holes at once. The special feature lies in the adjustability of the distance between the holes. In the machine illustrated this distance may be varied anywhere from 1 1/4 to 7 inches. When paper-punching is to be done, the machine will be found a very valuable office help.

Besides the great amount of time taken to punch with an ordinary hand punch through a limited quantity of papers, there is, of course, the difficulty of getting any sort of register of distances, either from the margin

or from one hole to the other, and this is accurately obtained in the device illustrated, which provides not only for a side gage, but also for a throat or margin gage; so that the distance from the margin can be exactly maintained, or, as the printers would say, made a perfect register. In the design special attention has been paid to the matter of durability, a feature in which so many other punches seem to fail.

The two cups set over the center, one of which is shown with the lid removed, catch all of the small disks removed from the paper, and avoid what would otherwise be a very annoying litter in using the punch.

**Photographic War History.**

The War Department has undertaken the compilation of a unique volume, a photographic history of the war with Spain. It has addressed a circular letter to all the officers in the service, asking them to contribute such prints, films, or negatives as they may have in their possession, promising to return such loans in good condition. It furthermore asks all officers to report the names of the persons known to have carried cameras in the region of active operations, so that their aid may be sought in compiling the volume. It is the desire of the department to produce in a single volume every obtainable feature and photograph bearing on the subject. Credit, of course, will be given to all contributors in the volume.

In the exciting campaign, both naval and military, the camera played an important part. By means of photographs the public became so thoroughly versed in the topography of Cuba and Porto Rico that they would recognize Morro Castle at the entrance to Santiago Harbor as quickly as the Narrows of New York Harbor. Although it is unusual for a government to undertake such a task, still it will tend to simplify the task of future historians, and such a work will prove of enormous importance.

**A New Electric Clock Dial.**

A Chicago inventor has recently patented an electrically illuminated clock. It seems practical, and is not very expensive to make. It is specially adapted for clock towers, and the idea is to illuminate the figures on the dial in turn, this end being obtained by the mechanism of the timepiece. Upon the hour hand is arranged a brush which travels in contact with a ring and segmental contact pieces, for the purpose of completing the circuit between the ring and each of the contact pieces in turn. By this arrangement the contact piece will be in circuit with the brush during one hour, or until the brush passes to the next contact piece, the actual lighting being effected by means of twelve electric lights, one behind each character. As soon as the hour hand passes the point midway between the two characters, the brush snaps down upon the next contact piece and throws the next lamp into circuit. The minute hand carries an electric light on the end of it, and the contact continues, so that the minute hand always indicates the exact minute by a single lamp, which is lighted continuously, whereas the hour hand uses twelve lamps in succession each twelve hours.

**England to Study American Railways.**

The British Railway Association has arranged to send five prominent railway officials to the United States to investigate the facts upon which the government bases the bill compelling the adoption of automatic coupling—a measure which would give the Board of Trade power, five years from its adoption, to compel British railroads to supply the whole of their rolling stock with this device, at an estimated cost of \$50,000,000.

**A WATER-HEATER FOR STEAM-BOILERS.**

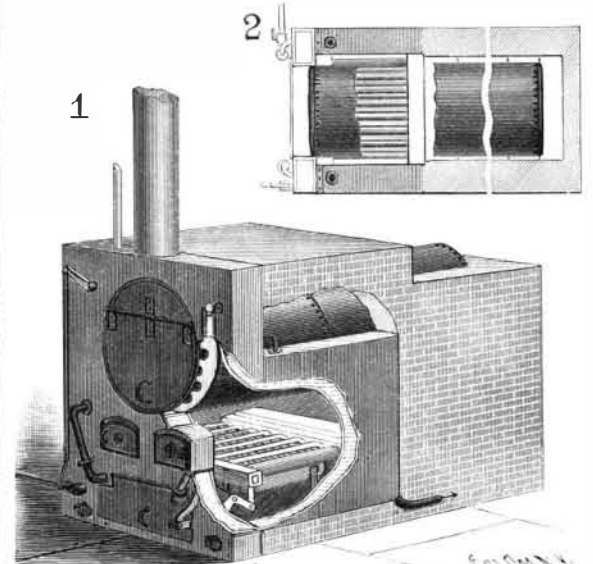
A water-heater has recently been patented by James T. Helms and Robert A. Keller, of Knoxville, Tenn., which is designed to supply steam-boilers with water heated directly by the burning fuel in the fire-box. As illustrated in the accompanying engraving, the water-heater forms part of the furnace of the boiler, and includes the furnace front, which supports one end of the boiler, and which is provided with a smoke-box into which the smoke-flues of the boiler open, and with a water compartment connected with a water supply, the water being automatically fed and cut off by

means of a float in the compartment, which float operates a valve in the pipe. The sides of the fire-box are formed by water boxes connected at top and bottom with the water compartment of the front. The grate consists of front and rear transverse tubes, and of horizontal pipes connecting the tubes. The front tube is connected with the water compartment, and the rear tube with the boiler. The burning fuel heats the water circulating through the grate and the water contained in the front water compartment. The smoke and gases, after emerging from the smoke flues of the boiler, pass into the smoke-box, in order again to heat the water in the front water compartment. The water already heated in the furnace front passes into the water boxes forming the sides of the fire-box, and returns to

the front water compartment. The water, after having been thus highly heated, finally passes through the tubular grate and enters the boiler at a high temperature. Whatever steam is generated in the water compartment can be carried off by a pipe to drive a condenser connected with the supply pipe.

In order to rake the burning fuel on the grate, an ingenious mechanism is provided, which consists of longitudinal rakes passing between the longitudinal pipes of the grate. The rakes are connected by means of links and bell crank levers with a lever fulcrumed on the outer face of the furnace front. When the lever is swung forward or backward, the bell-crank levers are actuated to impart an up-and-down movement to the rakes in order to rake the fuel.

The inventors claim that this water-heater will not only save fuel, but will prevent boilers' becoming coat-



**A WATER-HEATER FOR STEAM-BOILERS.**

ed with lime and other sediment, these impurities being precipitated before the water enters boiler.

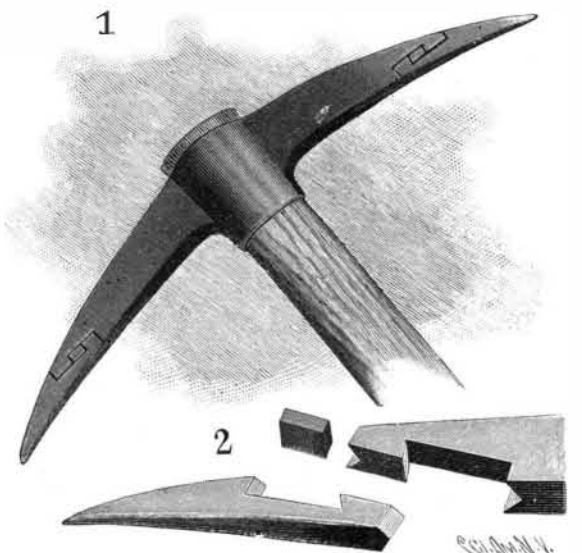
**AN IMPROVEMENT IN PICKS.**

Many a miner while prospecting has, no doubt, often been compelled to leave his work and seek a blacksmith in order to have his tools, grown dull by long usage, resharpened. An invention which has been patented by Walter H. Prest, of Bedford, Nova Scotia, Canada, enables the prospector to postpone the sharpening of his tools and to save much of the time which he would otherwise lose. The invention in question consists primarily in providing the tool-stock with a removable point held in place by a key.

The accompanying illustrations show the invention applied to a pick. Fig. 1 is a perspective view of the tool; and Fig. 2 is an enlarged perspective view, showing the point, key, and stock separated.

The stock and the point are formed on opposite faces with dovetailed grooves, and terminate at adjacent ends in tongues. The inner wall of the stock-groove and the end of stock-tongue are formed with V-shaped recesses which engage the correspondingly shaped shoulders of the point-tongue and of the point-groove. When the stock and point are fitted together with the shoulders and recesses in engagement, the lateral displacement of the point is prevented. When the key is placed in position, the point will be longitudinally locked.

When it is desired to remove a dull point and substitute a new one, it is necessary merely to knock out the



**PREST'S IMPROVEMENT IN PICKS.**

key. It is therefore evident that, by carrying a number of points with him, a miner can work for a long time without being compelled to take the pick to a blacksmith. The junction between the point and stock is such as to present no projection, thus enabling the pick to be used in the ordinary manner.