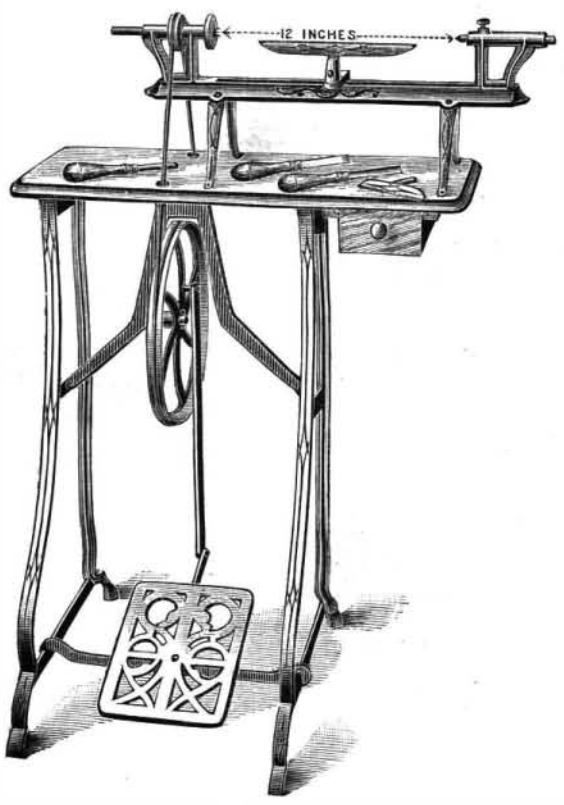
LATHE FOR AMATEURS AND LIGHT SHOP WORK.

The illustration herewith shows a practical form of lathe for a large variety of work. It is sold at a very low price, on account of the large demand that there is for such an article, from young beginners in mechanical work. The lathe has 4½ inches swing, is 12 inches between centers, and has a face plate for turning cups, a long and short tool rest, and three turning tools. A scroll saw is also furnished for use in connection with the lathe. The saw is attached to the table, so that it can be removed easily, and the lathe as



THE HOUSE LATHE.

easily attached. The saw swings nearly 16 inches in the clear, and, though not calculated for heavy work, saws inch walnut readily. The lathe rests on iron legs screwed to the table, the saw being operated independently of the lathe, thus avoiding the unsteadiness and noise which so often render one or the other of these appliances nearly useless.

This machine is made by A. H. Pomeroy, of Hartford, Conn., who furnishes an illustrated catalogue.

AN ELECTRICAL MUSIC BATON.

Those who frequent the opera must certainly have been struck with the regularity with which the choruses or orchestras of the side scenes follow the measure beaten by the leader of the orchestra. It is very rare that the arm of the one is in advance of or behind the voices or instruments of the others. How is such a result brought about? Up to the present, the means have been of the most elementary character. The leaders of the choruses in the side scenes have followed by eye the motions of the orchestra leader's arms. This was not always an easy thing to do, especially when the stage was entirely closed by scenery; and the musician who beat the measure in the side scenes was obliged to obtain a glimpse of the hall through an aperture or fissure, and get over the difficulty the best way he could.

This process has recently been discarded, and there is now being used for leading the music of the side scenes a metronome, which we herewith illustrate, and which is the invention of Mr. Carpentier. The operation of this is of the simplest character. At the representation of "Patrie," for example, in the fourth act the confederate Flemings perceive that they have been denounced, on hearing the music that precedes the Spanish troops, and the strains of which gradually mingle with those of the orchestra. In the side scenes, the measure is here marked by means of the Carpentier metronome placed upon the music stand of the side scenes leader, and connected with the orchestra leader's stand by two electric wires.

The apparatus is represented in Fig. 2. It consists of a blackboard, which, if it be desired, can be hung up on the scenery, and the principle of which is based upon a curious optical illusion. On the surface of the board the reader sees a white and a black line, the latter hardly visible. Each of these lines marks the position of a ruler mounted in a groove in the board in such a way that it can pivot a quarter of a revolution on its axis, and alternately show two surfaces, one of which is white and the other black like the board. In the figure, the upper ruler exhibits its white surface, and the lower its black one. As by a rapid and simultaneous pivoting the upper ruler becomes black and the lower one white, the spectator seems to see but a single ruler, which appears to move backward and forward. The illusion is perfect, even though the artifice be known.

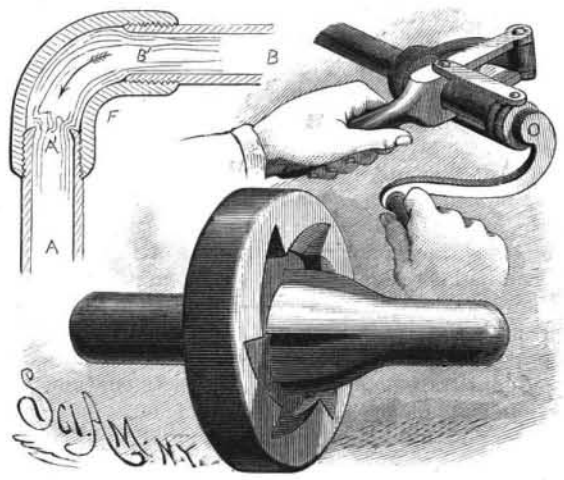
Such is the principle of the apparatus. As for its mechanism, that is very simple, and the details of it are shown in Fig. 3. Here may be clearly seen the two rulers, G, H, at the neighboring extremities of which may be distinguished two small rollers, over which run cords. Each of these cords is pulled at one end by a spring and at the other by the armature of an electro-magnet, F. As long as no current is traversing the electro, the springs hold the rulers in one of their two positions; but when the electro acts, the springs yield, and the rulers abruptly pivot.

As for the maneuvering of the apparatus, that devolves upon the leader of the orchestra. Fig. 1 shows the post of the leader, who stands upon a low platform among his musicians. Under his right foot he has an iron pedal, A, mounted upon two rods that extend beneath the platform, and at the least pressure set up an electric contact. The reader will see that if the leader presses the pedal, a current will pass, and the phantom baton will be observed in its lower position, and that if the pressure be removed the baton will rise, thus perfectly obeying the foot of him who controls it. While maneuvering the apparatus, the leader has his two hands free, the right one to hold his baton, and the left to turn the pages of his music. We must state, in addition, that he has under his eyes, and lying flat on his stand, an apparatus, D, which is a reproduction, on a small scale, of the one between the scenes. The two apparatus are connected by the wires, B, C, E, and make identical movements, the smaller one informing the leader of the effect of the motions of his foot, and guarding him against irregularities that might be followed by disagreeable consequences. The same small apparatus is shown at the bottom of Fig. 3.

This new electric baton operates with great precision, owing to the fact that the masses in motion are very small. It presents, moreover, the advantages of visibility that would be possessed by a baton held in the hand, since it has every appearance of such.—*L'Illustration.*

DEVICE FOR TRIMMING THE ENDS OF TUBES.

Tubes cut in two in the usual way have upon the outside a slightly roughed or burred edge and upon the inside a rough and ragged edge, that serves to most materially lessen the bore of the tube at each joint, as



DELGADO'S DEVICE FOR TRIMMING THE ENDS OF TUBES.

shown at A', and at the same time to form a well adapted lodging place for any sediment carried by the fluid passing through the pipe. The obstruction thus presented is gradually and surely increased by the lodging sediment, and the flow through the pipe thereby lessened, until finally the pipe is completely choked. To easily and quickly remove these rough edges, so that the end of the pipe will present an evenly rounded surface, as shown at B', that will offer no obstruction to the flow and form no recess for the sediment to lodge in, is the object of the simple and ingenious device here illustrated.

Pivoted in the forked end of the handle is a curved arm, having an aperture formed in its enlarged outer end, through which the pipe to be trimmed is passed. Upon the inner side of the end of the arm, and flush with the edge of the aperture, is a projection, the serrated edge of which rests against the tube to hold it firmly. To each shank of the fork is pivoted a link, between the outer ends of which is swiveled an apertured disk, through which the shaft of the cutting tool passes, the outer end of the shaft receiving a crank handle, by means of which the cutter may be turned to trim the end of the tube. The cutting tool, shown enlarged in the lower view, consists of a disk through which passes a shaft. One face of the disk is formed with cutting teeth, while the hub of the shaft upon the same side is slightly enlarged and also formed with

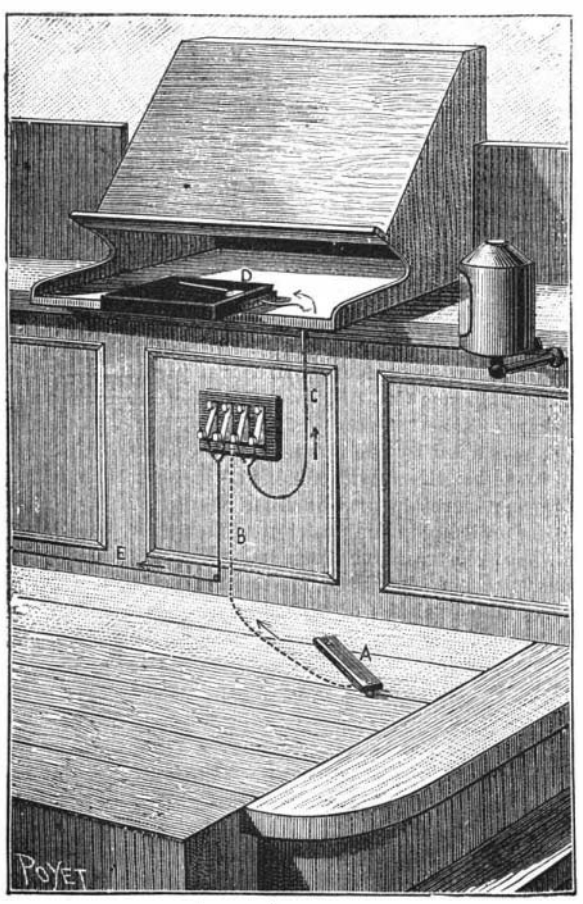


Fig. 1.—LEADER'S STAND.

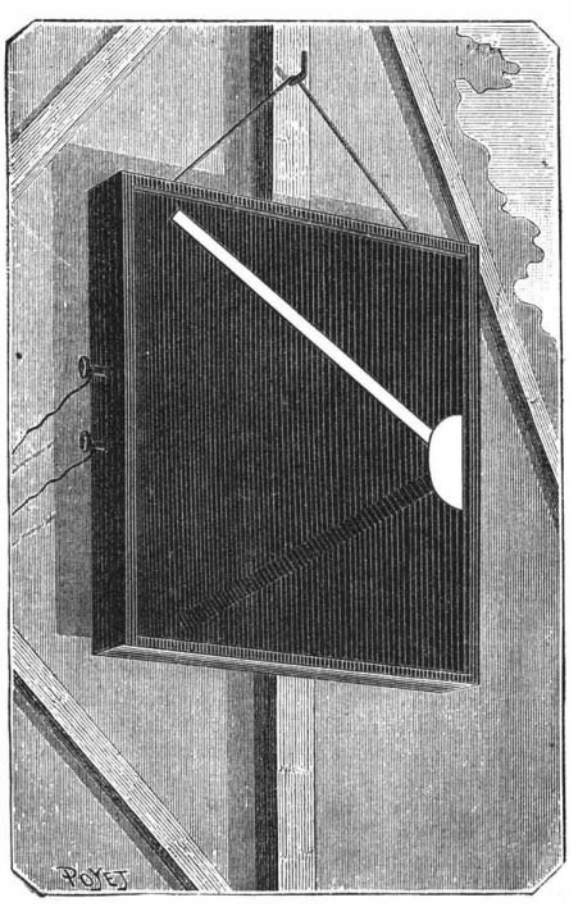


Fig. 2.—ELECTRIC MUSIC BATON.

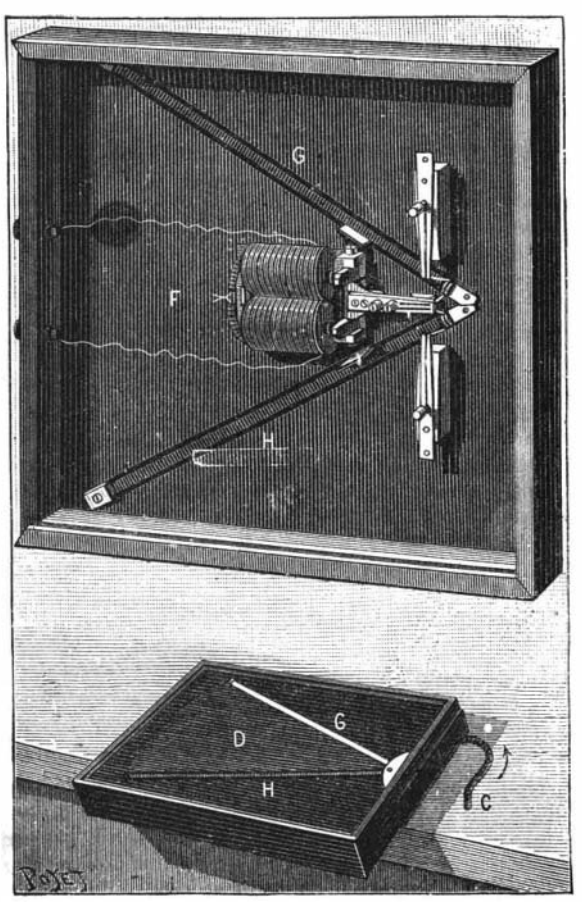


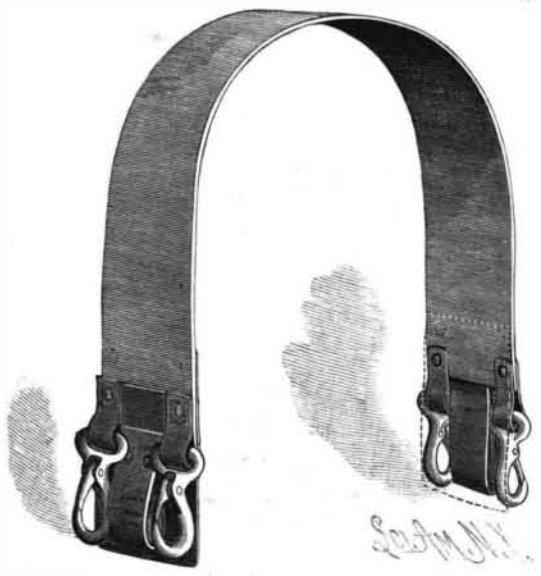
Fig. 3.—MECHANISM OF THE BATON.

teeth. It is evident that this cutting tool, which may be turned either by hand or by means of the device above described, is well adapted to the work, and will effectually remove the rough edge from both the inside and outside of the tube.

This invention has been patented by Mr. E. Querol y Delgado, whose address is 142 Hull Street, Brooklyn, N. Y.

BACK BAND FOR HARNESS.

This back band is designed for use in harness in which chains form the traces. To each end of the back band, which is a broad piece of leather of sufficient



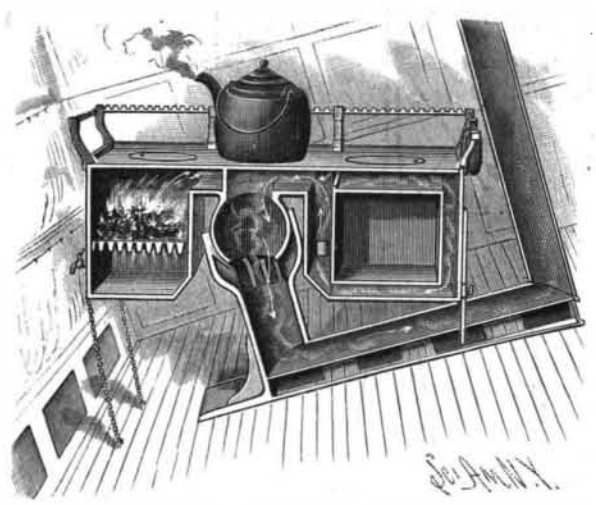
JOHNSON'S BACK BAND FOR HARNESS.

length to pass over the back of the horse, is riveted a metal plate formed with a T-head at one end, through which the rivets pass. The lower portion of the plate is folded upon itself to form the loop for the trace. To prevent the plates chafing the horse, they are covered with leather strips, which are, preferably, tongues formed at the ends of the back band. Snap hooks are attached to the ends of the band and to the plates by means of metal loops held to the band and plates by the same rivets that connect the plates to the band. The loops are covered with leather strips. By making the back band in this way, the loops in the plates take the wear of the traces and preserve the leather of the band, while the metal loops holding the snap hooks take the wear of the hooks, so that the durability of the band is greatly increased; and by the use of the snap hooks the band is made much more convenient than the ordinary band of this character.

This invention has been patented by Mr. Ike Johnson, of Honey Grove, Texas.

BALANCED COOKING STOVE FOR SHIPS.

This stove is designed for use on ship board, as it is accurately equipoised on its base, so that it will always maintain a horizontal position, no matter to what extent the ship may roll. The frame of the stove is constructed to form a fire box and ash pit at one end and a separate oven at the opposite end. The oven and fire box are separated by a central space or chamber inclosing the upper end of the base or support. The top plate, to which the fire box and oven are joined, is provided with a hollow ball, open at the top and bottom, and fitting in a hemispherical



BEKOFSKY'S BALANCED COOKING STOVE FOR SHIPS.

seat or cup of the base, thus pivotally supporting the stove. The base forms the chimney of the stove, and is connected at its bottom with a horizontal pipe which extends as far as convenient, and connects with a vertical pipe. Beneath the horizontal pipe is formed an air space that prevents burning the deck. The flame and products of combustion may, by properly arranging a damper, be made to pass directly to the chimney or to pass first around the oven. Between the fire box and oven are formed boxes, which may be closed by doors and which serve as warming ovens to be used for heating plates, etc. From the top of the stove rise arms supporting rods notched in the upper edges, and on these are placed two movable weights formed with open hooks, so that they can be easily shifted, in order to be brought opposite any pan or kettle for properly counterbalancing and keeping the stove in an upright position. When the stove stands at an angle, the lower opening in the ball will be partially closed by the sides of the cup, which tends to interfere with the draught. To avoid this, the cup portion is formed with numerous side openings, sufficient in size and number, so the aggregate area of the openings will never be less than the sectional area of the support. At one end of the fire box may be formed a water-heating reservoir. On smooth water the stove may be chained to the deck by four chains, or four legs sliding in vertical grooves may be used instead.

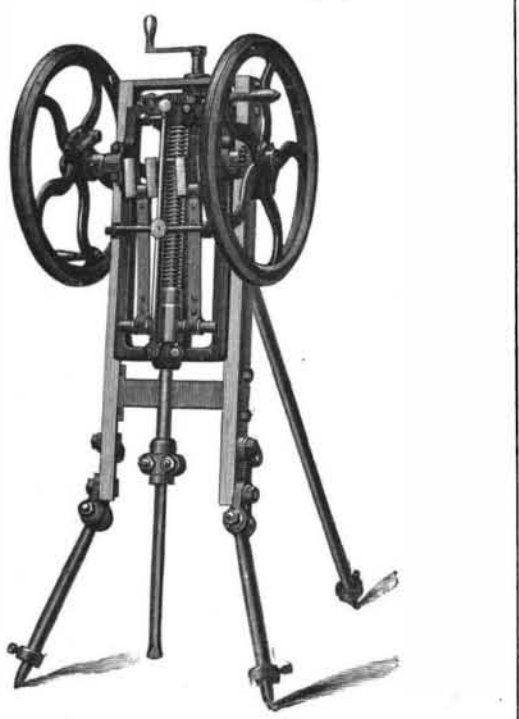
This invention has been patented by Mr. V. S. Bekofsky, Isaakiefsky. pl. n. $\frac{6}{5}$, care Restaurant, Mrs. Michel, St. Petersburg, Russia.

THE INGERSOLL DUPLEX ROCK DRILLING MACHINE.

The engraving illustrates an invention which was patented in July, 1886, in the United States, Canada, England, France, and Germany. It is the result of many years' practical experience, and has several novel features.

The drill shaft is journaled to revolve, and to reciprocate vertically in bearings in a carriage, which is fitted to slide on the side bars of the frame. The hand crank wheels are mounted to revolve freely on the main shaft, with which they are connected by pawls and ratchets.

The main shaft is journaled horizontally in the drill carriage, and is provided with two cranks, which are connected by straps with the cross head of the drill shaft. The cross head is fitted to slide vertically on the drill carriage, and the drill shaft is journaled to rotate in the cross head, but it is provided with rigid



THE INGERSOLL DUPLEX ROCK DRILLING MACHINE.

collars above and below the head, whereby the head lifts the drill shaft. Around the drill shaft a powerful spring is coiled, to drive the drill into the rock. A feed screw, provided with a hand crank at the top of the machine, is journaled in the upper cross bar of the frame. On the feed screw is a nut journaled in the upper cross bar of the carriage, and provided with ratchet teeth. On the front of the carriage is a feed lever, whose upper end is provided with a pawl to engage the feed screw nut, and whose lower end has a screw point to be engaged by a wedging collar on the drill shaft at each throw thereof. The drill shaft is spirally grooved and provided with a splined ratchet wheel and a pawl, whereby the drill is rotated a little at each stroke, so as to take a new chip. The frame is mounted on a tripod, each leg of which has telescopic adjustment, and the hinge joints are so arranged that the drill may be set to work horizontally, or at any downward slant, and at almost any upward slant.

In operation, the feed screw is first to be turned until the drill point rests firmly on the rock to be drilled, then turn the crank wheels until the hole is drilled deep enough. The pawls on the wheels engage the ratchets on the main shaft and turn it forward, lifting the drill against the resistance of the spring. When the shaft cranks pass over center, the spring drives the drill into the rock with all its force, the ratchets of the shaft revolving freely forward ahead of the pawls on the wheels, and the shaft cranks throwing past their lower dead center. Then the pawls again engage the ratchets as before; so that two full revolutions of the shaft and two strokes of the drill are produced by each revolution of the drive wheels, thus permitting the operator to work moderately, and at a living speed, while the drill makes double the same speed without any jar on the machine. This is a new mechanical device, and it gives the name "Duplex" to the machine. While the feeding device may be adjusted to feed at different rates of speed, yet it is purely automatic when at work, and adjusts itself to the varying hardness of the rock in the progress of drilling each hole, so that, if a soft stratum be entered, the carriage will be fed fast enough to make each stroke do work; or if a hard streak be struck, the drill will not be forced ahead any faster than it has cut away. Practical miners will appreciate the value of this characteristic in the saving of drill points and in the saving of wear and tear on the machine.

Already the demand for these machines is very large, and it has become necessary for the manufacturers to provide them with engines attached to meet all requirements.

For further particulars, address the agent of the manufacturers and owners of the patents, Mr. W. X. Stevens, 705 G Street, N. W., Washington, D. C. Also see our Business and Personal column.

IMPROVED GAS PLIERS.

The engraving represents a combination tool embodying pliers having variously sized jaws, a wire

DAHL'S IMPROVED GAS PLIERS.

cutter, a lava tip turning attachment, a band for cleaning the slots of lava tips, a screw driver, and a stopcock or valve turning recess. Each jaw is formed with two concave serrated recesses arranged to register as shown. In the extreme end of each jaw is a serrated recess, back of which is a semicircular flange, still back of which is a plain-faced recess. When the faces of the end recesses are brought into engagement with the tops of the burners, the lava tips will pass through the apertures of the flanges and enter the plain recesses. The lava tips may be brought into the bite of the flanges, and so forced within their sockets. In each section of the pliers, just back of the recesses, is formed a slot having a cutting edge. These constitute a wire-cutting attachment. The inner edges of those portions of the handles next the pivot are parallel when the jaws are brought together, thus providing for the reception of the thumb piece of a valve and enabling the operator to turn any valve or stopcock that may have become bound. The rear end of one handle is formed as a screw driver, while in a recess in the other handle is fitted to slide a spring strip, that may be used to clean out the slits of lava tips.

This invention has been patented by Mr. Will P. Dahl, of 919 25th Avenue South, Minneapolis, Minn.

IMPROVED LEAD PIPE REEL.

Lead pipe is usually put up on reels which do not have an inclosing case, the heads of the reels being con-

EITAPENC'S IMPROVED LEAD PIPE REEL.

nected by slats, which must be knocked off before the pipe can be unreeled and disposed to customers; and before the reel can be turned, it is necessary to elevate it upon a bar passed through its hollow shaft or body. Like trouble also attends the putting up of the pipe on the reel. These difficulties are obviated in the invention here illustrated, which has been patented by Mr. Fred. Eitapenc, of Oneonta, N. Y. The outer reel case