

**No. 636,409.**

**Patented Nov. 7, 1899.**

**H. D. LEEKING.**  
**POWER MECHANISM.**

(Application filed May 13, 1899.)

(No Model.)

**2 Sheets—Sheet 1.**

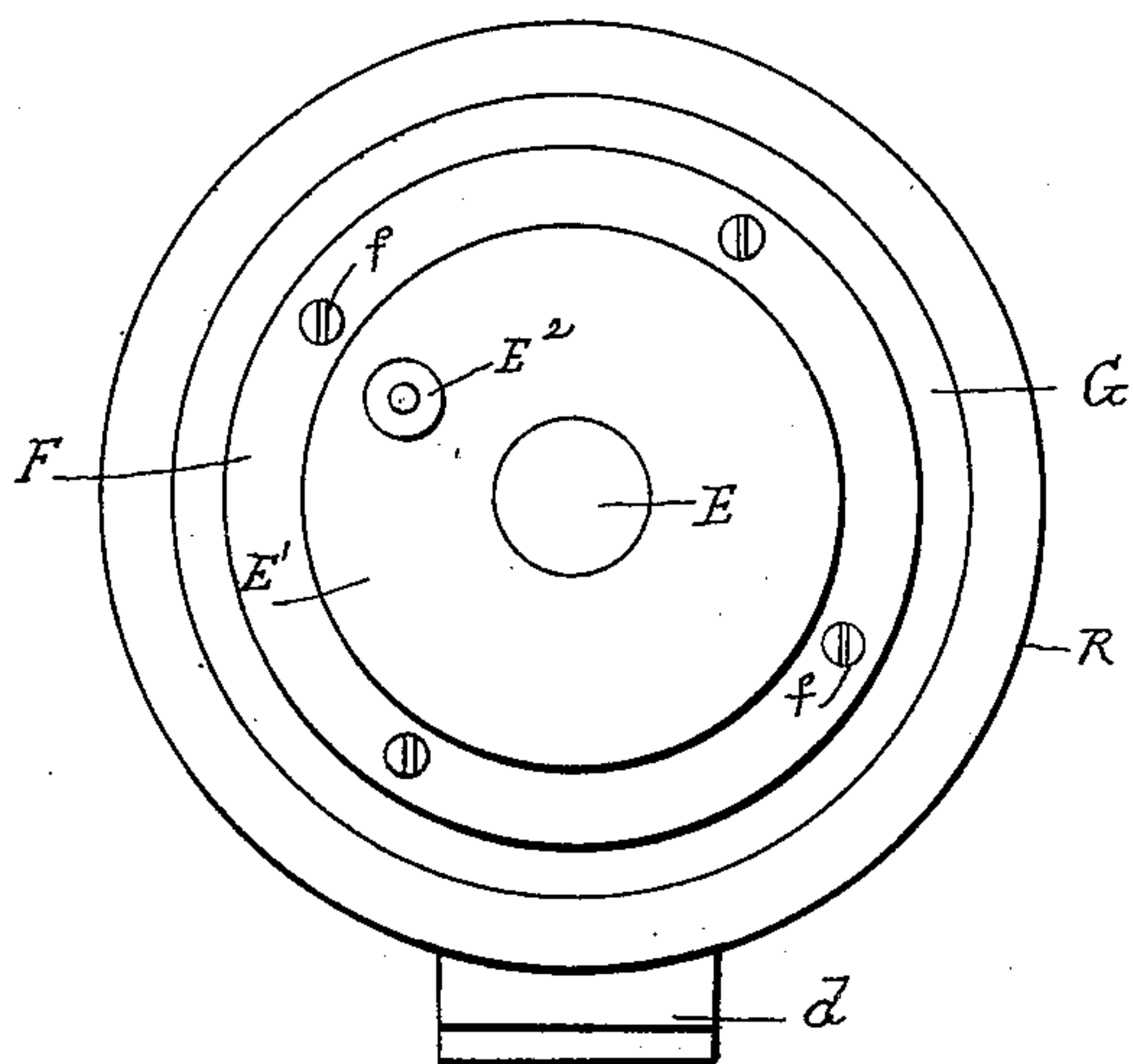


Fig. 3.

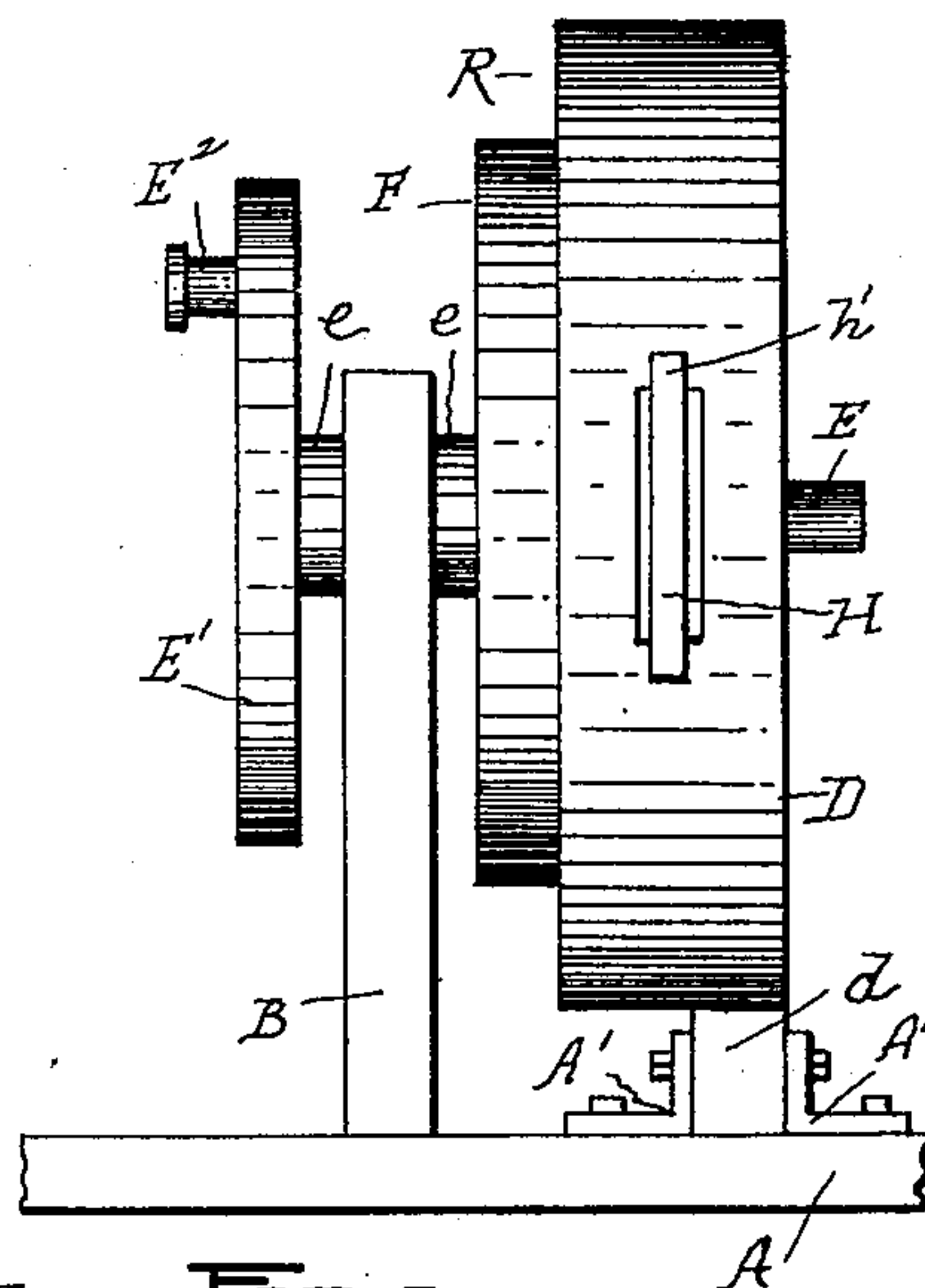


Fig. 1.

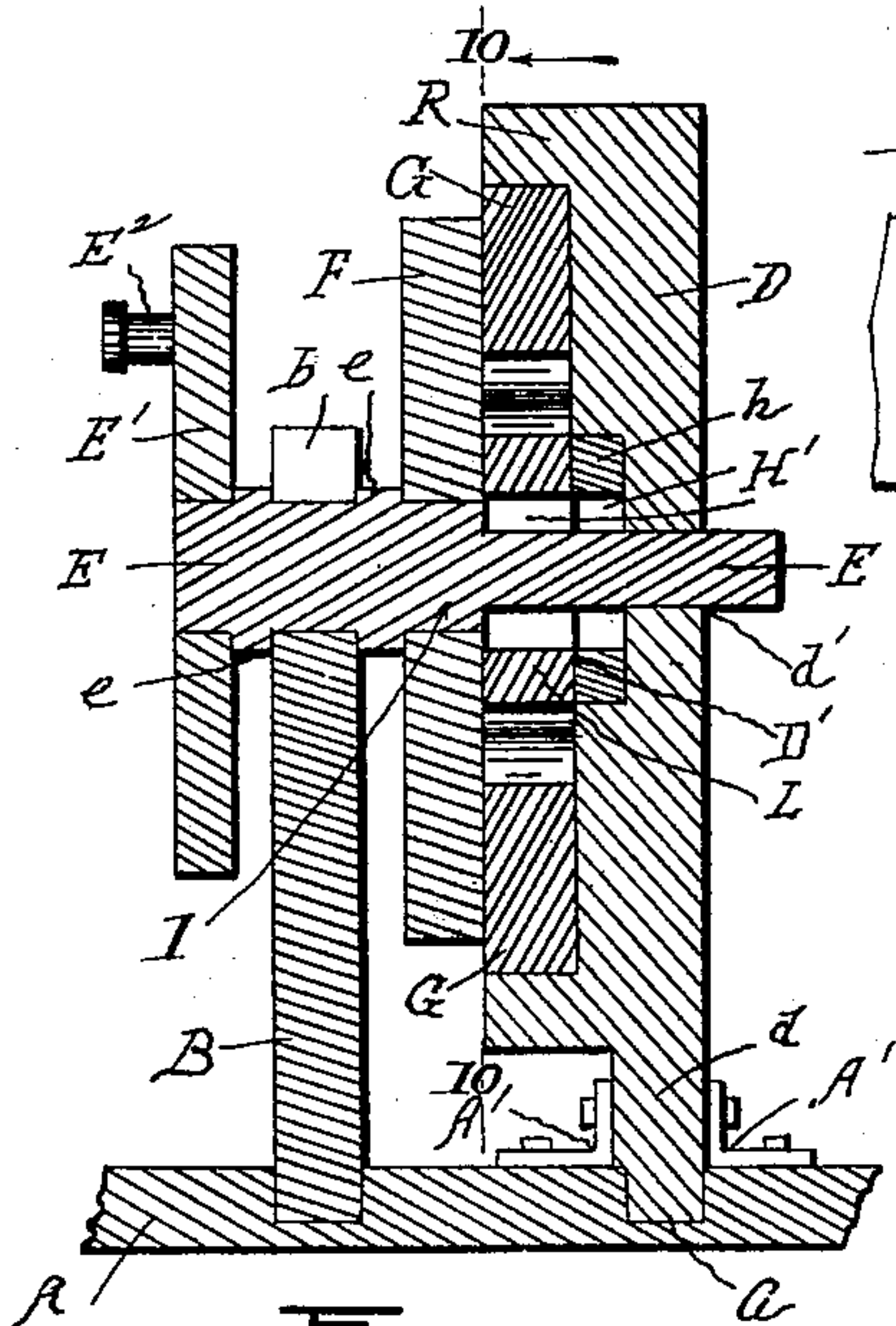
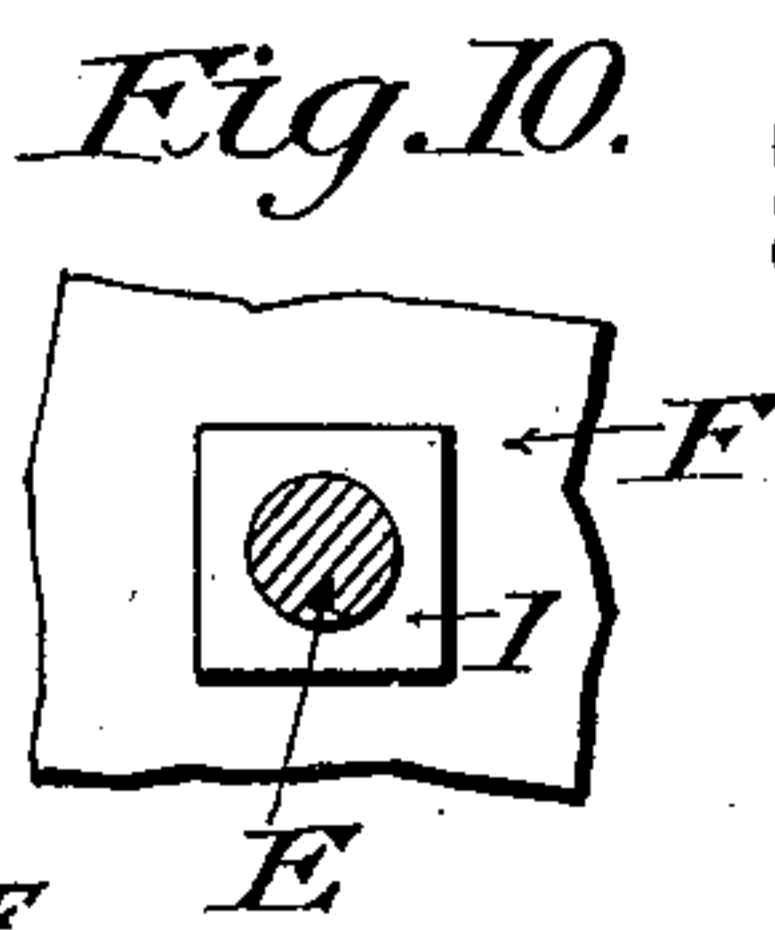


Fig. 2.



*Fig. 10.*

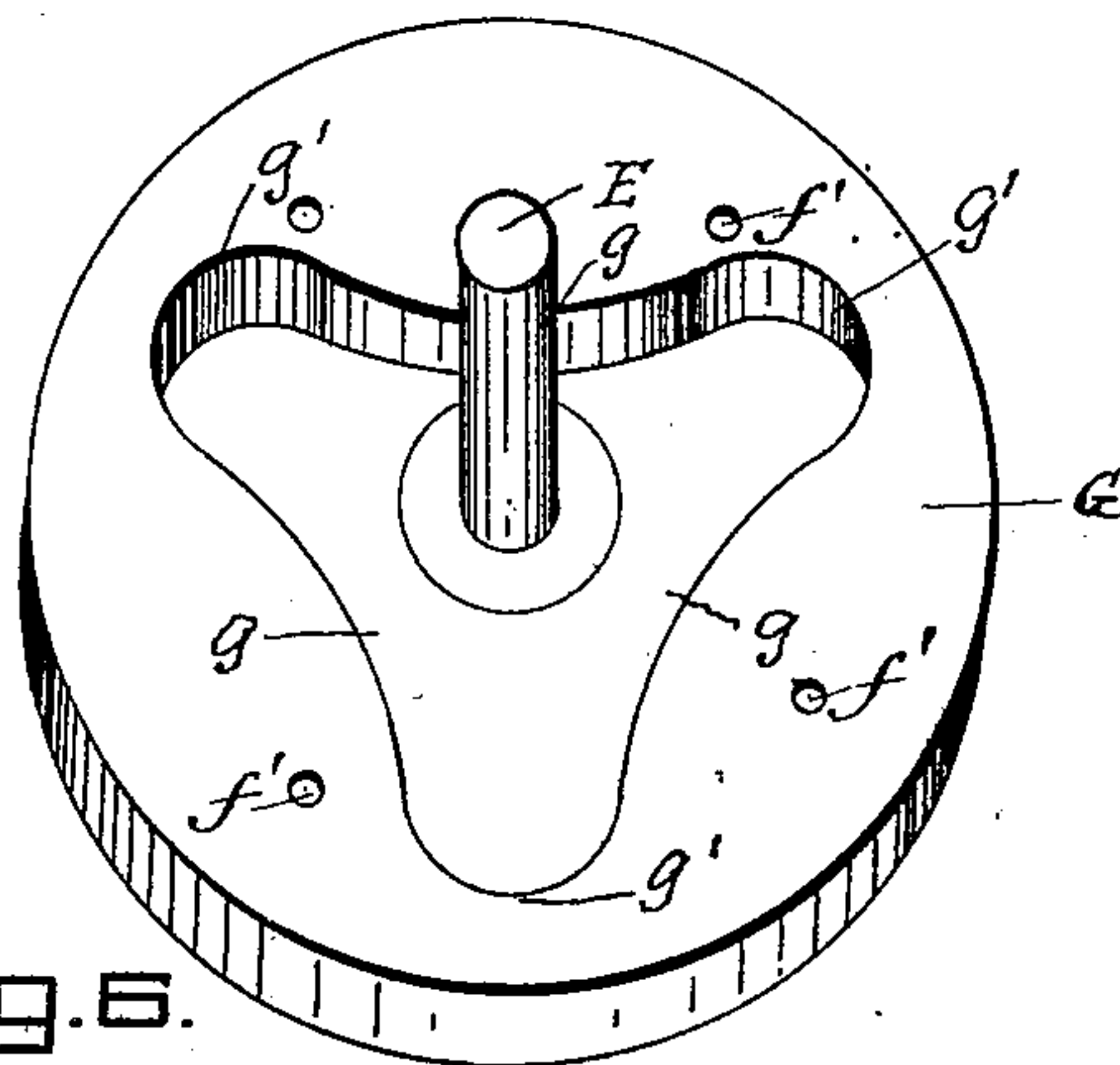


Fig. 6.

WITNESSES

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2 Sheets—Sheet 2.

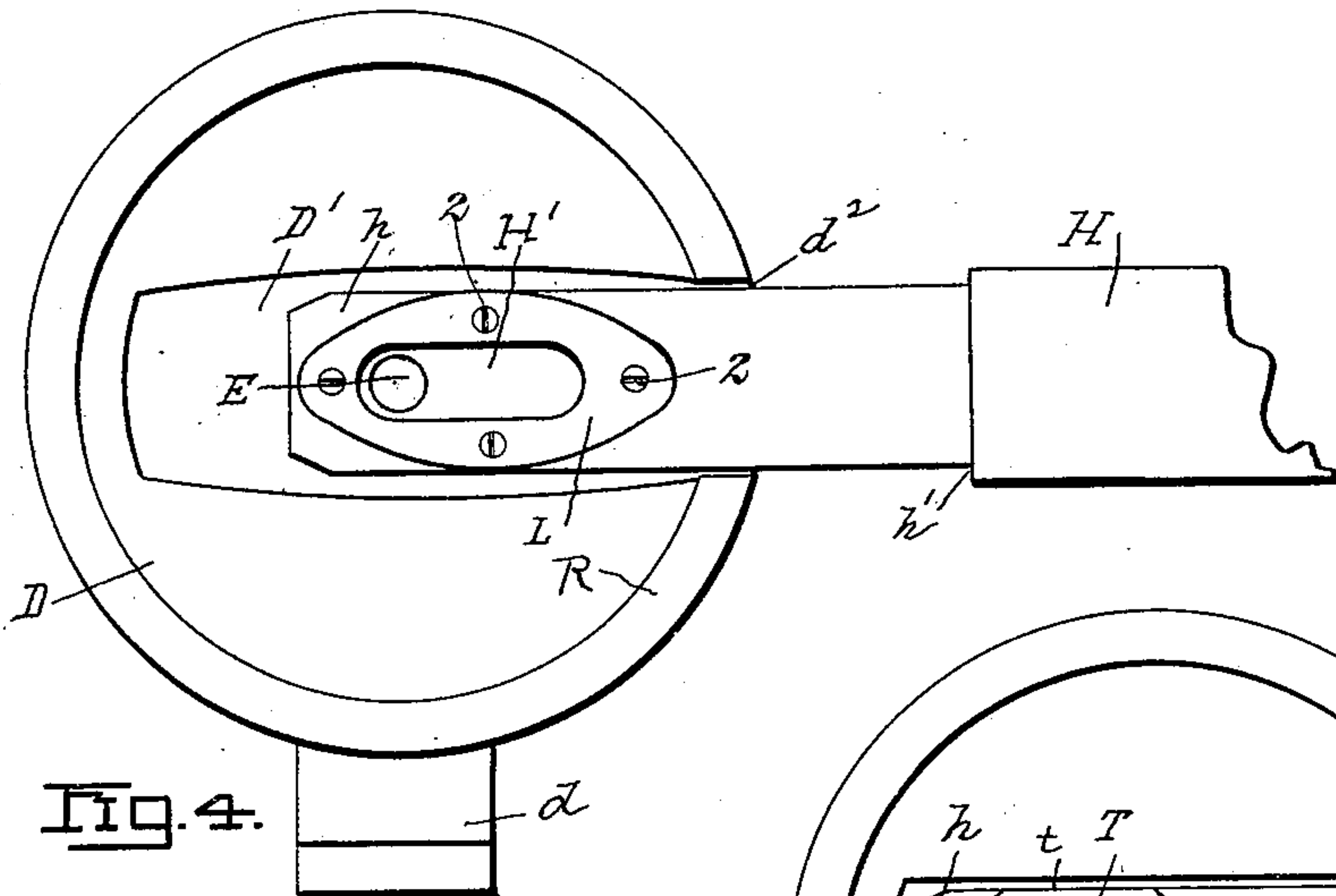


Fig. 4.

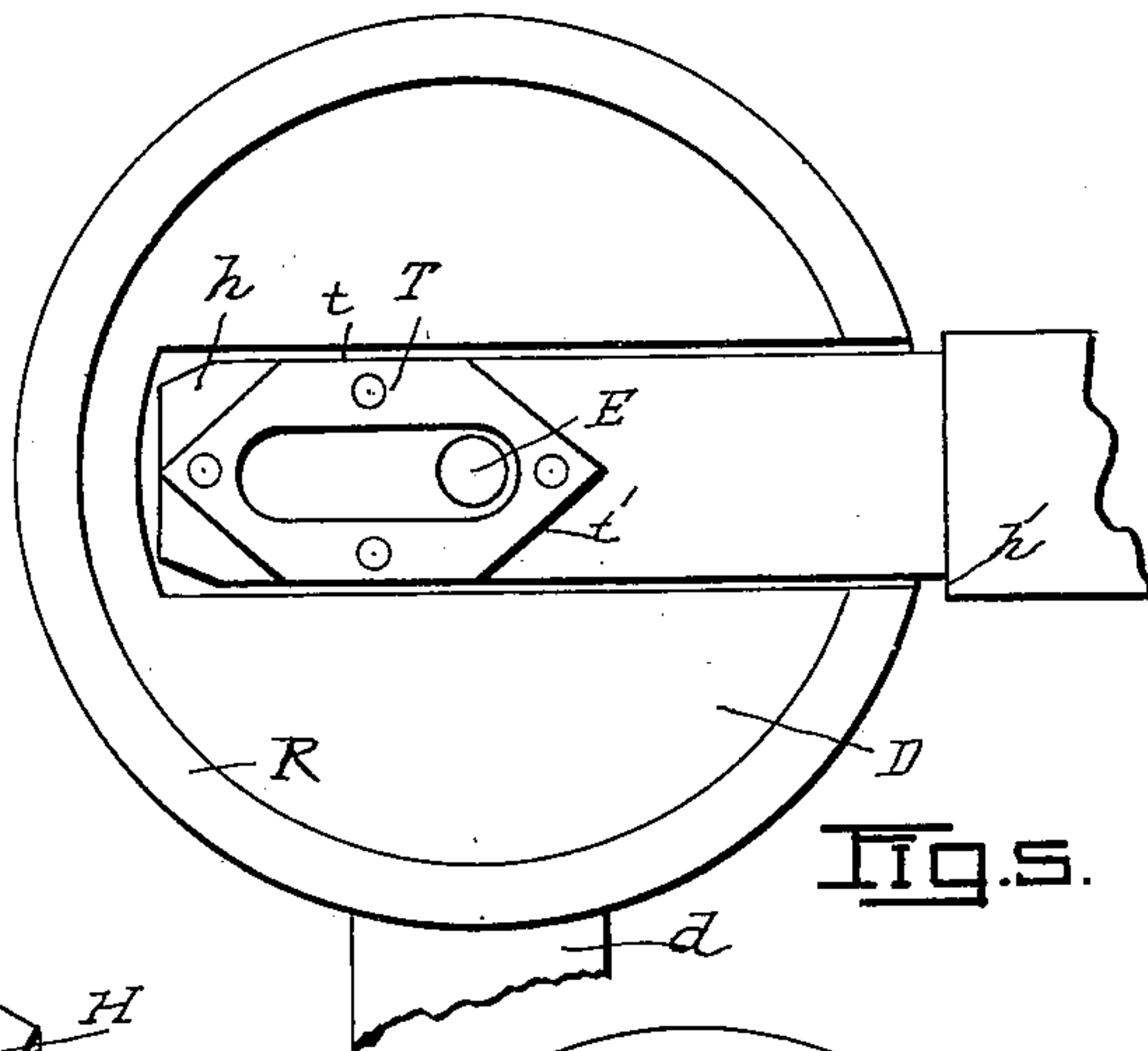


Fig. 5.

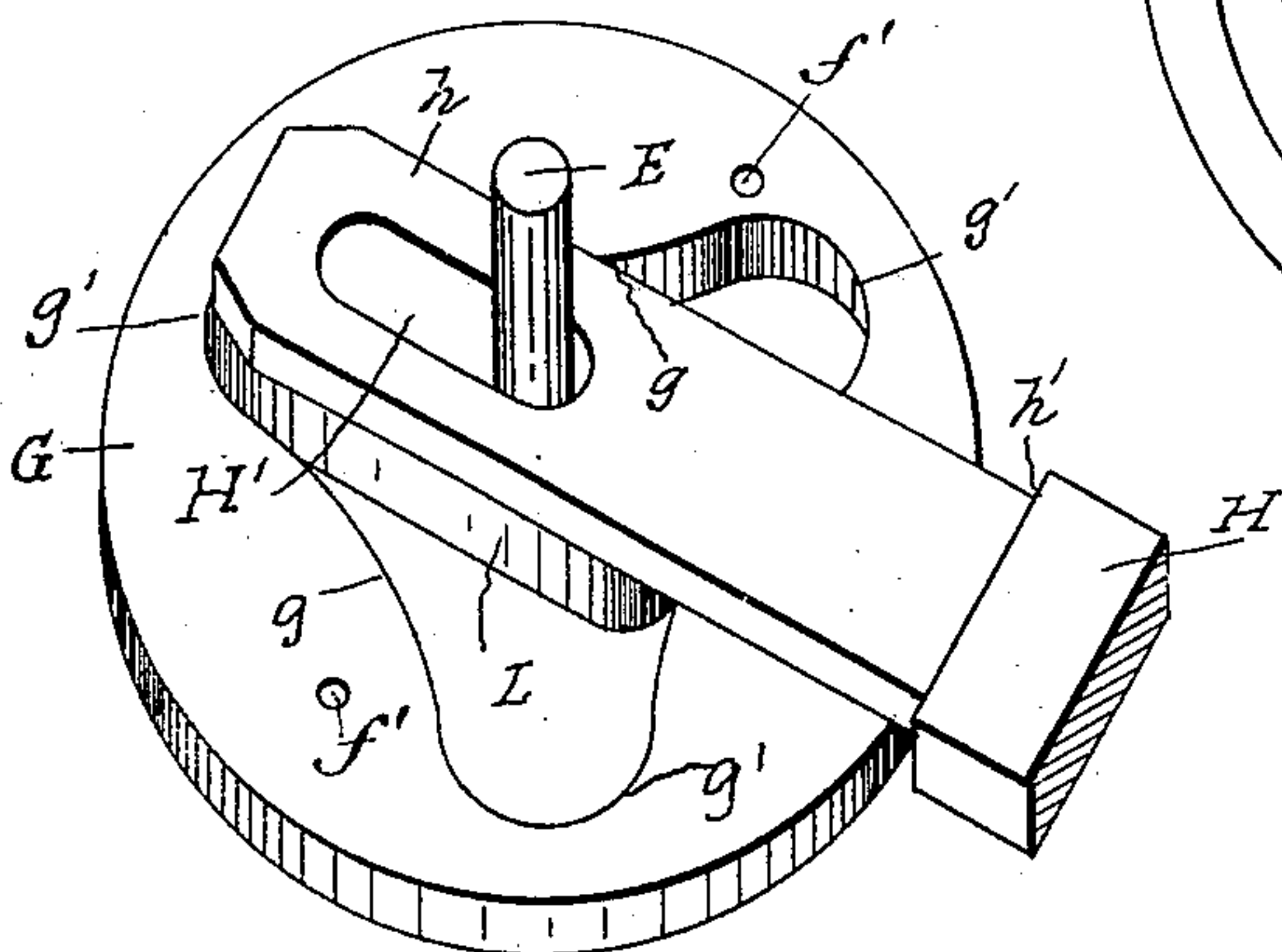


Fig. 7.

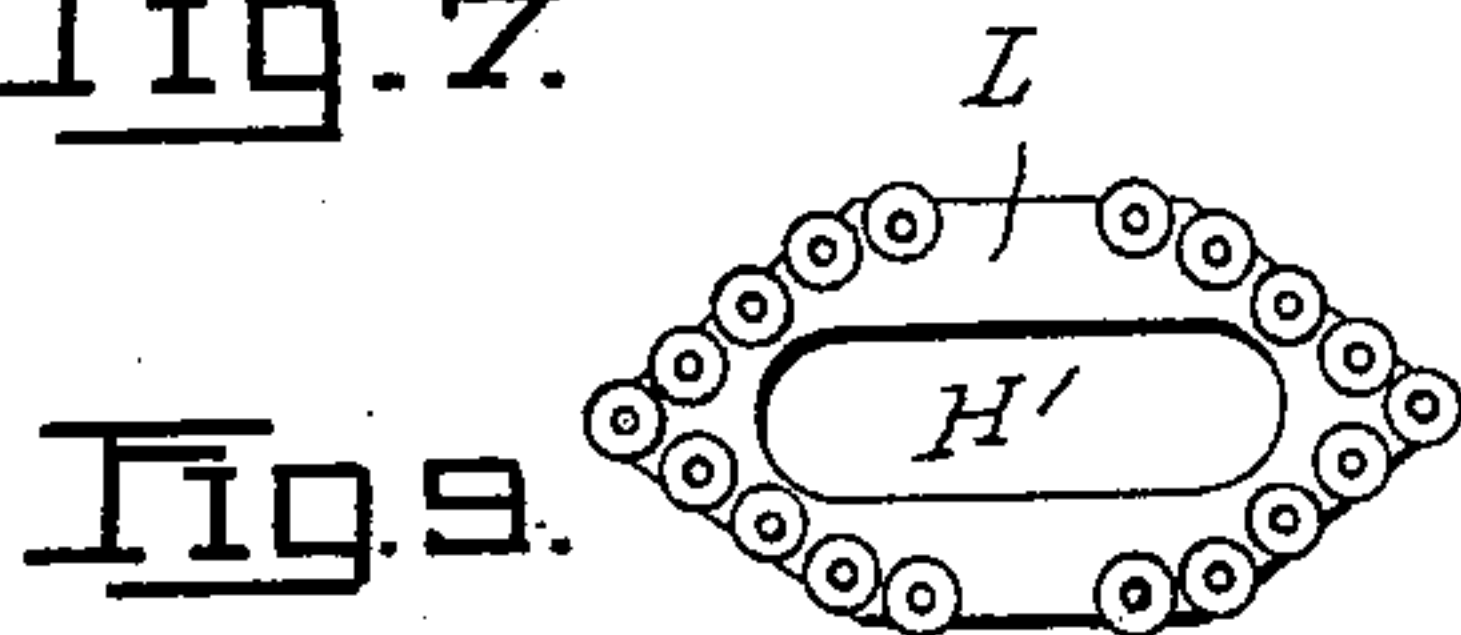


Fig. 9.

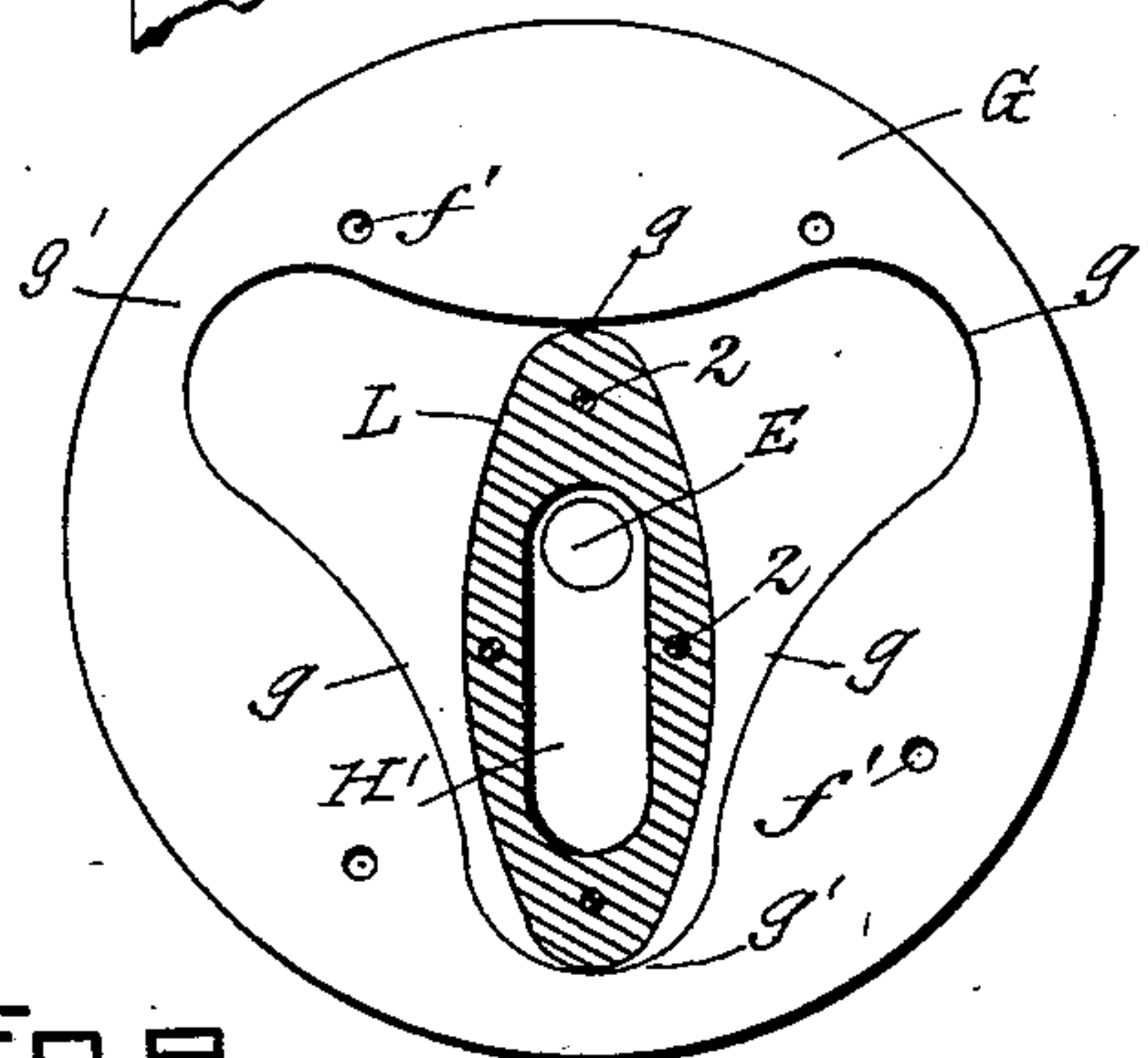


Fig. 8.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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TO MILTON M. MYER, OF SAME PLACE.

## POWER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 636,409, dated November 7, 1899.

Application filed May 13, 1899. Serial No. 716,640. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY D. LEEKING, a citizen of the United States, residing at Witmer, county of Lancaster, State of Pennsylvania, have invented certain Improvements in Power Mechanisms, of which the following is a specification.

This invention relates to improvements in that class of mechanisms whereby power received through rotary motion is transmitted by a reciprocating movement; and the object of my improvements is to produce a plurality of movements of the reciprocating member of the mechanism with each complete revolution of the rotary member thereof.

The invention consists in the details of construction and the combination of the various parts, as hereinafter fully described, and then pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a front elevation of a mechanism embodying my invention; Fig. 2, a transverse central section, and Fig. 3 an elevation, of the side of the device to which the power is applied shown detached from the base. Fig. 4 is a view of the inner face of the guide-plate and of the connecting-rod, and Fig. 5 a similar view of another form of said plate and of the connecting-rod. Fig. 6 is an inner face view of the cam-plate; Fig. 7, a similar view showing the shoulder-plate engaged therewith; and Fig. 8, a like view with the shoulder-plate engaged in the cam-plate, but in a somewhat different position from that illustrated in Fig. 7, the connecting-rod being cut away. Fig. 9 illustrates a modification of the shoulder-plate. Fig. 10 is a vertical section on broken line 10 10 of Fig. 2, showing the connection between the shaft and a plate attached thereto, the outer portions of said plate being cut away.

Similar letters and numerals indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates the base supporting the operating mechanism, and B a post set in base A and having a recess *b* in the upper end thereof, wherein rests the shaft E, to be described.

D indicates an annular guide-plate having a foot *d*, which engages a socket *a* in base A

and which is firmly held in position by angle-plates A', bolted to said foot and to base A, as shown in Figs. 1 and 2. Guide-plate D is also provided with an annular flange R, which takes over the periphery of cam-plate G, to be described.

Shaft E is supported in recess *b* of post B and an opening *d'* in guide-plate D, and it has on one end, outside of post B, a crank-wheel E', provided with a wrist-pin E<sup>2</sup>, whereby power is applied, and on each side of post B there is a collar *e*, rigidly affixed to said shaft, to prevent longitudinal movement of the same.

Inside of post B an annular plate F is rigidly secured to shaft E, said plate having a rectangular opening in which fits the squared section 1 of said shaft, and to the inner face of said plate F a cam-plate G is secured by screws or bolts *f* passing through plate F and into holes *f'* in said cam-plate. An opening is cut through the cam-plate, which opening has the general outline of an equilateral triangle wherein the apex of a cam *g* is located in the center of the wall of each side, and the angles between the sides have substituted therefor curved surfaces forming sockets *g'*, as clearly shown in Figs. 6, 7, and 8, the parts of the wall connecting the cams and the sockets being curved surfaces. The open face of said cam-plate sits up flush against the inner face of guide-plate D, the plate F closing the outer side of the cam-opening.

In the face of guide-plate D adjacent to the cam-plate is a diametrically-located channel, (indicated by D' in Fig. 4.) In this figure the longitudinal walls of said channel have concave faces. Engaging channel D' is the driven end *h* of a connecting-rod H, the body of said rod having shoulders *h'* to prevent undue inward pressure on the shoulder-plate L, as will be described. This shoulder-plate is an elongated oval in outline, of the same depth as the cam-opening in cam-plate G and of a length equal to the distance from the apex of each cam to the center of the opposite socket, the curved ends of the cam-plate being adapted to fit the sockets. Through the end *h* of connecting-rod H and the shoulder-plate L is an elongated oval slot H' therefor of greater width than the diam-



eter of shaft E and wherethrough passes  
aid shaft E. Shoulder-plate L is secured to  
he driven end *h* of the connecting-rod by  
screws or bolts 2 or in any other well-known  
5 way. Motion is imparted to the cam-plate  
through crank-wheel E' and shaft E, whereby  
a reciprocating movement is given connect-  
ing-rod H through the engagement of shoul-  
der-plate L with the walls of cam-opening  
10 *g g'*. In Fig. 4 the mouth *d*<sup>2</sup> of channel D'  
is wider than driven end *h* of connecting-rod  
H, forming opening H' of shoulder-plate L of  
greater width than the diameter of shaft E,  
and constructing the longitudinal walls of  
15 channel D' of guide-plate D with concave  
faces gives the ends of connecting-rod H a  
vibrating as well as a reciprocating motion,  
as when the driving end of said rod is applied  
to the wrist-pin of a wheel, and widening the  
20 mouth *d*<sup>2</sup> of said channel D' adds to the free-  
dom with which the vibrating movement is  
made.

In Fig. 5 the walls of channel M are par-  
allel and the mouth of said channel is of the  
25 same width as the end *h* of the connecting-  
rod, whereby simply a reciprocating move-  
ment is imparted to said connecting-rod. The  
shoulder-plate also differs in shape from the  
shoulder-plate first described, the ends be-  
30 ing angular in outline, as shown, instead of  
rounded.

The construction of the walls of cam-open-  
ing *g g'* and of the sides of shoulder-plate L is  
such that some part of the ends of said shoul-  
35 der-plate is always in contact with some por-  
tion of the walls of the cam-opening.

Fig. 9 illustrates a shoulder-plate provided  
with antifriction-rollers to reduce the fric-  
tion of said shoulder-plate and the walls of  
40 the cam-opening.

Power may be applied to shaft E in any  
well-known manner, and it is not necessary  
that the back of the cam-plate be closed, for  
said cam-plate may be secured on shaft E by  
45 other means than plate F.

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

1. The combination, in a power mechanism,  
50 of a shaft, a cam-plate rigidly secured on the  
shaft and provided with a series of cams ar-  
ranged about its center and having a socket  
located opposite each cam, an immovable  
guide-plate provided with a channel having  
55 its open side toward the cam-plate, a con-  
necting-rod in the channel of the guide-plate,  
and a shoulder-plate on the connecting-rod  
and engaging the cams of the cam-plate, the  
shaft passing through a slot in the connect-  
60 ing-rod and the shoulder-plate, for the pur-  
pose specified.

2. The combination, in a power mechanism,  
of a shaft, a cam-plate rigidly secured on the  
shaft and provided with a series of sockets,  
65 convex walls connecting the sockets and form-  
ing the cams of the cam-plate, an immovable  
guide-plate provided with a channel having

its open side toward the cam-plate, a con-  
necting-rod in the channel of the guide-plate,  
and a shoulder-plate on the connecting-rod 70  
and engaging the cams of the cam-plate, the  
shaft passing through a slot in the connecting-  
rod and the shoulder-plate, for the purpose  
specified.

3. The combination, in a power mechanism, 75  
of a shaft, a connecting-rod, a cam-plate rig-  
idly secured on the shaft and provided with  
a series of cams arranged about its center and  
having a socket located opposite each cam,  
80 curved walls connecting the cams and sock-  
ets, an immovable guide-plate provided with  
a channel having concave longitudinal sides,  
a connecting-rod in said channel, and a shoul-  
der-plate on the connecting-rod and engaging  
the cams of the cam-plate, there being an 85  
elongated slot through the connecting-rod and  
the shoulder-plate and of greater width than  
the diameter of the shaft, the shaft passing  
through said slot, for the purpose specified.

4. The combination, in a power mechanism, 90  
of a shaft, a connecting-rod, a cam-plate rig-  
idly secured on the shaft and provided with  
a series of sockets, convex walls connecting  
the sockets and forming the cams of the cam-  
plate, an immovable guide-plate provided 95  
with a channel having concave longitudinal  
sides, a connecting-rod in said channel, the  
mouth of said channel being of greater width  
than the connecting-rod, and an elongated  
oval shoulder-plate on the connecting-rod 100  
and engaging the cams of the cam-plate, there  
being an elongated oval slot through the con-  
necting-rod and the shoulder-plate and of  
greater width than the diameter of the shaft,  
for the purpose specified. 105

5. The combination, in a power mechanism,  
of a post, a stationary upright guide-plate  
having a channel therein, a shaft journaled  
in the post and the guide-plate, a wheel rig-  
idly secured to the shaft and having a cam- 110  
opening therein, the inner face of said wheel  
being flush against the guide-plate, three  
cams formed by the wall of said opening and  
arranged symmetrically about the center, a  
socket being formed by said wall opposite 115  
each cam, the wall forming a curved connec-  
tion between the cams and the sockets, a con-  
necting-rod having an end in the channel of  
the guide-plate, the mouth of the channel  
being wider than said end of the connecting- 120  
rod, and an elongated oval shoulder-plate on  
the connecting-rod and adapted to have both  
ends thereof in continuous engagement with  
the wall forming the cam and the sockets and  
the curves connecting the cams and the sock- 125  
ets, the shaft passing through an elongated  
oval slot in the shoulder-plate and the con-  
necting-rod and of greater width than the  
diameter of said shaft, substantially as and  
for the purpose specified.

HARRY D. LEEKING.

Witnesses:

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