

D. Fellenbaum,
Steam Cut-Off.
N^o 28,632. Patented June 5, 1860.

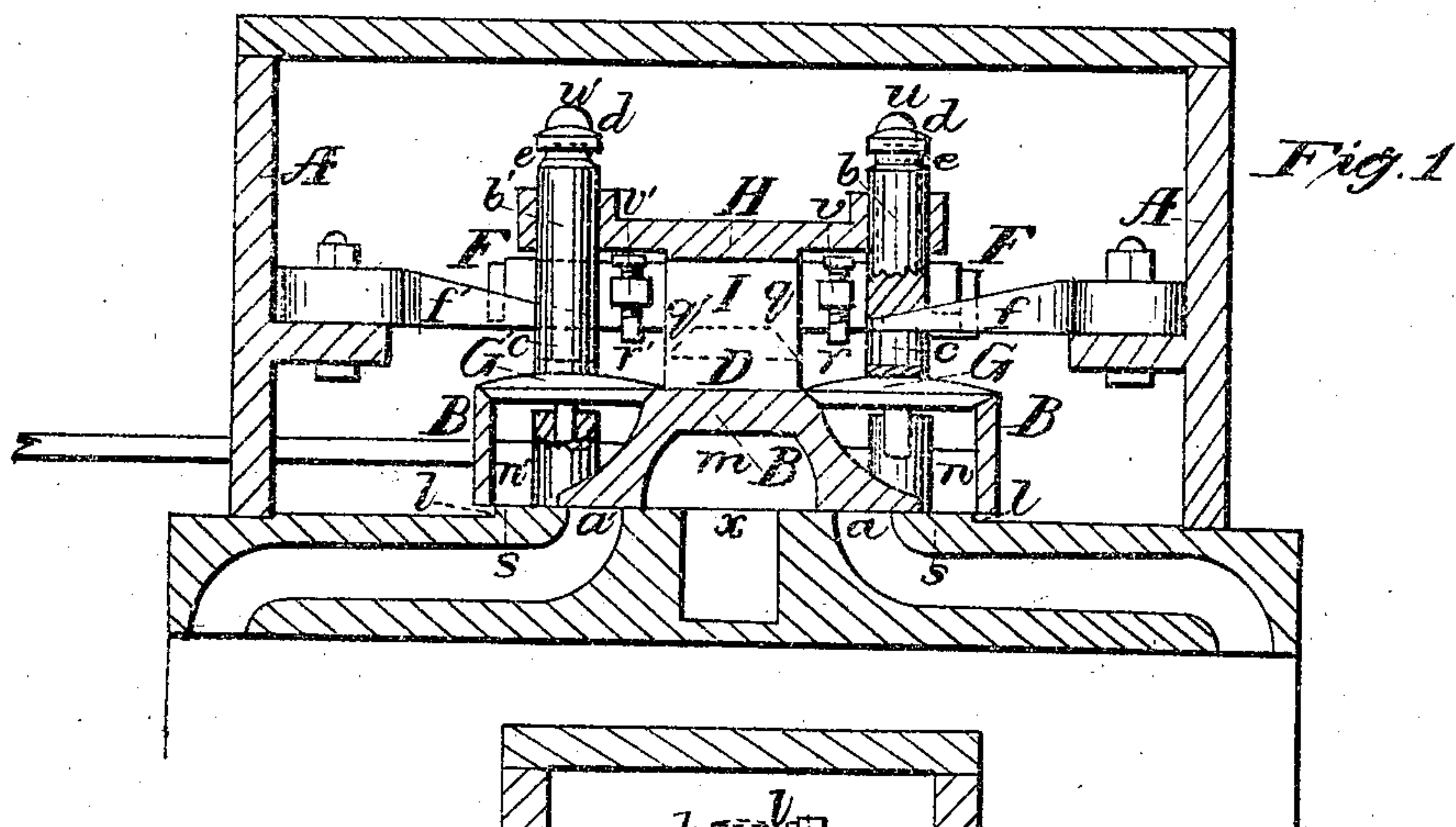


Fig. 1

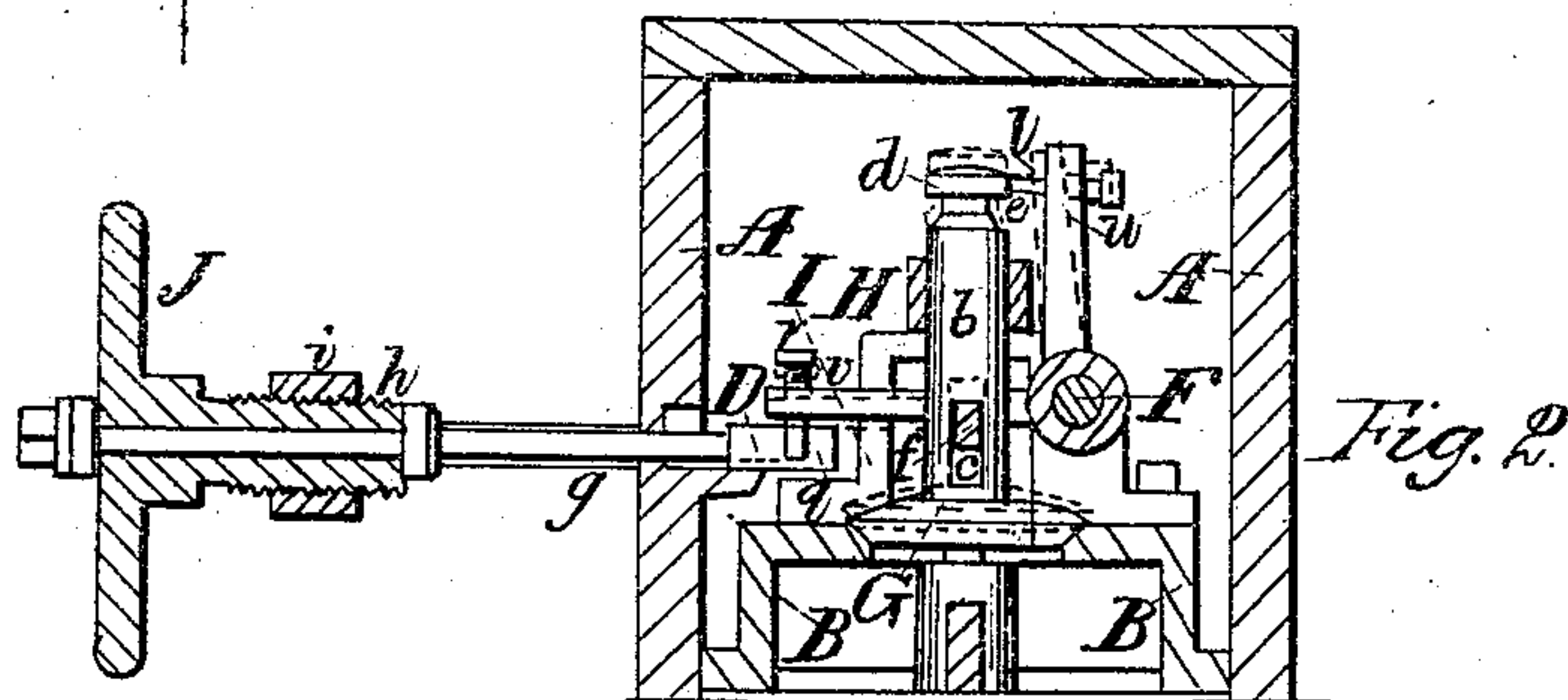


Fig. 2

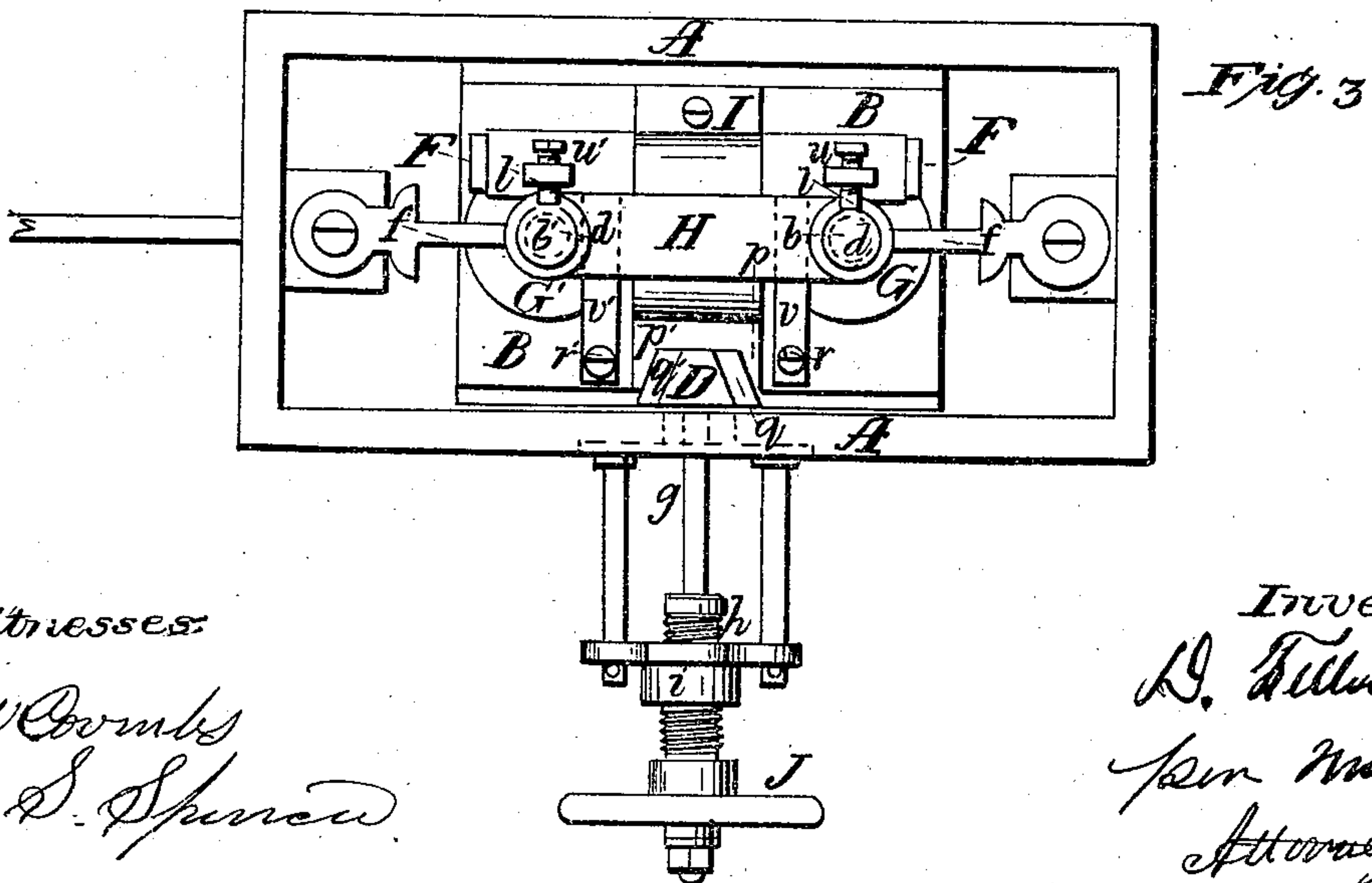


Fig. 3

Witnesses:
J. W. Coombs
R. S. Spencer

Inventor:
D. Fellenbaum
per Munroe
Attorneys

UNITED STATES PATENT OFFICE.

DAVID FELLENBAUM, OF LANCASTER, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND
NATHL. BAKER, OF MARIETTA, PENNSYLVANIA.

VARIABLE CUT-OFF FOR STEAM-ENGINES.

Specification of Letters Patent No. 28,632, dated June 5, 1860.

To all whom it may concern:

Be it known that I, DAVID FELLENBAUM, of Lancaster, in the county of Lancaster and State of Pennsylvania, have invented a new and Improved Variable Cut-Off for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of the steam chest of a horizontal steam engine with my improved cut-off. Fig. 2 is a transverse section of the same. Fig. 3 is a plan of the steam chest with its cover removed.

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

My invention relates to the employment as a cut off in combination with a slide valve or valves by which the induction and eduction of steam to and from the cylinder of the engine are effected, of two puppet valves applied to seats provided for them in the ports of the slide valve or valves; and my said invention consists in certain means of opening the said puppet valves at the proper time for the induction of the steam and of keeping them open as long as desired within the first half of the stroke of the piston, and then tripping them and permitting them to close and cut-off the steam, the whole being arranged within the steam chest of the engine and operated by the movement of the slide valve but made variable under the control of hand gear applied outside of the steam chest or of a governor.

To enable those skilled in the art to make and use my invention I will proceed to describe its construction and operation.

The drawing represents the application of my invention in connection with a single slide valve of the three port kind for the induction and eduction of the steam.

A is the steam chest.

s, s, is the valve seat; and B, is the slide valve.

a, a', are the steam ports and x, the exhaust ports of the valve seat, and n, n', are the steam ports and m, the exhaust port of the valve. The two steam ports n, n', terminate in the back of the valve in conical seats to receive the two cut off valves G, G', which are of the puppet kind. The stems b, b', of these valves extend upward some

distance above the bodies of the valves, and each contains a slot c, and is made with a head d, below which there is a notch or neck e, (best shown in Fig. 2) which has an upward bevel terminating in an abrupt projection which forms the bottom of the head; and each of said stems is fitted to a guide in a plate H, which is secured by a standard I, to the back of the valve.

f, f', are wedge like lifting pieces secured to the ends of the steam chest A, for the purpose of entering the slots c, c, in the valve stems to act against the upper ends of said slots in such a manner as to raise the valves G, G', from their seats as they, moving with the slide valve, approach the ends of the steam chest. u v and u' v', are tripping levers of elbow form working on a fixed shaft F, that is secured in the standard I, and is arranged with its axis parallel with the face of the valve, each of said levers being arranged opposite to one of the valves G, G', and having secured to its upper and nearly vertical arm u or u', a stop piece t, which is so arranged as to be capable of entering the notch e, in the stem of its respective valve when the said valve is lifted from its seat by its respective lifting piece f or f', and each of said levers having its lower and nearly horizontal arm v or v', fitted with a screw r or r', whose point projects through the bottom of the said arm.

D, is a tripping piece consisting of a plate of metal having its sides which are toward the ends of the steam chest tapered in a direction parallel with the face of the valve as shown at p, p', Fig. 3 and also beveled as shown at q, q', in Figs. 1 and 3, in opposite directions away from the face of the valve. This plate is attached to a stem g, which works in a direction parallel with the face of but at right angles to the movement of the slide valve through a stuffing box in one side of the steam chest. This stem is furnished outside of the steam chest with a screw thread h, which works in a fixed nut i, secured to the outside of the steam chest or cylinder. The said stem is furnished at its outer end with a wheel J, by which to turn it to adjust the tripping piece D, farther from or nearer to the side of the steam chest. The said wheel screw h, and nut i, constituting a hand gear; but instead of this hand gear being employed the stem g, may be connected with a governor.

The operation of this cut-off is as follows: As the side valve B terminates its stroke toward the right of Figs. 1, and 3, the stem of the puppet valve G, has the upper end of its slot *c*, passed along the wedge like upper edge of the lifting piece *f*, and the said valve is thereby lifted and the port *n*, opened to the steam, and the head of the stem *b*, of the valve G, is caused to pass upward above the stop piece *b*, of the lever *u v*, which then drops into its notch *e*, and so holds the valve G, open while the valve B, moves in the opposite direction until the screw *r*, of the tripping lever *u v*, comes in contact with the beveled surface *q*, of the tripping piece D, and causes the lower arm *v*, of the tripping lever *u v*, to be raised by passing over the said surface *q*, and the upper arm *u*, of the said lever to be thrown back far enough for its stop piece *t*, to be thrown back out of the notch *e*, of the stem *b*, of the valve G, when the said valve being no longer supported, drops to its seat and closes the port *n*, thereby cutting off the steam. As the stroke of the valve B, to the left terminates the puppet valve G', is lifted by the slot *c*, in its stem *b'*, passing along the lifting piece *f'*, and the head of the said stem is caught by the stop *t*, of the lever *u' v'*, the port *n'*, thus opened to the steam, and this valve is in its turn dropped during the movement of the slide valve to the right by the screw *r'*, of the tripping lever coming in contact with the beveled surface *q'*, of the tripping piece D. The lifting of the valves G, G', and opening of their respective valve ports *n*, *n'*, does not take place till the slide valve has moved far enough for their respective valve ports *n*, *n'*, to have completely passed their respective cylinder ports *a*, *a'*, and this opening takes place invariably at the same point in the stroke of the slide valve though it may be made to take place sooner or later by a longitudinal adjustment of the lifting pieces *f*, *f'*; but the dropping of the said valves G, G', to close their respective ports takes place sooner or later in the movement of the valve and the stroke of the engine piston in either direction, according as the tripping piece D, projects more or less into the steam chest, and the said piece may be brought so near to the side of the steam chest as to prevent the valves being dropped at all, and so allow the piston to work under a full head of steam throughout its whole stroke. By adjusting the screws *r*, *r'*, higher

or lower in the arms *v*, *v'*, of the tripping levers the valves G, G', may be caused to remain open during a greater or less portion of the stroke of the main valve B, independently of the variable action produced by the tripping piece D, and so the engine may be made to work at a greater or less power, and a like effect may be produced by an adjustment of the stop pieces *t*, *t'*, in the arms *u*, *u'*.

The only change necessary to adapt this cut-off to two separate slide valves, one for each end of the cylinder, will be to provide a separate tripping piece D, for each puppet valve, one puppet valve and its tripping lever being attached to each slide valve.

The tripping piece D, instead of being of the form represented may be of conical form.

In order that the valves G, G', may not have the pressure of the steam acting upon the whole of their upper surfaces at the time of lifting, recesses *l*, *l'*, are provided as shown in Fig. 1, in the face of the cylinder below the ends of the valve seat *s*, *s'*, and the ports *n*, *n'*, are so arranged that their outer edges pass the ends of the seat before the lifters *f*, *f'*, operate, and in this way steam is admitted to the ports *n*, *n'*, below the said valves G, G', which are thus nearly balanced at the time of lifting.

I do not claim broadly the combination of two puppet valves with one or more slide valves to act as a cut-off. But

What I claim as my invention and desire to secure by Letters Patent is.

1. The stationary lifting pieces *f*, *f'*, applied and operating in combination with the slide and puppet valves substantially as herein described.

2. The combination of the two tripping levers *u*, *v*, and *u'*, *v'*, attached to the slide valve B, and the tripping piece D, made adjustable with the steam chest the whole applied and operating in combination with the slide and puppet valves substantially as and for the purpose herein specified.

3. The combination of the lifting pieces *f*, *f'*, the two tripping levers *u*, *v*, and *u'*, *v'*, and the tripping piece D, the whole applied and operating in connection with the slide and puppet valves substantially as herein described to constitute a variable cut-off.

DAVID FELLENBAUM.

Witnesses:

WM. B. WILEY,
B. N. BAKER.