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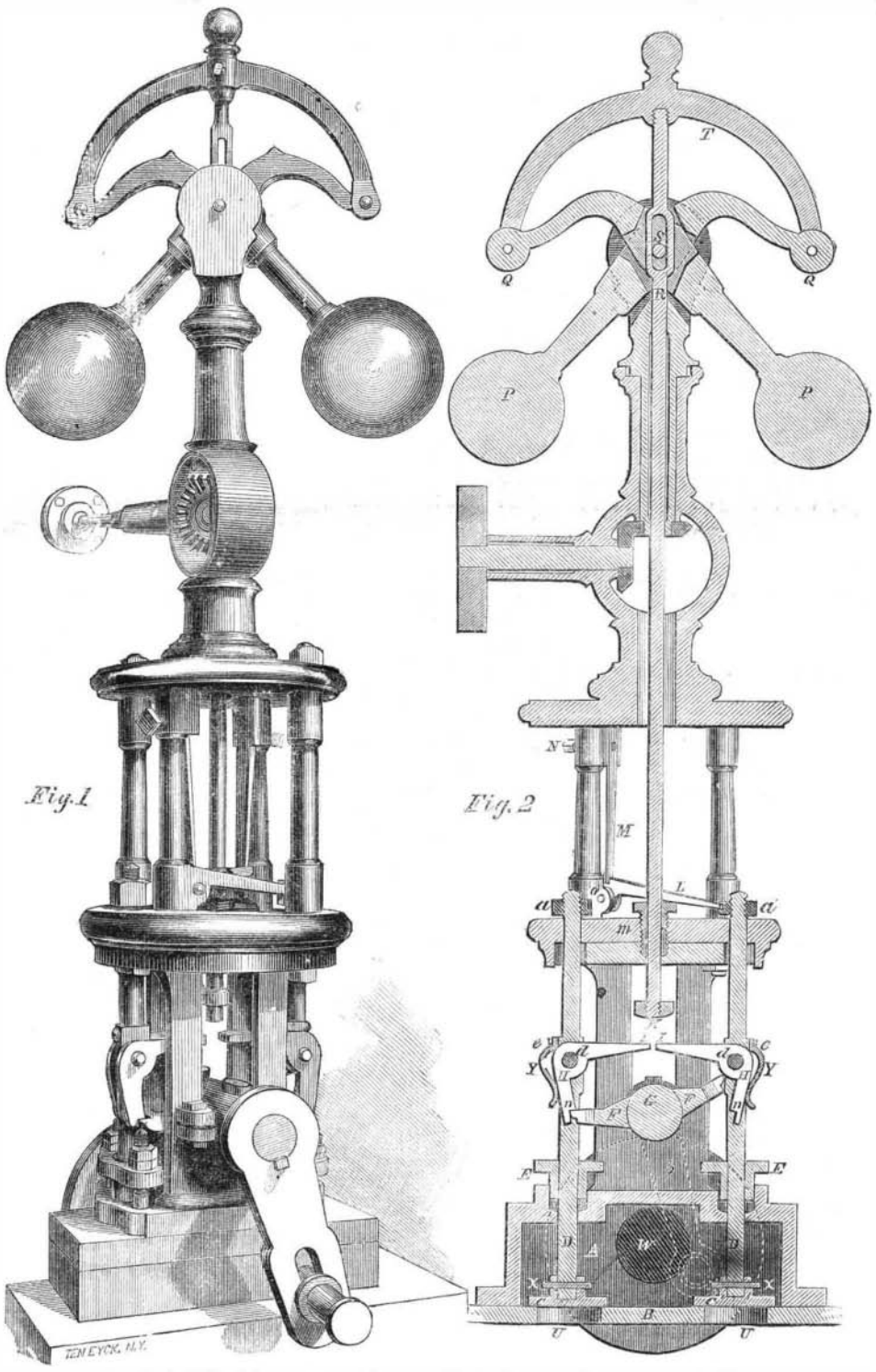
IMPROVED VARIABLE CUT-OFF VALVE.

The importance of a good cut-off valve for steam engines is fully shown by the numerous patents recently issued for improvements to effect that object. The one we are about to describe was patented on the 23d of August last, through the Scientific American Patent Agency, and lays claim to important features, producing results attained by no other.

A is the steam-chamber into which the steam is admitted direct from the boiler through the opening, W, on one side. B is the valve seat, with the openings, U U, directly under the valves, to admit the steam into the steam chest in which the main slide valve works. C C are the valves, the stems of which, D D, pass upward through the stuffing-boxes, E E, and through holes in the cap, *m*, which form guides for the upper ends. H H are drops attached to the stems by the pivot pins, *d d*, having notches, *n n*, in the lower end to receive the points of the lifters, F F, by which they, with the valves, are raised to admit the steam into the main steam chest. These drops are double, and hang down on each side of the stem, which is square at that part. The ends of the lifters are also forked, so as to reach round on each side of the stem, and catch into both parts of the drops. The crank G, which operates the lifters, is moved by an eccentric on the main shaft, so adjusted as to commence raising one valve as soon as the slide valve has closed the port of the engine. On the top of each stem is a nut with a notch in one side to receive the end of the lever, L, which, by means of the spring, M, throws the valve back to its seat after it is disengaged from the lifters. The spring, M, is caused to act on the lever, L, with any desired force by the screw bolt, N. The lower ends of the drops are pressed inwards by the springs, Y Y, so as always to catch on the ends of the lifters.



BUCKINGHAM'S IMPROVED VARIABLE CUT-OFF VALVE.

The governor is so arranged that as the balls, P P, rise, the points, Q Q, of the arms descend, and draw down the yoke, T, and with it the rod, R, at the bottom of which is the tripping button, K. It will be noticed that the rod, R, is slotted, for the pin, S, to pass through, and one arm of the governor is slotted for the rod to pass through, while the other arm is slotted for both; so that each arm has two bearings on the pivot pin, one on each side of the rod, and in this way the balls are carried round by the pin alone, the side rubbing on the joint avoided, and the governor made very sensitive and obedient to any slight change of motion.

The operation is as follows:—The crank being at its extreme point of motion, as shown in the engraving, and the point of the lifter having caught into the notch of the drop; as soon as it begins to move to the opposite side, the lifter raises the valve and admits the steam into the steam chest. The valve will continue to rise until the point, I, of the arm of the drop strikes the tripping button, K, at the bottom of the governor rod. This throws the lower end, *n*, of the drop, H, off from the point of the lifter, and the valve instantly drops back into its place, cutting off the admission of steam. When the piston returns, the other valve rises and performs the same duty. It will be seen that the valve, if not tripped, would continue to rise until the steam port was closed, so that the range of action of this cut-off is during the the whole stroke of the piston until the steam is cut off by the main valve.

The tapping of the arms, I, against the tripping button, K, produces a gentle jar or vibration through the governor which keeps the joints free and ready to obey the slightest alteration in the motion of the engine. This vibration can, however, if necessary, be controlled or entirely destroyed, by a small dash-pot attached to the stem of the governor. The valves being relieved from the pressure of the steam, the moment they leave their seats, require a very slight blow to disengage the drops from the lifters.

This valve can just as well be attached to the main slide valve rod, if desired, by making a slight alteration in the shape of the lifters; but in that case, as in all cases where it is thus attached, the range of its action will be considerably less than half the stroke of the piston, depending on the "lap" of the main slide valve.

The advantages claimed for this valve are:—1. Its simplicity and economy. Every part acts in the most direct and advantageous manner, so that it can be made light and yet strong. 2. The lifters take hold directly on the valve stem, and raise it straight up without any side pressure. 3. The lifters do not slide on the drops, but raise them without friction until they are tripped, and that is done instantly, so that any slight variation in the construction of the parts would not sensibly affect the regularity of their action. 4. There is but one tripper, which insures perfect regularity of action. 5. The lower end of the drop, where the lifter acts, wears alike over its entire surface, so that it will never wear uneven, and cause the danger of the lifter slipping off before the proper time.

Further information may be obtained by addressing C. P. Buckingham & Co., Mount Vernon, Ohio.

The explosion of the great meteor in Ohio, on the 1st inst. was at first generally believed to be an earthquake.