

MECHANICAL INVENTIONS.

An improved horse power mechanism has been patented by Mr. William McE. Dye, of New York city. The object of this invention is to furnish an improved horse power mechanism for various industrial operations usually performed by steam, water, or wind power. This invention is an improvement in that class of power mechanism which combines a continuously acting lever and an endless inclined plane, formed practically of a circular disk pivoted at its center on a ball-and-socket or other universal joint, upon which joint the disk is made to oscillate by the weight of a draught animal moving in a regular manner around its perimeter and up the inclined plane.

Mr. Adam Breth, of New Washington, Pa., has patented a new and improved device for cutting or clipping bolts. The invention consists in pivoting the movable jaw of bolt clippers to a block made adjustable by a clamp screw passing through slots of spring and jaw.

An improved wagon has been patented by Mr. Fredrick Borntrager, of St. Clair, Mich. This invention relates to that class of wagons which have jointed reaches for enabling the wagon to be turned within a small compass.

Messrs. Charles E. Mayo and William L. Perry, of Lowell, Mass., have patented an improved foot power machine for driving saws, lathes, and performing work of similar character requiring small power and high speed. The invention consists in a clutch pulley of novel construction and a treadle arranged to act always in one direction, these parts being combined to secure continuous motion of the driven shaft.

An improved ice cutting machine, patented by Mr. James Shannon, of Cohoes, N. Y., consists of a sled-shaped frame supporting vertical side standards, on which are pivoted forward projecting arms, that are adjustable in a vertical plane by eccentrics and levers, and carry on their free ends vertically-revolving circular saws for cutting the ice, which saws are operated by suitable belts and pulleys on gearing that form part of the device; and it consists, further, of a series of revolving toothed wheels keyed on a horizontal cross shaft in the rear portion of the device, which wheels are designed to rest upon the ice and to urge the machine forward by their revolutions. The saw carrying arms and the rear portion of the machine are also provided with platforms for the operators to stand upon or for the reception of weights to force the saws and toothed wheels into the ice for their more efficient work.

IMPROVED STEAM ENGINE PISTON.

The engravings illustrate the improvements patented by Henry Waterman, of Brooklyn, N. Y., July 12, 1881, and relate to metallic pistons. The object of the invention is to render the piston tight and prevent loss of power by passage of steam into and through the piston; also to compensate for wear and render the packing and its parts easily adjustable. The invention will commend itself to engineers as being very practical in all its details, easily made, durable, and readily adjustable.

In the accompanying drawings, Fig. 1 is a plan view of the piston, with the face plate and packing disk removed. Fig. 2 is a transverse section of the piston; and Fig. 3 a section of the convex spring packing plate.

A is the hub, formed with the face plate, *a*, and with radial arms, *b*, to which the face plate, *c*, is secured by screws, *d*. B B are split rings placed upon a wide inner split ring, C, between the plates, *a c*. The ring, C, is backed at three equidistant points by spring plates, *e*, and keys, *f*, and at the side opposite its open ends by a curved block or plate, *g*, and key or keys, *h*. The arms, *b*, of the hub are recessed at their outer ends to form lugs, *i*, between which the keys, *f h*, enter. The plates, *e*, at each point are two or more in number, so as to form leaf springs, and are secured by a rivet or otherwise to the keys. The block, *g*, is formed with a central hemispherical socket, *k*, in its inner face, and the key, *h*, is formed with a hemispherical stud, *l*, which enters the socket, *k*, the stud thus preventing lateral movement of block, *g*, while permitting it to rock. The outer convex surface of block, *g*, is formed with a transverse groove, *m*, that is engaged by a stud, *n*, projecting from ring, C. By this construction the ring, block, and key are retained in their proper relative positions, and the block may adjust itself accurately to the inner surface of the ring.

In the recesses of the arms, *b*, behind the keys, *f h*, are filling plates or strips, *o*, of any desired number, as required to expand the ring, C. These being placed to fill out the space when the piston is set or from time to time, as required, furnish solid resistance, and unequal wear can be accurately compensated for.

It will be seen that the expansible ring, C, is held rigidly at its middle portion between the ends, while the remaining portion is allowed a limited amount of movement by the leaf springs, *e*.

Between the plate, *c*, and the edges of rings, B C, is the packing, *p*. This may consist of a circular plate of spring metal, of convex concave form, as shown in Fig. 3, which being clamped by plate, *c*, packs the joints between the plate and rings, so as to exclude steam from the interior of the piston.

For large size pistons I prefer to use packing rings or ring segments. These will be made of spring metal and curved transversely, so that when placed upon the expansible rings and clamped down by the face plate they insure a tight joint.

This piston, when fitted with plate, *g*, is especially adapted for use in horizontal cylinders, where, on account of the

sag, the wear on the packing rings, B, is unequal. Such wear can be readily compensated for by adjustment of the backing without affecting the solidity of parts.

Fig. 1.

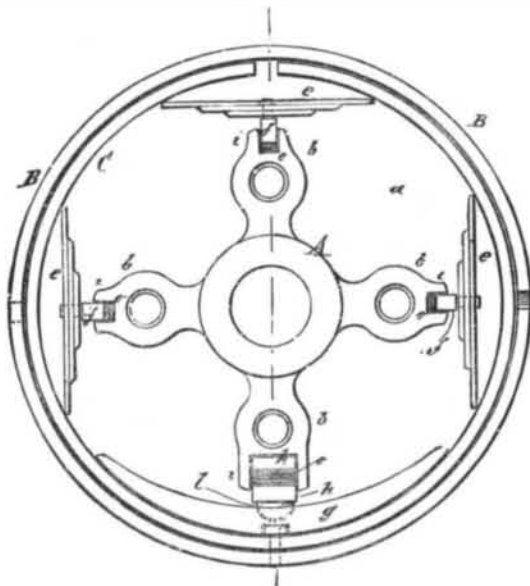


Fig. 2.

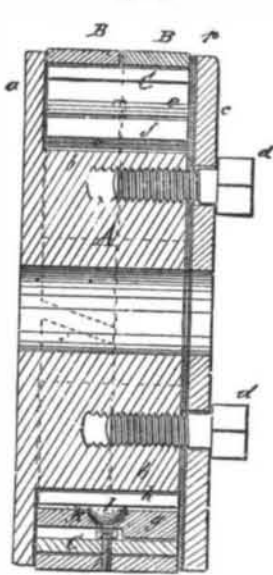


Fig. 3.

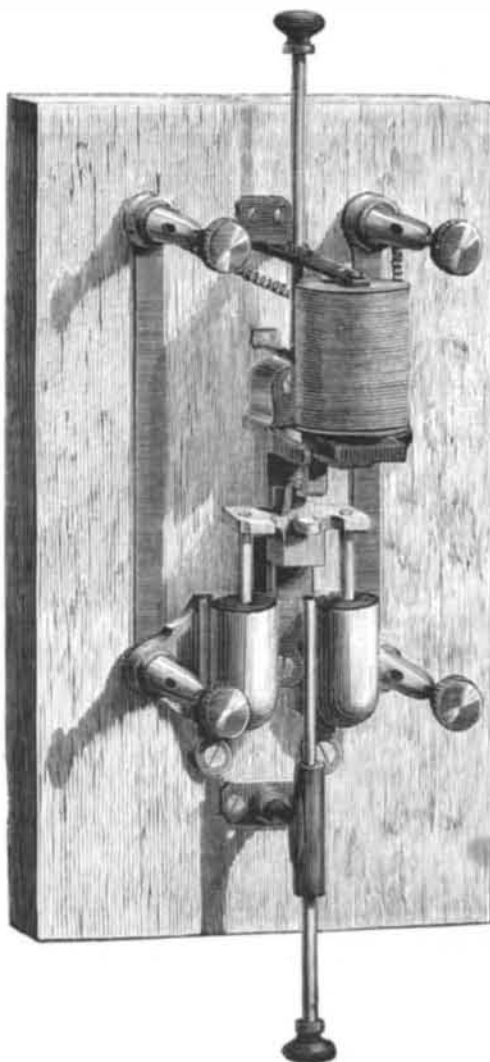


WATERMAN'S IMPROVED PISTON.

For use in vertical cylinders the plate, *g*, is not essential. Further information can be obtained by addressing the patentee, Henry Waterman, 18 Dunham Place, Brooklyn, N. Y.

CUT-OFF FOR ELECTRIC LAMPS.

The present tendency in voltaic arc systems is to place several lamps in the same circuit, their number varying from



RAPIEFF'S CUT-OFF FOR ELECTRIC LAMPS.

three or four up to forty. The great advantage of such an arrangement exists, as well known, in the great saving in wire that results from it. But, as an offset, it is necessary to employ currents of very high tension, and if this be too great the apparatus may become dangerous; and then, too, the insulation of the wire is very difficult.

In practice it is well not to attain so exaggerated tensions, but to be content with placing only ten, twelve, or sixteen lamps, at the most, in the same circuit. But under these conditions all the lamps are mutually independent, and if one of them, through some accidental cause, is extinguished all the rest go out at the same time. This is a very grave trouble, for which various remedies have been sought. It was for the purpose of obviating it that Mr. Rapiéff devised his "safety apparatus," and that all the Brush lamps are furnished with an arrangement called a "cut-off." Mr. Anatole Gérard's "automatic sentinel," which we are about to describe, accomplishes the same object with at least as great a simplicity and with one additional advantage—it is completely independent of the lamp; it forms an apparatus apart, easy to watch, and always within reach of the hand whenever it is desired to make several lamps in the same circuit independent of one another; and it is applicable to all lamps in service, whether they are continuous current or alternating current, voltaic arc or incandescent.

The accompanying cut will allow the working of the apparatus to be readily understood. It consists of a straight, fine wire and single-bobbin magnet, the extremities of whose wires are connected with the two upper terminals, to which, also, are joined the two wires coming from the lamp to which the apparatus is adapted. The conductor coming from the machine is connected with the lower terminal to the left, and the wire proceeding from the lower terminal to the right goes to the second lamp and second apparatus.

The two lower terminals are in metallic communication with two small iron cups which are half full of mercury. Above these cups there are two iron rods fixed to a metal cross-piece carrying a hook which engages with a second hook fixed to the armature of the electro-magnet. When the current passes it divides itself between the lamp and the fine wire of the electro-magnet without the armature being attracted thereby. In case of an accident or the extinction of a lamp, the entire current passes through the fine wire, and the electro-magnet becoming active, attracts its armature, which, on tilting, disengages the hook and allows the two rods to drop into the cups of mercury.

The current then passes directly from one lower terminal to the second, that is to say, from one lamp to the other, through the intermedium of the iron rods; and thus the circuit is not interrupted by the accident which happened to one particular lamp, and all the others continue to operate just as if nothing unusual had occurred.

As may be conceived, it would be easy, instead of establishing a direct communication, to intercalate a resistance equivalent to that of the lamp put out of service, so as not to disturb the conditions of the electric circulation; and it would be easy likewise to utilize the fall of the rods for actuating an alarm bell, or even an indicating tablet, and thus to convert the apparatus into an automatic tell-tale, which would not be without utility in certain kinds of night work.

This apparatus also replaces the ordinary commutator; since, in order to relight a lamp when extinguished it is only necessary to press on the button located beneath. On raising the rod it strikes against a spur projecting from the cross-piece which supports the two rods, and, lifting it, causes the two hooks to engage, and the current then passes through the lamp. To extinguish a lamp it is only necessary to press upon the upper button, when the rod to which it is attached tilts the armature, disengages the hooks, and closes the circuit anew by the dropping of the iron rods into the mercury cups.

In a more recent model than the one here represented Mr. Gérard has arranged the mercury cups one above the other, instead of placing them side by side. The present arrangement gives greater width to the apparatus, which often has to be located on a narrow support, but the principle is in no wise changed thereby.—*L'Electricien*.

A Wrong to be Righted.

The schooner M. C. Mosley, of Boston, on the way to Charleston, picked up at sea the captain and crew of the brig Alphonse, which had been disabled in a recent storm and abandoned. At Charleston the health authorities learned that the shipwrecked mariners were from the infected port of Cienfuegos, and properly ordered the Mosley to quarantine. The chance of yellow fever infection from shipwrecked sailors, who had endured twenty-four hours of severe exposure to storm in open boats, was certainly slight; but the law was specific, and the health officers were constrained to obey it.

It does not seem right, however, that the performance of a meritorious act on the part of the captain of the Mosley should meet with no other recompense than the inconvenience and losses incident to quarantine. That would be very like imposing a penalty for doing an act of humanity. The case would seem to be a suitable one for special action on the part of the national government, to recognize and reward appropriately the conduct of the captain and crew of the Mosley, and to repay the owner of the vessel for the loss occasioned by the delay in quarantine. The case is not likely to be often repeated; still, it would be a misfortune to have an evil precedent established by means of it.