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IMPROVED SLOTTING MACHINE AND SLOTTING AND PLANING TOOL.

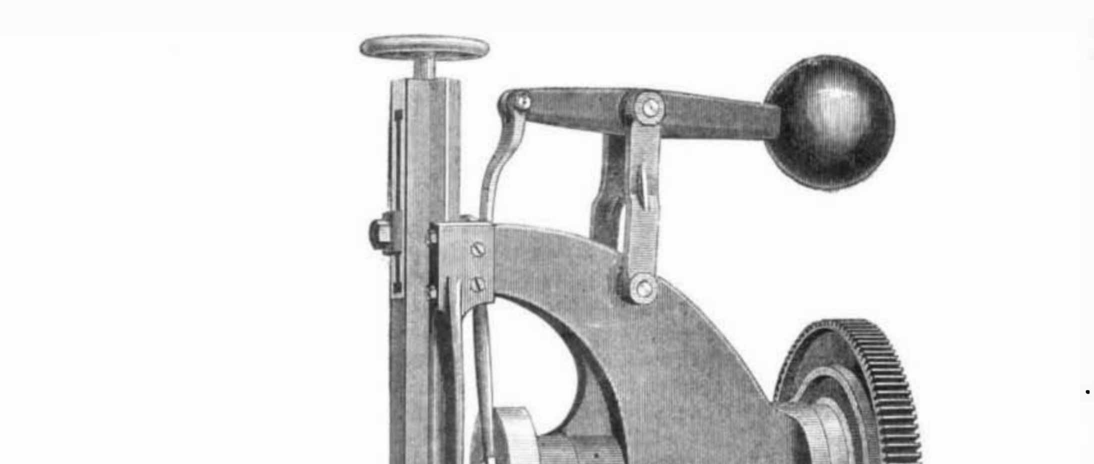
Our engraving represents a new form of slotting machine, which combines a number of the best improvements contained in those of previous construction, making it a most compact and efficient machine with excellent proportions, which our engraving illustrates. As the general arrangement of the device is familiar to mechanics, no detailed explanation is required. A few dimensions, however, may be of interest in enabling the reader to form a better idea of the advantages and merits claimed for the invention. The extreme stroke, we learn, is 8¼ inches, and will slot to the center of 36 inches. The bar, which has a vertical adjustment of 10 inches, has a continuous guide, and is so connected with the crank shaft as to have a quick return, while it is perfectly balanced by the lever and weight shown. The pinion shaft has a cone of three changes driven by a 3 inch belt, the largest end of the cone being 14 inches. The crank motion is driven by a gearing of seven and a quarter to one. The table is circular, has feed in three directions, longitudinal, transverse, and circular, and also possesses traverse of 16 inches longitudinally and 16½ inches transversely.

All the feeds are driven from one feed shaft in a simple and effectual manner. There are several minor conveniences about the machine which increase its value, and which the eye of the practical workman will readily understand.

To the ingenious slotting and planing tool, which is represented in position upon the table, we direct special attention. It consists of a steel yoke bar attached to the main slotting bar, to which, by screws and tool holders, the cutting tools are secured, so that the faces of the latter may be adjusted as far apart, within the capacity of the yoke, as desired. The piece to be planed—say, for instance, a bar which it is desired to form into a square, hexagonal, or octagonal rod, is placed on a center which connects with the index wheel shown on the left. This last is simply a disk having 24 notches cut in its circumference, and arranged with a stop, which, engaging with any notch, ho'ds the wheel, and consequently the rod to be cut, in any desired position. From this it will be evident that, by turning the wheel regularly one notch ahead, the tools will plane a twenty-four sided bar, two notches a twelve sided, three an eight sided, and so on; so that a nut, for example, of any geometrical figure or section that has parallel sides, may be accurately and readily made. In attaching this appliance to a planer, the yoke is fastened to the clapper or tool box.

The New York Steam Engine Company, of No. 98 Chambers street in this city, to which enterprising concern mechanics and manufacturers generally are indebted for the production of a variety of the best forms of standard metal working machines now in the market, are introducing the improved machine tool above described.

Further information may be had by addressing as above. Parties visiting the city are invited to call and see the machine at their warerooms.



SLOTTING MACHINE AND SLOTTING AND PLANING TOOL.

New Results with Magnets.

The common idea is that, at each temperature, *t*, steel takes a certain magnetization, which is less as *t* is higher, and which it retains on cooling. This is not correct. M. Jamin placed a bar, heated in a sand bath so as to receive the blue color of springs, in a bobbin traversed by a current, and retarded its cooling (by a suitable arrangement). The steel took somewhat less magnetism than if it had been cold. Then he broke the circuit, and, on examining the remanent magnetism with a proof contact, found it much greater than the bar would retain if first cooled (109 grammes instead of 54). Thus the coercitive force does not diminish with heating, but increases. But if the force of detachment be again measured, minute by minute, it is found to increase, at first very rapidly, then less so, till in a quarter of an hour it has quite disappeared; and this whether the bar be kept hot, or allowed to cool naturally. The transition is almost continuous from total magnetization to remanent, which in time descends to zero. Now reheat the bar, but to a less temperature. Its total magnetization (while the current passes) is greater than in the former case; but immediately on breaking, the remanent magnetism is less than in that case; on the other hand, it disappears less quickly, and never entirely. Again, begin without heating the bar. The total magnetism is still greater; the remanent (on breaking) still smaller, and invariable with the time.

M. Gaugain observes that, when one has magnetized an iron bar as strongly as it is possible to do so with a current of given intensity, the magnetization may be considerably increased by using currents of the same direction, but of less intensity. This, however, depends on the mode of detaching the armature after interruption of the current; in these cases it was detached by a sudden movement at right angles to the polar faces; if it is detached by sliding along the faces, the feebler currents do not add to the magnetism developed by the stronger initial current. M. Gaugain considers the detaching of the armature weakens the magnetism; and this, through a shaking (*ebranlement*) of the molecules of iron, which diminishes the coercitive force. He works out a hypothesis of these and other phenomena.

TRANSPARENT GUM.—A little glycerin added to gum or glue is a great improvement, as it prevents the gum or glue becoming brittle. It also prevents gummed labels from having a tendency to curl up when being written on.

Fuller's Computing Telegraph.

It is singular to how small an extent general use is made of the various instruments which have, from time to time, been introduced for reducing the labor of numerical calculation. Some of these instruments are, no doubt, costly, but this is far from being the case with all. The "slide rule" is within the reach of every one; but how rarely do we come upon any person who uses it to a great extent? And yet the amount of fatiguing calculation a simple slide rule may save is something wonderful. Such rules can be made, and can be procured of special manufacture, which increases the range of their utility by enabling calculations to be made, embracing several figures. Another useful contrivance is the "computing telegraph" just reintroduced amongst us by Mr. John E. Fuller, of Boston, Eng., who first produced it some thirty years ago, and who since that time has been continually improving it, so that at the present moment it is a most complete instrument.

It consists of a squared board made of old tarred rope, a material which is not given to expansion or warping; upon this is pasted an engraved card, which has a graduated circle of the diameter of 8½ inches. Within this circle there is an inner circle, which revolves, and is graduated in the same manner as the outer circle. The divisions are from 0 to 10, completing the circle, and are the same for both; the divisions are similar to those of the ordinary slide rule, and decrease in a perfectly regular logarithmic order. In fact, the instrument is a circular slide rule. It possesses a great advantage over the ordinary straight slide rule, in consequence of its length (the actual length of the rule being 26·7 inches); this advantage is further increased from the circular arrangement being endless. Only one of 0 to 10 is required; while in the ordinary rule, one wants 0 to 10 and 10 to 100.

The instrument, in fact, forms a slide rule of a very perfect character, and enables one to work out the simplest and most complicated arithmetical question. In calculations where the same factor has to be used many times, the saving of time is simply enormous. Where in a multiplication sum the product is over four figures, and accuracy may be required, it is only necessary to make a mental calculation as to the tens and units, the computor furnishing the leading figures: for instance, 565 × 179 = 101,135; the slide rule at once shows the 101,1 and a small mental calculation gives 35 as the final figure. For engineers of whatever kind, such a calculating machine is invaluable, and no engineer's office, electrician's testing room, or manufacturer's counting house should be without it.—*Engineering.*

Sixty Miles an Hour on the New York Central Railway.

Recently, says the Syracuse *Journal*, a special train conveying Vice President Vanderbilt and other Central Railroad officials, consisting of an engine, (Mr. James Wood, engineer) and two passenger coaches, made the run from Rochester to Syracuse in eighty-five minutes, including one stoppage for water at Clyde of five minutes. This would leave the running time, the distance being eighty-one miles, eighty minutes, or at the rate of 60¾ miles in one hour. This is the fastest time on record between the two cities.

AMERICAN car wheels have now become a permanent and reliable item in our domestic export trade. In the year 1871 the number exported was 2,318; in 1872 it was 4,760, and in 1872 it rose to 7,515, despite the stagnation of the last four months. This is of much more importance to American industrial interests than the question whether our raw iron can be profitably exported to England.