

A. H. LOWRY.
VENTILATOR FOR FIRE DOORS, &c.
APPLICATION FILED OCT. 8, 1907.

900,402.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

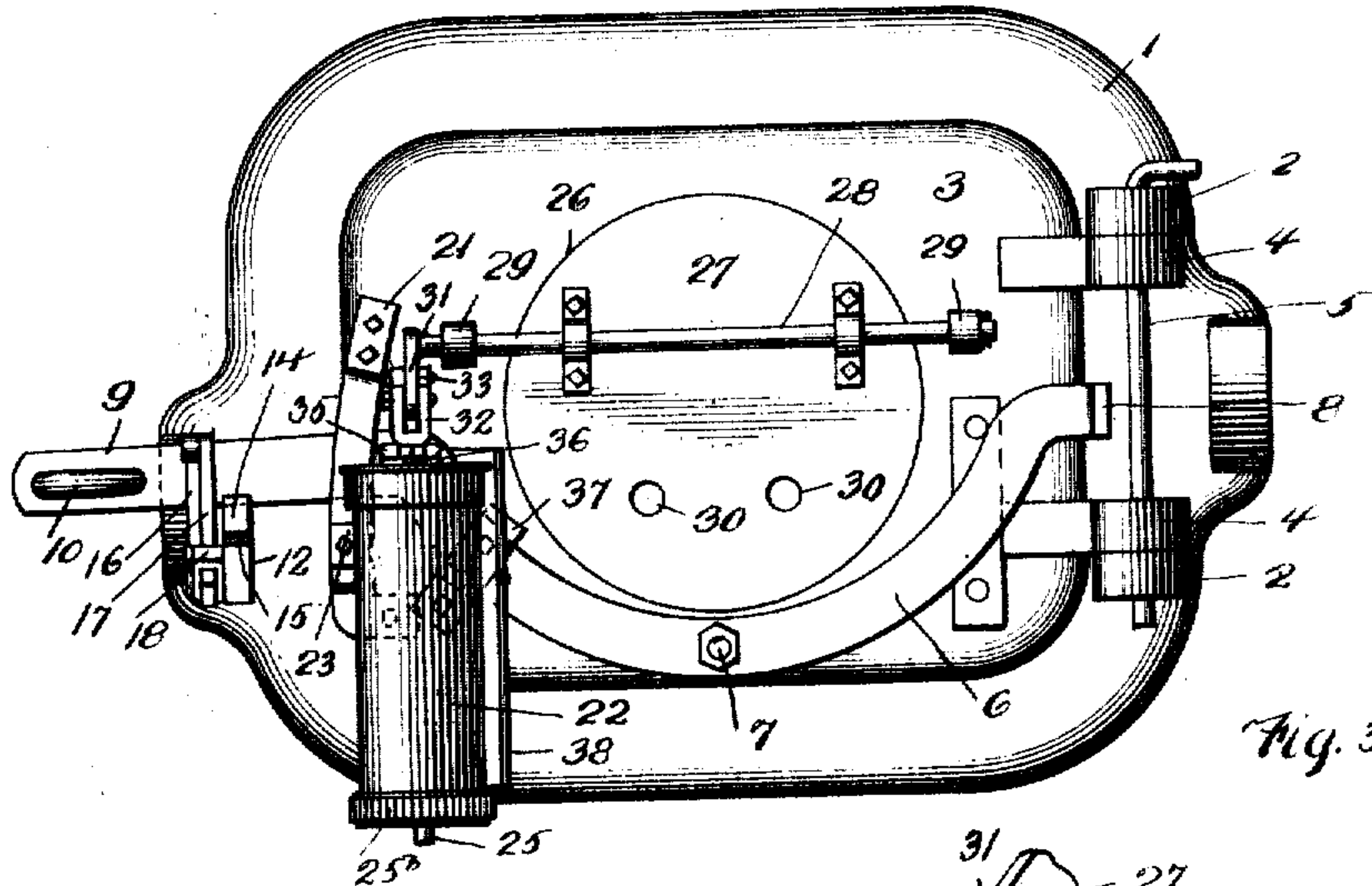


Fig. 3.

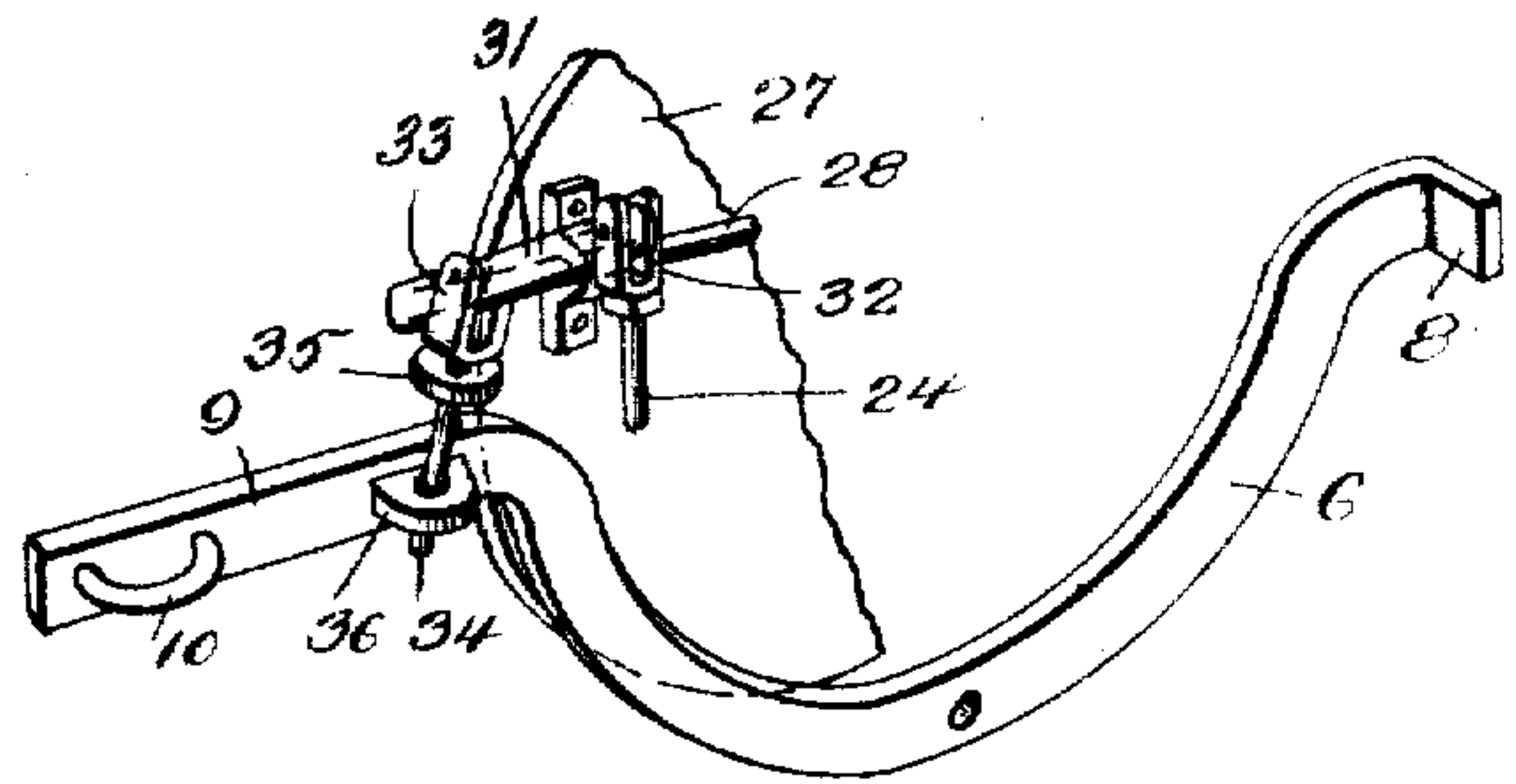
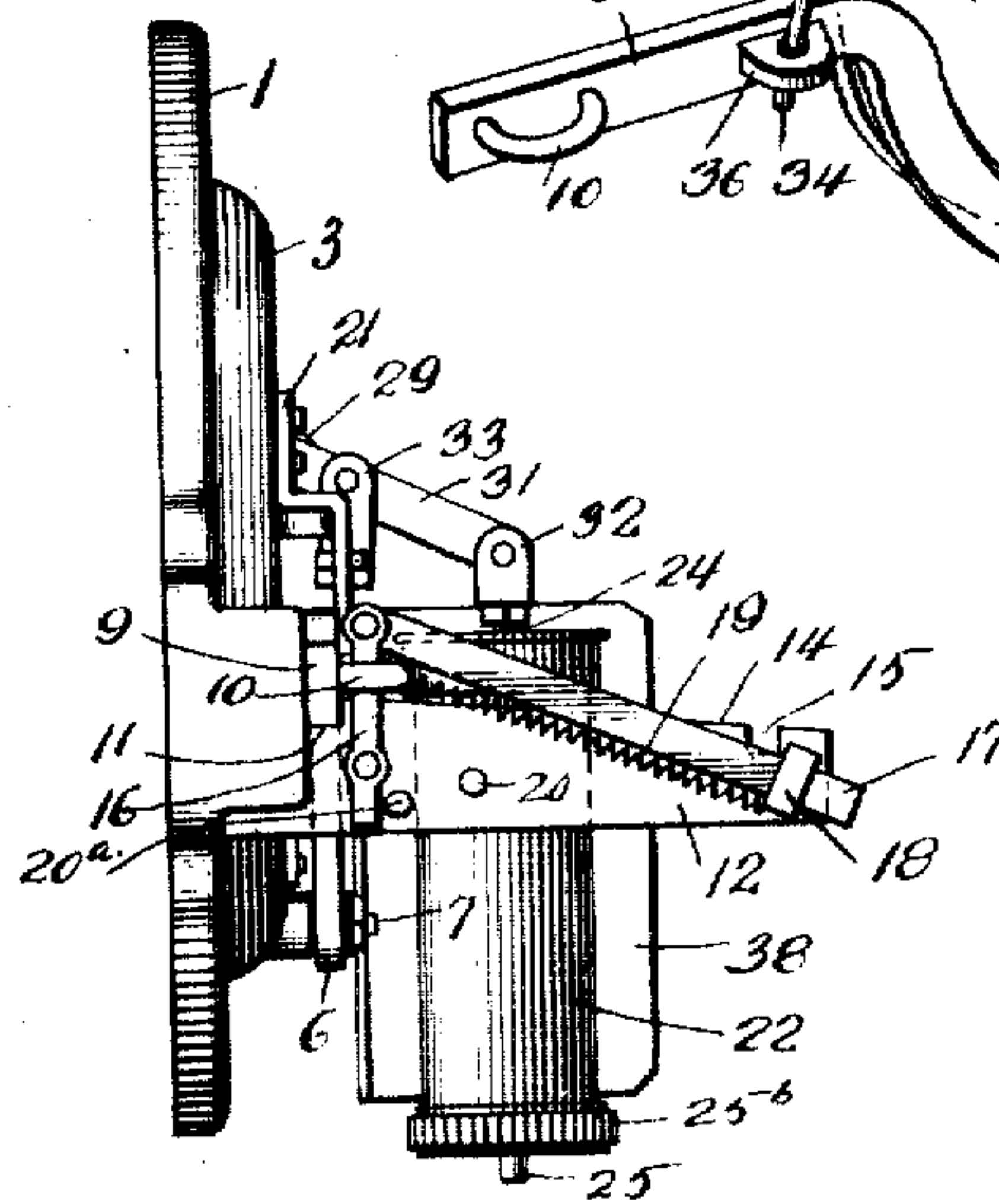


Fig. 2.



Inventor

A. H. Lowry.

Witnesses

Samuel Payne.
A. H. Butler.

By

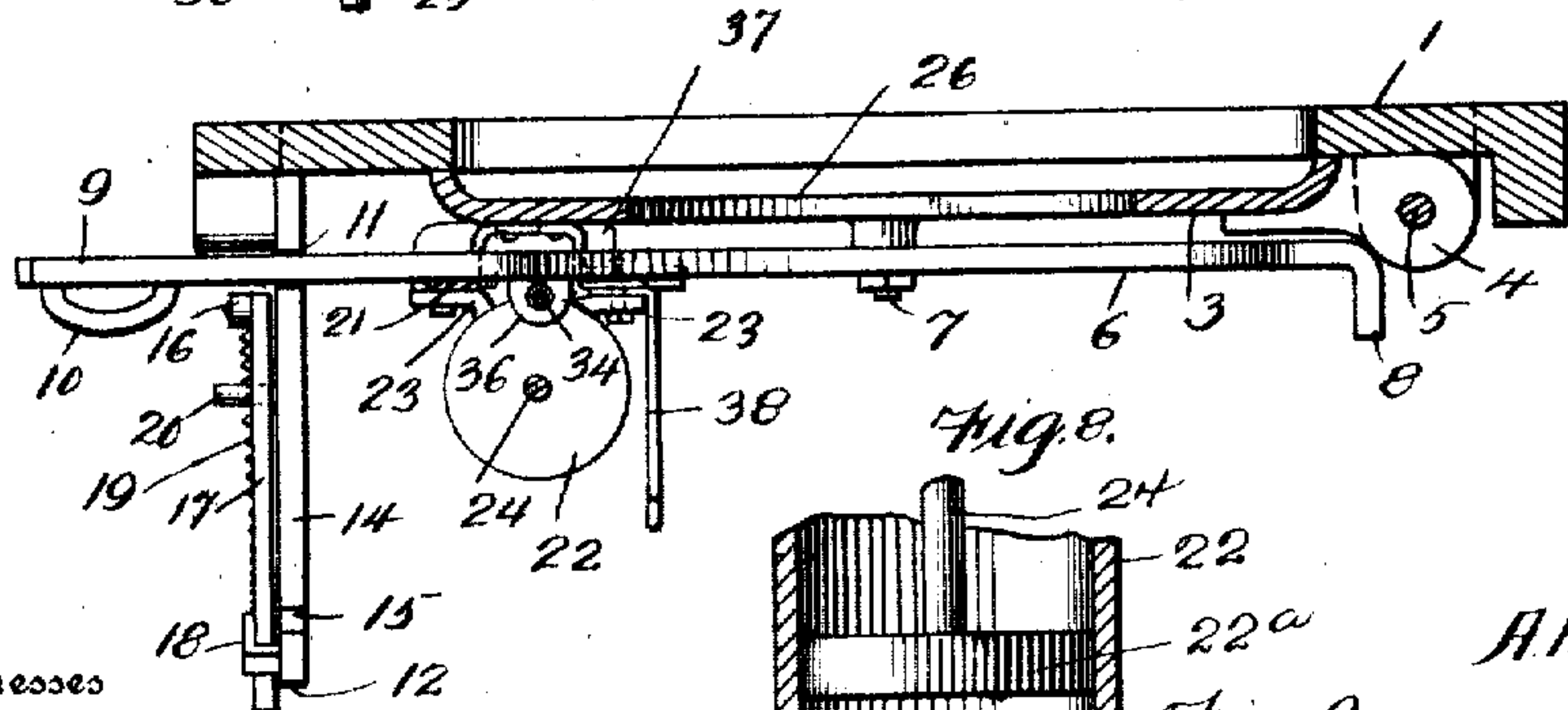
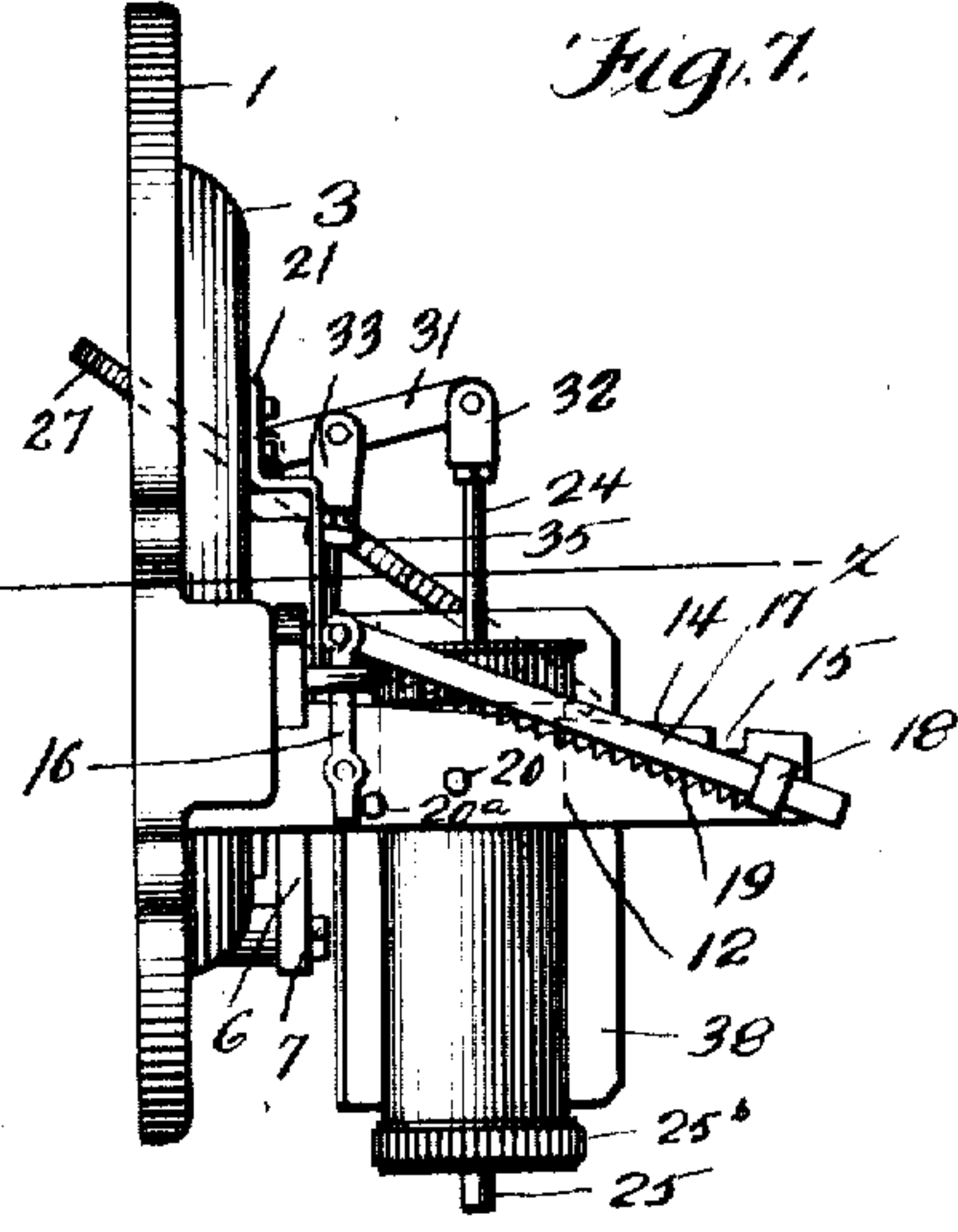
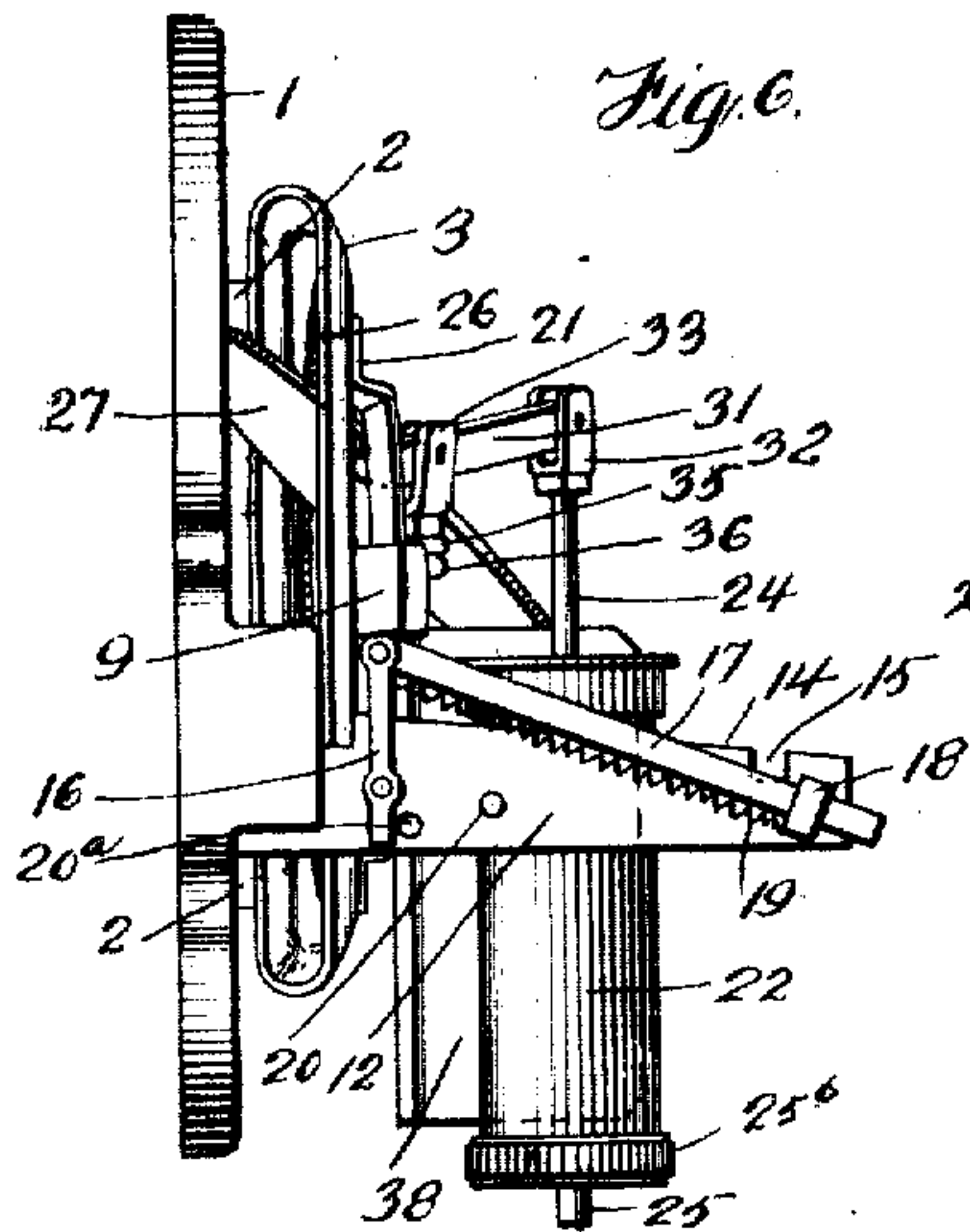
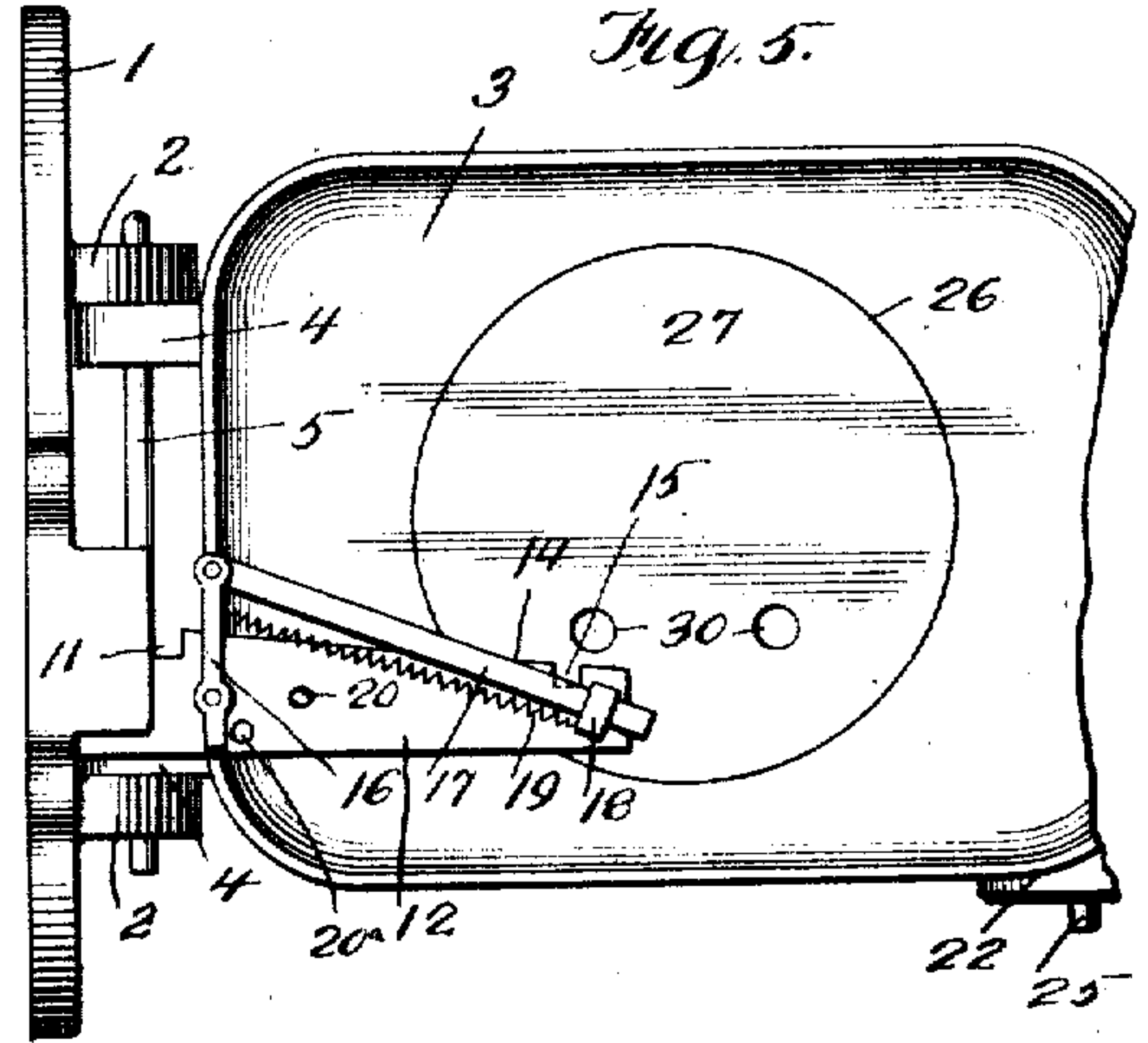
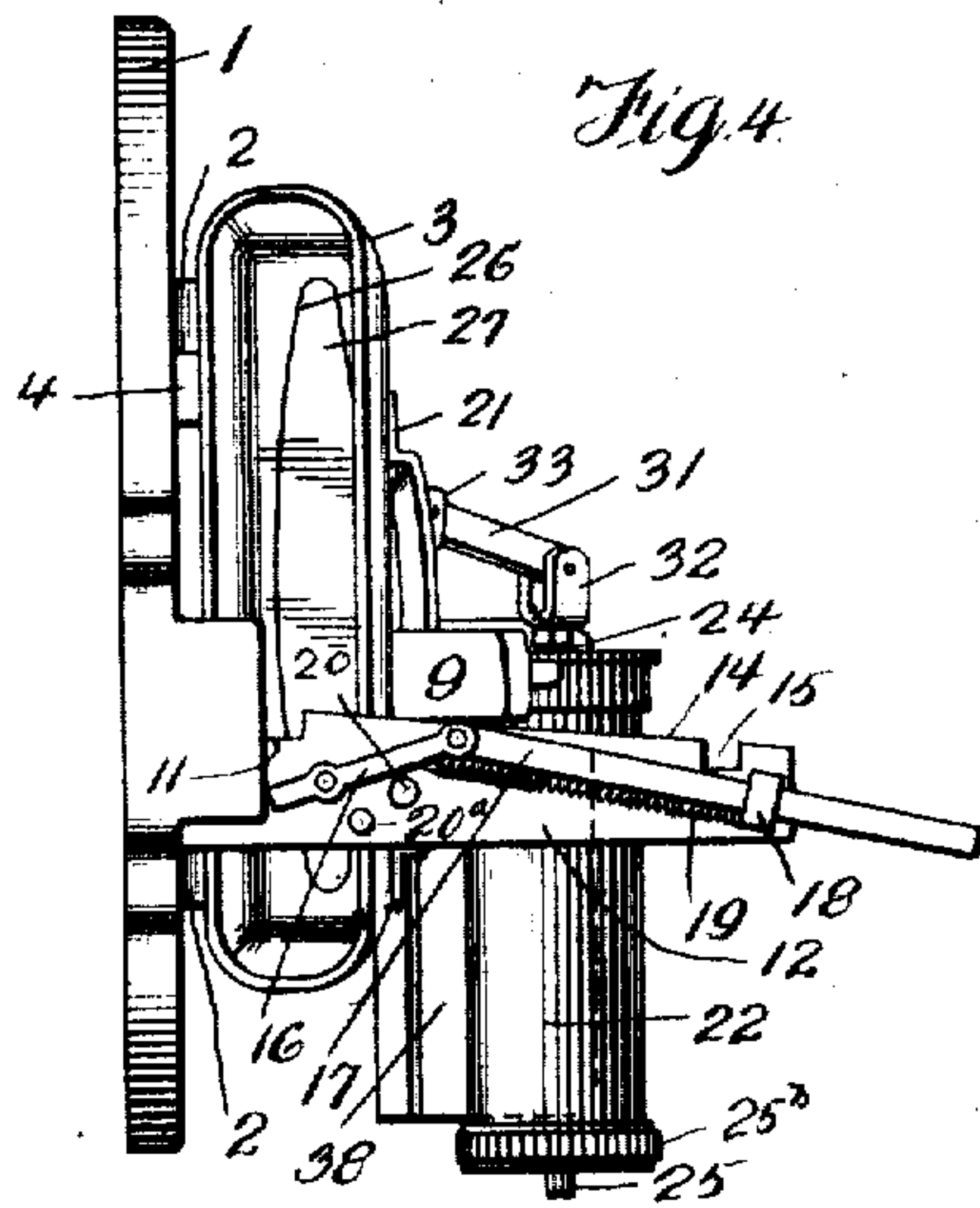
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2 SHEETS—SHEET 2.



Witnesses

Samuel Payne,
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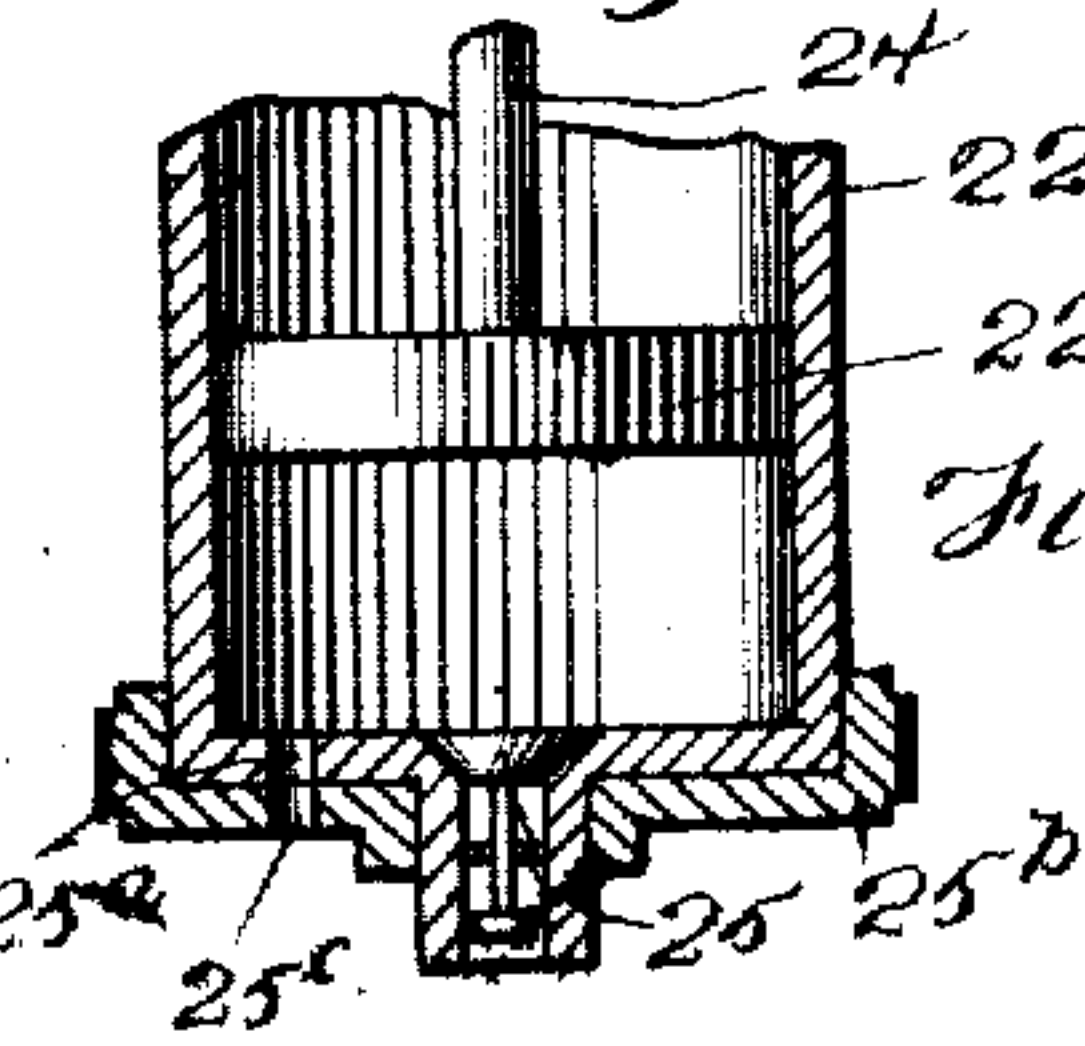


Fig. 9.

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UNITED STATES PATENT OFFICE.

ALBERT H. LOWRY, OF SHERIDANVILLE, PENNSYLVANIA.

VENTILATOR FOR FIRE-DOORS, &c.

No. 900,402.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed October 8, 1907. Serial No. 396,422.

To all whom it may concern:

Be it known that I, ALBERT H. LOWRY, a citizen of the United States, residing at Sheridanville, Allegheny county, Pennsylvania, have invented certain new and useful Improvements in Ventilators for Fire-Doors, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to ventilators for the doors of furnaces, fire boxes and combustion chambers.

The invention has for its primary object to admit a sufficient quantity of air above the fire of a fire box, for a short period of time, to cause a combustion of the gases arising from fresh coal placed in the fire box, whereby the closing of the fire door and the admitting of all air through the grate area will effect the combustion of the carbon properties.

Another object of the invention is to provide an automatic ventilator for a door, which will prevent a reverse draft in the fire box and will prevent a fireman from "crowding" the fire by too rapidly applying fuel to the same. To this end, I provide the fire box door with a gravity shutter, said shutter being automatically opened as the fire box door is closed, and its closing by gravity retarded by virtue of a dash-pot used in connection with the shutter operating mechanism.

35 The ventilator has been particularly designed for the fire box doors of locomotives, and as such, will be described in detail hereinafter.

Referring now to the drawings: Figure 1 is a front elevation of a fire door ventilator constructed in accordance with my invention, Fig. 2 is a side elevation of the same, Fig. 3 is a perspective view of a portion of the shutter actuating mechanism and the fire door latch, Fig. 4 is a side elevation of the fire door partially open, Fig. 5 is a similar view illustrating the fire door completely open, Fig. 6 is a side elevation of a fire door, as partially closed, illustrating the ventilator shutter as partially open, Fig. 7 is a similar view illustrating the fire door as closed and the shutter in the act of closing, Fig. 8 is a horizontal sectional view of the fire door and its mechanism, said section being taken on the line $x-x$ of Fig. 7, and Fig. 9 is a detail sectional view of the dash-pot.

In the accompanying drawings, I have

illustrated a door frame 1 as ordinarily used upon furnaces, fire boxes and combustion chambers, said door frame carrying two projecting lugs 2 at one side to permit of a door 3 having hinge members 4 being connected to said lugs by a pintle 5. The door 3 is maintained in a closed position by a latch 6 pivotally connected to said door as at 7. The rear end of the latch 6 is bent forwardly, as at 8, to prevent the door 3 from swinging entirely open, the forwardly bent end of said latch engaging the door frame 1, and acting as a stop for maintaining said door, when in an open position, at a substantial right angle to the door frame 1. The opposite or what may be termed the outer end of the latch 6 terminates in a handle bar 9 having a link or hand grip 10. This handle bar is adapted, when the door 3 is closed, to engage in a notch 11 formed in a latch-keeper 12, extending forwardly from the side of the door frame 1, opposite the hinged side of said door. The latch-keeper 12 is in the form of a forwardly-projecting arm, and has a beveled upper edge 14, and near its outer end is provided with a notch 15, said notch accommodating the handle bar 9 of the latch, when it is desired to retain the door 3 partially open.

Pivotally connected to the outer side of the latch-keeper 12 is a link 16, said link being connected to a slide bar 17 movably mounted in a keeper 18 carried by the latch-keeper 12, near the outer end thereof. The link 16 is normally maintained in a vertical position by a coil spring 19 interposed between the link 16 and keeper 18, said spring being placed under tension, when the link 16 and the slide bar 17 are lowered, as will be presently described. A pin 20 carried by the latch-keeper 12 limits the downward movement of the link 16 and the slide bar 17, and a pin 20^a carried by said latch-keeper and adapted to be impinged by the lower end of the link 16, limits the movement of said link towards the door frame 1.

Connected to the door 3 is a keeper or strap 21, said keeper or strap serving two functions, namely, to support the handle bar end of the latch 6, when the door 3 is open, and also support a dash-pot 22 by virtue of lugs 23 carried by said dash-pot. This dash-pot is of a conventional form comprising a piston head 22^a, a piston rod 24 and a check valve 25, said check valve controlling the admission of air to the dash-

pot. The bottom of the dash pot is provided with a port 25^a, and revolvably mounted upon the bottom of said dash-pot is a cap 25^b having a port 25^c formed therein adapted to register with the port 25^a of the dash-pot. The ports 25^a and 25^c are employed for controlling the exhaust of air from the dash-pot, consequently the descent of the piston head 22^a.

10 The door 3 is provided with a circular opening 26 normally closed by a shutter 27 mounted upon a rock shaft 28, journaled in bearings 29 carried by the door 3. By reference to Fig. 1, it will be observed that the
15 shutter 27 is journaled off center, whereby said shutter will close by gravity, when released. The shutter is provided with openings 30 to permit of light passing through said shutter and illuminating the tender of the locomotive and permitting of a fireman properly
20 performing his duties, when otherwise surrounded by darkness. The one end of the rock shaft 28 is provided with a crank arm 31, which is connected as at 32 to the bifurcated end of the piston rod 24. The crank
25 arm 31 carries a pivoted stirrup 33 having a depending pin 34, said pin carrying a circular head 35 adjacent to the stirrup 33. The pin 34 passes through a lug 36, carried
30 by the handle bar end of the latch 6.

Upon the door 3 is mounted a bracket 37 carrying a shield 38 for protecting the dash-pot 22 from the intense heat of the fire box, which passes through the circular opening
35 26 while the shutter 27 is open. To the bracket 37 is also secured one of the lugs 23 employed for supporting the dash-pot 22.

Operation: When the latch 6 is raised from the notch 11 of the latch-keeper 12, the handle bar end of the latch is adapted to strike the link 16 and lower said link and slide bar 17 to the position shown in Fig. 4 of the drawings. The spring 19 then returns the link 16 and the slide bar 17 to their
40 normal positions, while the door 3 is in an open position as illustrated in Fig. 5 of the drawings. Sufficient space exists between the circular head 35 and the lug 36 to permit of the latch being raised, without actuating the shutter mechanism. As a fireman
45 closes the door 3, the handle bar end 9 of the latch 6 rides upwardly upon the slide bar 17, causing the lug 36 to engage the circular head 35 of the pin 34 and through the
55 medium of the stirrup 33 raise the crank arm 31 of the rock shaft 28. This movement of the crank arm 31 rotates the rock shaft 28 a sufficient distance to open the shutter 27, besides elevating the piston rod
60 24 of the dash-pot 22. Immediately upon the handle bar end of the latch 6 receding into the notch 11 of the latch-keeper 12, the shutter 27 commences to close by gravity, its closing movement being gradual, due to its
65 being retarded by the dash-pot 22. The pe-

riod of time which said shutter is open is regulated through the medium of the revolvable cap 25^b carried by said dash-pot, and by this cap the shutter can be made to close very slowly or to close with considerable
70 rapidity by its own weight and the weight of the mechanism attached thereto.

It is apparent from my invention that I have devised a novel ventilator for fire doors, together with novel means for causing a re-
75 tardation in the closing movement of the ventilator, thus allowing sufficient time for the admission of a quantity of air, and insure a perfect combustion within the fire box. It is a well known fact that in order
80 to maintain a perfect combustion and obtain the highest number of heat units, that a sufficient quantity of air must be admitted to the fire box. As air contains a large percentage of oxygen, and as hydrogen gas is
85 first emitted by the ignited fuel, these gases co-mingle and produce carbon dioxide, which is the desired highest and richest element for maintaining a high heat unit producing combustion.
90

My ventilator prevents firemen from "crowding" or choking a fire, principally by continuously placing fresh fuel upon the fire and preventing a proper combustion
95 within a fire box.

Having now described my invention what I claim as new, is:—

1. In a ventilator for fire doors, the combination with a door frame, and a door hinged thereto and having an opening formed
100 therein, of a latch pivotally connected to said door, a latch keeper carried by said door frame, a spring pressed slide bar carried by said latch-keeper, for gradually raising said latch, a keeper carried by said door for sup-
105 porting said latch when said door is open, a dash-pot supported by said keeper, a shutter movably mounted in the opening of said door, a crank arm for moving said shutter, said crank arm connecting with the piston
110 of said dash-pot, a depending pin carried by said crank arm, a head carried by said pin, a lug carried by said latch for engaging said head and raising said crank arm, and means for regulating said dash-pot to retard
115 the closing movement of said shutter.

2. In a ventilator for doors, the combination with a door frame, and a door hinged thereto and having an opening formed there-
120 in, of a latch pivotally connected to said door, a latch keeper carried by said frame, a keeper carried by the door for supporting said latch when said door is open, a dash-pot supported from said keeper, a gravity closing shutter movably mounted in the open-
125 ing of said door, a crank arm for moving said shutter and connecting with the piston rod of said dash-pot, a depending pin carried by said crank arm, a head carried by said pin, a lug carried by said latch for en-
130

gaging said head and elevating said crank arm, means for regulating said dash-pot for retarding the closing movement of said shutter, and means carried by said latch keeper
5 for elevating said latch, and actuating said crank arm.

3. In a ventilator for doors, the combination with a door frame, of a door hinged thereto and having an opening formed therein, a latch pivotally connected to said door,
10 a latch keeper carried by said frame, a gravity closing shutter movably mounted in the opening of said door, a crank arm for opening said shutter, a dash-pot carried by
15 said door for retarding the closing movement of said shutter, a head suspended beneath said crank arm, a lug carried by said latch for engaging said head and elevating
20 said crank arm, means for regulating the operation of said dash-pot, and means carried by said latch keeper for elevating said latch and actuating said crank arm.

4. In a ventilator for doors, the combination with a door frame, a door hinged thereto and having an opening formed therein, a
25 latch pivotally carried by said door, and a latch keeper carried by said frame for holding said latch in a closed position, of a gravity closing shutter movably mounted in the opening of said door, a crank arm for
30 opening said shutter, a dash-pot carried by said door and operating with said crank arm for controlling the closing movement of said shutter, means carried by said crank
35 arm and impinged by said latch for raising said crank arm and opening said shutter, and means carried by said latch keeper for raising said latch and actuating said crank arm.

5. In combination with a door-frame, a door hinged thereto and provided with an opening, a rock-shaft carried by the door, a
40 shutter carried by said rock-shaft for closing the opening in the door, a latch-keeper carried by the door-frame, a latch carried by
45 the door, means carried by said latch-keeper to be engaged by said latch during closing movement of said door to effect operation of said rock-shaft and open said shutter, a dash
50 pot supported from said latch-keeper, and connections between said dash pot and said

rock-shaft for effecting a gradual closing of the shutter after the door is closed.

6. In combination with a door-frame, a door hinged thereto and provided with an opening, a rock-shaft carried by the door, a
55 shutter carried by said rock-shaft for closing the opening in the door, a latch-keeper carried by the door-frame, a latch carried by the door, means carried by said latch-keeper to be engaged by said latch during closing
60 movement of said door—to effect operation of said rock-shaft to open said shutter, a suitably-supported dash pot, and connections between said dash pot and said rock-shaft
65 for effecting a gradual closing of the shutter after the door is closed.

7. In combination with a door-frame, a door hinged thereto and provided with an opening, a rock-shaft carried by the door, a
70 shutter carried by said rock-shaft for closing the opening in the door, a latch-keeper carried by the door-frame, a latch carried by the door, means carried by said latch-keeper to be engaged by said latch during closing
75 movement of said door to effect operation of said rock-shaft to open said shutter, a suitably-supported dash pot, connections between said dash pot and said rock-shaft for effecting a gradual closing of the shutter
80 after the door is closed, and a shield carried by the door for protecting said dash pot.

8. In fire doors, the combination with a door-frame, and a latch-keeper carried by the door-frame, of a door hinged to the door-
85 frame and provided with an opening, a pivoted latch carried by said door to engage said latch-keeper, a rock-shaft carried by the door, a shutter carried by said rock-shaft for closing said opening, means carried by the latch-
90 keeper to be engaged by said latch during the closing movement of the door to effect actuation of said rock-shaft to open said shutter, and means to effect a gradual closing of the shutter after the door has been closed. 95

In testimony whereof I affix my signature in the presence of two witnesses.

ALBERT H. LOWRY.

Witnesses:

MAX H. SROLOVITZ,
A. J. TRIGG.