C. H. HAWKINS.

Slide-Valve.

No. 227,165. Patented May 4, 1880.

FIG. 1

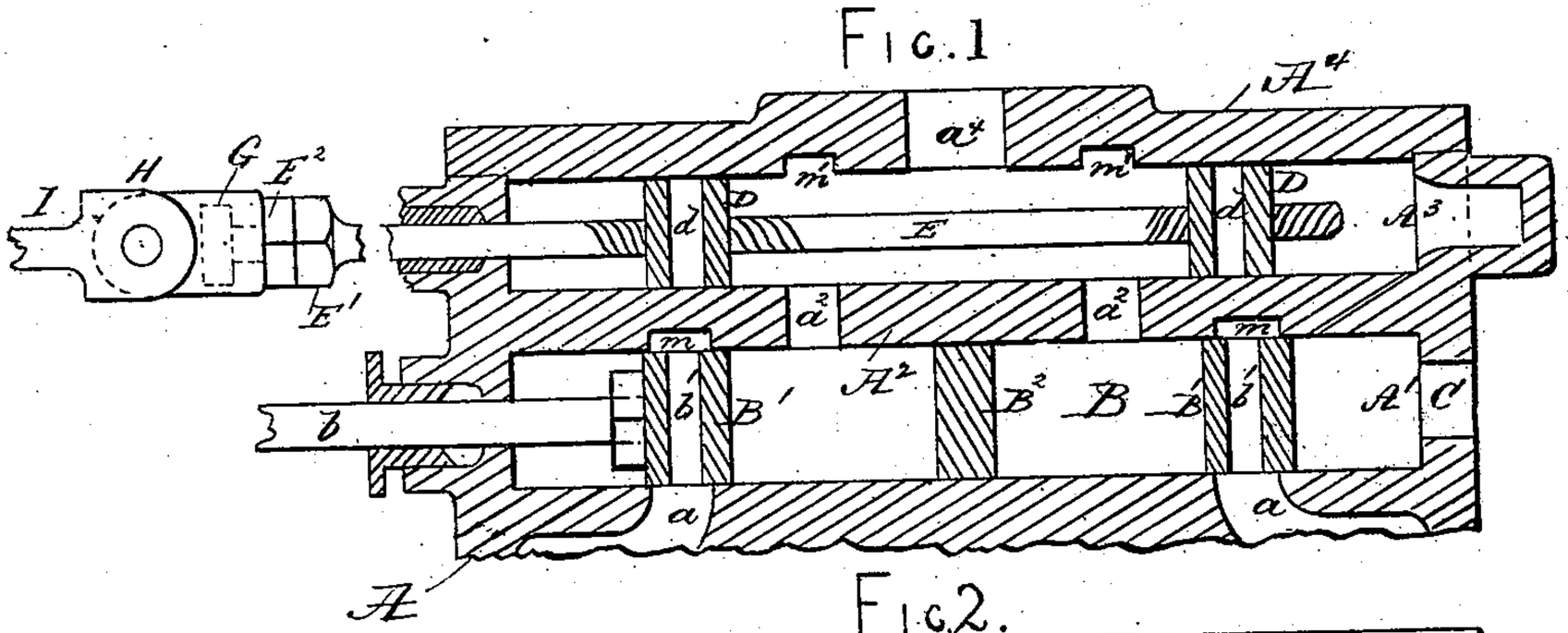


FIG. 2.

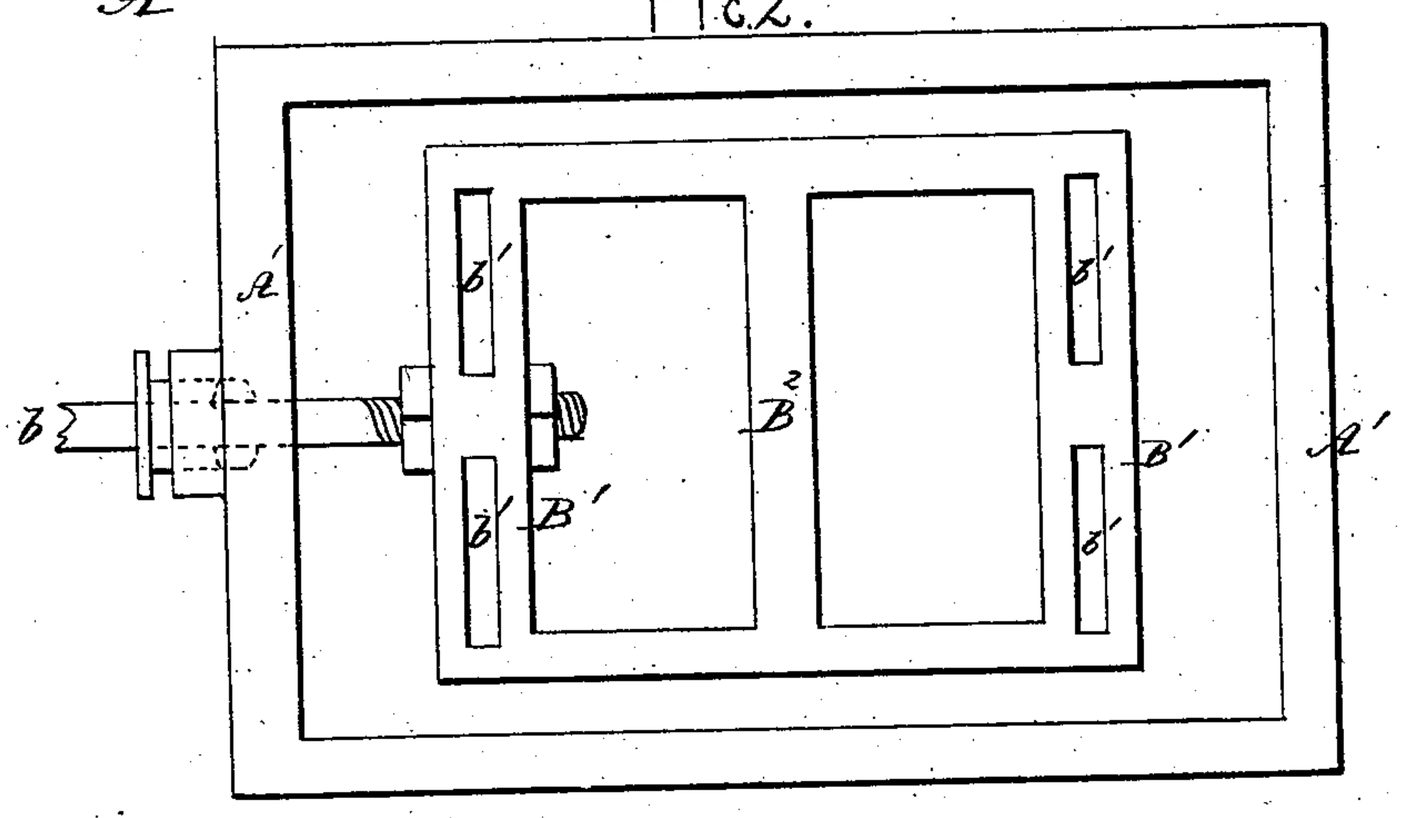
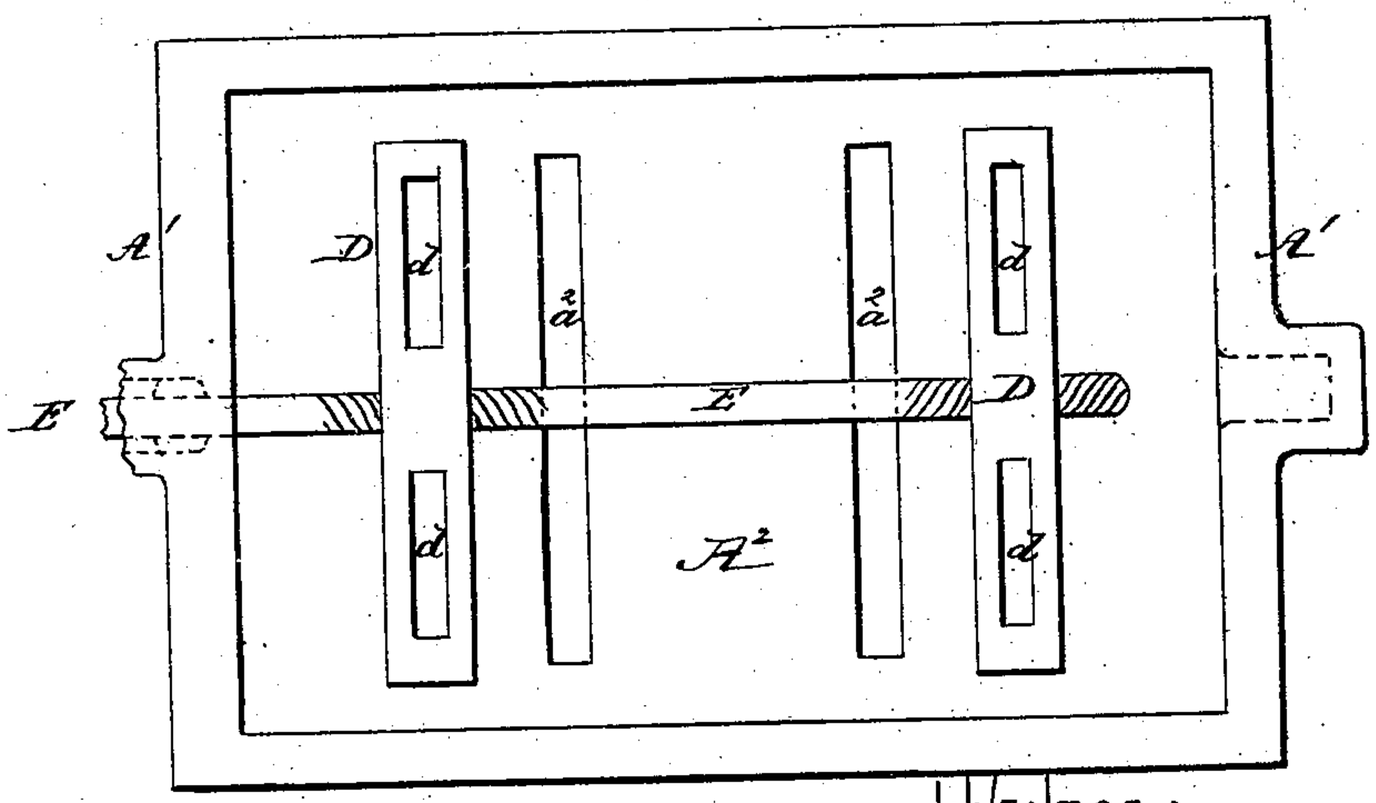


FIG. 3.



WITNESSES:—

W. Colborne Brookes

Charles C. Stetson

INVENTOR:—

Cyrus H. Hawkins

by his attorney

T. D. Stetson

UNITED STATES PATENT OFFICE.

CYRUS H. HAWKINS, OF NEW YORK, N. Y.

SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 227,165, dated May 4, 1880.

Application filed October 15, 1879.

To all whom it may concern:

Be it known that I, CYRUS H. HAWKINS, of New York city, in the county and State of New York, have invented certain new and useful Improvements relating to Slide-Valves for Steam and Air Engines, of which the following is a specification.

I make my valves perfectly balanced. I provide a cut-off valve working on and over the principal slide, which is also perfectly balanced, and which is capable of ready adjustment within wide limits. The cut-off may be adjusted automatically; but I will show it adapted for adjustment by hand.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of the specification.

Figure 1 is a longitudinal section, and Fig. 2 is a plan view with all above the main slide removed. The figures show the parts which show the novelty with so much of the other parts as is necessary to show their relation thereto. Fig. 3 is a plan view with only the top plate removed.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A is a portion of the cylinder-casting, formed with ports *a*, which may be of any ordinary or suitable length and contour to lead the steam to and from the ends of the cylinder. A′ is the steam-chest; A^2, the top plate or steam-chest cover, formed with two ports, a^2; A^3, the cut-off chest, and A^4 the top plate therefor. A sufficient opening, a^4, receives the steam through a pipe (not represented) leading from the boiler.

The main slide is indicated by B, some of its parts being designated by additional marks, as B′ B^2.

The stem or rod *b* extends out through a stuffing-box and receives the proper reciprocating motion from any ordinary or suitable connections. (Not shown.)

The slide is carefully finished to present a strictly uniform thickness at all points exactly equal to the space between the cylinder-face A and the steam-chest cover A^2. The under face of the cover A^2 is recessed, as indicated at *m*, each to a length and breadth exactly corresponding with the port *a*, which is opposite.

B′ B′ are cross-pieces, accurately arranged and finished to give the proper lead and lap. Each is formed with openings *b*′, as shown. B^2 is a central cross-bar.

C is an opening for the exhaust-steam. There is sufficient space along each side of the main slide to allow the exhaust to escape freely from either end through this opening. The under side of A^4 is formed with recesses *m*′, corresponding in form and position to the ports a^2.

D D are two independent cut-off valves, accurately finished as to height to exactly fill the space between the plates A^2 and A^4. They are tapped to receive right and left hand screw-threads formed on the cut-off rod E. The cut-off valves D are each formed with openings *d*, as shown.

The cut-off rod E is provided with a squared part, E′, outside of the stuffing-box, which allows of ready operating with a forked wrench or other convenient device to turn it, as required, to set the cut-off valves D D nearer together or farther apart, and thus to change the point of cut-off.

The rod E is connected to the eccentric-rod I, not only by the ordinary knuckle H, but also by a swivel-joint, G, which allows the rod E to be turned to any extent desired. The turning of this rod by means of the squared part E′ changes the cut-off by moving the valves D D nearer together or farther apart without moving the rod E endwise at all. When it is desired to hold it firmly against any further change this may be effected by tightening a jam-nut.

Modifications may be made in many of the details. The apertures *b*′ may be made sufficiently large to allow them to aid in inducting and educting the steam, or they may be contracted much smaller than here shown, so long as they are sufficient to allow a free flow of the steam to and from the cavities *m*. The pressure in these cavities must be always exactly equal to that in the ports.

The openings *d* in the cut-off valves D perform the simple but important function of insuring that the pressure in each cavity *m*′ is always exactly equal to that in the port below.

It follows that the valves are all worked in absolute balance.

The swivel-joint by which the cut-off rod E connects with its operating mechanism may be varied in construction within wide limits, so as it allows the rod to be turned as required, without inducing any longitudinal motion of the rod, but only to change the distances apart of the cut-off valves D D. I can connect a device operated by a governor, if desired.

I claim as my invention—

The covers A^2 A^4, formed with recesses *m m'*, corresponding to the ports below, in combination with the main slide B and cut-off valves D, having apertures *b' d*, as shown, and with the right and left screw-threaded cut-off rod E, adapted to serve with a suitable swiveling connection to the eccentric-rod, as herein set forth.

In testimony whereof I have hereunto set my hand this 9th day of October, 1879, in the presence of two subscribing witnesses.

CYRUS H. HAWKINS.

Witnesses:

M. L. WILCOX,

CHAS. F. WILCOX.