SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XXIX.--No. 15. [NEW SERIES.] NEW YORK, OCTOBER 11, 1873. [$3 per Annum. IN ADVANCE

IMPROVED VARIABLE CUT-OFF.

It is hardly necessary for us to call the attention of engineers to the advantages gained by being able to close sooner or later the steam valve of an engine while the same is in operation. Instead of closing the throttle in order to prevent the machine working off steam faster than it can be generated, in cases where the fullest power is required, and thereby losing much of the elastic force by wire-drawing the steam into the cylinders, that valve can be thrown open. Then, by means of the variable cut-off, the full energy of the steam can be utilized, while the extreme pressure allowed is maintained in the boiler. And, on the contrary, if steam is made faster than the engines can work it off with a fixed cut-off, instead of holding up the levers by hand (as is sometimes the case) the variable cut-off again affords a means of employing the full capacity of the generators.

The cut-off herewith illustrated is especially adapted to poppet valve or side lever engines, such as are in general use on high pressure river steamers.

Fig. 1 is the design used on double engines, such as are in general use on stern wheel boats. Fig. 2 represents an enlarged view of the poppet head, A, Fig. 1, showing more clearly the operation of sliding blocks, C, and roller, D.

The poppet heads, A, Fig. 1, have each a long slot or mortise through which a lever, B, passes. The sliding blocks, C, Fig. 2, are arranged on the top of the lever, B, and under the roller, D, Fig. 2, immediately above the mortise pin, E, Fig. 2. The latter is fastened on the lever, B, works in a slot in the poppet head, and acts as a guide. The blocks, C, are connected by the rods, F, Fig. 1, to the T headed lever, G, which is pivoted to the upper end of the arm, H, that turns on the rock shaft, I. The arm is connected by the rod, J, with an eccentric on the main shaft. This eccentric moves the block, C, in an opposite direction to the piston head. The free end of lever, G, is connected by the rod, K, to the adjusting lever, L, which stands midway between the two engines. The semicircles between which the lever works are notched to correspond with minute divisions of the stroke. By changing the lever in the notches the lever, G, is raised or lowered thereby, and the blocks, C, are drawn nearer together or moved further apart. The steam is thus cut off sooner or later according to the position of the lever, L, which, as represented in our engraving, indicates that the steam is cut off at three tenths of the stroke. It will also be noticed that the inclined end of the block, C, at the right hand, has moved from under the roller, D, allowing the valve to be closed by means of the spring, M, acting on the bar, N.

This cut-off, it is claimed, greatly facilitates the handling of the engine, as, the cutting off being varied at will, the engineer need not leave the throttle when reversing the engines. Fig. 3 shows the device as applied to a side wheel or single engine, as used on side wheel boats, where each engine is handled independently of the other. The eccentric rod is connected to the right and left screw rod, O, at the swivel joint, P. The sliding blocks, C, are connected to the rod, O, by the nuts, Q, so that by means of the crank, R, at the hand of the engineer, the sliding blocks, C, are drawn nearer together or moved further apart by turning the rod, O. Thus the cutting off can be varied at will, when the engine is in motion, to any part of the stroke required, as readily as the throttle can be opened or closed. This variation, it is stated, is made without wire-drawing the steam or pounding the valve seat so as to cause any extra wear or additional expense for repairs. On the contrary the steam valve is guided in its motion. Its velocity, when closing, has been determined by the use of the steam indicator, and hence the angle of the sliding blocks, C. The exhaust valves are not in any way effected by the cutting off.

Fig. 1

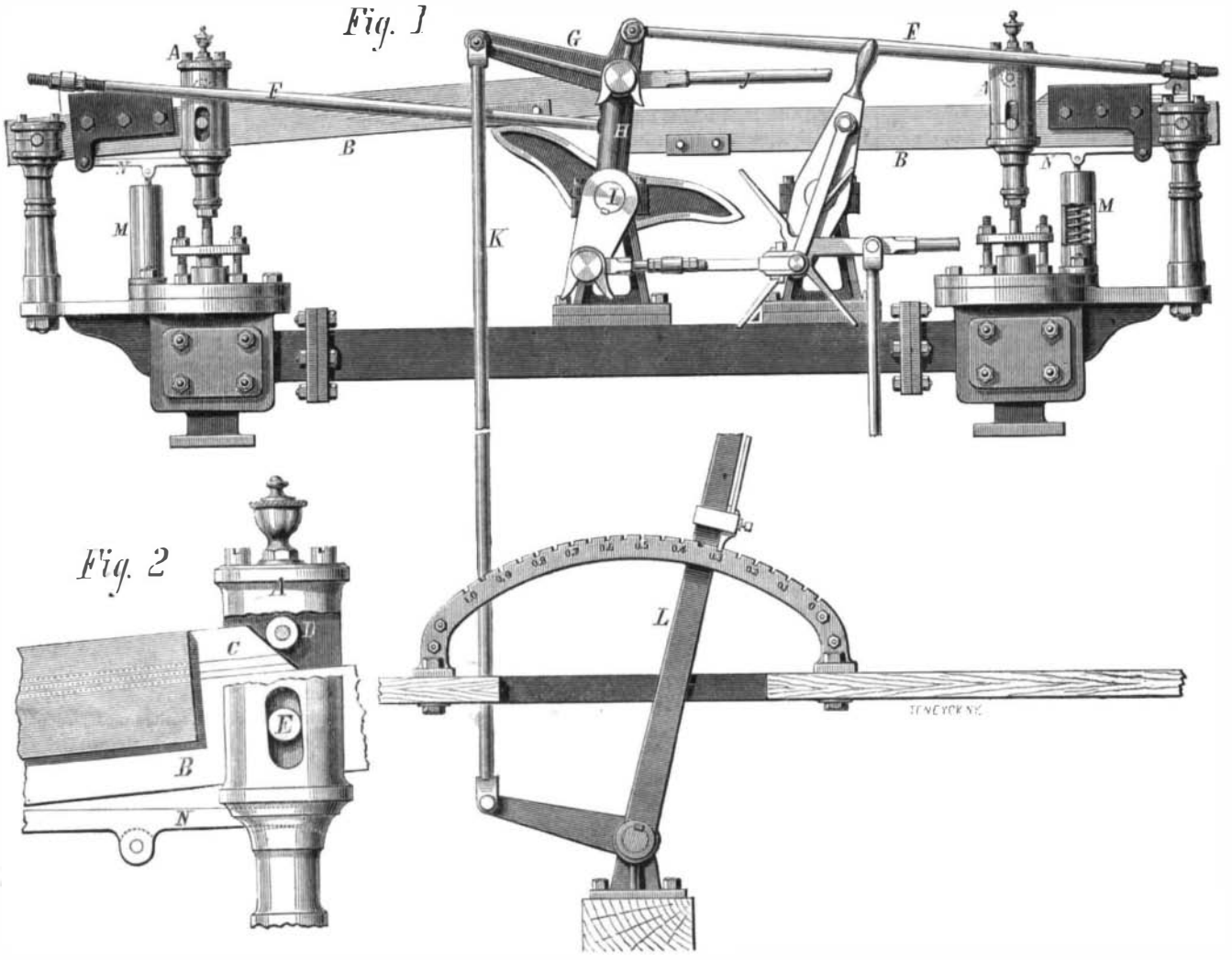
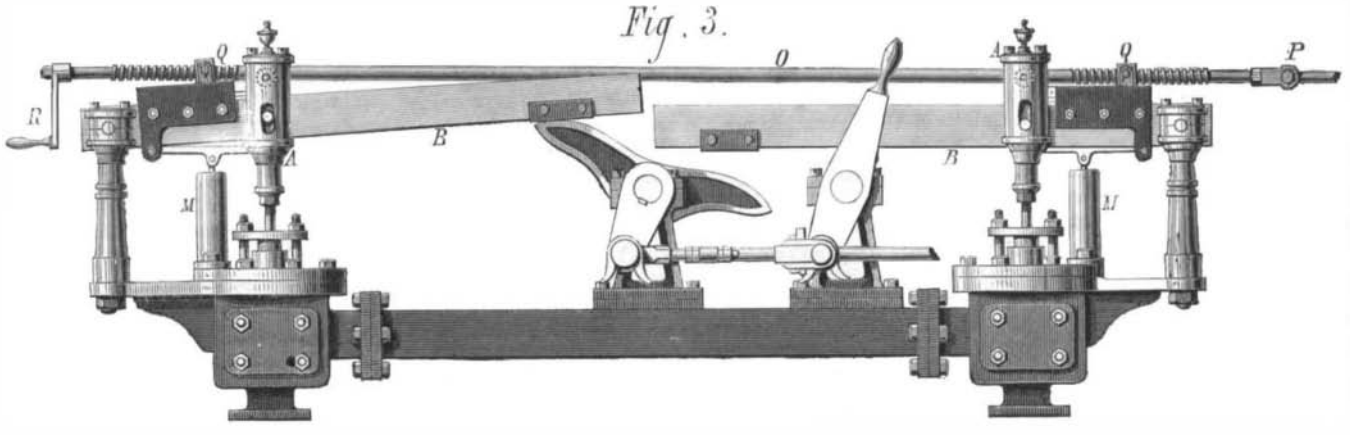


Fig. 2

Fig. 3.



CROSS' VARIABLE CUT-OFF.

The invention has been in use for three years on the stern wheel steamer Chin-Du-Wan, in the form shown in Fig. 1, giving, as we understand, entire satisfaction, and this without costing one dollar for repairs. The steam valves, by their positive and accurate motion in closing, have been kept from leaking during the whole three years, while the exhaust valves have been repaired several times. The Chin-Du-Wan is owned by the California Pacific Railroad Company, and has two cylinders 18 inches by 5 feet stroke. The cut-off has also been in use two years on the steamer Petaluma (from the apparatus on which Fig. 3 was drawn), giving the same results as on the Chin-Du-Wan. The Petaluma has two 22 inch cylinders and 6 feet stroke, with single valves, and is owned by the Contra Costa Steamboat Company. The device is also in use on other steamers with like results, and on various land engines.

For further particulars regarding rights to manufacture, etc., address the patentee, Mr. Wm. B. Cross, Sacramento, Cal. Patented January 14 and August 8, 1871, through the Scientific American Patent Agency.

A Possible Moses.

The reader of "Put Yourself in His Place" will remember the charming picture which the novelist draws of a child found floating in his cradle the day after the bursting of the Hillsboro' reservoir. Washed from some unknown home among the hundreds destroyed by the pitiless flood, this young navigator had somehow escaped the fate of his kinsfolk; and in happy unconsciousness of danger, was discovered drifting along, kicking up his heels and crowing at the unfamiliar brightness of the sky, and the pretty colors of the birds and butterflies that hovered around.

A sunken Ohio river steamboat afforded, the other day, a still more remarkable and affecting case of infant preservation. The steamer ran on a snag in the night, and sank in deep water, drowning several passengers, among them a number of children.

One of the parents was a Mrs. King, who was, with the rest of the passengers saved, sent on to Shawneetown, Ill., mourning her son as lost. The next morning, the men who went to recover the bodies of the drowned discovered a mattress floating in the cabin, which was filled with water to the ceiling. Peacefully sleeping on this dangerous bed lay a little boy, who had been upborne all night by the water-soaked yet still buoyant mattress. The spasm of hope aroused in the hearts of the bereaved mothers when news came of the miraculous escape of somebody's child, the joy of one and the agony of the rest when the saved was identified, no novelist could conceive or portray. The effect on the mother's future cannot be small. Will it have any influence on the boy's life? Time alone can tell. Certain it is that, if he turns out to be a king indeed, a leader of his fellow men for good, his followers will have a pretty tale to tell of providential interposition to prove the divinity of his calling.

SCORESBY and other arctic voyagers and whale hunters have observed that whales have some means of communicating with one another at great distances. It is probable that the animals bellow in a tone too grave for the human ear, but quite within the range of the cetacean ear.

© 1873 SCIENTIFIC AMERICAN, INC