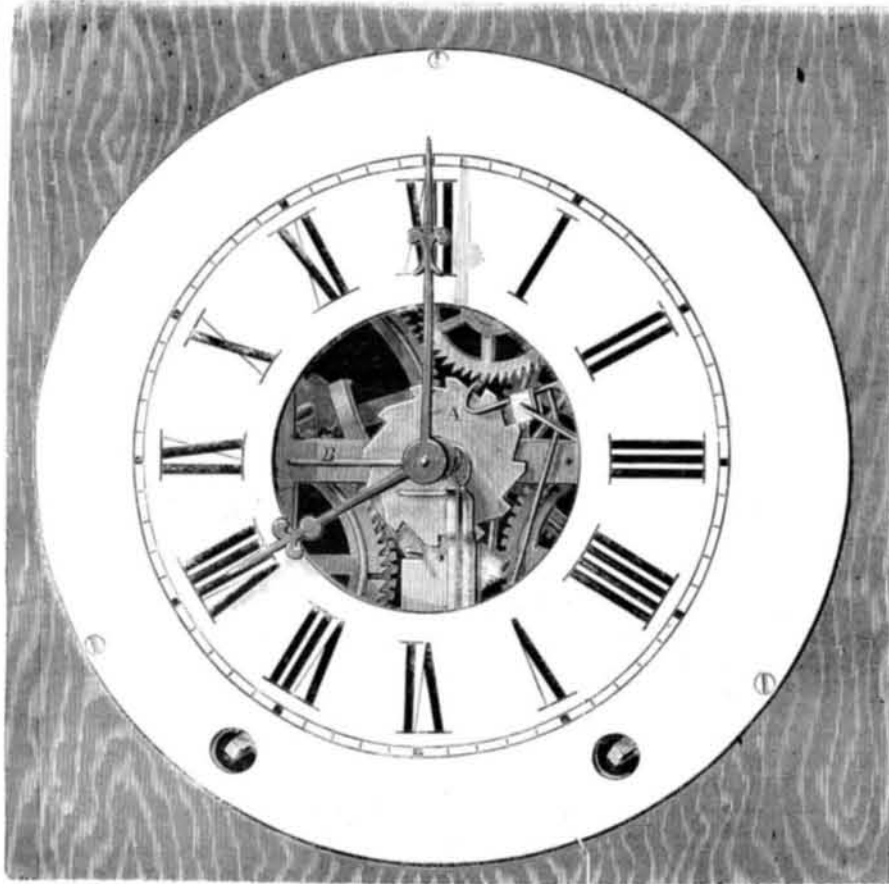


Improved Differential Movement.

The three engravings herewith presented show different views of a device for taking the place of the cannon wheel, lifting wire, and connections, which constitute the differential movement. Fig. 1 is a clock face showing a front view of the attachment; Fig. 2 a face view of a temporary model, and Fig. 3 a reverse view of the same. The hour hand is rigidly secured to the ratchet wheel, A, which turns on the spindle that carries the minute hand. This wheel is held against the face plate by a spring, B. The minute hand is attached to the spindle by a sleeve in a manner similar to the ordinary way of attaching the hour hand. The minute hour spindle has attached at the rear of the face plate two cams, C, the outer one of which gives a reciprocating movement to a long lever, D, and carries a shorter one—jaw seen at E—which is pivoted at F, and has a projecting pin, G, that engages with the teeth of the wheel, A.

The operation is as follows: When the clock is to be set to the hour the minute hand is turned two-thirds or five-sixths of a revolution as the cams may be set. The pin, G, by the movement to the lever, E, is carried out of the wheel teeth and transversely across and up sufficiently to again engage a tooth before the hour hand receives any motion. The wheel is then turned by the pin one tooth or one-twelfth of a revolution. From this brief description watch and clock makers may understand the device and its objects. The inventor claims it is cheaper than the common differential movement in a clock, that there would be no pin and washer to be lost, that applied to a watch the face could be made permanently fast and the wheels would not get changed by watch tinkers. It is the subject of a patent obtained March 13, 1866, by Hoban J. Holden, of Genoa, N. Y. Hewill furnish any additional explanations.



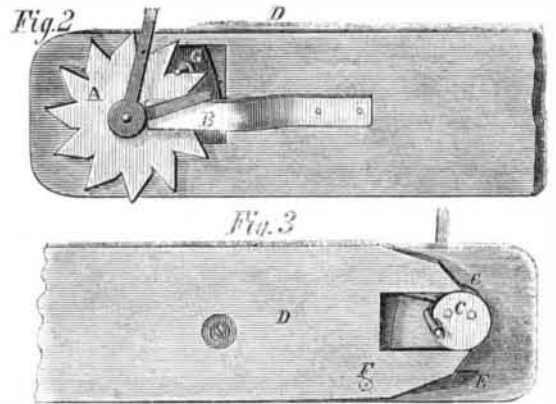
HOLDEN'S DIFFERENTIAL MOVEMENT.

DEVICES FOR ELEVATING LIQUIDS.

Should the question be propounded to any one haphazard; "what machine is most generally used?" he might reply, the sewing machine. But although the number of these useful machines which have been manufactured and sold within the past fifteen years is almost incalculable, and they are in common use, we are disposed to award the palm to the pump. Just glance at the variety of form, the numberless adaptations of one single principle, to say nothing of the designs

of leather, brass, wood, lead, glass, india-rubber, canvas, and combinations of several of these; pumps in which the bucket is the valve; those with flexible barrels or cylinders and others with them of rigid material; those the barrel of which works on a fixed piston, and others having a compressible air chamber for ejecting the water. Every manufacturer seemed to suppose his pump could be of little value unless it was as different from all others as it was possible to make it; still the same principle is at the bottom of all of whatever style and operation; that of atmospheric pressure, vulgarly called suction.

As pumps are the most generally used of machines, so they are the most generally abused. The common household pump is used to pump turgid and sandy water, which rapidly cuts away the valves, of whatever material made. It is left with water in the barrel and the valves allowed to freeze. It is exposed to the action of the salts held in solution in spring water, and is operated by the mechanically inclined, by adults, children, and by anybody. It is evident, then, that the sim-



pler the pump, the fewer its parts, the stronger its build, the better it is fitted for its work. That pump which fulfils these conditions and can be repaired by any person of ordinary ability, being made of material not likely to injuriously affect the water for domestic purposes is the best common pump for ordinary uses. The object, then, of the improvers of the pump who are continually claiming to perfect this implement should be to make it so simple and durable that getting out of order shall be nearly impossible unless from legitimate wear. Such a pump would, to be sure, largely diminish the amount of work now expended in repairs, but as these repairs are not the special business of any workshop but are generally done by home tinkers, this loss would not be felt except as diminishing vexation and annoyance.

which are the product of the fancy, and we find among the list, pumps with one bucket and those with two in the same chamber; pumps with and without valves; those with valves

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