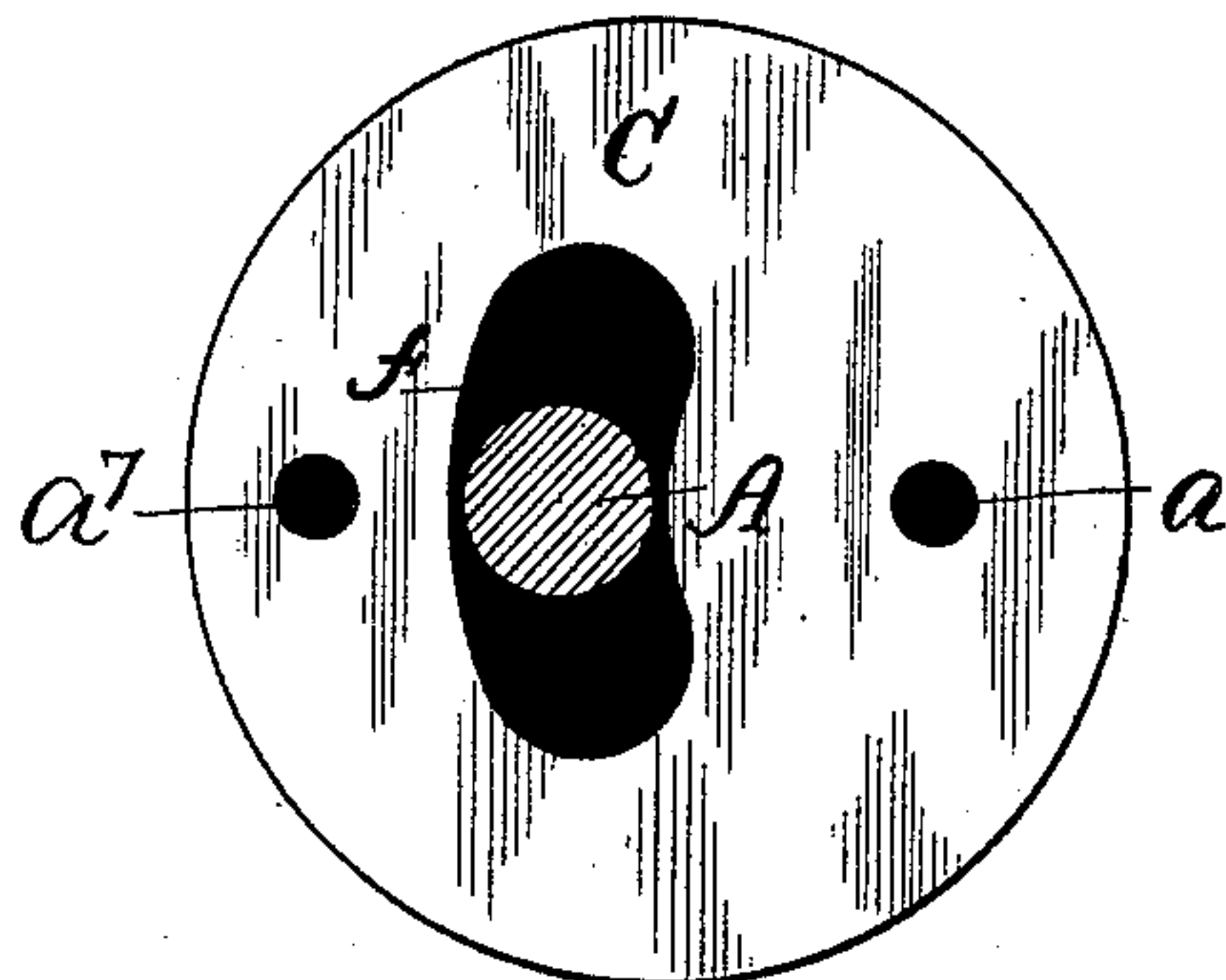
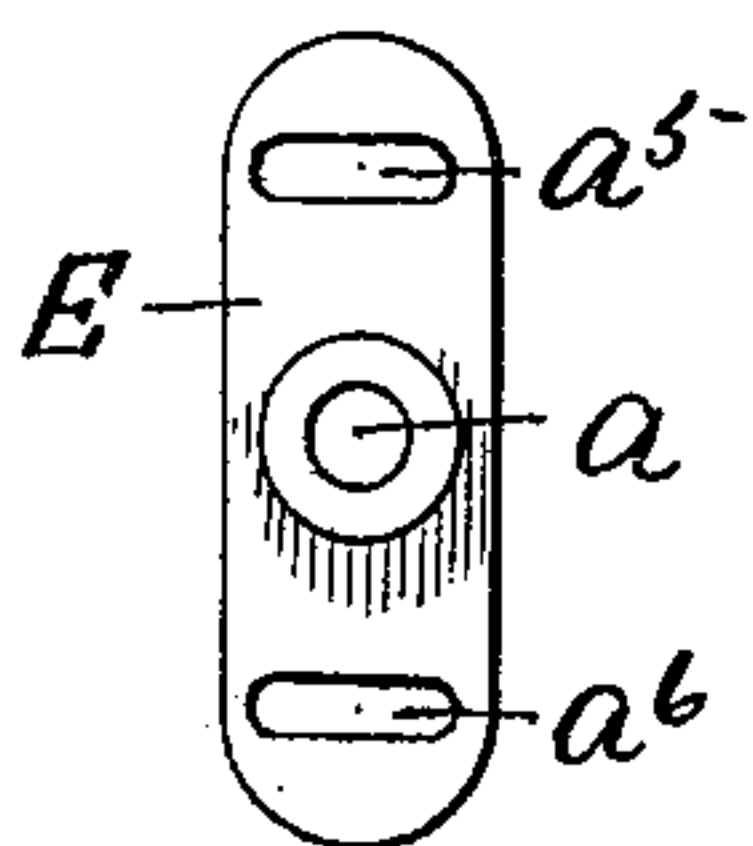
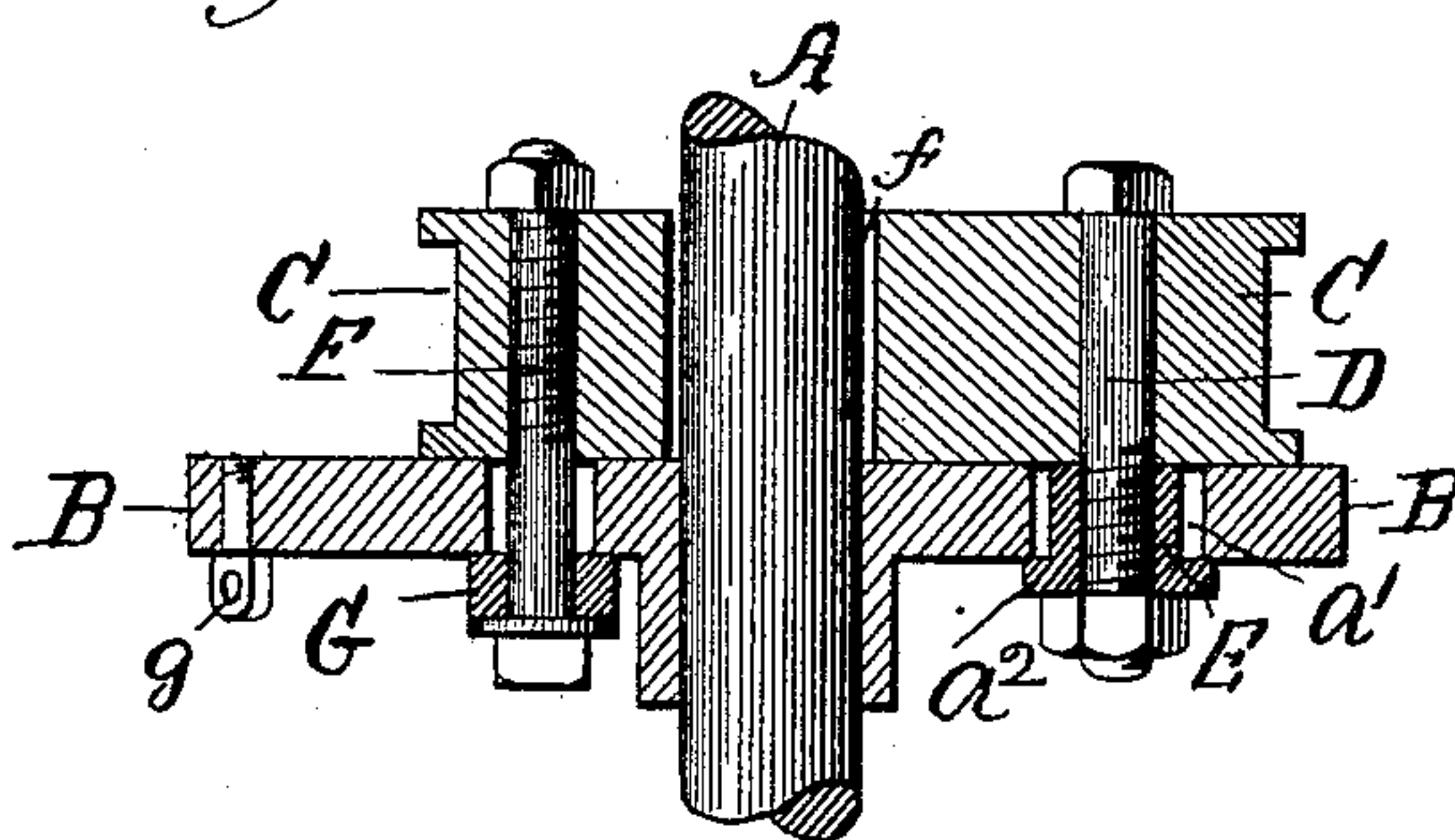
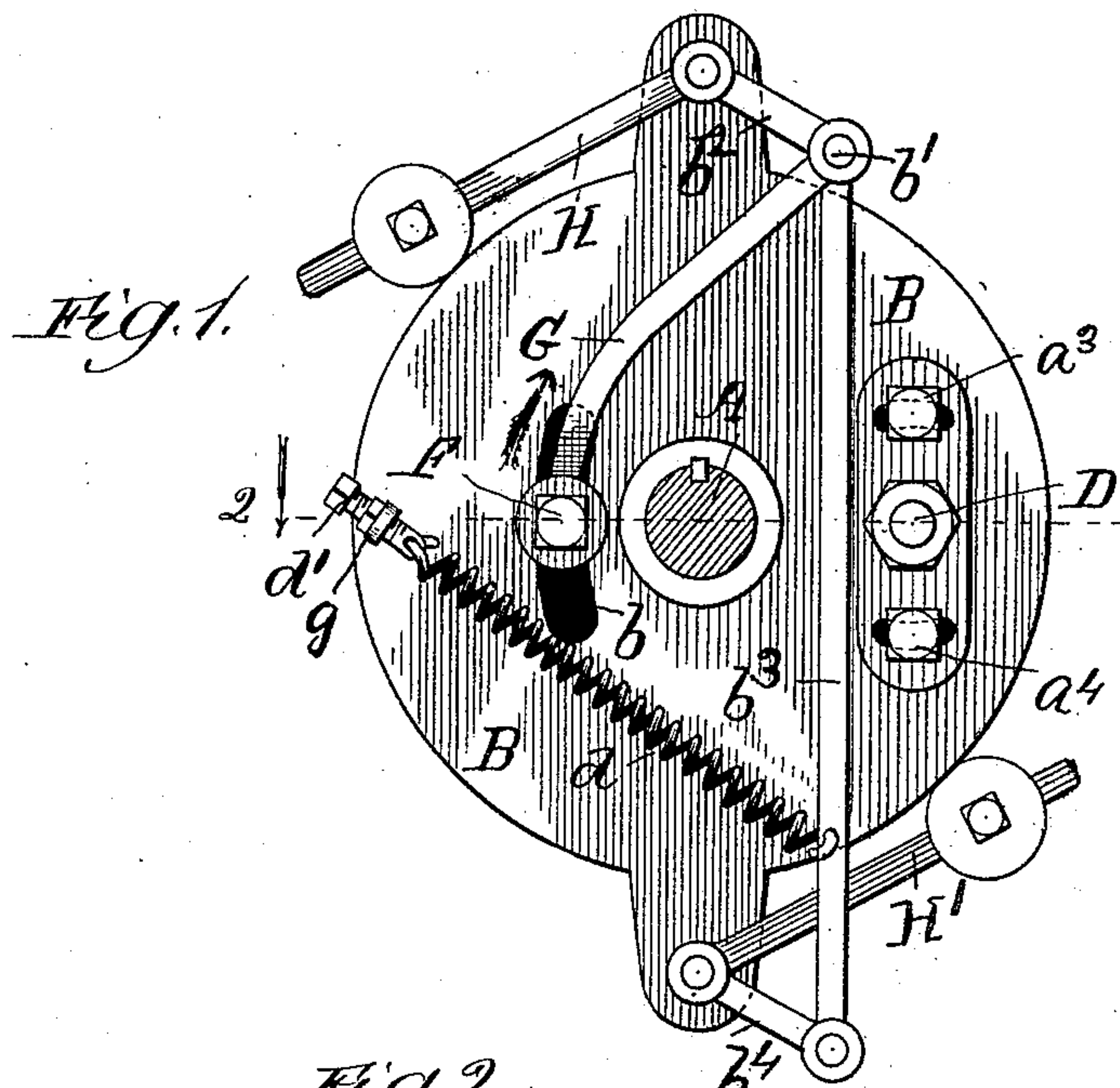


(No Model.)

A. J. SCHINDLER.
STEAM ENGINE GOVERNOR.

No. 463,873.

Patented Nov. 24, 1891.



Witnesses:
 Geo. Gaylord,
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UNITED STATES PATENT OFFICE.

ANDREW J. SCHINDLER, OF CHICAGO, ILLINOIS.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 463,873, dated November 24, 1891.

Application filed February 19, 1891. Serial No. 382,104. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. SCHINDLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Engine Governors, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in the class of centrifugal or shaft governors; and it consists of certain novel features in the construction, arrangement, and operation of the same, as will be hereinafter set forth.

This improvement is adapted to be used in connection with the different types of steam-engines, either double or single, and will handle a double engine with one eccentric, dispensing with the link or hook motion. The throw of the eccentric may be varied automatically or set stationary and altered by hand in accordance with the style of engine and the work to be done. By this arrangement the ordinary friction or slide valve may be actuated with the same facility and ease as a balance or rotary valve.

In the drawings, Figure 1 is an elevation, the crank or engine-shaft being in section; Fig. 2, a transverse section on line 2, Fig. 1, looking in the direction indicated by the arrow; Fig. 3, an elevation of the eccentric, showing the opposite side from that illustrated in Fig. 1; Fig. 4, a detached plan of the eccentric adjusting-plate.

Referring to the drawings, A represents the crank-shaft of the engine, B a disk rigidly mounted thereon, and C the eccentric. The eccentric is pivotally secured to the disk B by means of the pin or bolt D passing through the aperture *a*, Fig. 3, and the adjusting-plate E, recessed in the carrying-disk, as shown in Fig. 2. The pivot-pin D, on which the eccentric swings, passes through the same at one side and is set on a line diametrically opposite the engine-crank, and is therefore always in position for running the engine in either direction.

The carrying-disk B is provided with the elongated slot *a'*, Fig. 2, in which is set the adjusting-plate E. Sufficient space is left

between the sides of the plate and the inclosing walls of the slot to permit of the plate being moved in the direction of or away from the center line of the crank-shaft, and thereby impart a corresponding movement to the eccentric across the face of the disk to alter the throw of the same, and thereby vary the lead and cushion accordingly. The plate E is provided with the flange *a³*, which overlaps the surface of the disk surrounding the slot *a'* and is adjustably clamped in place by the tap-bolts *a⁴* *a⁵* passing through the slots *a⁶* *a⁷* and having a threaded engagement in the disk. This provides for the locking of the plate at the desired point.

The shifting-pin of bolt F is rigidly secured in the eccentric at a point diametrically opposite the pivot-pin through aperture *a⁷*, and, in connection with the weighted levers shown, illustrates one of the means that may be employed in imparting an automatic action to the eccentric, as the varying service of the engine may require.

The carrying-disk is provided with the curved slot *b*, through which the shifting-pin F projects, and connects with one end of the eccentric shifting-lever G, the opposite end of which is pivoted at *b'* to one end of the link *b²*, connecting the lever G and the weighted governor-arm H. One end of the reach-rod *b³* is also pivoted at *b'*, the opposite end being pivoted to the link *b⁴*, connecting the same with the companion governor-arm H', thus providing for a simultaneous movement of the governing mechanism. The drawings illustrate the application of the device to a single-acting stationary engine running in one direction only. The weighted arms are at their extreme outer limit, the pin F being on the line of its innermost position and playing between that point and the end of the slot *b*, as indicated by the arrow. If the governing mechanism were inverted, the movement of the eccentric shifting-pin F would be in the opposite direction in the slot *b* from the center position in which it is shown and the motion of the engine reversed.

In applying the improvement to a double-acting engine suitable mechanism will be employed to instantly shift the eccentric in either direction in reversing the motion of the engine. The curved slot *f* provides for the throw

of the eccentric with reference to the crank-shaft.

5 The gist of the present invention is the feature of setting the pivot-pin of the eccentric on a line directly opposite the crank and in moving the eccentric in or out on a straight line running through the center of the crank-shaft in setting a valve or altering the lead. Moving the pivot-pin outwardly increases the
10 lead, and inwardly the reverse. By this arrangement no matter at what point the steam is cut off the lead is always the same.

15 In using this improved arrangement on stationary engines the automatic shifting of the eccentric may be dispensed with and the pivot-pin made to act as a clamping-bolt and rigidly fasten the eccentric to the carrying-disk. The lead on the valve is changed by moving the eccentric in or out in a straight
20 line, just the same as when the clamping-bolt is a pivot-pin. Thus the lead may be conveniently changed in accordance with the work of the engine. It will be observed that this arrangement possesses many ad-
25 vantages over the ordinary eccentric mounted on the crank-shaft.

d represents the usual tension-spring, one end of which is attached to the reach-rod and the other to the tension-adjusting bolt *d'*,
30 fastened to the disk B by the tap-bolt *g*.

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

35 1. In a steam-engine governor, the combination, with the crank-shaft, of a carrying-disk rigidly mounted thereon and an eccentric adjustably secured to said disk and adapted to be moved in a straight line across

said shaft to alter the throw of the eccentric, whereby the lead on the valve is the same, no
40 matter in which direction the crank-shaft is turning, substantially as described.

2. In a steam-engine, the combination, with the crank-shaft, of a carrying-disk rigidly mounted thereon, the eccentric loosely encir-
45 cling said shaft, the pivot-pin or bolt adjustably securing the eccentric to said disk, said pin or bolt being set on a straight line with reference to the engine-crank, the adjusting-plate through which said pin or bolt passes
50 and provided in the respective ends with elongated slots, and the tap-bolts inserted through said slots and fastening said plate to said disk, whereby the eccentric may be
55 moved in the direction of or away from the engine-shaft, and always in a straight line with and opposite to the crank, substantially as described.

3. In a steam-engine governor, the combination of the engine-shaft, the carrying-disk
60 rigidly mounted thereon, the eccentric loosely encircling said shaft and adjustably pivoted at a point directly opposite the engine-crank, the shifting-pin rigidly secured in said eccentric in line with and opposite to the
65 pivot-pin, said shifting-pin passing through a curved slot in the carrying-disk, and in which the same moves in swinging the eccentric, the lever connected to the shifting-pin, the reach-rod, the connecting link, and the
70 weighted arms, substantially as described.

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Witnesses:

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