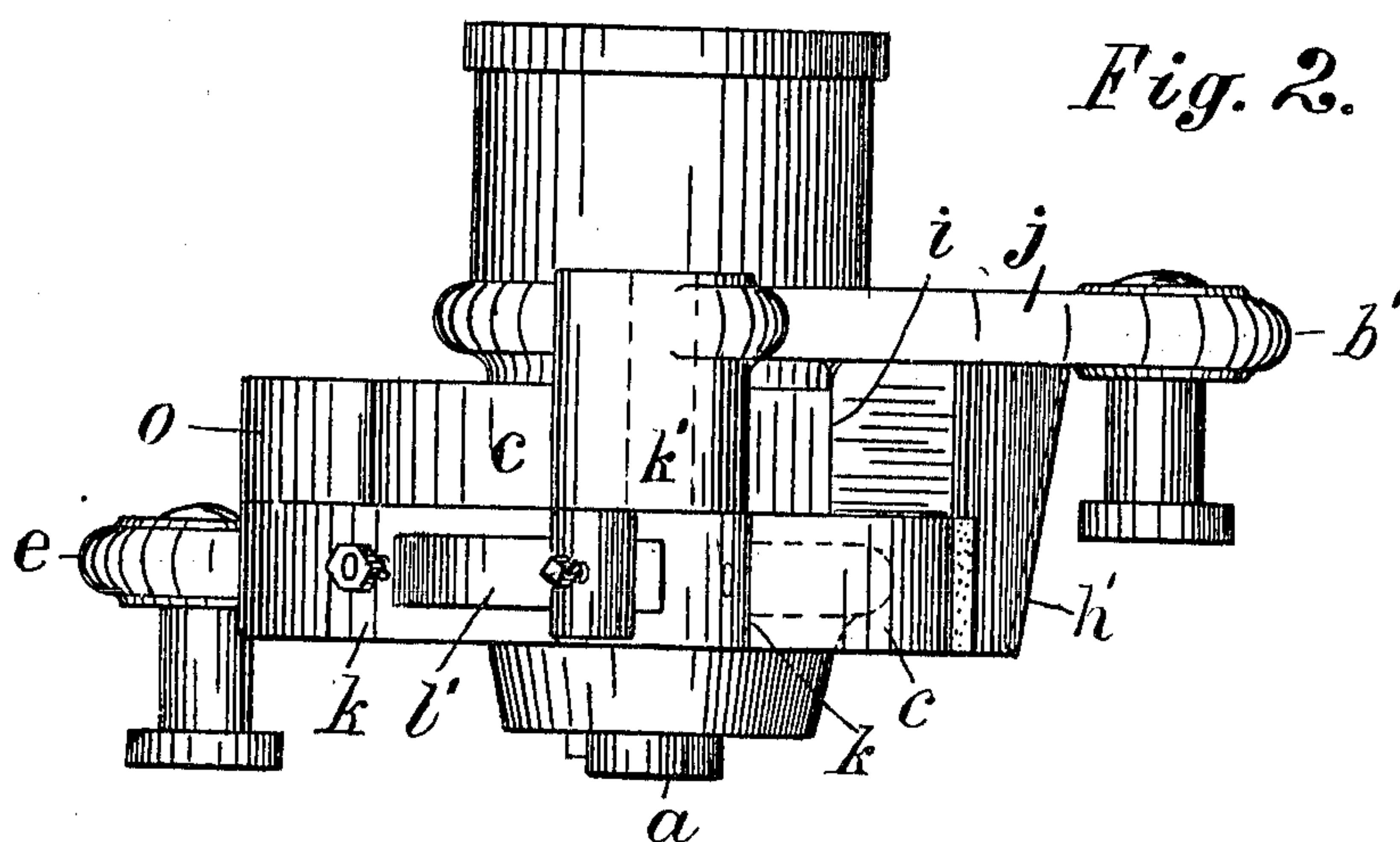
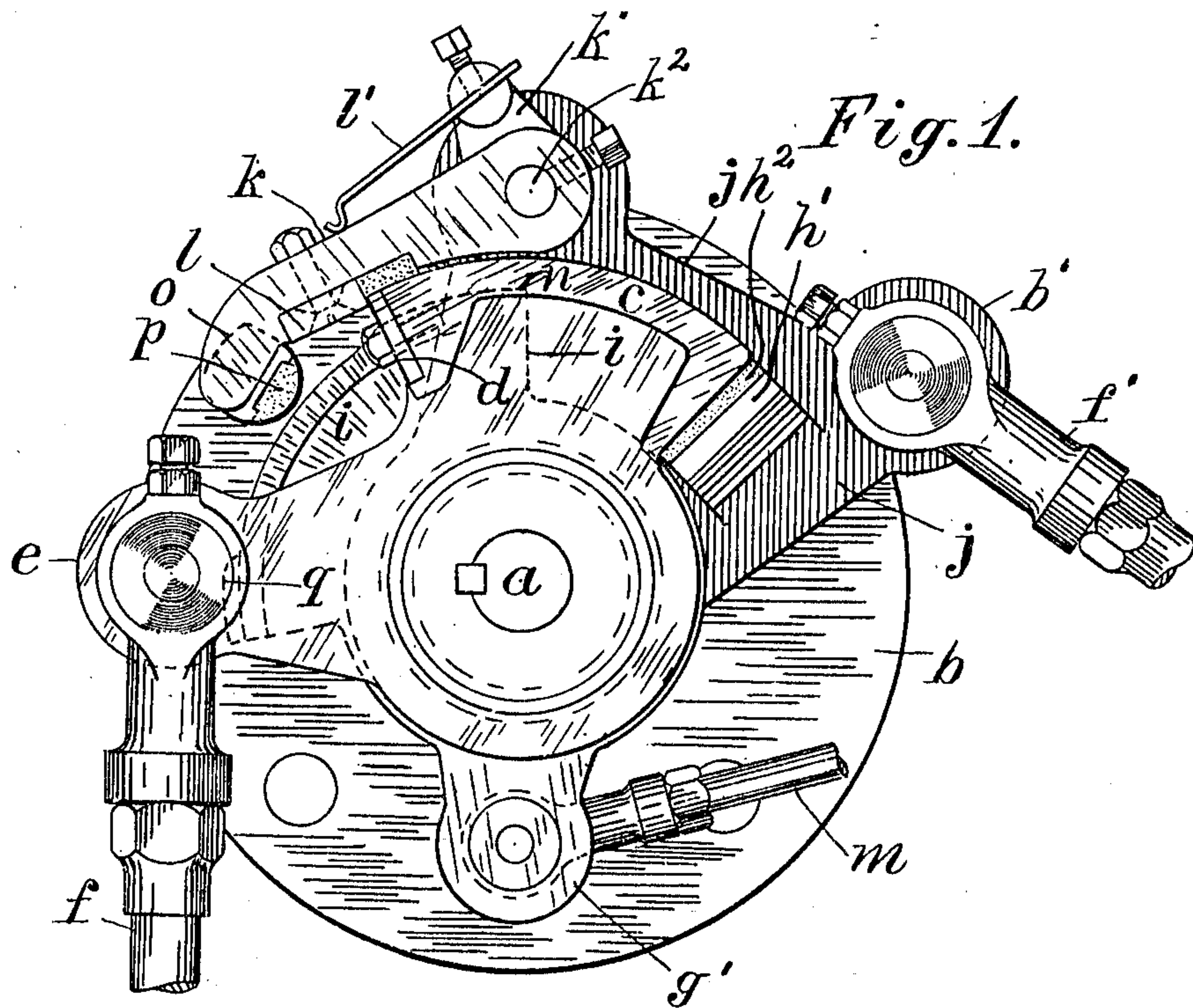


F. PHILLIPS.  
CORLISS VALVE GEAR.  
APPLICATION FILED JUNE 27, 1908.

969,802.

Patented Sept. 13, 1910.  
3 SHEETS—SHEET 1.



Witnesses:  
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Thomas S. Crane, Atty.

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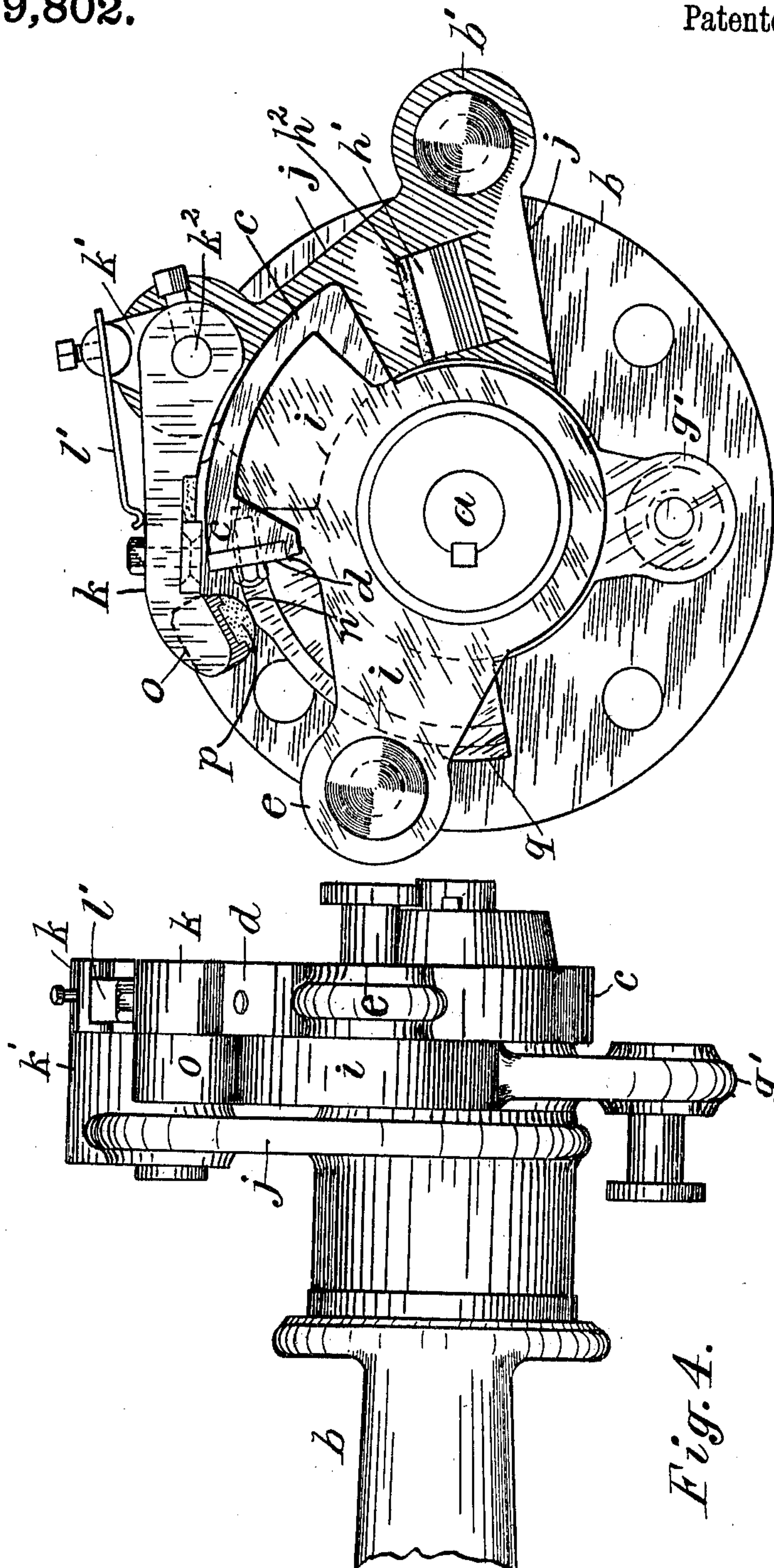


Fig. 3.

Fig. 4.

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3 SHEETS—SHEET 3.

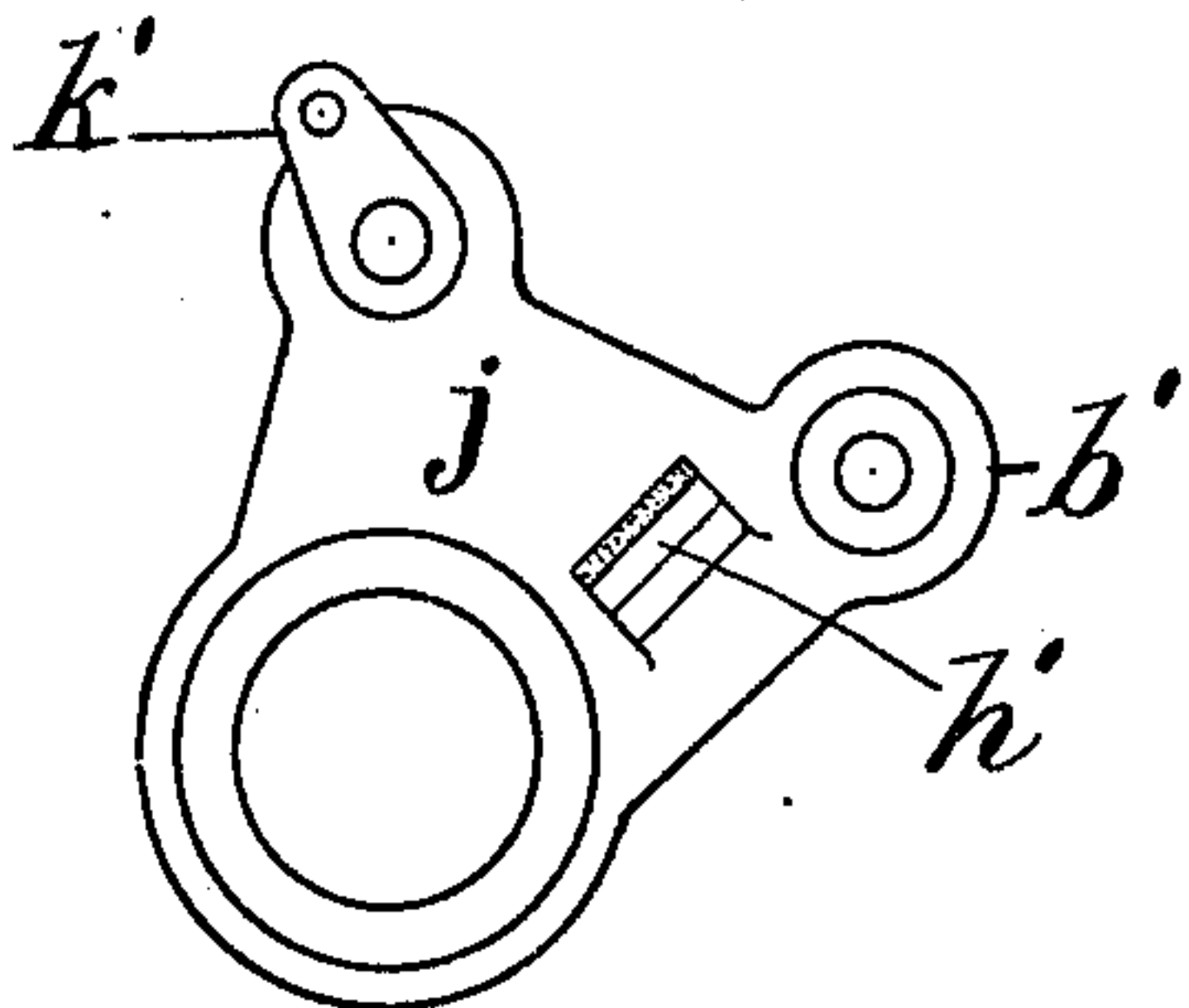
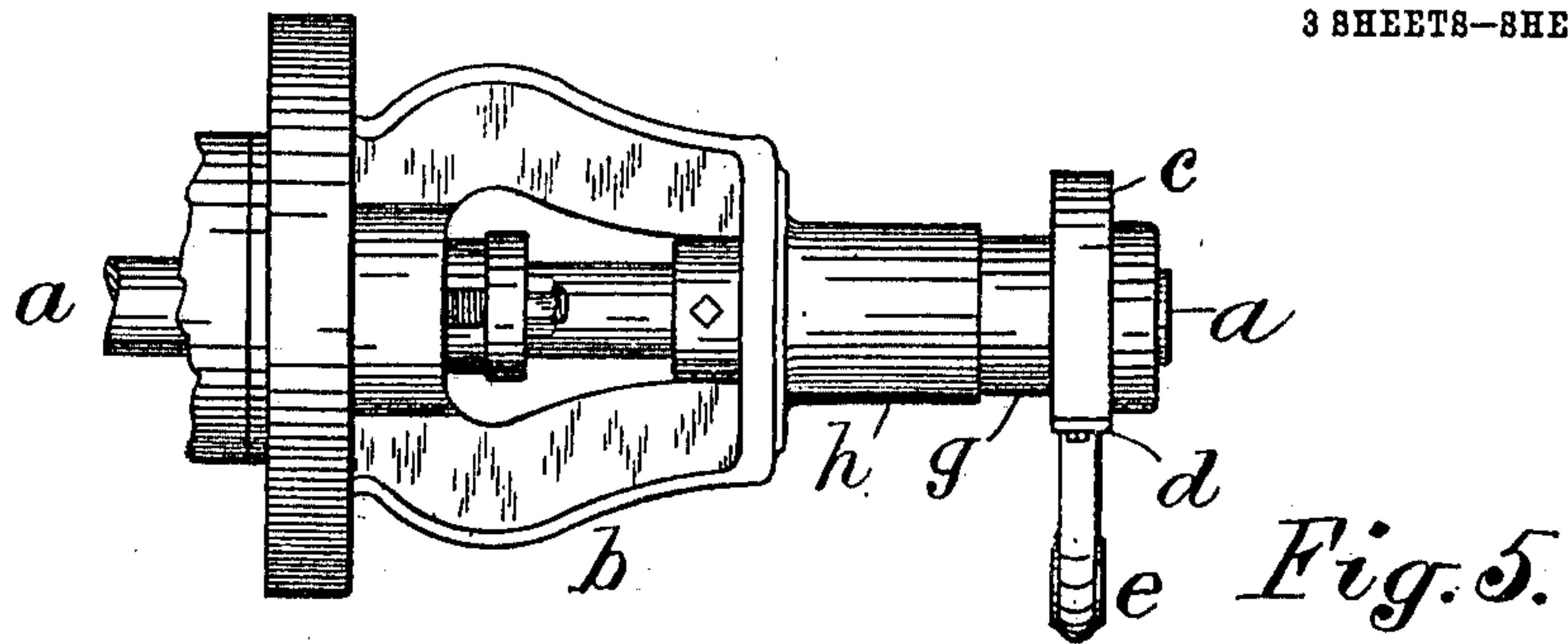


Fig. 6.

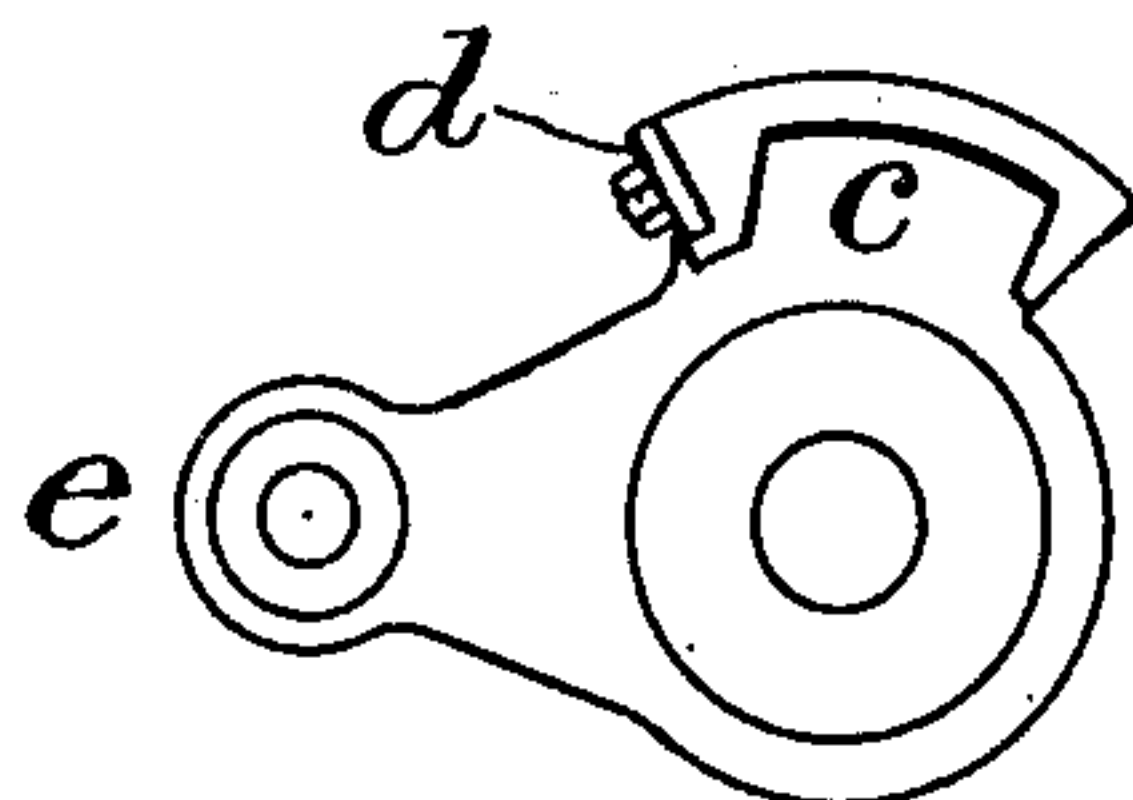


Fig. 7.

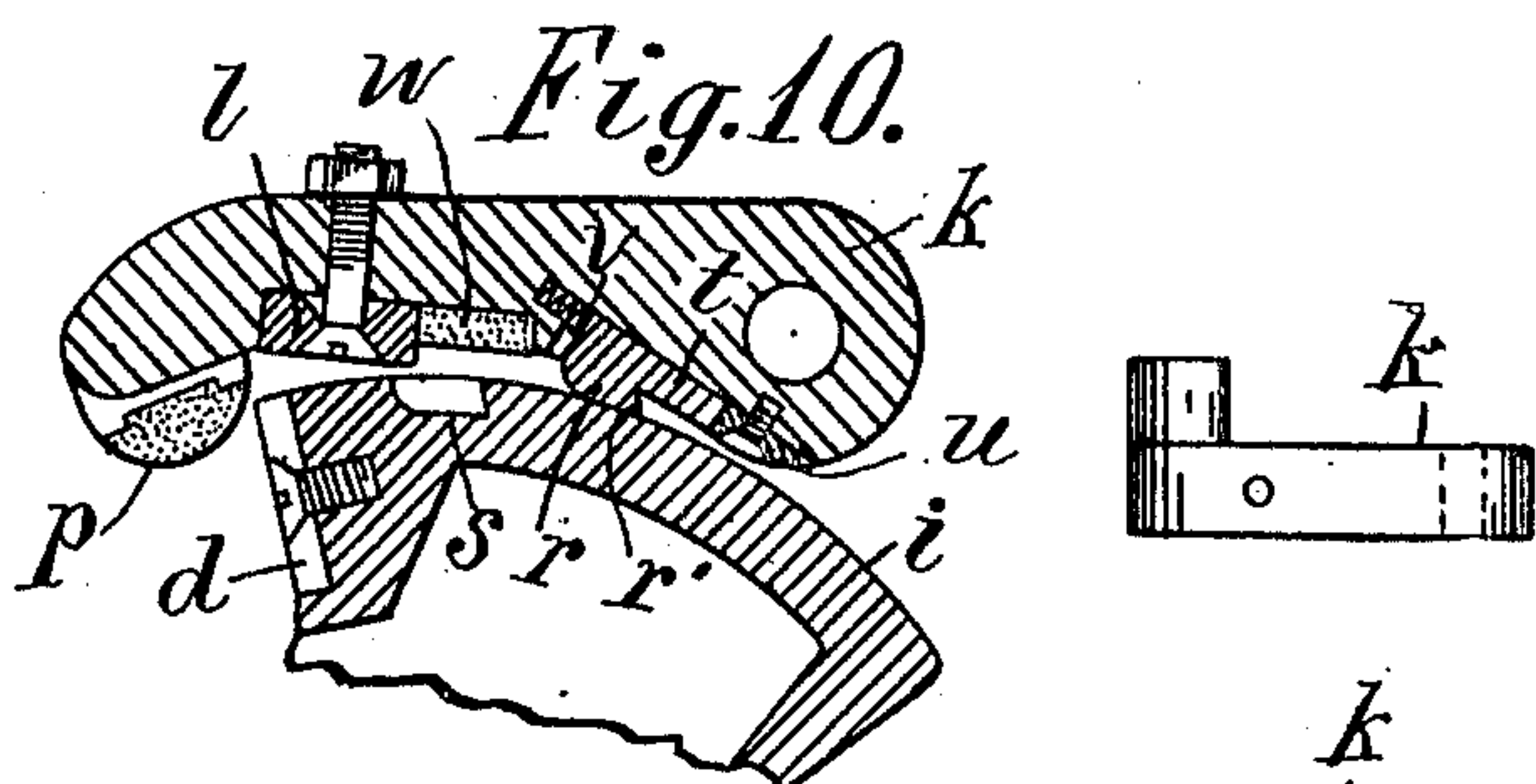


Fig. 8.

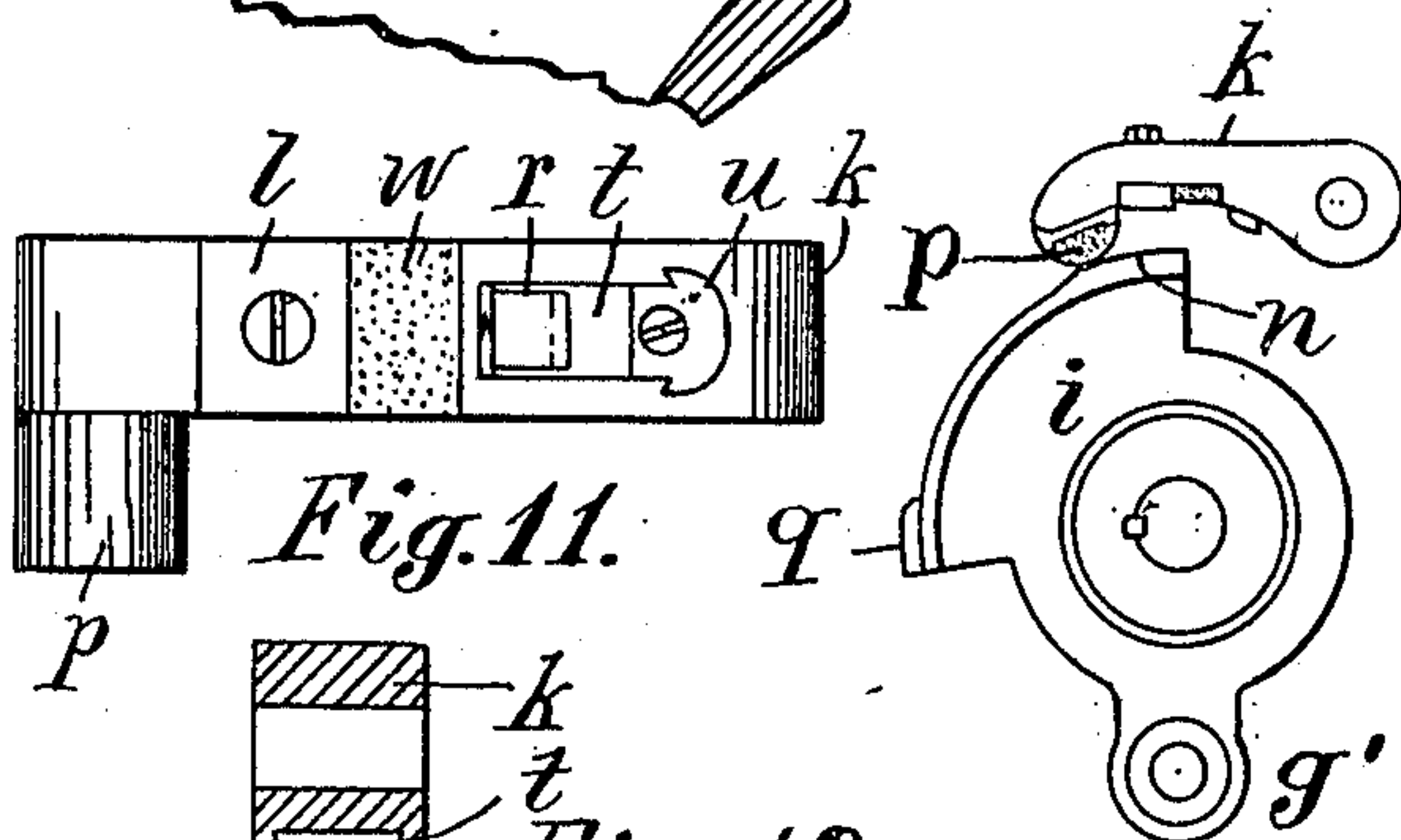


Fig. 9.

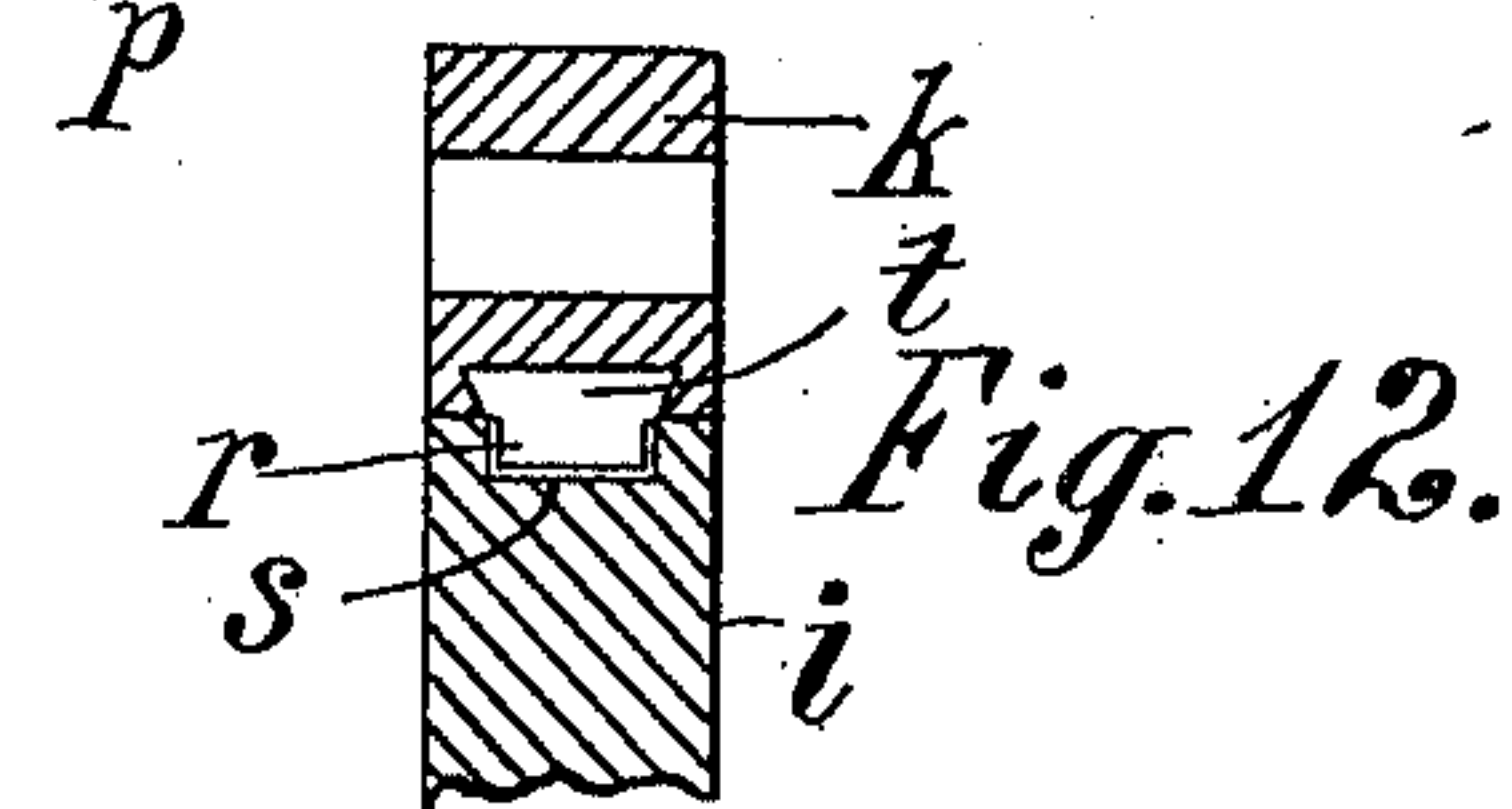


Fig. 10.

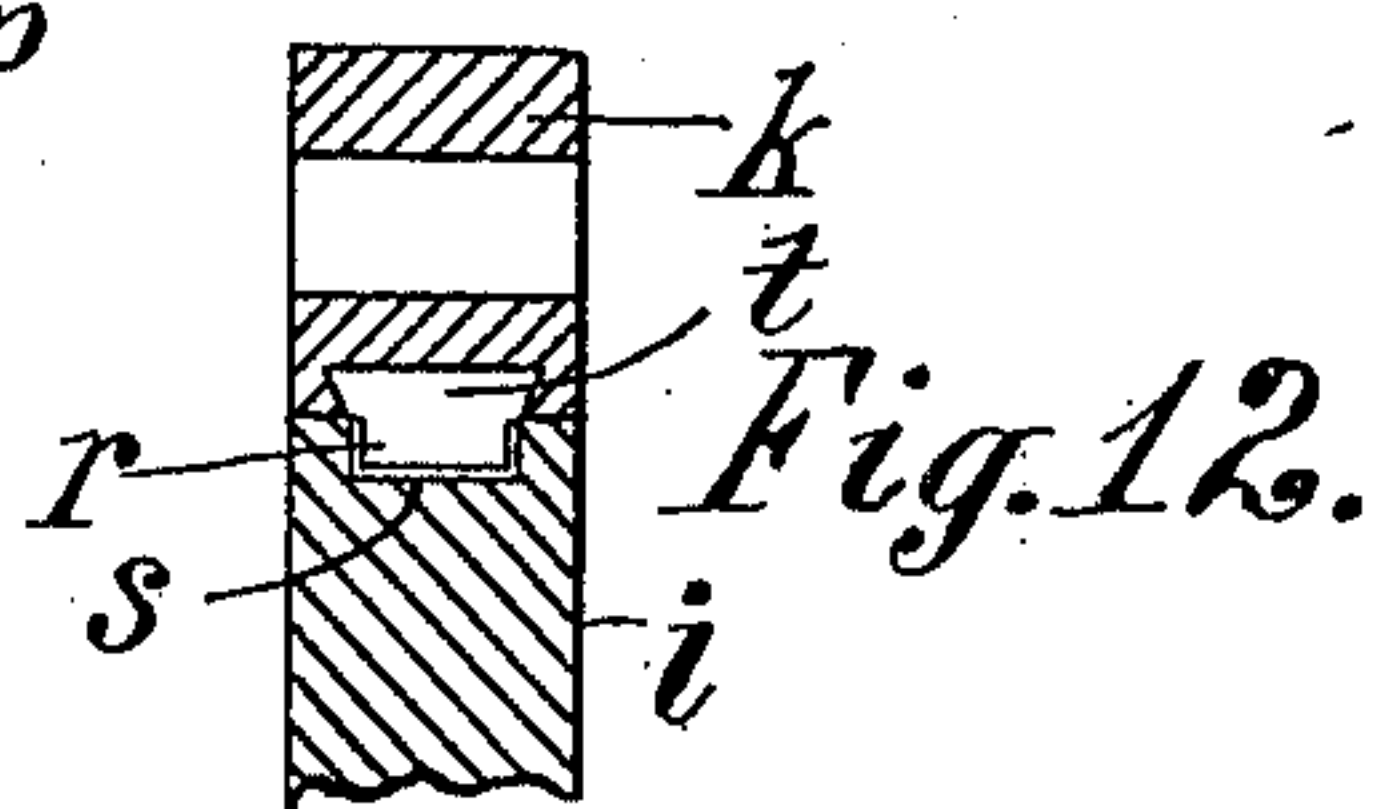


Fig. 11.

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# UNITED STATES PATENT OFFICE.

FRANKLIN PHILLIPS, OF NEWARK, NEW JERSEY.

CORLISS VALVE-GEAR.

969,802.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed June 27, 1908. Serial No. 440,640.

*To all whom it may concern:*

Be it known that I, FRANKLIN PHILLIPS, a citizen of the United States, residing at 539 Mount Prospect avenue, Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Corliss Valve-Gear, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to the cut-off valve-gear for the oscillating steam-valve used in Corliss engines. In such Corliss valve-gear, it has been common to mount upon the valve-stem an arm carrying a catch-block and to mount a rocker-plate upon the bearing of the valve-stem with a latch pivoted upon such rocker-plate to engage the catch-block. In such construction, a cam has been mounted to oscillate between the arm of the catch-block and the rocker-plate, and the catch-block has been projected over such cam in line with the same, and the latch formed with two arms in the same plane, one the hook-arm carrying a hook to engage the catch-block and one, the lever-arm extended inwardly over the cam to be actuated thereby. The catch-block and the cam are brought in line with one another by projecting the catch-block from the arm which carries it toward the rocker-plate.

The object of the present invention is to simplify the construction by dispensing with a separate lever arm upon the latch to be actuated by the cam-plate, and this is effected as follows. To carry the catch-block, I substitute a so-called hook-plate for the valve-moving or catch-block arm, placing the catch-block upon the edge of such hook-plate. The latch lies directly over the edge of such hook-plate and carries a so-called hook to engage the catch-block. A cam-plate is journaled to move close to the side of the catch-block upon the hook-plate, and the latch is formed with an offset finger projected laterally over the edge of the cam-plate to be actuated thereby. The cam thus operates upon the latch itself.

The invention includes certain details of construction which facilitate the operation of the latch and its actuation by the cam-plate, and reduces the wear upon the offset finger which engages the cam-plate.

The invention will be understood by reference to the annexed drawing, in which—

Figure 1 is a front elevation of the valve-

gear upon the end of the valve-stem with the bracket-bearing for the stem; Fig. 2 is a plan of the gear viewed from the upper side of Fig. 1. In these figures, the latch is shown engaged with the catch-block. Fig. 3 is a front view of the gear with the hook-plate partially moved to open the valve and the latch disengaged from the catch-block by the operation of the cam-plate; Fig. 4 is an edge view of the gear and the valve-stem bracket viewed from the left side of Fig. 3; Fig. 5 is a side elevation of the bracket and valve-stem with the hook-plate upon the end of the stem; Fig. 6 is a front view of the rocker-plate; Fig. 7 is a front view of the hook-plate; Fig. 8 is a plan of the latch, and Fig. 9 is a front view of the latch and cam-plate. Fig. 10 shows the latch and part of the hook-plate in section lengthwise of the latch; Fig. 11 shows the under side of the latch, and Fig. 12 is a cross section of the latch and margin of the hook-plate with the tooth in the mortise.

*a* designates the valve-stem, and *b* the bracket-bearing in which the stem is commonly journaled upon the end of the valve-chest.

*c* designates the hook-plate attached to the valve-stem *a* and having the catch-block *d* fitted radially thereon to engage the latch, and provided as shown in Fig. 1, with an arm *e* and rod *f* for connecting it to the dash-pot as usual.

The bracket-bearing *b*, as shown in Fig. 5, is formed adjacent to the end of the valve-stem with two journals *g* and *h* which support, respectively, the cam-plate *i* and the rocker-plate *j*. The rocker-plate has the arm *b'* for the usual eccentric connection *f'*. The cam-plate lies close by the side of the hook-plate, between the same and the rocker-plate. The rocker-plate has a boss *k'* projecting over the edge of the cam-plate, and the latch *k* is pivoted upon the said boss, in line with the edge of the hook-plate, by a pivot *k<sup>2</sup>*, and is provided with the usual steel block or hook *l* to engage the catch-block *d*. The working face of the cam *i* is of segmental form and it projects from the cam-plate upon the same side of the valve-stem as the catch-block, so as to move closely adjacent to the catch-block when actuated by the governor through the arm *g'* connected to the governor-rod *m*. To actuate the latch at the desired point of cut-off, the segmental edge of the cam-plate



is provided at one end with a raised seat  $n$  and the latch is provided with a laterally projecting or offset finger  $o$  having a renewable wearing piece  $p$  in line with the edge of the cam-plate and thus adapted to collide with the seat  $n$  and lift the latch from the catch-block, as required to close the valve. The end of the cam-face opposite to that formed with the seat  $n$  is provided with a safety-dog  $q$  which operates to detach the latch from the catch-block if the governor collapses, and thus permits the steam-valve to close at once in such event. In order that the cam-seat  $n$  and the dog  $q$  may operate upon the finger with equal facility, the wearing piece  $p$  upon the finger is beveled in opposite directions, so as to present a rounding face to the oppositely inclined projections  $n$  and  $q$ .

To preserve the face of the hook  $l$  from wear when the hook-plate  $c$  is moved beneath it, I furnish a tooth  $r$  upon the bottom of the latch to sustain all the wear by resting upon the hook-plate until the hook is in position to engage the catch-block. At that instant the tooth falls into a mortise  $s$  in the margin of the hook-plate and remains therein until the latch is lifted by the cam-seat  $n$ . The tooth  $r$  is attached to a side  $t$  which is dovetailed into the under side of the latch, as shown in Figs. 10 to 12 inclusive, and held from displacement by a stop-piece  $u$ . A spring  $v$  presses the slide constantly toward the stop-piece. The tooth  $r$  has a shoulder  $r'$  formed concentric with the pivot  $h^2$  of the latch and one end of the mortise  $s$  is similarly curved and so disposed that the tooth may drop into the mortise by a noiseless sliding movement exactly when the hook  $l$  contacts with the catch-block  $d$ . The contact of the tooth with the end of the slot thus occurs at the same time as the contact of the hook with the catch-block and produces only a single click or concussion, thus avoiding any unnecessary multiplication of noises in the operation of the valve-gear. The spring  $v$  holds the tooth  $r$  normally in its operative position, but permits the tooth to slide slightly if the hook or catch-block become worn at their point of contact so as to throw any pressure upon the end  $r'$  of the tooth. It will be understood that the tooth holds the latch normally raised during the oscillations of the rocker-plate as shown in Fig. 3, except when the hook is in the exact position to engage the catch-block, thus preserving the hook entirely from rubbing upon the face of the hook-plate. A leather facing-block  $w$  is shown upon the under side of the latch to soften its concussion with the edge of the hook-plate when the tooth falls into the mortise.

With the use of a hook-plate, and a latch operating directly upon the hook-plate and

cam-plate, a special provision is required to positively close the valve if the dash-pot fails to operate, and such provision is made in a post or lug  $h'$  projected from the rocker-plate  $j$  in line with the rear edge of the hook-plate, and having a leather-facing  $h^2$ . The lug  $h'$  is so disposed upon the rocker-plate that at each oscillation of the rocker-plate it comes in contact with the rear edge of the segment  $c$  of the hook-plate just when the valve is closed. So long as the valve is closed by the dash-pot this lug performs no function, but upon any failure of the dash-pot to close the valve promptly the lug or post  $h'$  effects such closure positively.

It will be observed that the use of a lever-arm extended from the pivot of the latch to coöperate with the edge of a cam, is avoided in the present construction by placing the catch-block on the edge of a hook-plate and projecting the segmental face of the cam-plate at the side of the catch-block upon such hook-plate; so that the end of the latch may be constructed to lie over both, and contact directly therewith. To secure such an operation of the latch, the catch-block and the cam-face of the cam-plate are both projected at the same side of the valve-stem and movable close to one another, and the rocker-plate is movable at the side of the cam-plate to carry the latch in the proper relation to both the hook-plate and the cam-plate.

By forming the boss  $h'$  on the rocker-plate to project over the edge of the cam-plate the latch is brought into line with the catch-block, so that its pull in opening the valve may be directly in line with its own pivot, and the engagement or coöperation of the latch with the cam-face being, in such construction easily effected by projecting the offset finger  $o$  laterally from the side of the latch.

Having thus set forth the nature of the invention what is claimed herein is:

1. In a Corliss valve-gear, the combination, with a segmental hook-plate attached to the valve-stem and a rocker-plate oscillated by the side of the same, of the post or lug  $h'$  projected from the rocker-plate past the rear edge of the hook-plate and disposed to positively close the valve when required, by pressure upon the edge of the hook-plate.

2. In a Corliss valve-gear, the combination, with a segmental hook-plate having the catch-block  $d$  upon its forward edge and mortise  $s$  adjacent thereto, and a rocker-plate oscillated by the side of such hook-plate, of a latch pivoted upon the rocker-plate and movable in line with the edge of the hook-plate, and having the hook  $l$  to engage the catch-block, and the tooth  $r$  to rest upon the face of the hook-plate and adapted



to enter the mortise when the hook engages the catch-block.

3. In a Corliss valve-gear, the combination, with a segmental hook-plate having  
5 the catch-block *d* upon its forward edge and mortise *s* adjacent thereto and a rocker-plate oscillated by the side of such hook-plate, of a latch pivoted upon the rocker-plate and movable in line with the edge of  
10 the hook-plate, and having the hook *l* to engage the catch-block, the slide *t* movable in the under side of the latch with tooth *r* pro-

jected therefrom, the spring *v* to press the slide endwise, and the stop *u* to limit such end movement, the construction operating 15 to relieve the tooth from any longitudinal pressure.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRANKLIN PHILLIPS.

Witnesses:

L. LEE,

THOMAS S. CRANE.