

(No Model.)

2 Sheets—Sheet 1.

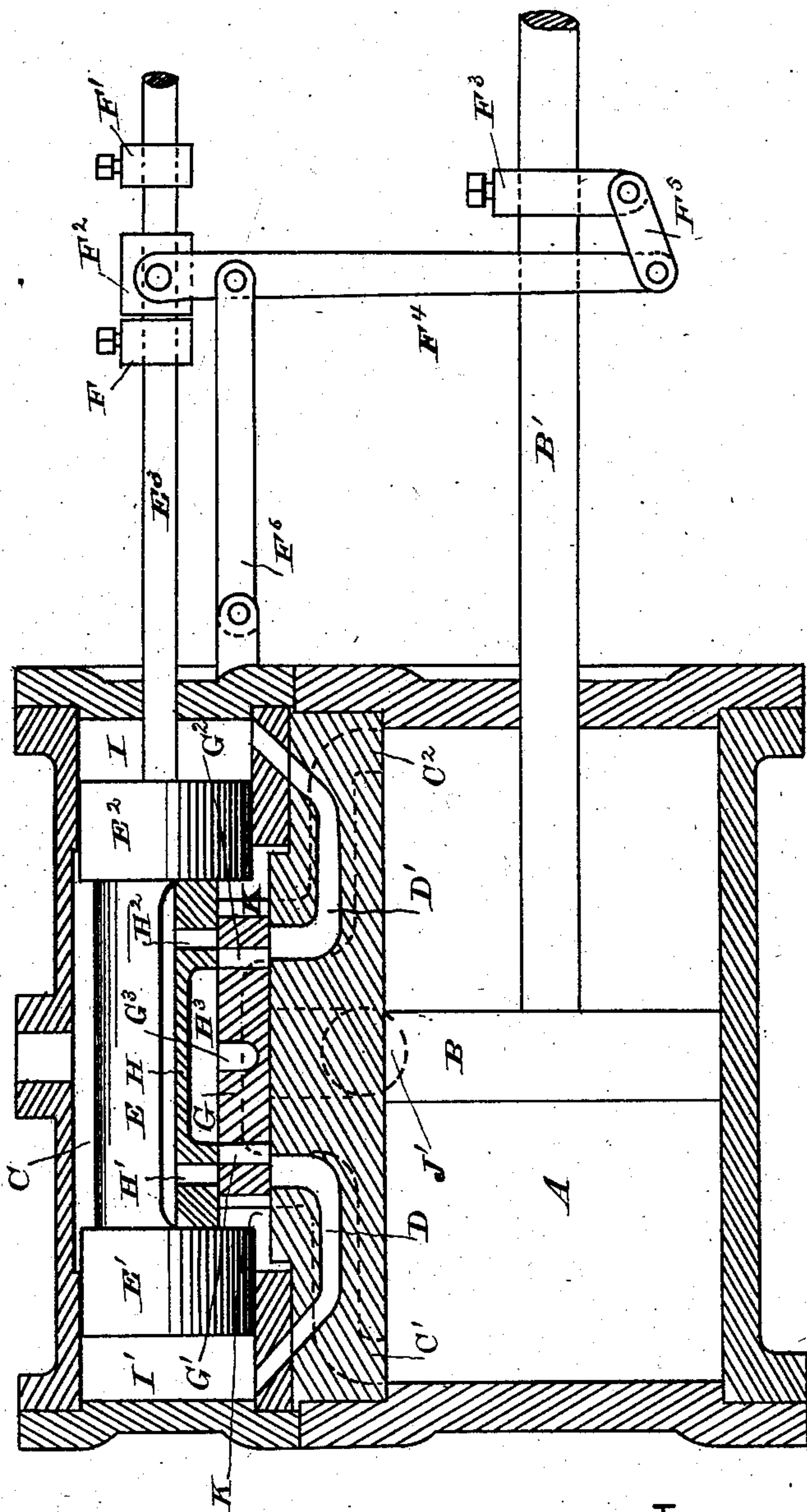
H. KESSLER.

STEAM ACTUATED VALVE.

No. 290,063.

Patented Dec. 11, 1883.

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WITNESSES

Wilmer Bradford
Edwin Derby

INVENTOR.

Henry Kessler
By C. W. M. Smith,
Attorney.

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FIG. 2.

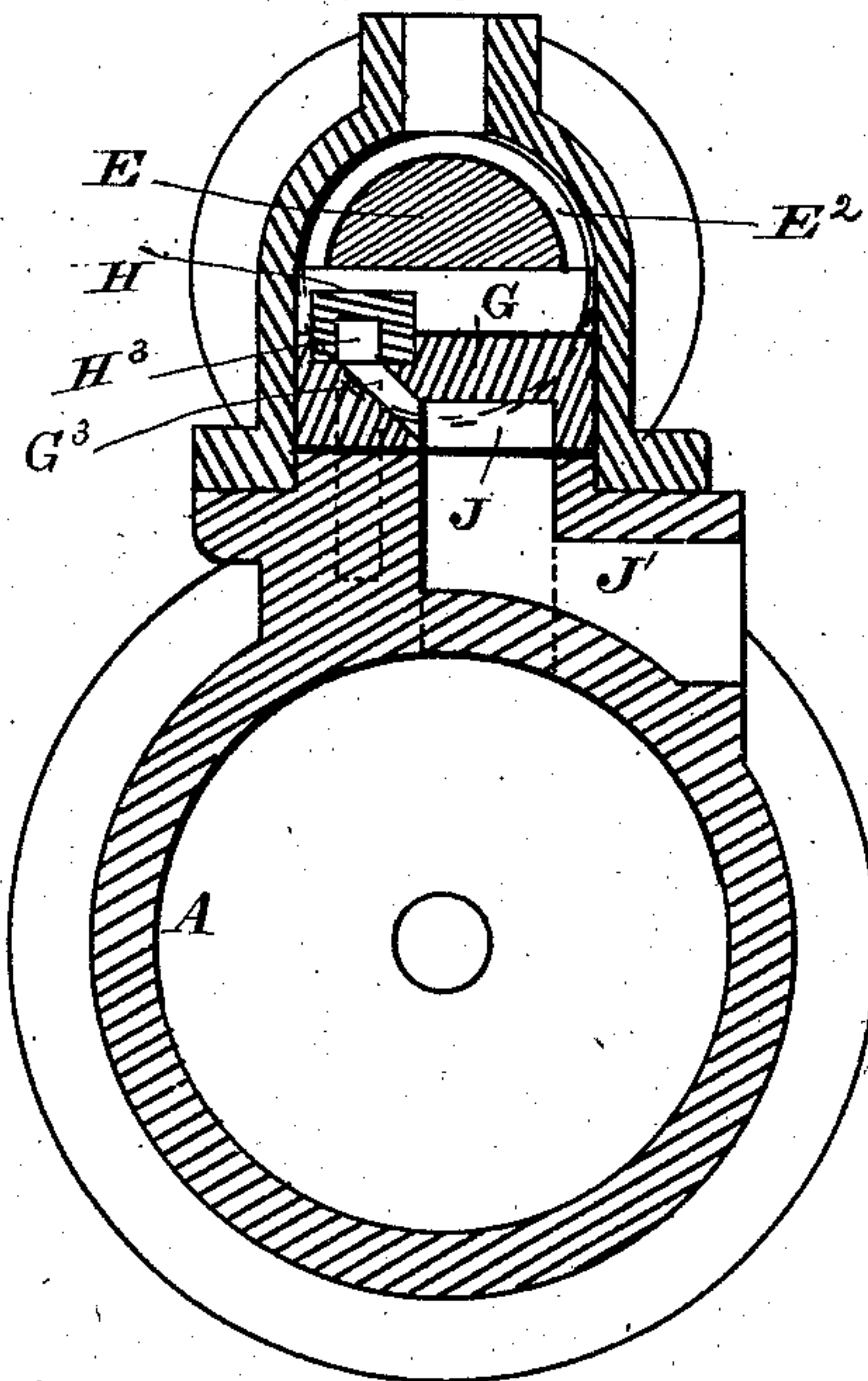


FIG. 3.

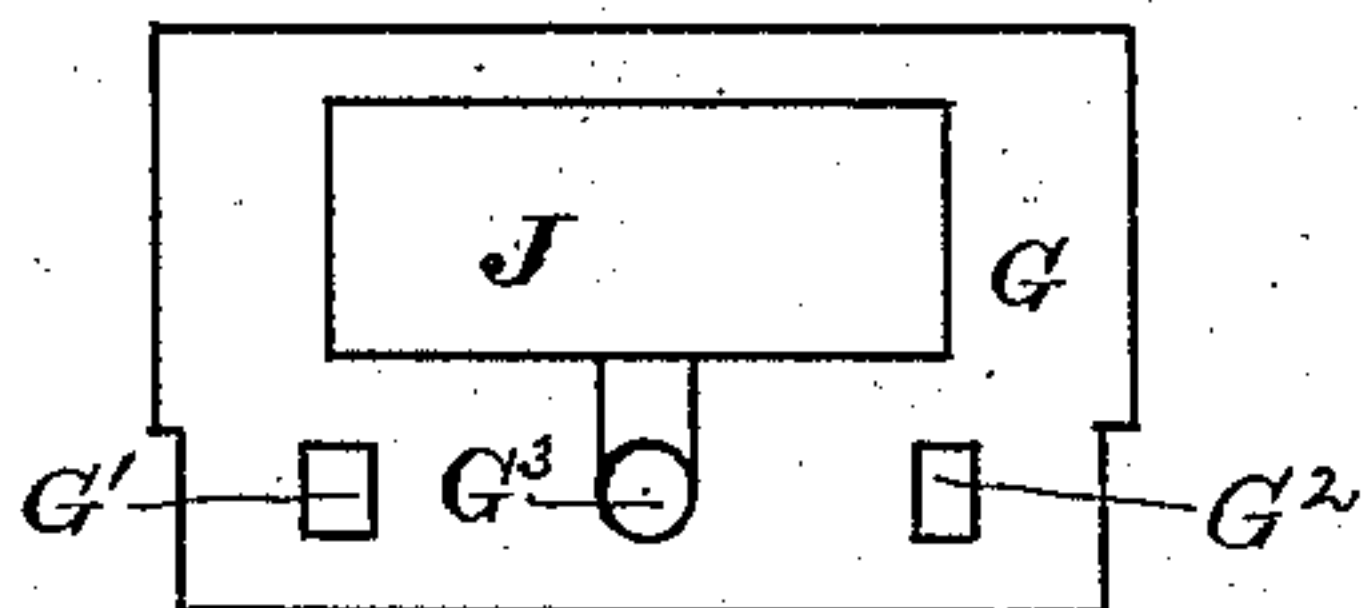


FIG. 4.

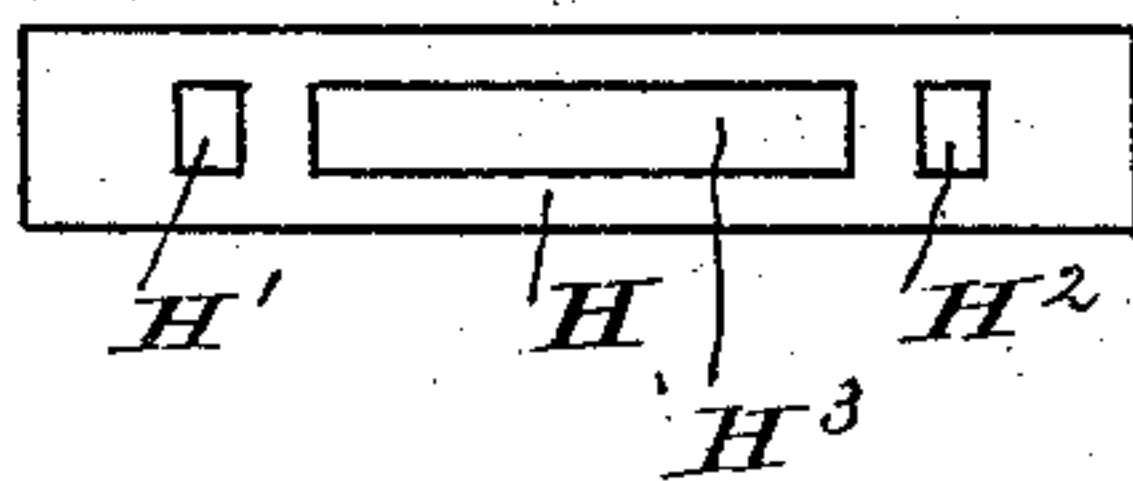
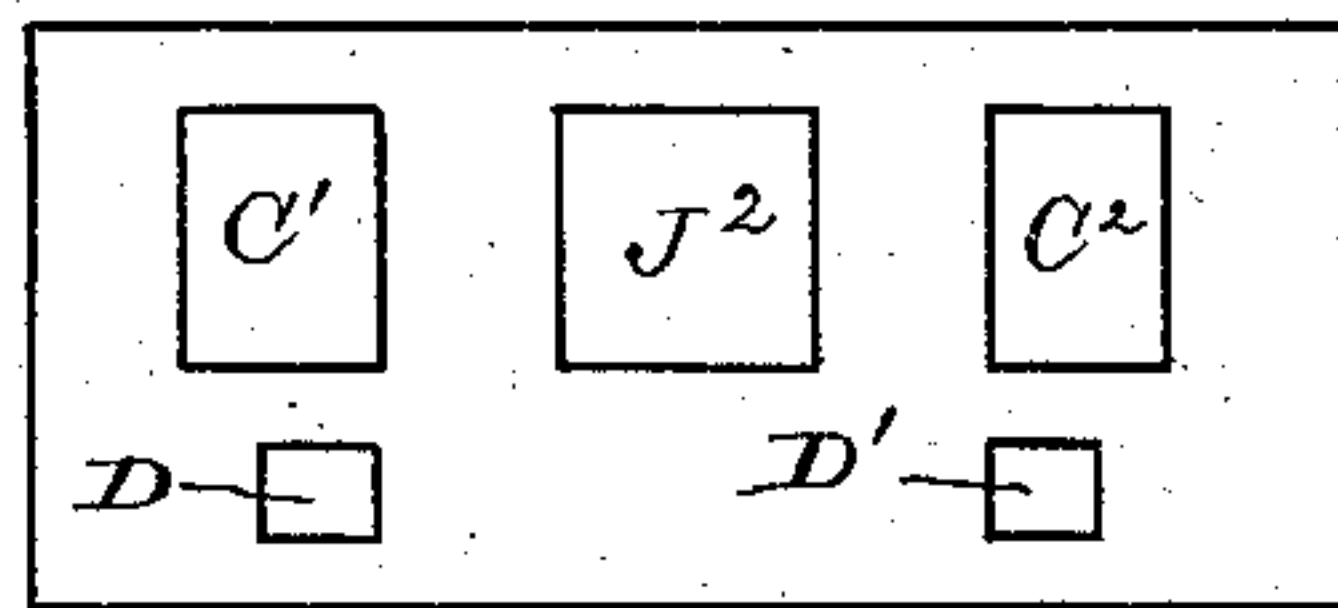


FIG. 5.



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UNITED STATES PATENT OFFICE.

HENRY KESSLER, OF SAN FRANCISCO, CALIFORNIA.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 290,063, dated December 11, 1883.

Application filed April 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY KESSLER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Steam-Actuated Valves for Direct-Acting Steam-Engines, of which the following is a specification.

The object of my invention is to provide a steam-engine with an improved steam-actuated valve, by means of which leakage at the steam-ports will be prevented, and great economy will be had in the working of the engine. This object I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through the steam-cylinder and steam-chest. Fig. 2 is a cross-sectional view of the same. Fig. 3 is a bottom view of the main valve. Fig. 4 is a bottom view of the reversing-valve. Fig. 5 is a plan view of the valve-seat.

Similar letters of reference are used to indicate like parts throughout the several views.

A represents the steam-cylinder, and B and B' the piston and piston-rod.

C is the steam-chest, which is provided with the usual steam-ports, C' and C'', communicating with either end of the main cylinder. This steam-chest is also provided with two other steam ports or passages, D D', the uses of which will be hereinafter explained.

Within the steam-chest I fit an auxiliary piston or plunger, E, having two heads, E' E'', connected together by the main body of the piston, and having a piston-rod, E³, which extends through one head of the steam-chest, and is fitted with two adjustable collars, F' F'', between which is placed the sliding collar F², connected to an adjustable collar, F³, upon the main piston-rod by pivoted links F⁴ F⁵. A hinged bar, F⁶, is attached to the head of the steam-chest, and to its outer end is pivoted the link F⁴, and thus a fulcrum is obtained for the said link.

G represents the main valve, having supplemental ports G' G'' and an eduction port or passage, G³.

Near one side of the main valve I cut a rabbit, within which is fitted the reversing-valve H, having induction-ports H' H'', and an exhaust-cavity, H³. The reversing-valve is

made to fit closely between the inner faces of the double-headed plunger and slides upon the upper face of the main valve, and the two valves are operated by the reciprocation of the said double-headed piston.

In order to start up the engine from the position shown in Fig. 1, (and into which it cannot come again by its own working,) the supplemental piston may be moved to the left, which will cause the reversing-valve to also move to the left, and as the ports H², G², and D align themselves, steam is admitted into that end of the steam-chest designated by the letter I, which forms a separate chamber not in direct communication with the steam-supply pipe, and is separated from the steam-chest proper by the tightly-fitting piston-heads E' E'', as shown in Fig. 1. At this same time the exhaust-passage H³ of the reversing-valve will communicate through the ports G' and D with the chamber I' at the left-hand end of the steam-chest and permit of the said chamber I' exhausting itself through the passages G³ and J into the main exhaust-pipe J', thus causing the valves and the double-headed piston to move to the left; but when the inside edge of the port G' has passed the outside edge of the steam-passage D, the exhaust from the chamber I' will be closed, and the forward movement of the valves will be stopped by the compressed steam in the said chamber I' and passage D. While the aforesaid movements are taking place, the main valve opens the main port C'', admitting steam into the main cylinder and driving the piston to the left until, through the link movement attached to the main piston-rod, the sliding collar F² is brought into contact with the fixed collar F', and thereby moves the double-headed piston and the valves back again toward the right and opens the steam-ports H' and G', thus admitting live steam into the chamber I' through the passage D. In the meantime the passage D' from the chamber I is open to the small space lettered K between the inside face of the piston-head E'' and the end of the main valve, thus equalizing the pressure on both ends of the valve-piston, the exhaust at the time being closed to both ends until the main valve is nearly closed to the right. Then by the reason of the lead that the port G² has over the port D', the steam will be exhausted from the chamber I

until the inner edge of the port G^2 passes the outer edge of the passage D' , when the main valve will open the induction-passage C' to the left-hand end of the main cylinder, and at the same time open the exhaust through C^2 to the open air, thus reversing the motion of the piston.

The valve-motion herein shown and described may be changed by substituting a B-valve for the D main-slide-valve, and a straight arm be carried by the piston-rod, instead of the links or pivoted levers shown, and the collars F and F' moved to suit the increased travel of the last-mentioned vertical straight arm upon the slide-valve piston-rod.

It will be seen from the above that the leakage of steam through the valve-piston is reduced to a minimum, as the exhaust-passage from the steam-chest is only open during one-half of the stroke or travel of the main valve, said movement being made very rapidly, and

only enough steam is exhausted to allow of sufficient movement of the main valve.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In a steam-actuated valve, the combination of the cylinder A , having a piston, B , provided with piston-rod B' , the steam-chest C having ports C' C^2 D D' , and exhaust-spout J J' , the plunger E , having heads E' E^2 and rod E^3 , said rods B' and E^3 being connected by means of adjustable collars and links, as shown, the rabbeted valve G , having ports G' G^2 G^3 , and the reversing-valve H , having ports H' H^2 H^3 , all substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

HENRY KESSLER. [L. s.]

Witnesses:

C. W. M. SMITH,
CHAS. E. KELLY.