A NOVEL MECHANICAL MOVEMENT.

Mr. Bernard Frese, of Gilman, Ill., has patented, January 6, 1874, an ingenious device for converting rotary into rectilinear reciprocating motion, or *vice versâ*. Its object is to transmit an even and uniform power to a wheel, for example, and, when used in connection with a single cylinder engine, it obviates the possibility of a dead center. It is hardly necessary to point out the many applications of which the invention is susceptible, as these will be readily apparent from the following description of its operation:

Our engravings show the apparatus in two views, the first of which, Fig. 1, may be termed the working side, and the second, Fig. 2, the governing side. A is a frame upon guides in which travels the reciprocating head, B, to which is attached a rod, C, passing through one end of the frame. Journaled in the central portion of the latter, and passing through the longslot shown in the head, is a shaft which, at

Fig. 1

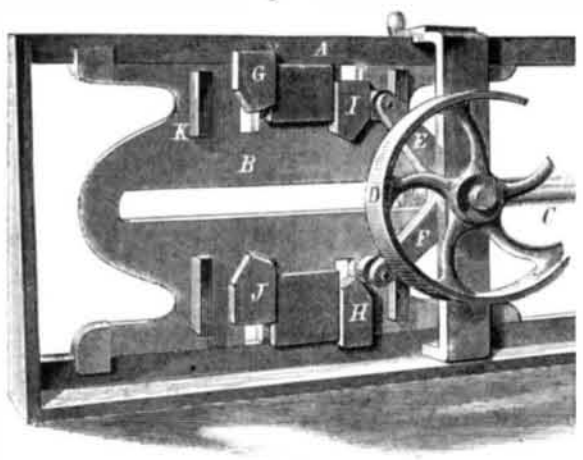
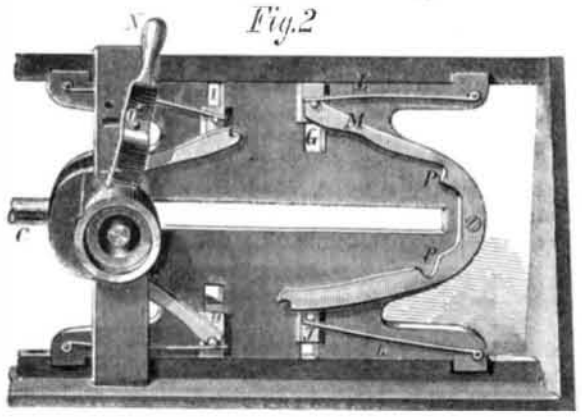


Fig. 2



one extremity, carries the belt wheel, D. At the same end of the shaft, but on the other side of the journal, are two arms, E F, at right angles to each other, formed from a single piece and rigidly attached, at their angle, to the shaft. The head, B, has on its edges four slots, which serve as guides for four small movable plates or blocks, G, H, I, and J. Adjoining these last are four fixed studs, K, firmly secured to the head. The rear sides of the blocks are shown correspondingly lettered in Fig 2, and upon each is a pin, against which springs, L, act so as to hold the blocks against the inner ends of their slots.

Pivoted at each end of the head are V-shaped pieces, M, in each arm of which is a notch, which, when engaged with the pins on the back of the blocks, tend to hold the latter to the outer portions of their slots, or, in other words, to act against the springs, L. It will be observed that, in our engravings, the blocks, G and H, are thus immovably held, while the blocks, I and J, are free to travel forward and back in their slots, pushing, of course, in one direction against their springs.

We can now follow the operation of the device under the conditions represented. The head, being at the extremity of its stroke to the left, begins its motion to the right. The arm, E, of the pair secured to the shaft, is first struck by the block, I, which impinges against a friction roller on the end of the same. The block, traveling to the right, carries the arm with it, so turning the latter into a lever to rotate the shaft. The arm, F, being unobstructed, for the corresponding block, H, is held back out of the way, is necessarily carried upward, so that the two arms, being placed at the proper distance apart, arm, F, after the head has traveled half its stroke, enters between the block, G, and the stud on the left of the same, and takes against said stud. We have now the arm, E, between the block, I, and its stud, and the arm, F, between the block, G, and its corresponding portion. This arm, F, is next acted upon, and being caused to turn to the right, by the pushing against it of the stud, rotates the shaft, and in so doing brings the arm, E, so that its extremity takes against the right hand inclined edge of the block, J. The latter is, however, merely held forward by its spring, so that it readily yields to the pressure of the arm, which slips behind it. The head is now at the end of its stroke, the ends of the arms are once more in a vertical line, and the shaft has made half a revolution. The return movement being begun, the same operation is repeated. The arm, F, travels over from the outside of block, G, to the inside of block, H, and the arm, E, over against the block, I, which, in turn, yields, so that at the conclusion of the stroke the various portions are once more as represented in the engraving.

In order to reverse the movement or cause it to stop, the lever, N, Fig. 2, working loose on the shaft, engages with a projection, O, which passes through a curved slot in the frame. This projection is formed upon a bar, not shown, which also works upon the shaft. At either side of the latter and formed on the under portion of the bar, are two projections which, by turning the lever so as to throw either end of the bar at an angle to the vertical, may be placed one in advance of the other in respect to either end of the head. Near the curved portions of the V-shaped bars, M, are notches, P, into which the lugs on the governing bar may enter. As placed in Fig. 2, it is clear that the upper lug on the bar is thrown in advance or to the right, and the lower one to the left. Now suppose the lever to be thrown over the other way, and the stroke of the head to begin. The lower lug is now in advance, to the right. Consequently, as the head finishes its stroke, the lower lug will strike the lower side of the forward bar, M, enter the notch, and, by tilting the V downward, disengage the hook in the upper bar from the pin on the upper block, causing the latter to be thrown inward by its spring, while, at the same time, causing the hook on the lower bar to catch the pin on the lower block, holding the latter immovably, as we have already explained. The return stroke does the same with regard to the other V bar and the other pair of blocks, so that the result is that, instead of blocks, G and H, being held, as in Fig. 1, they are left free, and I and J fastened. A little consideration will show that the result, on moving the head, will be a reverse motion of the arms to that already described. If now the lever, N, be placed exactly in the center, the effect is to throw all the hooks of the V bars off the pins on the block, and the arms, pressing equally on both blocks nearest them, are unable to move in either way, and thus the motion is arrested.

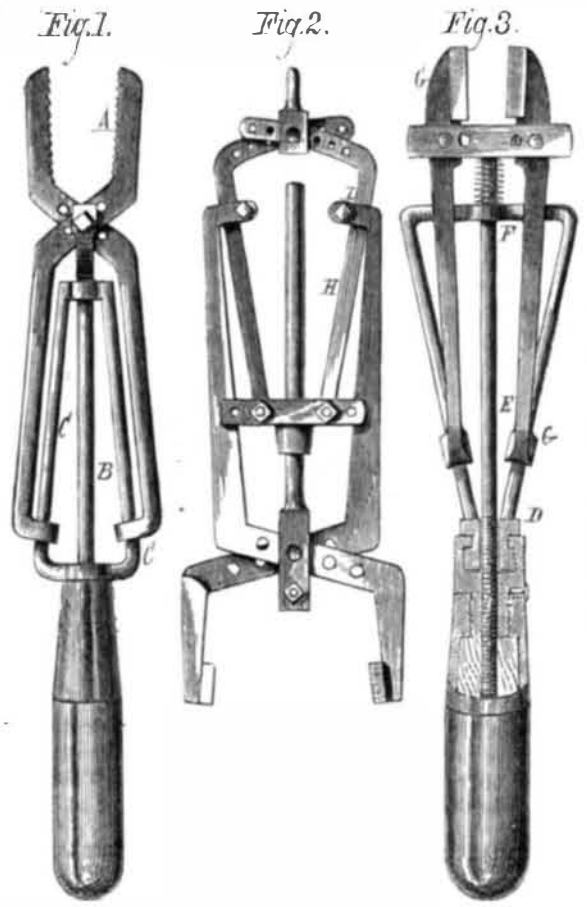
It is claimed that this device will be of considerable utility as applied to hoisting engines, as it allows the motion of the machine to be quickly altered or arrested, while using almost the full power. For further particulars address the inventor, as above.

IMPROVED GRAPPLING TOOLS.

We illustrate herewith three forms of grappling tools patented March 18 and 25, 1873, through the Scientific American Patent Agency, by Mr. Simon B. Dexter, of Mason City, Iowa. In Fig. 1 is shown a device which may be used as a wrench, pincers, or grapple for raising and carrying weights. The jaws, A, by means of a series of holes, are made adjustable to adapt them to articles of different sizes. A shank rod, B, is connected by means of a fork on its end with the fulcrum pin, and extends back into the handle. Upon it is a wedge-shaped slide, consisting of two rods, C, which pass through eyes on the pincer handles. When any object is secured between the jaws, it is griped by pulling upon the handle, causing the arms of the pincers to come together, and is loosened by a contrary movement. This feature adapts the tool for grappling for articles under water, as well as for carrying heavy articles in founderies.

Fig. 3 is an improvement on the above mentioned device, in which, by turning the handles, a swivel band, D, is also turned. The shank rod, E, is provided with a screw thread, and passes through the swivel band, so that, by the above mentioned motion, the slide, F, is moved up or down on the

Fig. 1. *Fig. 2.* *Fig. 3.*

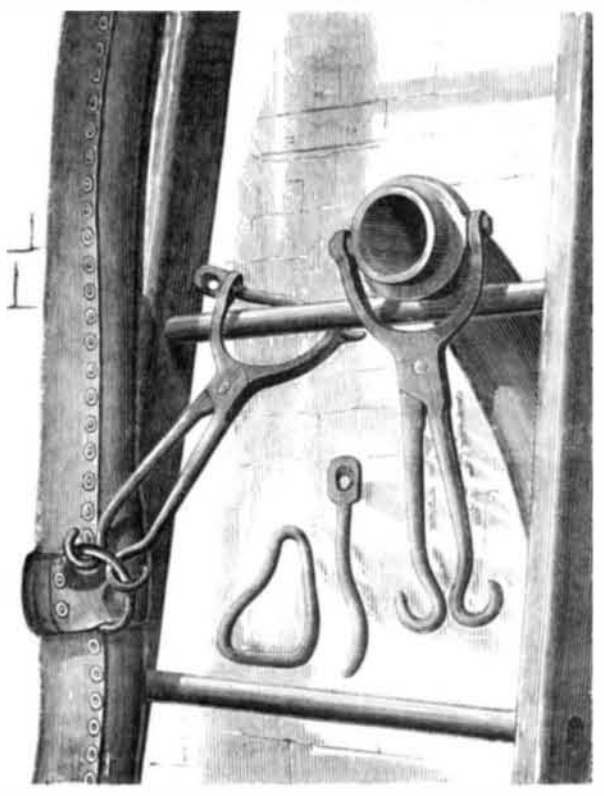


rod. The long ends of levers, G, are thus spread apart or brought together. In this manner the jaws may be adjusted with great nicety and with sufficient power to make the instrument valuable as a hand vise.

The device shown in Fig. 2 is intended for raising or turning stones for buildings, etc., by means of derricks or cranes. It has adaptable jaws, the upper ends of the levers of which are turned towards each other to receive the bars, H, confined in forks therein by rollers, I, and bolts. It will be seen that these bars incline from the vertical guide rod, and together form a wedge-shaped slide for each of the levers. In drawing upwards, the bars bear against the rollers, I, and so close the jaws, and by pushing downwards the reverse takes place.

POND'S PATENT SPANNER.

It is unnecessary for us to dwell upon the importance of any invention which will facilitate the extinguishment of fires. A series of disastrous conflagrations has fully informed the public mind upon this point. Pond's patent spanner, which we illustrate herewith, is an invention of the character referred to. This instrument is, essentially, a pair of tongs, with an eye at the end of each jaw, and a hook at the end of each handle. The advantages claimed over the common spanner are as follows: It cannot be put on wrong; it will turn the coupling either way without being removed; it will not drop off; it can be used in carrying the hose, the point of lifting being at the heaviest portion thereof, namely, at the coupling, instead of one or two feet from the same. The hook handles may be instantly inserted in rings or straps on the hose, which may thus be the more easily dragged or carried. The device also enables the hoseman, by hooking the handles into a ring in his belt, to carry the hose up a ladder or elsewhere while he has both hands free, and also



to fasten the hose to any projecting point or to a ladder. For this latter purpose a pin is furnished, which passes through the eyes at the ends of the jaws of the instrument. One point of excellence which will recommend this spanner to the firemen, especially on cold winter nights, is the fact that by its use hose can be handled without touching the wet exterior with the hands. In short, it is claimed that, by the use of this invention, hose can be handled more easily, quickly, and advantageously than by any other method. Pond's patent spanners are made of malleable steel, finished in best English japan, weighing one pound each, and of sizes to fit different kinds of hose.

Patented in the United States November 25, 1873, and in the Dominion of Canada, May 19, 1874. For further particulars address Lewis Pond, patentee and manufacturer, Foxboro', Mass.

Restoration of Burnt Steel.

J. L. Davies, Landore, near Swansea, Wales, writing to *Iron*, says: "I have found that resin oil, with which is intimately mixed one fourth (more or less) its weight of the residue of paraffin stills, has a wonderful effect upon burnt steel.

"Chisels which have been burnt and rendered useless may be, by means of this fluid, restored and made as valuable as ever. This fluid, which was many months ago christened *restitutor chalybis*, may be used as follows: Burnt steel must be heated red hot, then plunged into the restitutor for a few seconds; then re-heated and cooled in the ordinary way. The steel after this process is perfectly restored.

"Experience in the use of the restitutor will quickly enable persons to give any desired temper to their tools, but it may be stated that tools can be made especially hard by heating them red hot, dipping into the restitutor, then reheating to a slightly white heat, and immediately cooling in pure water."

INCOMBUSTIBLE PAPER AND INK.—An English inventor has secured letters patent for an incombustible and fireproof ink. The pulp for the paper is composed of vegetable fiber, one part; asbestos, two parts; borax, one tenth part; and alum, two tenth parts. The ink can be used either in writing or painting, and is made according to the following recipe: Graphite, finely ground, twenty-two drachms; copal or other resinous gum, twelve grains; sulphate of iron, two drachms: tincture of nut galls, two drachms; and sulphate of indigo, eight drachms. These substances are thoroughly mixed and boiled in water. The graphite can be replaced by an earthy mineral pigment of any desired color.

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