

J. Scheitlin,

4 Sheets. Sheet 1.

Steam-Engine Valve-Gear.

N^o 14,338.

Patented Feb. 26, 1856.

Fig. 2.

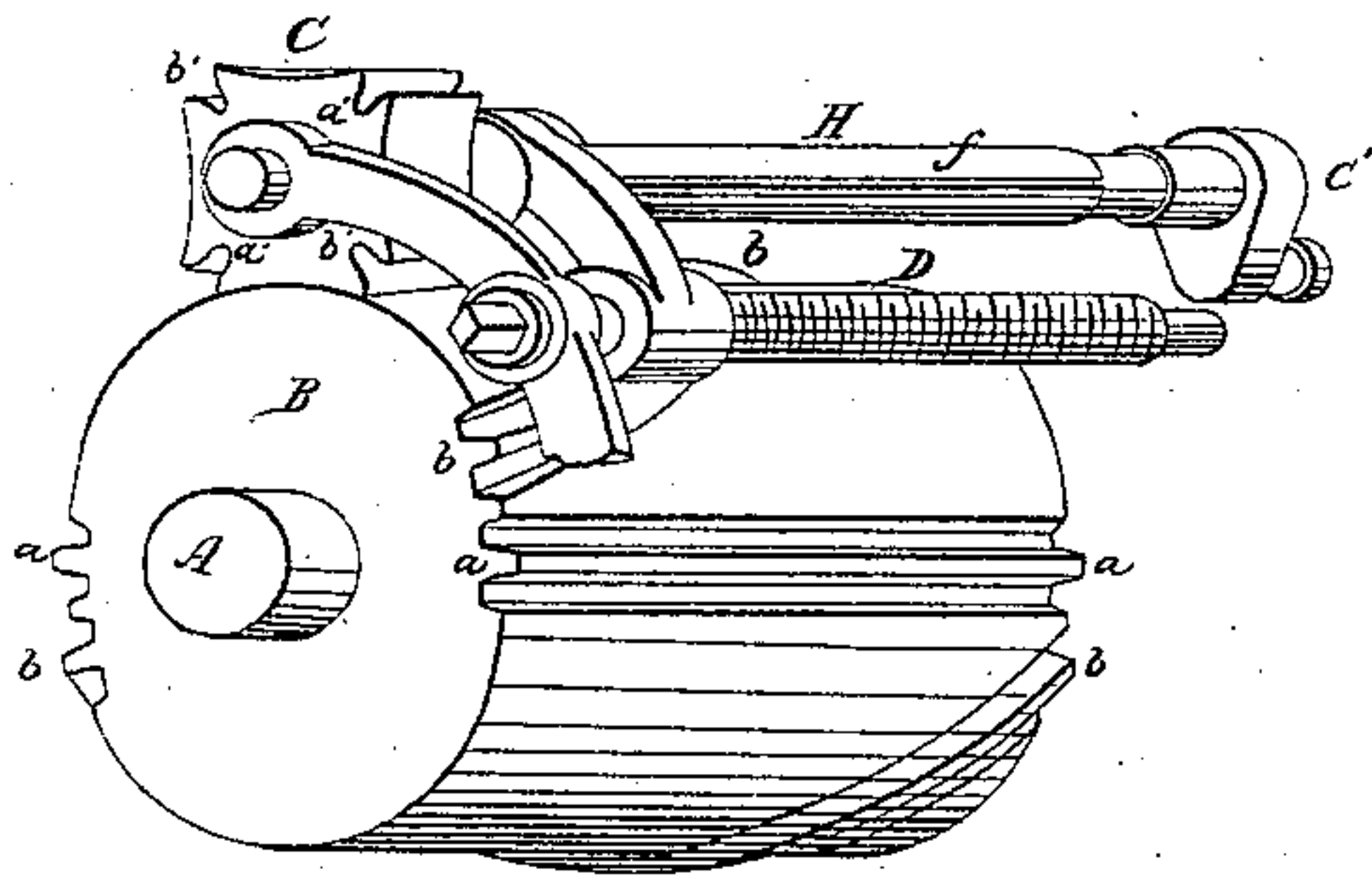
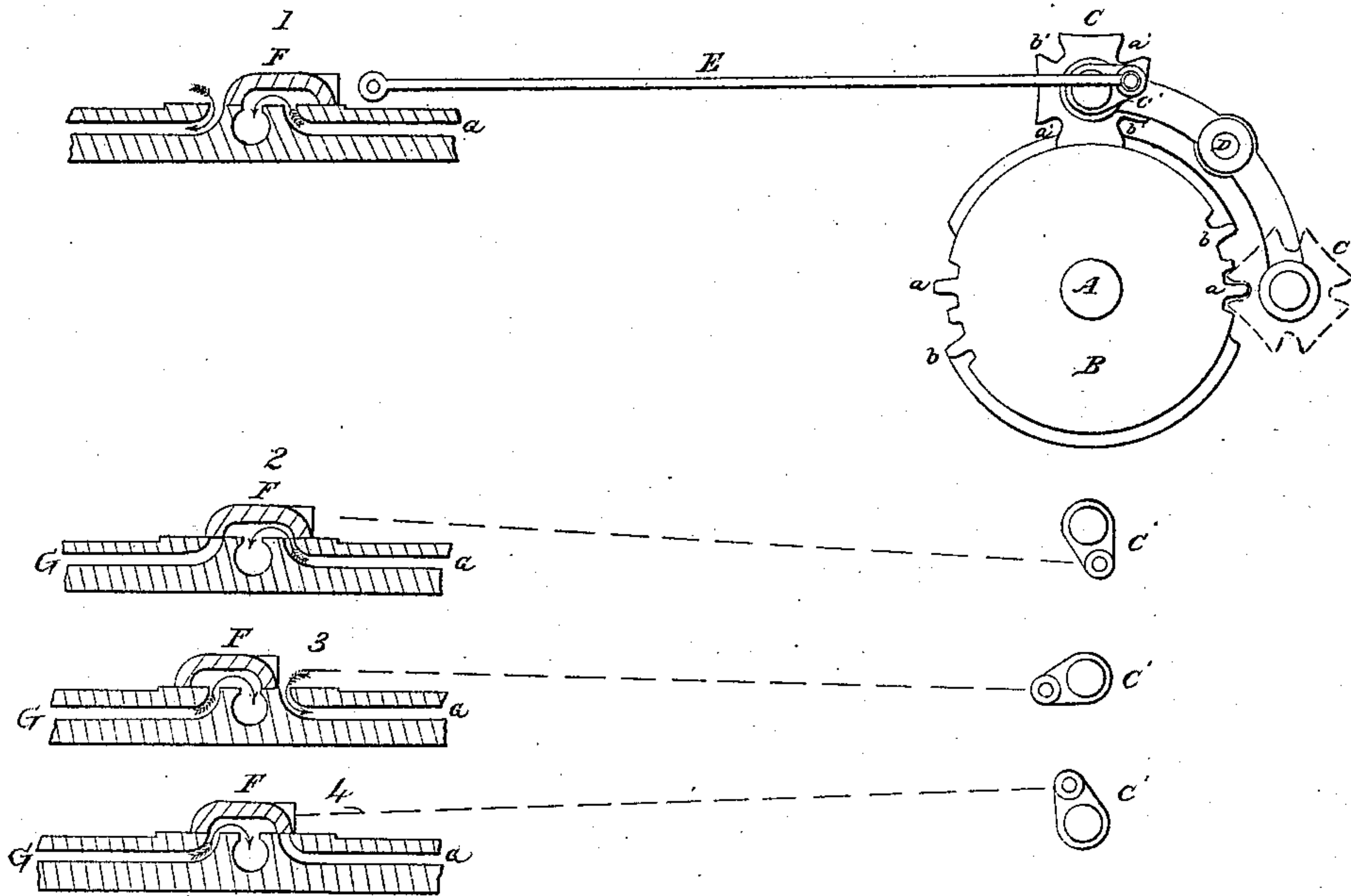


Fig. 1.

J. Scheitlin, 4 Sheets-Sheet 2.
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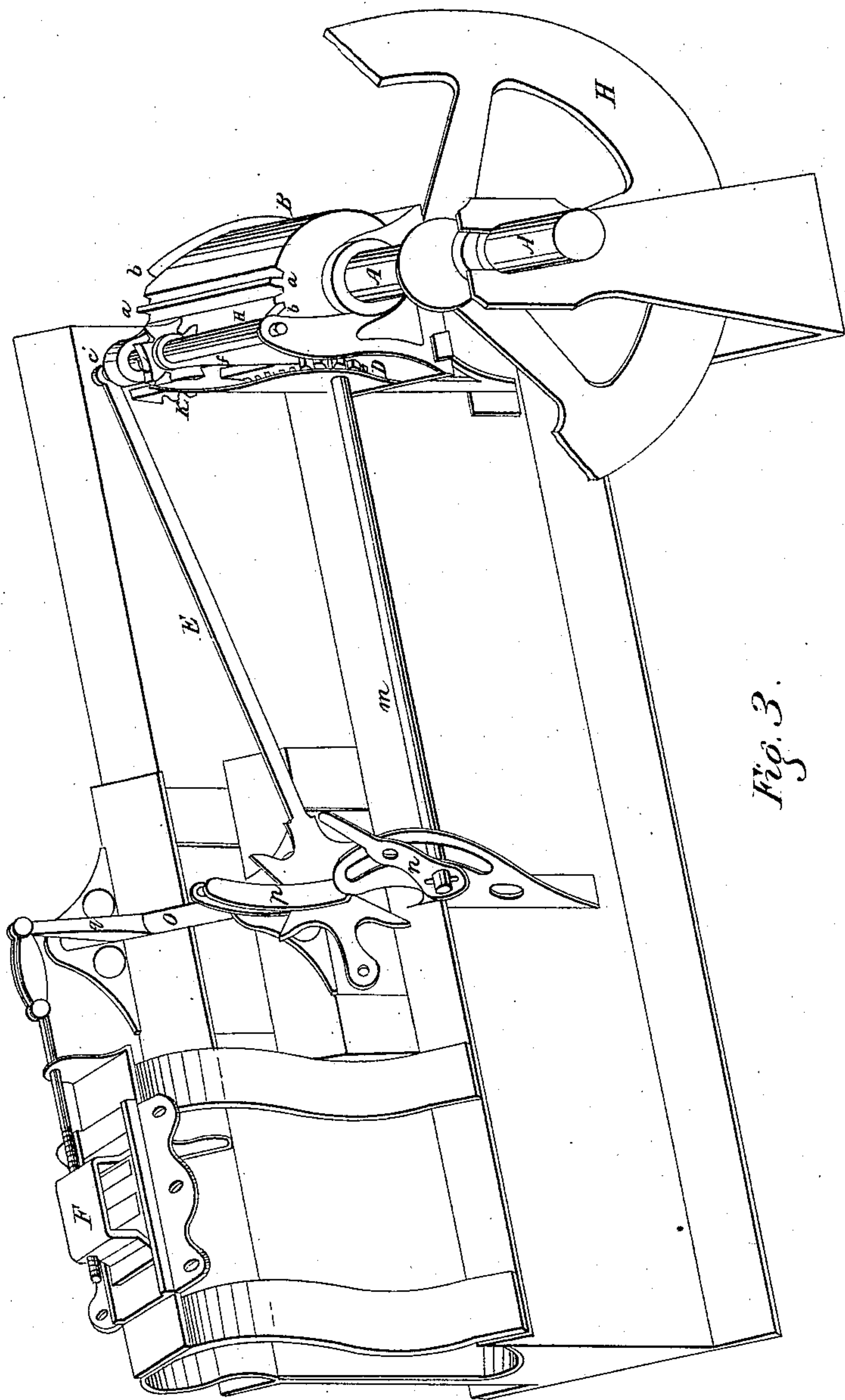


Fig. 3.

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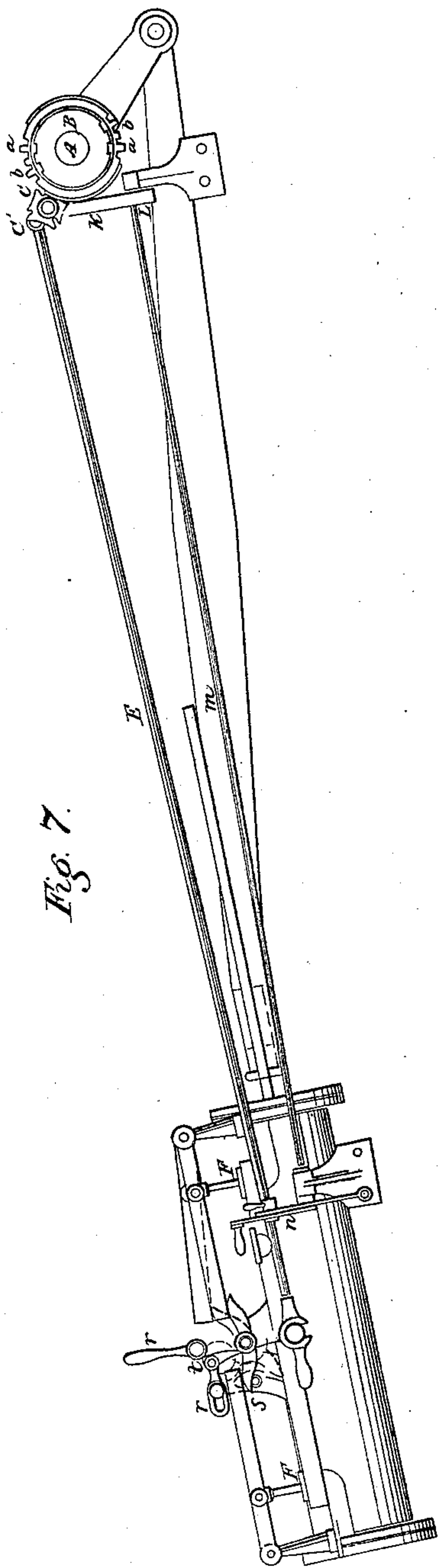
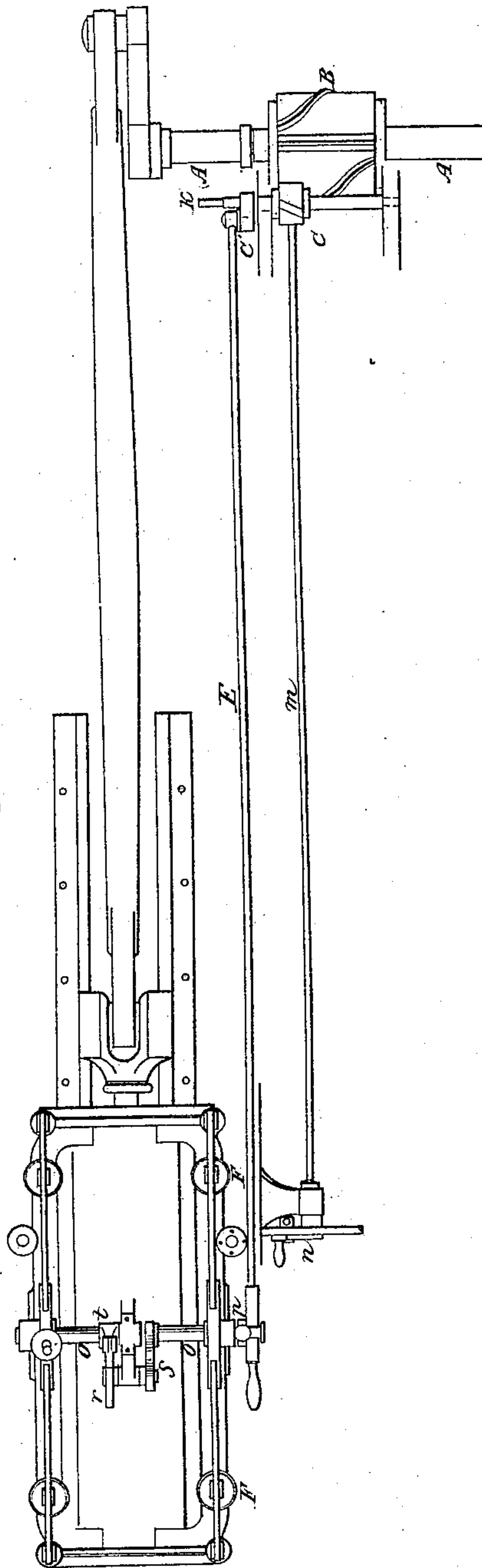


Fig. 7.

Fig. 8.



UNITED STATES PATENT OFFICE.

JACOB SCHEITLIN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO J. SCHEITLIN
AND A. O. DAILEY.

ARRANGEMENT OF MEANS FOR OPERATING THE VALVES OF STEAM-ENGINES.

Specification of Letters Patent No. 14,338, dated February 26, 1856.

To all whom it may concern:

Be it known that I, JACOB SCHEITLIN, of Washington, District of Columbia, have invented a new and useful valve-gear whereby
5 a single steam-valve of a steam-engine can be operated either as a feed-valve or as a feed and a variable cut-off valve alternately; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying
10 drawings, and to the letters of reference marked thereon.

The nature of my invention consists of a hollow metallic cylinder B, Figure 1, of
15 proper dimensions firmly keyed on the main driving or crank shaft A, and of another part which from its peculiar form I call the Maltese cross. This cross is so adjusted to a shaft lying parallel with the axes of the
20 cylinder, as not to revolve on the shaft, but to slide on it backward and forward in obedience to a rack and pinion, screw, or other equivalent contrivance, there being fixed at one end of this shaft a crank C, doing here
25 the work of an eccentric to which is attached a connecting rod E, Fig. 2, communicating the motions to a single valve F, hereinafter described.

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

Fig. 1 is a perspective view exhibiting the particular parts of my invention; Fig. 2, represents sectional views of the different
35 positions of the valves; Fig. 3, is a perspective view of the steam engine in connection with my new mode of single valve movement and cut-off, the whole corresponding with my model; Fig. 4, is a section of a locomotive engine; Fig. 5, is a plan of a locomotive engine; Fig. 6, is a side elevation of a puppet valve steam engine; Fig. 7, is a plan of the same.

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

In the surface of the cylinder B are inserted two teeth *a a* diametrically opposite to each other, extending rectilinearly the whole length of the cylinder. There are
40 also inserted in the surface and between the straight teeth two screw thread teeth *b b* diametrically opposite to each other. These latter teeth terminate at the extremities of the rectilinear teeth, each winding half way
55 around the cylinder. These teeth are so

fixed as to be easily renewed when worn or broken, the diameter of the cylinder being the pitch line of the teeth. The Maltese cross has four indentations, two of them
a' a' diametrically opposite to each other 60 being adapted to the rectilinear teeth *a a*, on the cylinder, and two other indentations *b' b'* similarly placed with regard to each other, adapted to the screw thread teeth *b b*. The Maltese cross axle or shaft H carries at
65 its extremity, as above mentioned, the little crank C, which takes the place of an eccentric.

Fig. 2 illustrates in four sectional views the single-valve positions as they are produced by one full revolution of the crank C.

A, Fig. 2 represents the crank shaft of a steam engine. B represents a four teeth cylinder. C represents the Maltese cross. C' represents the crank on the Maltese cross shaft. 75 D represents the rack and pinion. E represents the connecting rod. G represents the steam and exhaust passages of the cylinder. 1^F represents the valve when moved by the rectilinear teeth, at full pressure, giving
80 steam to the left port of the cylinder and exhausting from the right port. 2^F, the valve moved by the screw-thread teeth, and made to cut off steam from the left hand port. 3^F, same as in 1^F, but giving steam
85 through the right hand port, and exhausting through the left. 4^F, same as in 2^F, but in relation to the right hand port instead of to the left.

The Maltese cross being free to slide on 90 its axle or shaft H by means of a feather *f* or by some other similar device-receivers from the cylinder, and transmits to the crank C', or motion corresponding to the relative position of the cross and cylinder. 95

The different parts of my invention being thus described, I now refer to Fig. 3 which gives a perspective view of my invention in connection with the engine.

A is the main shaft encircled by the four 100 teeth cylinder B. This cylinder drives the Maltese cross C and the crank C', both attached to the same axle H which has its bearings near the extremities of the four teeth cylinder. From the extremity of the 105 axle where crank C', is attached, extends the connecting rod E communicating motion to rock shaft O with lever 9, which operates the single valve F, as above described. This whole operation is effected by a contrivance, 110

alike simple and precise, with one connecting rod only, having at one end two open bearings fitting in two pins, the one above the axle of the rock shaft, the other below.

5 To the rock shaft axle is also affixed the double lever *p*, enabling the engineer to continue or reverse the motion of the engine. Another lever on Fig. 3, convenient to the engineer, and near the rock-shaft, connects
10 with shaft *m*, and through that shaft, with the rock-and-pinion D, attached to the Maltese cross, enabling the engineer while the engine is in motion to slide the cross on its axle so as to operate this single valve either
15 as a feed valve or alternately as a feed and as a cut-off valve cutting off at any desired point of the stroke. In stationary engines, a governor attached to lever *n*, would regulate the movements of the Maltese cross, and
20 consequently of the single valve and cut-off.

One great advantage of my improvement may here be noticed, that while the valve motion produced by an eccentric is necessarily a continuous motion, in which a moment must arrive when both channel ways
25 are at once closed and of course, the reduction of exhaust steam obstructed; this inconvenience cannot take place in my mode of crank motion which acts at regular intervals according to the peculiar mechanism
30 of my invention.

Figs. 4 and 5 represent plan and section of a locomotive engine with my improvement applied. I use for a locomotive engine
35 but one four-teeth cylinder B keyed to the axle of the main driving wheel moving two Maltese crosses C and C', placed at an angle of 90° with regard to each other. Each of these crosses with its axle, crank and connecting rod, operates the single valve either
40 as a feed valve or alternately as a feed and as a variable cut-off valve for each engine—the continued as the reverse motion being effected as already described. To enable the
45 engineer to regulate the steam feeding and cut-off, I make use of a screw *r*, Fig. 5 with a fast thread, affixing to the end a bevel wheel S. This screw I place immediately above the four teeth cylinder and at equal
50 distances from the Maltese-crosses, which are so connected with a female screw *t* as to be moved by the male screw through the bevel wheel in the hands of the engineer.

55 Figs. 6 and 7, represents a side elevation and plan of a puppet-valve steam engine

also in connection with my improvement. B, shows the four-teeth cylinder keyed on the main crank shaft A. C the Maltese cross with its axle and the crank C' affixed to its extremity. E the connecting rod with but
60 one bearing, which may be set in a higher or lower pin of lever *p* as it is required to drive the engine forward or back. K shows the rack attached to the cross; D, the pinion affixed to the rod *m*; *n*, at the extremity of
65 the rod, the lever with a handle, by which the desired movements are effected.

The lever *p* is attached firmly to axle O upon which a lifting lever sets to the right and left in order to move the feeding valve.
70 Axle O extends over the steam cylinder toward the middle resting there on a bearing which is also a bearing for another axle O' extending to the lifting lever of the exhaust steam valve. The reverse motion machinery
75 is also arranged that by the segment of the wheel S and connecting rod *r*, with a slot hole on one side for the lever T on the axle O', in order that the axle O' with its lifting
80 levers is always to be set in an oblique direction, when axle O with its lifting lever sets in a straight line position, and when this line becomes oblique, to apply an oblique position in the opposite manner.

Having thus described my invention I
85 claim and desire to secure by Letters Patent.

The four-teeth cylinder B keyed on the main driving or crank shaft A, the Maltese cross C with its shaft, H, and the small
90 crank C' keyed thereto; said cross, by means of the feather *f*, or any equivalent device, being susceptible of a free and steady to-and-fro motion along, while driving, its shaft H; and being so moved by the rock
95 and pinion, D, a screw or other equivalent means, and by which, also, it can be retained on its shaft H, in any desired position in relation to the cylinder, the whole being arranged, connected and operated substan-
100 tially as herein set forth, whereby a single steam valve of a steam engine can be worked either as a feed valve, or as a feed and as a cut-off valve alternately, and the steam cut off at any required point of the stroke,
105 while the engine is in operation.

JACOB SCHEITLIN.

Witnesses:

T. C. DONN,
L. K. OFFSETT.