# I. Jackman,

## Steam-Engine Valve-Gear.

No. 21,300. Patented Aug. 24, 1858.

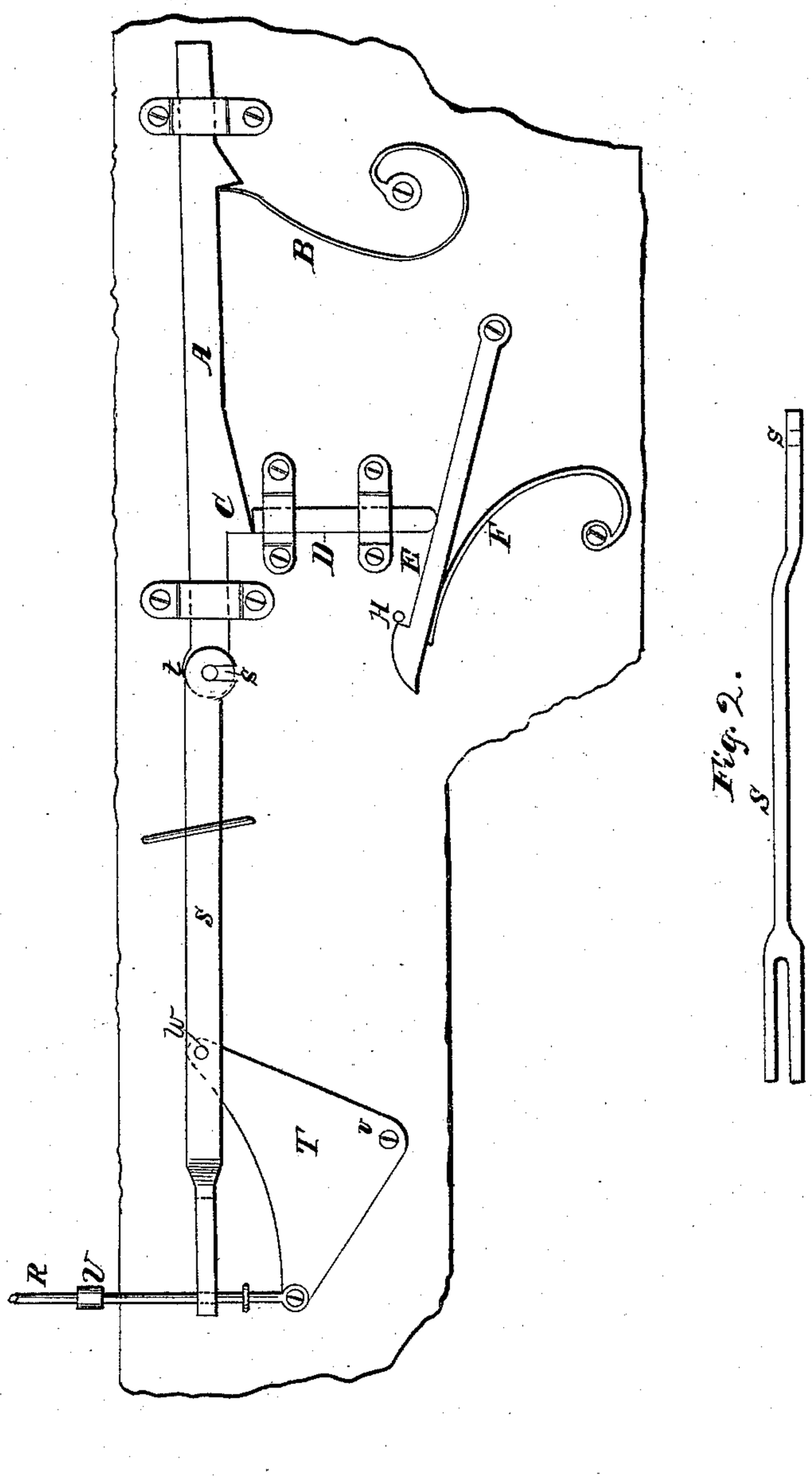


Fig. 2.

# UNITED STATES PATENT OFFICE.

JOHN JACKMAN, JR., OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR TO HIMSELF, AND E. H. ASHCROFT, OF BOSTON, MASSACHUSETTS.

## CUT-OFF VALVE OF STEAM-ENGINES.

Specification of Letters Patent No. 21,300, dated August 24, 1858.

*To all whom it may concern:*

Be it known that I, JOHN JACKMAN, JR., of Newburyport, in the county of Essex and State of Massachusetts, have invented an Improvement in Mechanism for Regulating the Operation of Cut-Off Valves of Steam-Engines; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawing or sketch, which is a front elevation of such invention.

My invention is more properly applicable to that described in No. 6,162 of United States patents and is intended to accomplish the same or a somewhat similar result which the reversed inclined plane S, as shown and described in the patent of the United States numbered 14,545 effects when used in connection with the main inclined plane of the regulator and valve mechanism. It however remedies an important defect or certain difficulties incident to the employment of two inclined planes standing in reverse of one another and acting as described in said patent numbered 14,545.

In the drawing A denotes a slide bar which when in use is worked or moved longitudinally in one direction (that is forward) by a spring B and drawn backward by the action of a ball governor of a steam engine. The said slide rod has an inclined cam or plane C, which rests against the upper end of a vertical slide bar, D, whose foot is supported on a movable catch, E, that is forced upward by a spring F. The said movable catch, the vertical slide bar, and the horizontal slide bar and inclined plane constitute parts of the valve mechanism of the well known "Corliss engine," in which the catch, E, at its rear end is jointed to a rocker arm, which imparts to it a reciprocating longitudinal motion such as will cause it to move a crank lever attached to the shaft of the cut off valve of the steam engine. The wrist of this crank is shown at H, in the drawing. All these parts, as well as their mode of operation, are generally known to engineers. I apply to them and to the vertical slide rod of the ball governor an apparatus such as I shall now proceed to describe, whose purpose is to prevent accident arising from accelerated motion of the engine, which results in case the driving belt of the regulator or ball governor should accidentally slip or fall off from its pulley.

When the Corliss engine is going at too great speed, the ball governor (whose vertical rod only is represented in the drawing, such being shown at R) will force the inclined plane toward the right or forward so as to depress the vertical slide and thereby cause the catch bar to be sooner liberated from the catch pin of the valve crank. So when the engine is moving too slowly the inclined plane will be moved in an opposite direction to the catch rod will be longer in being liberated from the catch pin or wrist of the valve crank. Now should the motion of the regulator or ball governor suddenly cease and its balls fall into their lowest position, it will readily be seen that the inclined plane will be so moved as to allow the slide bar to rise suddenly to its greatest height, and consequently the speed of the engine will be immediately and greatly accelerated owing to the increased flow of steam into the cylinder. In order to prevent the baneful results of this accelerated motion I apply to the ball governor and the slide rod, A, carrying the inclined plane C a mechanism such as will set free the slide rod from the ball governor in such manner as to allow it to be sprung forward to its full extent or sufficiently to create such a depression of the vertical slide rod as will prevent the catch bar from taking or catching the wrist of the bell crank. This of course will prevent any steam from entering the cylinder.

In carrying out my invention, I employ a catch bar S, formed with a recess, *s*, to catch upon or receive a stud, *t*, projecting from the rear end of the slide bar, A. The said lever S, formed in top view, as shown in Fig. 2, is bifurcated at its front end and embraces in its fork the vertical rod R, of the ball governor. The fulcrum, *u*, of the lever, S, is at one end of a bent lever T, whose other end is jointed to the lower end of the rod R, of the ball governor, the said lever T, turning on a fulcrum, *v*. The rod R, carries a collar or projection V, so arranged that in case the balls of the governor should fall to their lowest position the said collar shall

be made to descend upon the lever, S, and turn it on its fulcrum so as to raise it entirely off or out of connection with the stud of the slide A. When this takes place, the said slide A, will be thrown forward at once by its spring so as to depress the vertical slide rod and force its catch rod out of action on the wrist of the valve crank.

My improvement allows the engine to work at the full head of the steam or the steam to be cut off at any degree of the stroke of the piston. This cannot be effected by the invention claimed in the Patent of the United States numbered 14,545.

I do not claim the devices or mechanism covered by the patents hereinbefore mentioned, but

What I claim is—

My improvement, or the combination of the levers, S, and, T, and the collar U, as arranged and applied to the rod R, of the ball governor and to the slide rod, A, of the inclined plane, C, substantially in manner as hereinbefore specified.

In testimony whereof I have hereunto set my signature.

JOHN JACKMAN, Jr.

Witnesses:

WILLIAM DAVIS,

WAREHAM DRAKE.