A NEW TYPE OF WATCH DEMAGNETIZER.

BY A. FREDERICK COLLINS.

To the widely-extended use of high-potential currents for lighting, transmission, and power purposes may be traced a large percentage of the disorders which are now so universally found in afflicted watches. This is due to the magnetization of the delicate mechanisms which go to make up the works of these timepieces, and it is this vexatious cause which renders their perfect operation impossible.

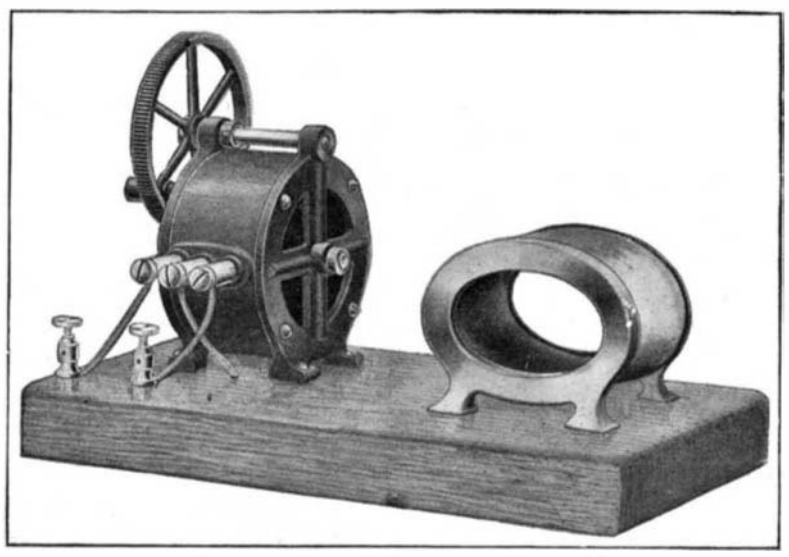
From the above statements it must not be inferred that magnetized watches are to be found only in the possession of the engineer and electrician, or those whose work brings them into close proximity with electric currents.

On the contrary, the watch carried by the minister, lawyer, doctor, and everyone else, whether it is a dollar Waterbury or the most expensive Swiss movement, is just as likely to fall under the untoward influence of a magnetic field, and so become inaccurate, and when this is the case the most careful adjustment will fail to set it right.

The hairspring of a watch is especially susceptible to any stray magnetic lines of force, and when magnetized it is no longer free in its movements, as designed by the maker, for the turns will attract each other and retard the speed of the train of wheels; in consequence of this ailment, jewelers are constantly confronted with watches that will not "keep time," and in nine cases out of ten the cause is traced to the effects of magnetism, hence the necessity of equipping the shop with a demagnetizer, so that this erratic and troublesome element may be eliminated. The fundamental principle upon which the demagnetization of watches is based is, that the latter shall be drawn through a rapidly-alternating magnetic field; and where a single or multiphase current is available, the apparatus usually consists of a solenoid and a contact key.

The new Knoblock-Heideman apparatus, shown in the illustration, may be used with either an alternating or direct current. Assuming that the watchmaker has an alternating current available, then the instrument consists of a solenoid, oval in form and wound with double-covered insulated magnet wire, the terminals of which are brought out to a spring contact key; now, when this device is connected by a flexible conductor cord and screw plug to an ordinary incandescent lamp socket carrying an alternating current, and pressure is applied to the spring key, the circuit is closed, and the current then flows through the solenoid, setting up inside the coil a very powerful alternating magnetic field.

The watch or tool to be demagnetized is now drawn slowly through the solenoid several times, when it will be found that all previous magnetic effects have entirely disappeared. The instrument operates better when energized by a single-phase alternating current, but it is quite efficient on polyphase currents. After the current is permitted to flow by pressure on the contact key, the article is withdrawn to a distance of say two feet from the instrument, and then the current is broken. The instrument is wound for currents of from 50 to 150 volts.



WATCH DEMAGNETIZER FOR DIRECT CURRENT.

The direct-current demagnetizer comprises a solenoid with brass metal-plated end supports similar to the one just described, but it is also provided with a pole-changer operated by a crank through gears to give the proper rotative speed, and by this means produce reversals of the direct current which is taken from a lamp socket connected with the lighting circuit.

The turning of the crank and pole-changer transfers the direct or constant current into an alternating current, which, as we have seen, is necessary for the purpose of demagnetizing steel. When it is desired to treat a watch or tool, the object is inserted in the solenoid, and the pole-changer is operated during the time the object is slowly withdrawn from the solenoid, until it is at a safe distance, when the current is turned off at the lamp socket.

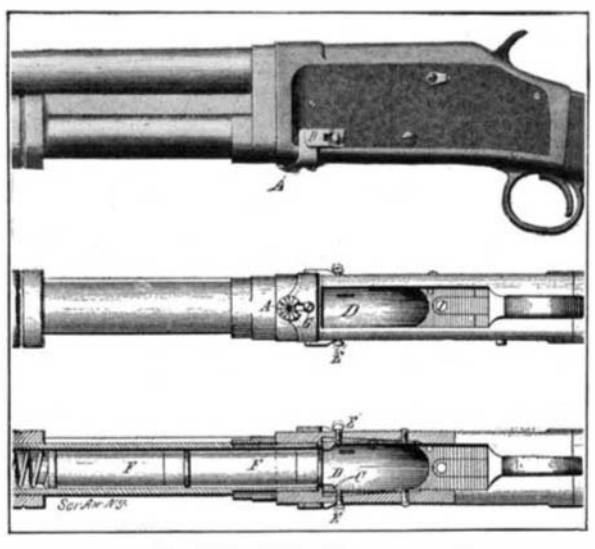
The demagnetizer is mounted on a wooden base, which can be screwed to a bench, thereby leaving both ends free to use in the process of eliminating the magnetism. The instrument is wound for from 100 to 220 volts. The construction of the machine is simple, there is no danger of its getting out of order, and properly used it will accomplish the desired result every time.

Prize for a Safe Method of Cutting Diamonds.

In order to render the industry of diamond cutting more healthy to the operatives than it is at present the Netherlands government has instituted a competition. The object is to discover a process of cutting diamonds which will dispense with the present use of an alloy which is so dangerous to health. For a complete solution of this problem a prize of $2,375 is offered. The answers must be written in either the English, Dutch, German, or French language and must be submitted to Prof. L. Aronstein, Chemical Laboratory of the Polytechnic School, Delft, Holland, on or before January 1, 1906.

IMPROVEMENT IN MAGAZINE FIREARMS.

In magazine firearms as usually constructed, the loaded shells are stored in a tube below the barrel of the gun, from which they are fed back by a spiral spring, and introduced into the barrel by the pumping motion of a sleeve sliding on the tubular magazine. After the gun is fired, the sleeve must again be reciprocated to discharge the empty shell and bring the new loaded shell to position. The accompanying engraving illustrates an arrangement whereby the magazine can be unloaded in a safe and expeditious manner without any pumping action, and without dropping the loaded shells. The improvement saves a great deal of unnecessary wear on the firing mechanism. A yoke embraces the lower edge of the frame just in front of the opening in which the breech block *D* plays. The screw *G*, which fastens the yoke in place, passes through a slot therein, thus permitting slight longitudinal reciprocation of the yoke. The two branches of the yoke curve upwardly around the frame, and carry at their ends two cam fingers *B*, which are slotted to pass under the heads of the screws *E*. These screws extend through the side walls of the frame, and are rigidly connected to the forward ends of two flat-springs *C*. The forward ends of these springs are formed with lugs, which normally rest against the rim of the rearmost shell in the magazine, and prevent it from being thrown to the rear under pressure of the magazine spring. When, however, the yoke is slipped forward, the cams *B* move the screws *E* out and with them the springs *C*, thereby removing the lugs from engagement with the rim of the shell. The loaded shell is then free to pass out of the magazine into the hand. To prevent unintentional movement of the yoke, a button *A* is pivoted thereto, which normally bears against the screw head *G*, thus locking the yoke against movement. But this button is cut away on one side, so that when this side is turned to face the screw, as shown in the illustration, the yoke may be slid to the rear, permitting removal of the loaded shell. Mr. William B. Atkinson, of Bowling Green, Ky., is the inventor of this improvement.



AN IMPROVED MAGAZINE FIREARM.

Horological Exposition at Nuremberg.

On the occasion of the unveiling of the memorial to Peter Henlein, the inventor of the watch, which event is to take place some time during the coming June, the German Watchmakers' Association will open an exhibition of ancient and modern watches which will clearly show the entire development of the watch from its origin to the present day. The exposition is to last from the 15th of June to the 15th of August.

A Washing Soap That Prevents Lead, Copper, and Mercury Poisoning.

Painters, whitewashers, varnishers, and in general workmen who handle compositions of which lead is an ingredient, will sooner or later suffer from lead poisoning. Despite the most scrupulous cleaning, the hand will retain some traces of the lead, which ultimately find their way to the mouth in eating, drinking, or smoking. The ordinary soap may, chemically considered, be one of the most deplorable cleansing agents, for the chemical combinations to which it may give rise when applied to paint-stained hands may even increase the amount of lead adhering to the skin.

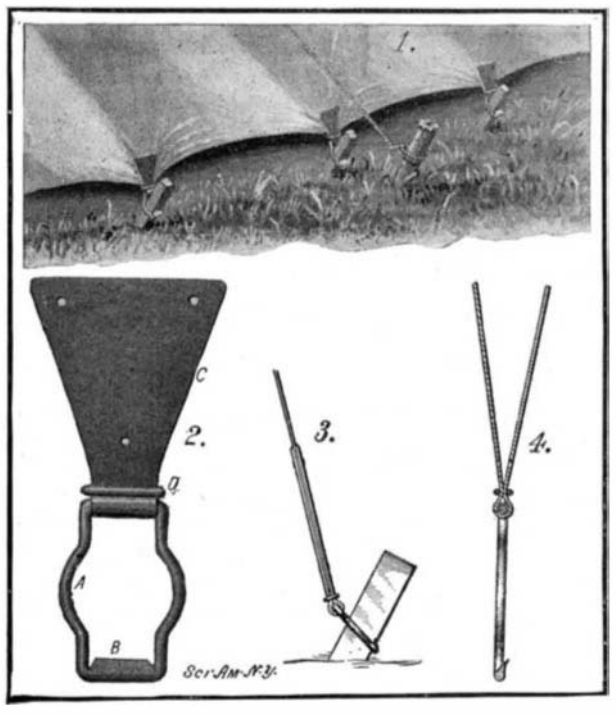
A German chemist has invented a soap for the purpose of so acting upon the lead adhering to the skin as to render it absolutely harmless. The particles of lead are changed into non-poisonous sulphide of lead by the simple process of washing with this soap.

The chemical principle underlying the use of this soap is simple enough. It consists simply in producing sulphureted hydrogen, which transforms the lead into harmless sulphide of lead, and renders it possible to cleanse the skin thoroughly. In washing the lead-stained hands with the soap, the skin becomes brown—evidence of the presence of lead. The brown color is readily removed by a thorough cleaning with the brush, and the skin loses the odor of sulphureted hydrogen. The soap itself is agreeable to the smell.

To the chemist it is obvious that a soap of this kind ought to be effective, not only for the purpose of preventing poisoning from lead, but from copper, mercury, and arsenic as well; for these, too, can be converted into innocuous sulphides.

TENT FASTENER.

Campers are liable to experience considerable difficulty in anchoring the side walls of a tent against displacement by wind or other forces. The usual rope loops fastened to the canvas are apt to tear out, and a makeshift arrangement is often used for anchoring the tent by driving the peg through the canvas, with the result that the rent is made larger and the material becomes badly torn. To obviate these difficulties in a simple manner, Mr. John Blair, Jr., of Rock Springs, Wyoming, has invented the improved tent fastener illustrated herewith. It consists of a metal link, *A*, which is suspended from a loop of leather, *C*. The loop may be sewed to the bottom of the tent wall, or the canvas may be inserted between the two leaves of the loop, and these leaves then fastened together with rivets, as shown in the drawing. The loop is kept tight upon the link by an eyelet, *D*, which prevents the parts from becoming separated and mislaid when the fastener is not attached to the tent. The lower bar of the link is preferably formed with a blade or knife-edge, *B*, adapted to sink into the peg, as shown in Fig. 3, and thus prevent the fastener from slipping off. The anchor pegs are preferably driven in at an angle, and are provided with a slight notch to receive the blade. The pegs usually furnished with tents are of substantially rectangular cross section, as illustrated, but when these are lost rough-cut pegs are often employed, and in order to adapt the links to their use, the side bars of the links are bowed out, as shown in Fig. 2.



TENT FASTENER.

A patent for a water-wheel was recently issued to Mr. Theodore R. Timby, of Brooklyn. His first patent, also for a water-wheel, was dated November 10, 1846.