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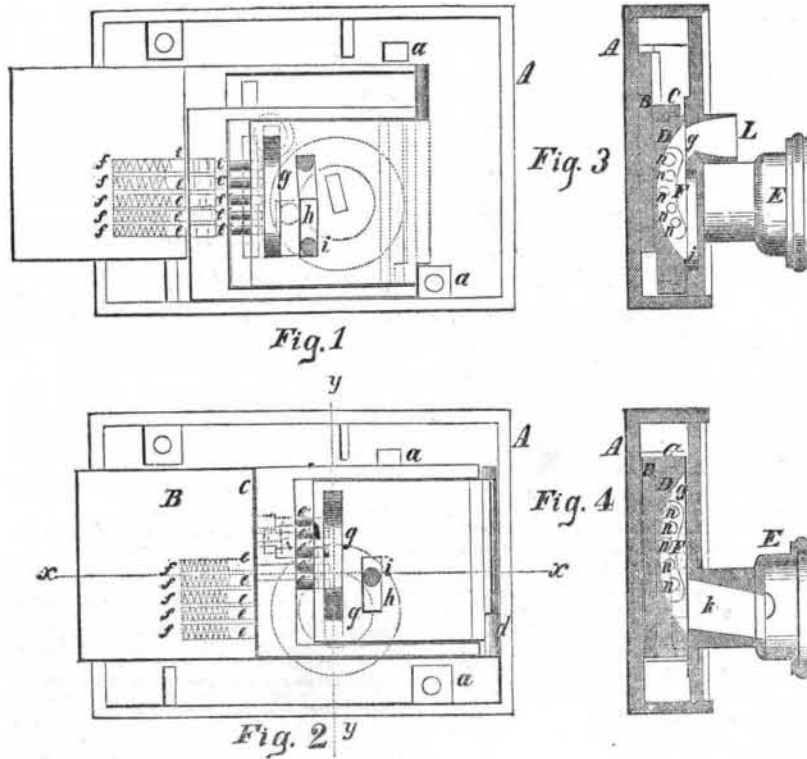
Improvement in Locks.

The annexed engravings represent an improvement in locks for fire proof safes, bank vaults, and other doors, for which a patent was granted to Linus Yale, of Newport, Herkimer Co., N. Y., on the 22nd of May last.

Fig. 1 is an internal view of the lock, the casing nearest the eye being removed, and the lock shown in a locked state. Fig. 2 is also an internal view, with the lock represented in an unlocked state. Fig. 3 is a transverse vertical section through fig. 1, and fig. 4 is a transverse vertical section through *yy*, fig. 2. Similar letters refer to like parts.

The nature of the invention consists in the employment of a sliding plate and frame, constructed, arranged, and operating in connection with pins or rods and a key of peculiar construction, as will be hereafter described. A represents the casing of the lock, and B is the bolt which works or slides between proper stumps, *a*, in the usual way. The back end of the bolt, B, has a recess or rebate, *b*, cut in it, leaving a shoulder, *c*, at one side, and a ledge, *d*, at the back end of the bolt, between the shoulder, *c*, and the ledge, *d*, a frame, C, is fitted. The side of this frame adjoining the shoulder, *c*, of the bolt has a series of holes made through it, and a corresponding number of holes are made into the shoulder, *c*, and rods, *e e'*, are fitted in these holes, two rods in each hole, the rods, *e*, in the holes in the shoulder, *c*, bearing against spiral springs, *f*, [see dotted lines, figs. 1 and 2.] The rods, *e*, in the shoulder, *c*, are of equal length, but the rods, *e'*, in the side of the frame, C, are of unequal length, and the rods, *e*, project into the holes in the side of the frame, C, and prevent said frame from being moved upward in the bolt when the lock is in a locked state. In the frame, C, there is fitted a sliding plate, D, which has a curved or segment recess, *g*, cut in it, and holes are cut through the edge of the plate, D, into the recess, *g*, in which holes the ends of the rods, *e'* pass, and project into the recess at unequal distances, as the rods, *e'*, as stated, are of unequal lengths. The plate, D, has also an oblong slot, *h*, cut through it, in which the bit, *i*, of the knob, E, fits. The knob is provided with a circular plate, *j*, at its inner end, said plate fitting in a circular recess in the inner surface of one side of the casing, as shown in figs. 3 and 4. The knob also has an oblique opening, *k*, which passes longitudinally through it, as shown in fig. 4. The plate, D, slides laterally a certain distance in the frame, C, a ledge, *l*, on the under side of the plate strikes against the side, *m*, of the frame, C, opposite the side in which the rods, *e'*, are fitted, and determines the length of the vibration of the plate. Through the front side of the casing, there is made a rectangular opening, L, fig. 3. F is the key of segment form corresponding to the recess, *g*, in the plate, D. The key has a series of holes, *n*, of different depths in one of its sides, (see figs. 4 and 5.) Suppose the lock to be in a locked state, as shown in fig. 1, it will be seen that the plate, D, and frame, C, are depressed or moved down, and its back end

IMPROVED LOCK.



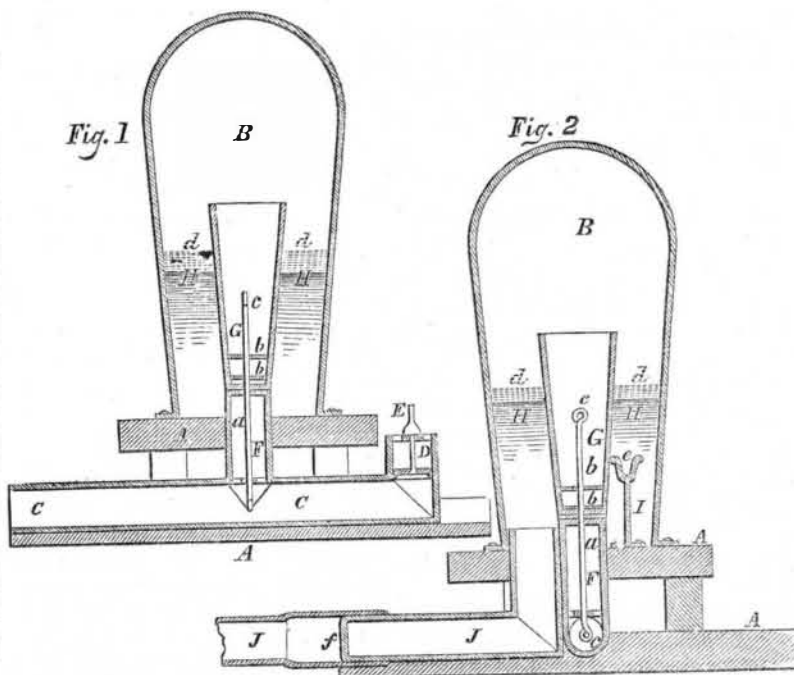
bears against the stump, *a*, and prevents the bolt, B, from being thrown back. The plate, D, and frame, C, therefore must first be raised. The key, F, is inserted in the opening, L, and passes down into the recess, *g*, in the plate, D, the holes, *n*, in the side of the key being opposite the rods, *e'*. The depths of the holes, *n*, vary, as before stated, and correspond to the difference in length of the rods, *e'*. The key being within the recess, *g*, the knob, E, is turned from left to right, and the bit, *i*, first moves the plate, D, towards the shoulder, *c*, and the key, F, is pressed against the ends of the rods, *e'*, which pass into the holes, *n*, of the key, F, and the key forces the rods, *e*, in the shoulder, *c*, till their ends are flush with the inner surface of the shoulder. The plate, D, and frame, C, may be raised, as the rods, *e*, are free from the holes in the side of the frame, C, and the bit, *i*, acts upon the upper edge of the slot, *h*, in the plate, D, and moves said plate upward free from the stump, *a*, and the bit, *i*, then acts against the side of the slot, and throws the bolt back as the ledge, *l*, acts against the

side, *m*, of the frame, C, and the side, *m*, against the ledge, *d*, at the back end of the bolt, B. When the bolt, B, is thrown back, the recess, *g*, is in line with the oblique opening, *k*, in the knob, L, and the key will pass out of the recess, *g*, and through the opening, *k*, into the hand. In locking the lock no key is required, the knob being merely turned in an opposite direction, and the plate, D, being moved back to its original position, as shown in fig. 1.

The advantages of the above lock are, that it cannot be picked, as the recess, *g*, is thrown beyond the opening, L, in the casing before the bolt can be thrown back, so that there is no opportunity for a burglar to tamper with the lock, or take impressions in wax to form a key. There is not sufficient space allowed to receive a requisite quantity of powder to blow off the lock. The key is convenient to carry in the pocket, and the construction of the lock is extremely simple and economical to manufacture.

More information may be obtained by letter addressed to the patentee.

VALVES FOR HYDRAULIC RAMS.



The accompanying engravings are views of an improvement in Hydraulic Water Rams, and other hydraulic engines, for which a patent was granted to Ellis Webb, of Parkersville, Pa., on the 5th of Dec. last.

Fig. 1 is a vertical longitudinal section through a water ram in the line of the pipe which carries the motive column. Fig. 2 is a transverse similar section passing through the discharge pipe. Similar letters refer to like parts.

This invention may be advantageously used in any and all forms of hydraulic engines, where an air chamber is used, in connection with any other motive power, as in a steam or water pump.

The nature of the invention consists, first, in the construction of the valve within the air chamber, viz., so that in rising it shall not rise against the column of water in the chamber. Second, in the method of introducing an oleaginous or other fluid packing on top of the column of water within the air chamber, for preventing the water from carrying out with it the air or gas from the inside of the air chamber. Third, in the check valve in the rising main or charge pipe, for the purpose of preventing the falling back of the column of water in said main and to avoid any irregularity in the beating of the valves in the air chamber or waste pipe.

A is the base upon which the apparatus may be supported; B is the air or gas chamber, and C the pipe for conveying the motive column of water from the spring head or water source. D is the waste pipe provided with a weighted or self-operating valve, E, for checking and then allowing the water to waste. F is a branch pipe rising up from the pipe, C, immediately underneath the center of the air chamber, and through this pipe the water is forced or let into the air chamber. Over the top of the inlet pipe, F, is arranged a valve, G, which is cylindrical or slightly conical; it is open at top and closed at the bottom, and provided at its seat on the pipe, F, with suitable packing to make it water tight when on its seat. This valve rises and falls perpendicularly, and as it rises, presents a uniform opening to the ingress of the water, and avoids that agitation in the air chamber, which is incident to a flap or hinged valve. To admit of the valve, G, rising and falling in a true line to come upon its seat over the opening in the pipe, F, a guide rod, *a*, is suitably supported, and passes up some distance, as shown. Guide strips, *b b*, may also extend across the inside of the valve. The top of the rod, *a*, should have a stop or eye, *c*, upon it, to prevent the valve at the first beat of the water (when the ram is started) from throwing it too high; after the ram is started the pressure of the air above it, will prevent it from rising too high. H represents the water line in the air chamber, when at or near its highest point. This point is only assumed, however, to show the relative positions of the water, the fluid packing, and the top of the valve, to each other, for by extending further up, the top or crown of the valve, the water and packing may rise higher, never however above the top of the cylinder valve. On top of the water, H, is an oleaginous fluid packing, *d*, lighter than water, so as to float thereon. This packing is interposed between the water and the air or gas in the top of the chamber, for the purpose of preventing the water from carrying out said air or gas from said chamber, which it effectually accomplishes.

The fact that a ram or other hydraulic engine often becomes, for the time being, perfectly useless from the want of air in the chamber, it having been taken up and car

