

No. 834,792.

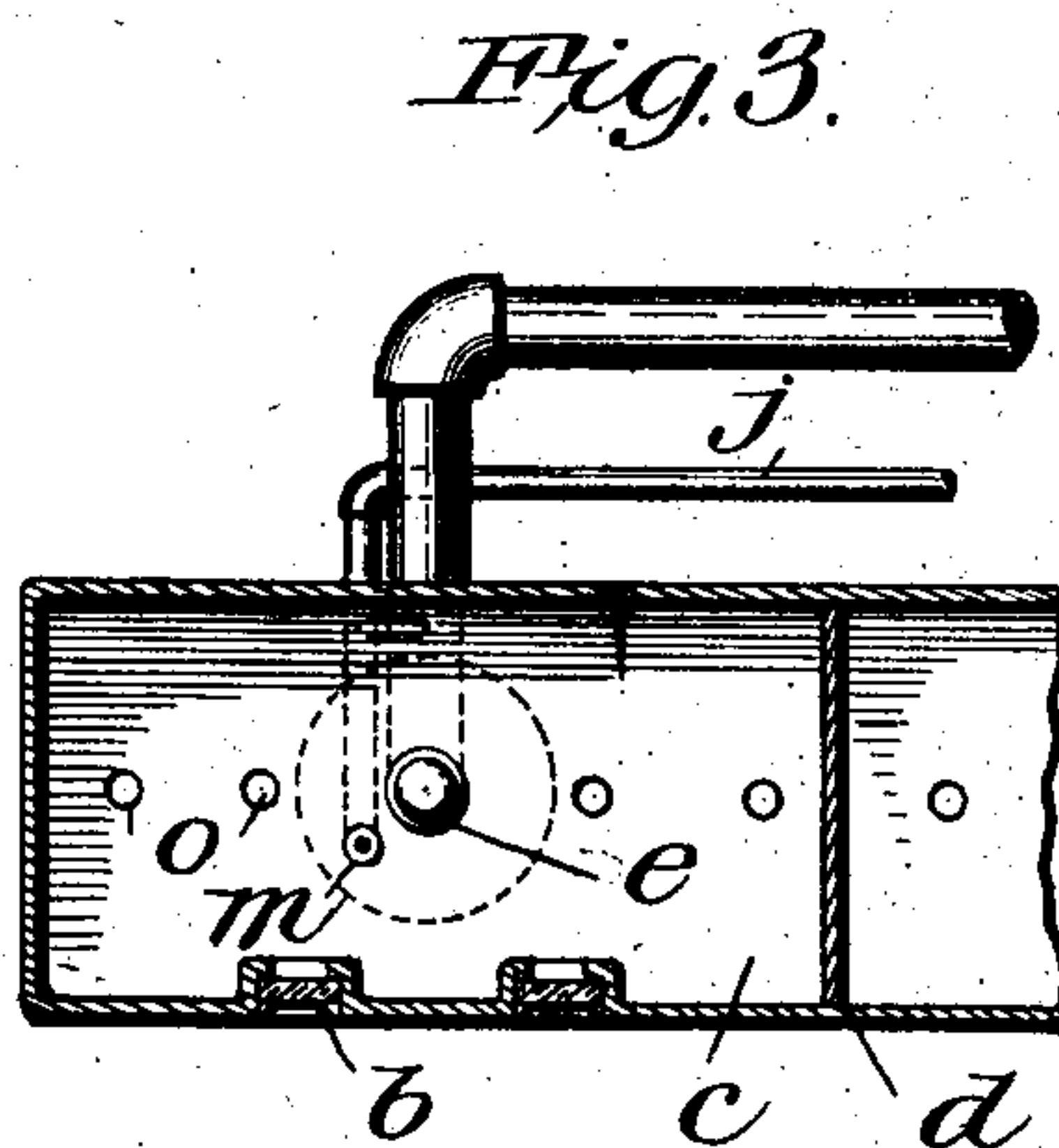
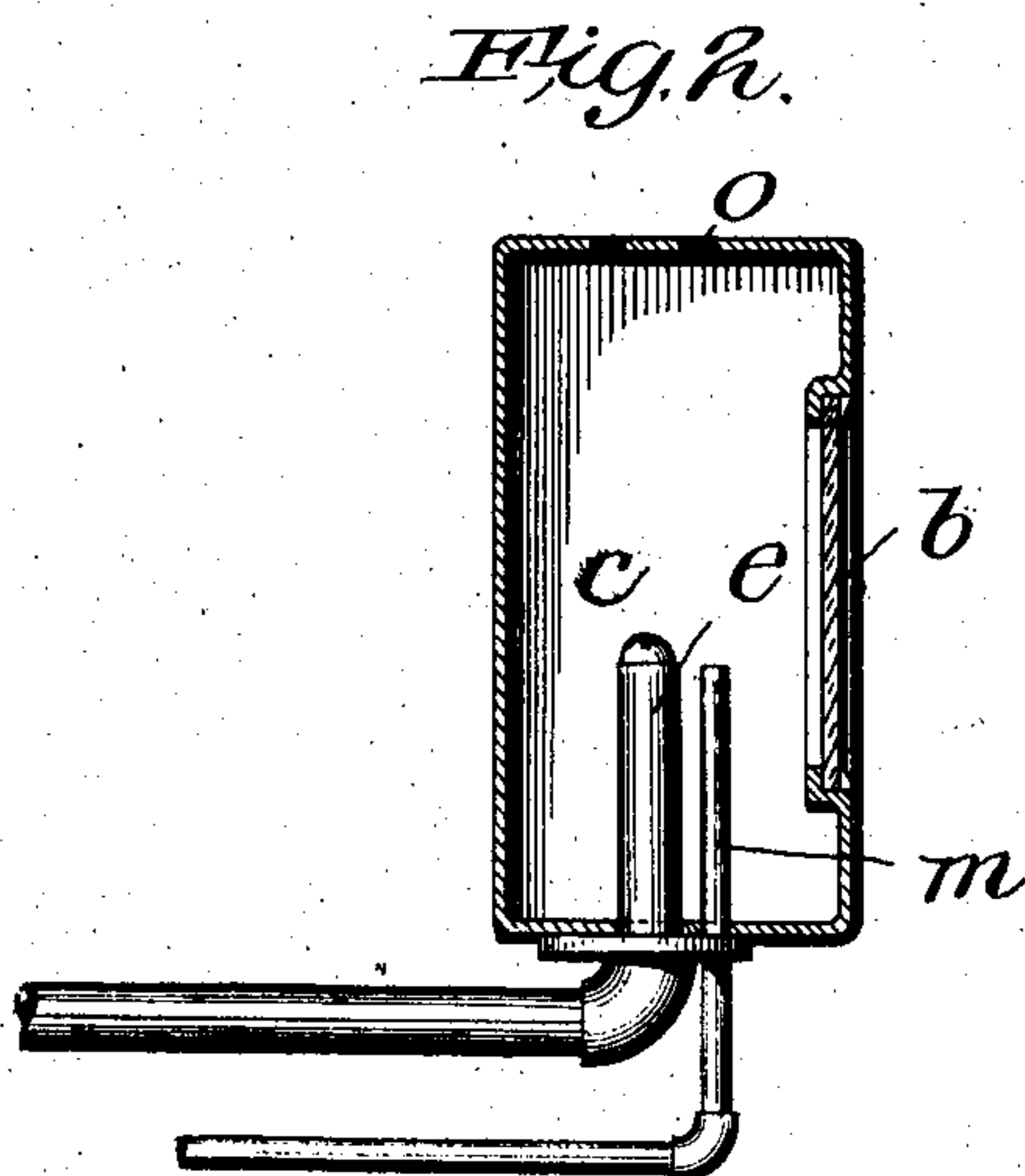
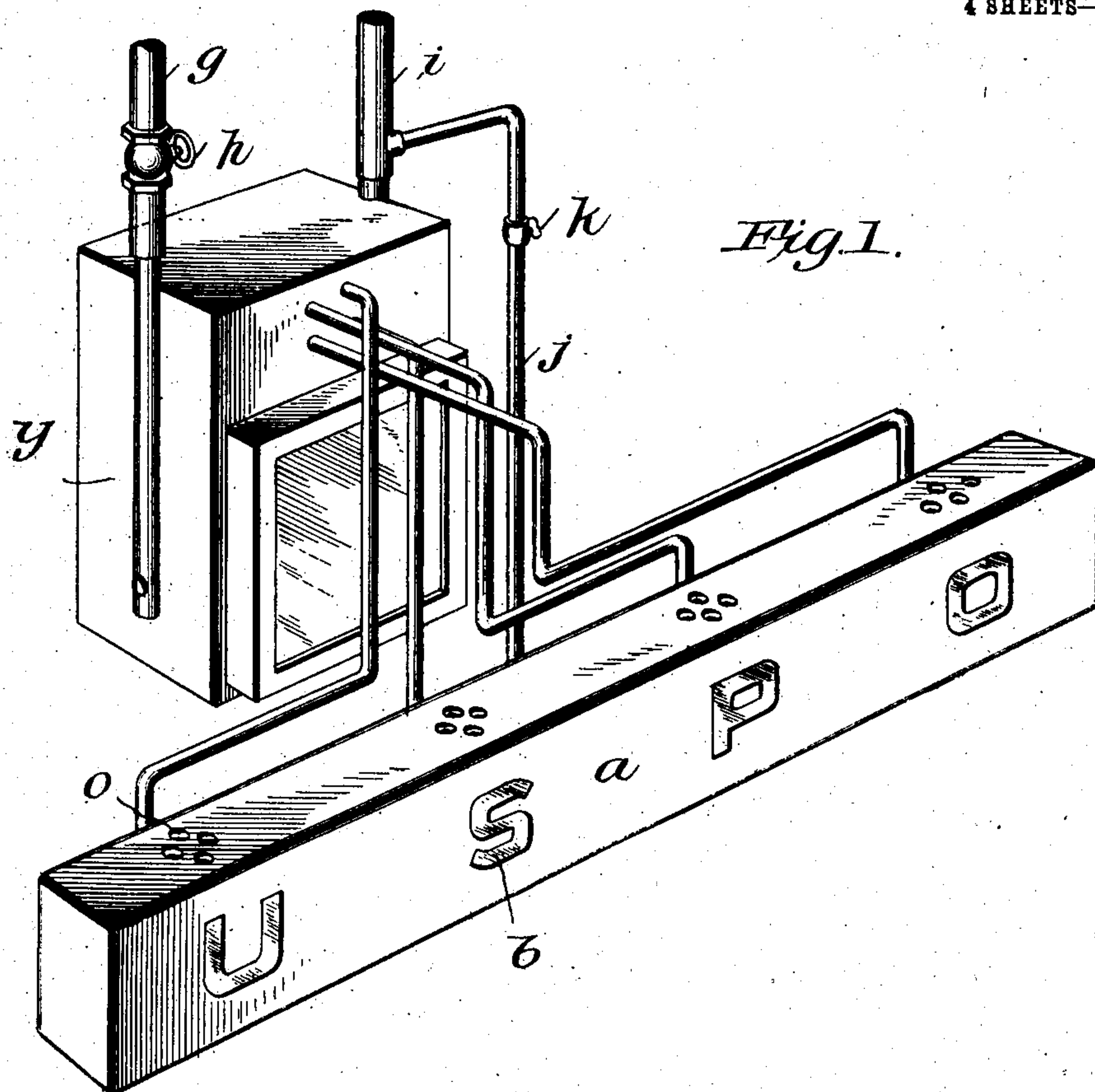
PATENTED OCT. 30, 1906.

G. H. DUNKLE.

ILLUMINATED SIGN AND OPERATING MEANS THEREFOR.

APPLICATION FILED JAN. 23, 1908.

4 SHEETS—SHEET 1.



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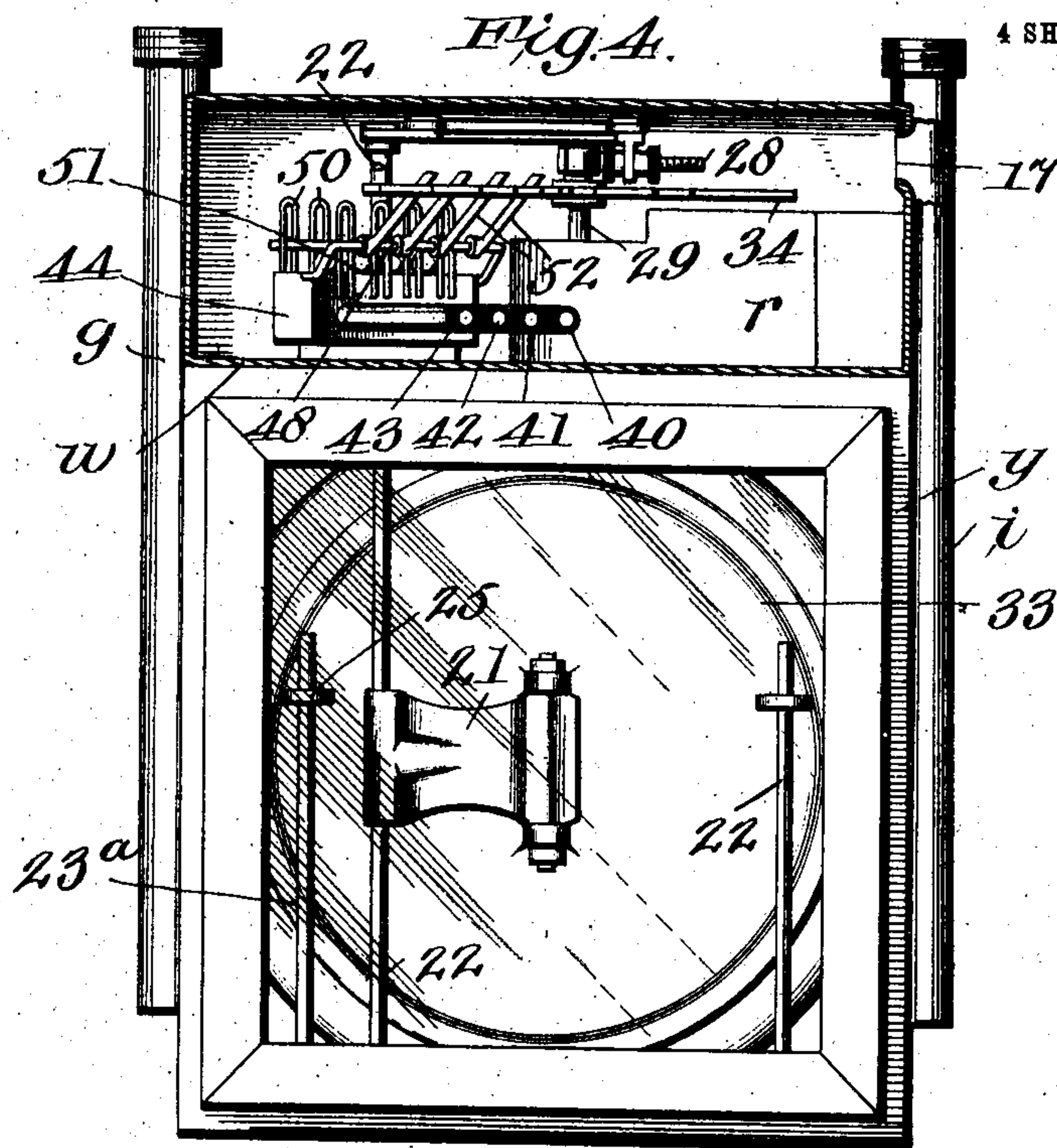
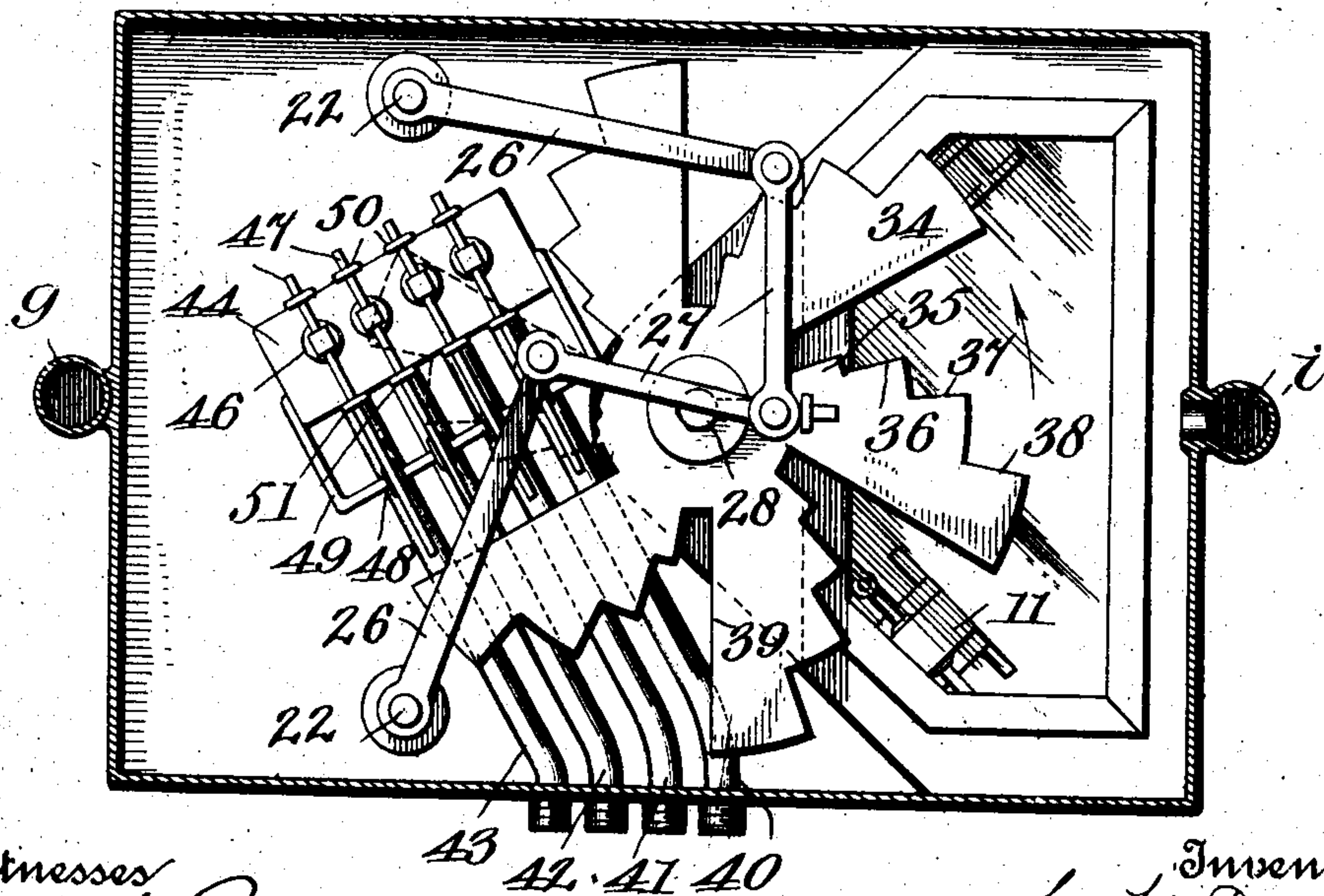


Fig. 5.



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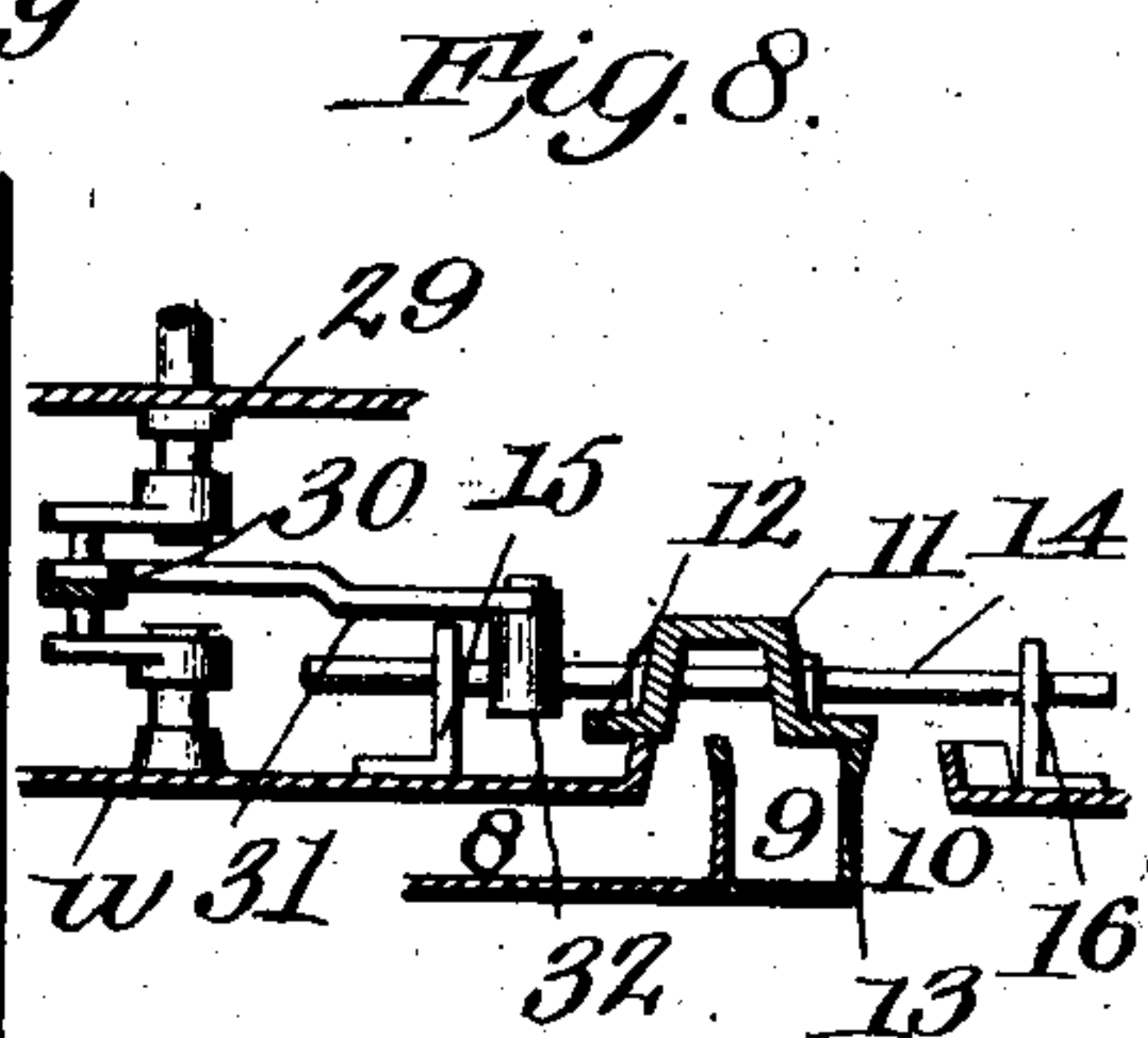
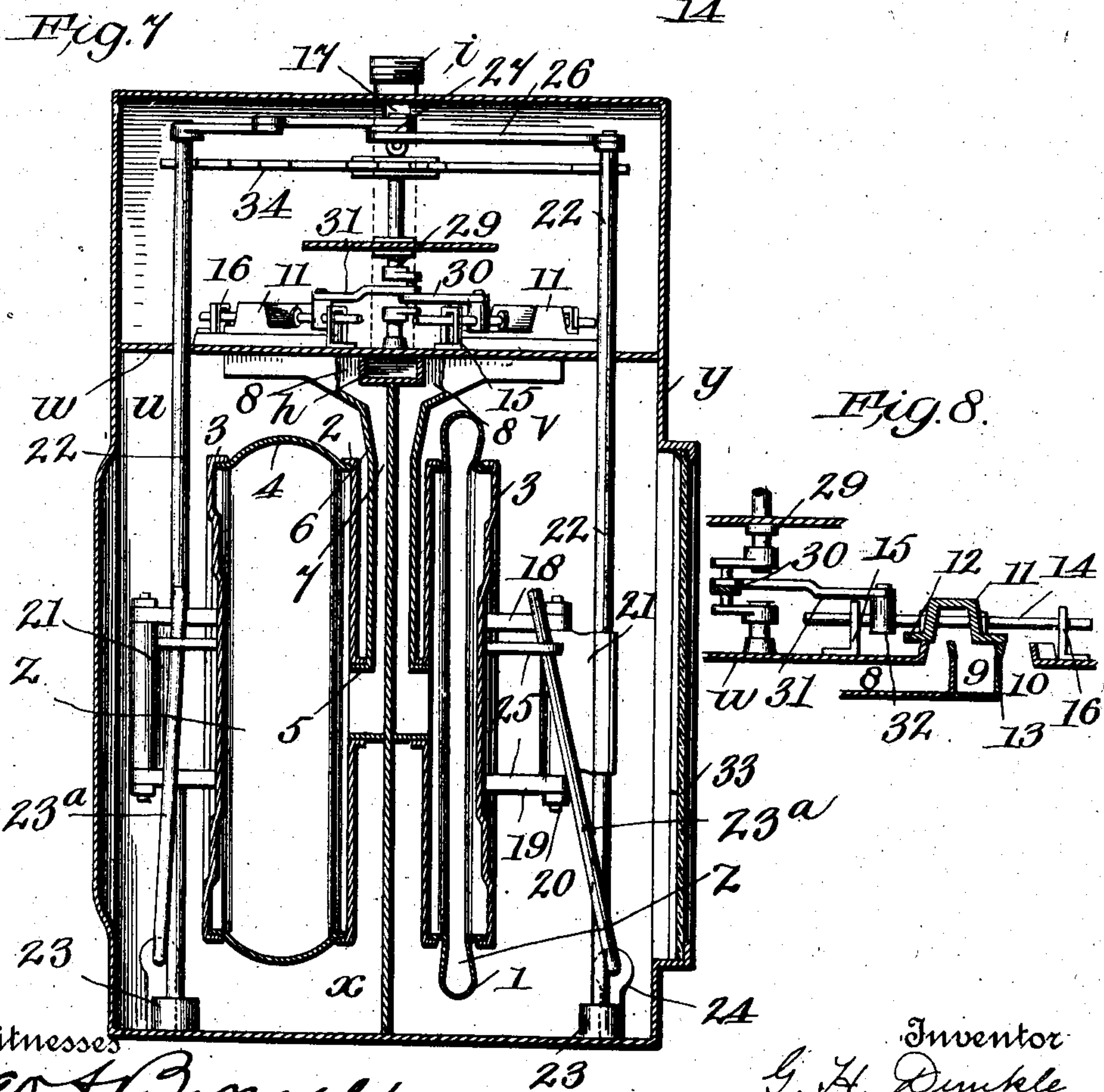
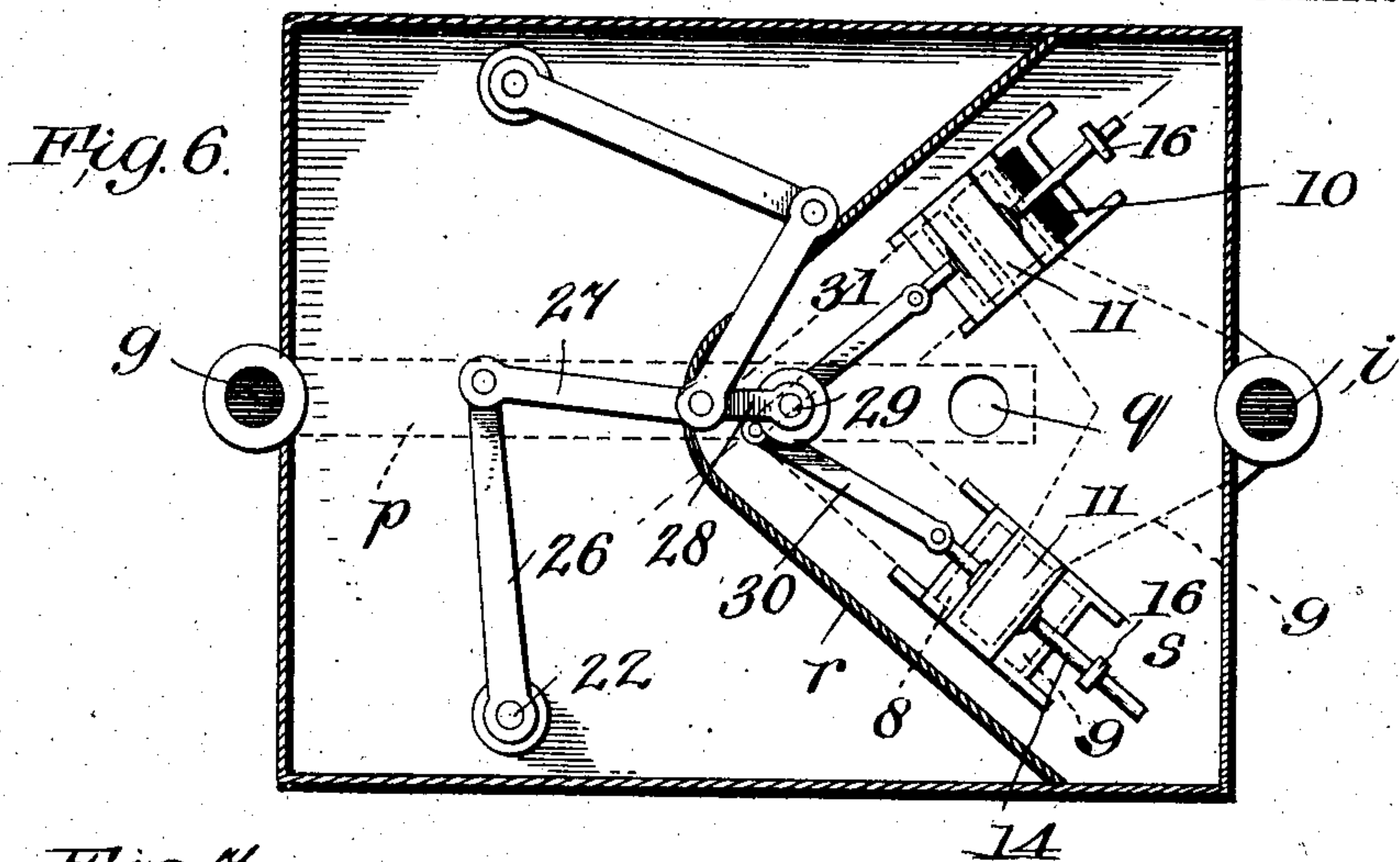
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4 SHEETS—SHEET 3.



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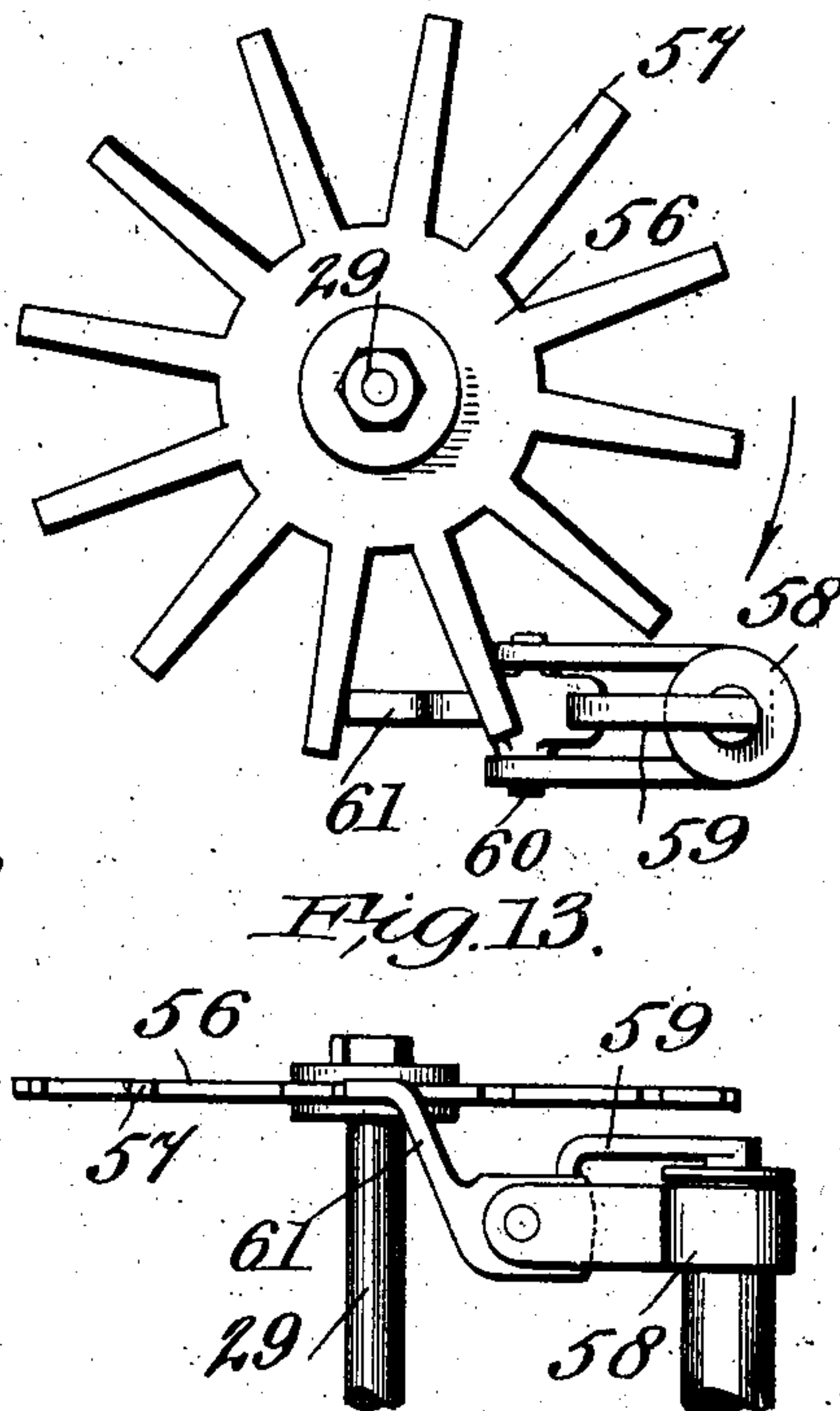
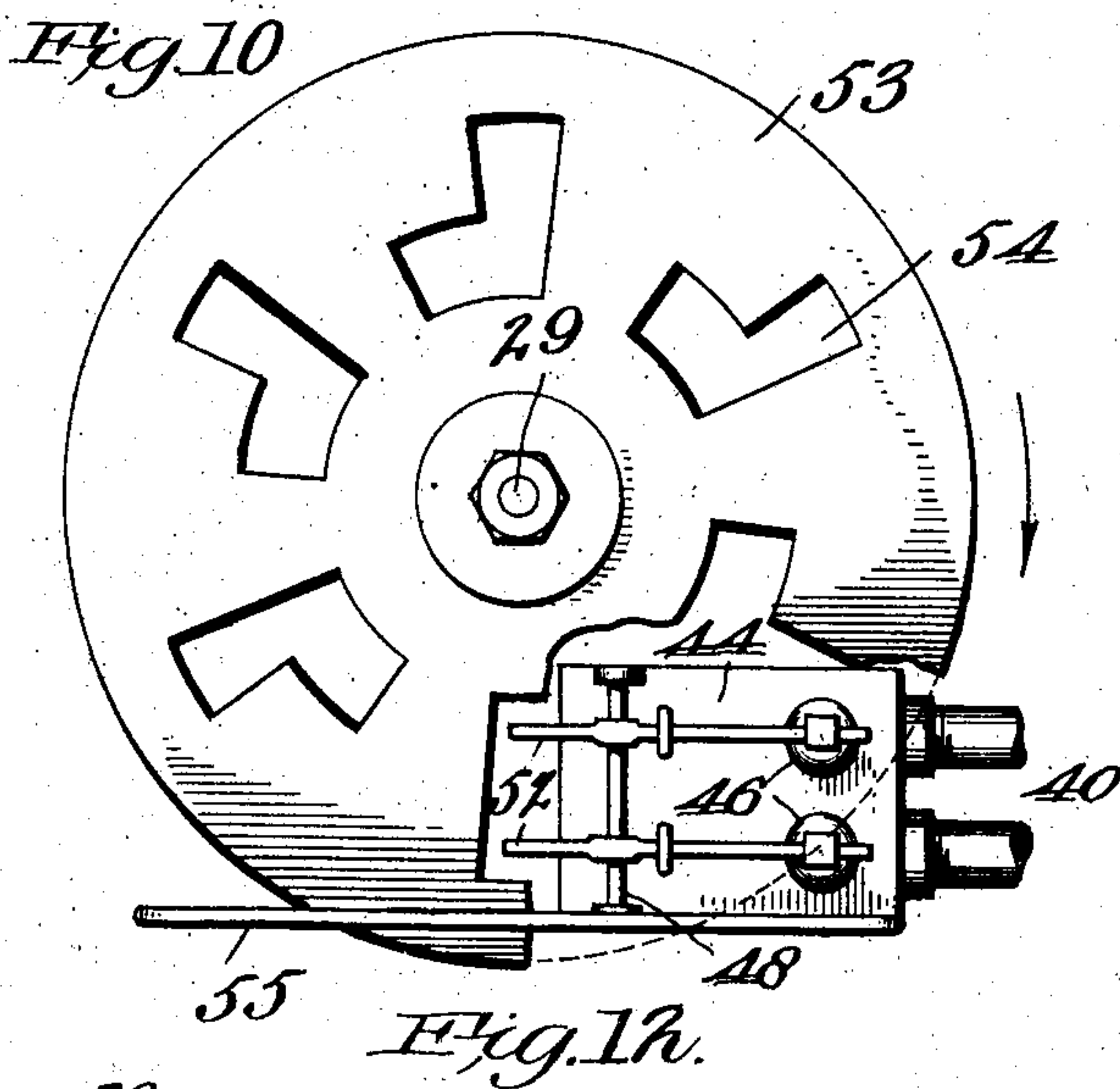
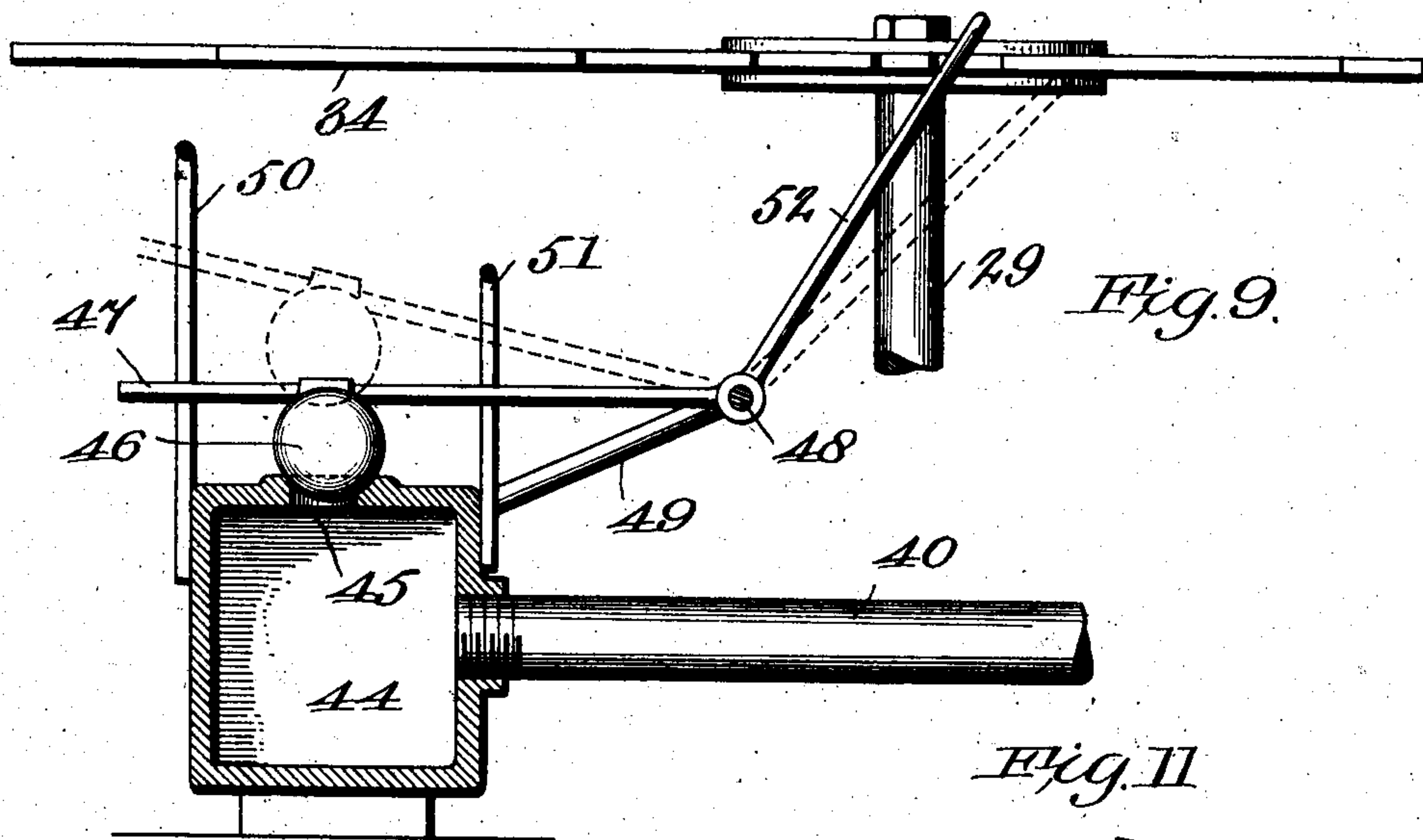
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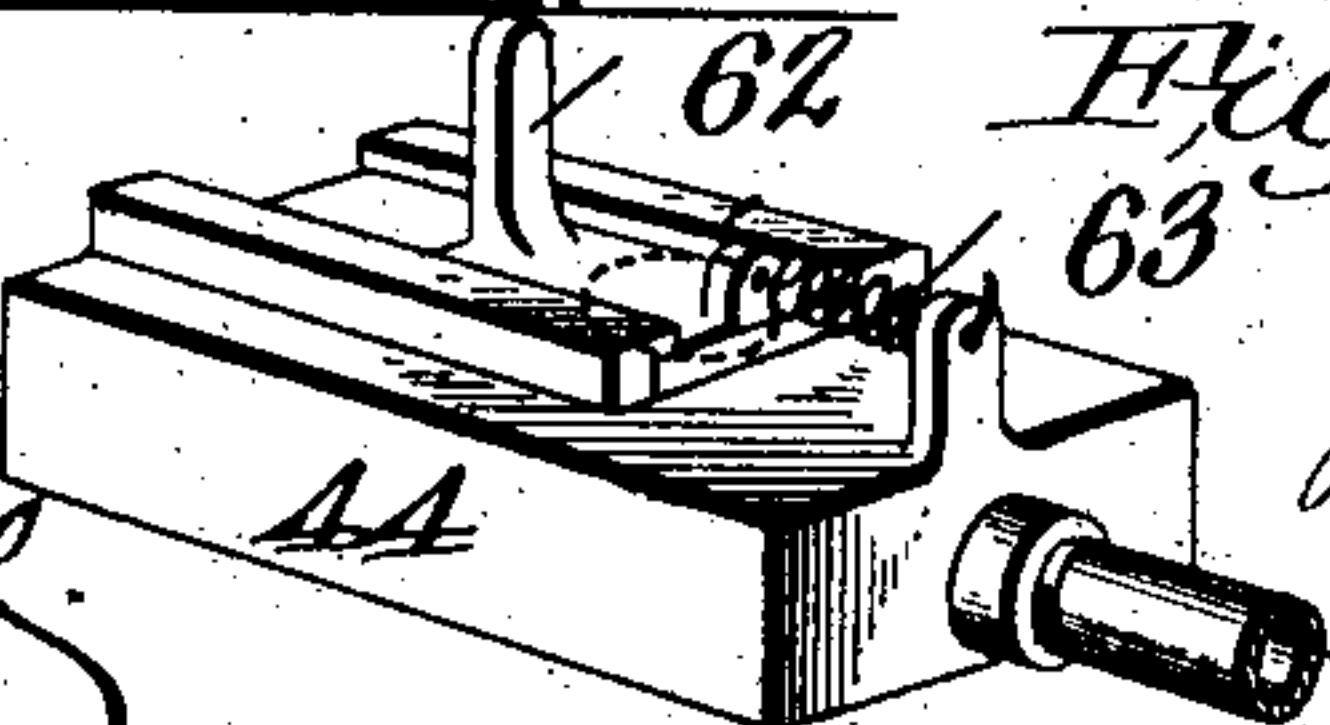
ILLUMINATED SIGN AND OPERATING MEANS THEREFOR.

APPLICATION FILED JAN. 23, 1906.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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ONE-THIRD TO JAMES P. FREEMAN, OF NEW ORLEANS, LOUISIANA,
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ILLUMINATED SIGN AND OPERATING MEANS THEREFOR.

No. 834,792.

Specification of Letters Patent.

Patented Oct. 30, 1906.

Application filed January 23, 1906. Serial No. 297,479.

To all whom it may concern:

Be it known that I, GEORGE HARVEY DUNKLE, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Illuminated Signs and Operating Means Therefor; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in illuminated signs and operating means therefor, and has for its object to provide a simple device of this character which after the gas has been turned on and lighted will automatically operate itself, producing flashes of light at intervals.

With this object in view my invention consists in the construction and combinations of parts, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of my entire device. Fig. 2 is a cross-section of the sign proper. Fig. 3 is a longitudinal section of a part of the same. Fig. 4 is a side elevation, partly in section, of my improved motor for operating the flashing devices and which motor is driven by the gas as it passes through the device. Fig. 5 is a plan view of the same, the top being removed. Fig. 6 is a plan view, parts being removed, showing the operation of the valves. Fig. 7 is a cross-section of the motor. Fig. 8 is a detail of the valve-operating mechanism. Fig. 9 is a detail view, on an enlarged scale, showing details of the valve-operating mechanism for governing the flashes. Figs. 10 and 11 are top plan views of modified forms for operating the flashing-valves. Fig. 12 is a side view of the modification shown in Fig. 10. Fig. 13 is a side view of the modification shown in Fig. 11, and Fig. 14 is a perspective view of a different form of the flash-operating valve.

a represents the sign, the front of which is provided with a window *b*, on which is painted or otherwise secured any suitable sign. The part *a* is divided into chambers, such as *c*, by partitions *d*, one chamber for each flash. *e* represents one of the gas-pipes coming from the motor-casing and located behind

the window *b*. *g* represents a gas-supply pipe leading to the motor-casing, which is provided with a cock *h*.

i represents the outlet-pipe for the gas, and to this is connected a pipe *j*, provided with a cock *k* for the purpose of supplying pilot-lights, one of these, *m*, being in proximity to each one of the pipes *e*. The casing *a* is of course supplied with ventilating means, such as small perforations, such as *o*, at the top or bottom for the purpose of admitting air and allowing the products of combustion to escape.

On opening the cocks *h* and *k* and lighting the pilot-lights the apparatus will operate to give intermittent flashes by the flow of the gas by means of the motor shown in Figs. 4 to 8. The gas entering the pipe *g* flows through a pipe *p* in the interior of the casing (shown in dotted lines in Fig. 6) and issues through an opening *q* into a chamber inclosed by the gas-tight casing *r*. The chamber *s*, formed by the casing *r*, the chamber *t* in proximity to the chamber *s*, and the chambers *u* and *v* are all separated from each other by gas-tight partitions or casings *r*, *w*, and *x*, dividing the interior of the motor-casing *y* into four separate chambers.

Within the chambers *u* and *v* are the bellows *z* and *1*, each of which is formed with rigid heads 2 and 3 and a flexible collapsible connection 4, of rubber or leather. The gas entering these bellows expands them alternately, operating the motor, and then flowing out supplies gas for the flashing-lights. The casing 2 of each of the bellows has a central perforation fitting around the projection 5, fastened to the partition *x* and to the partition 6, thus leaving a passage for the passage of the gas into the bellows, the construction being the same on each side of the partition *x*.

The delivery of the gas into either of the passages 7 is governed by means of valves. (Shown in plan in Fig. 6 and in cross-section in Fig. 8.) 8 represents a horizontal passage connecting with the passage 7, leading down into the bellows. 9 represents a passage leading to the discharge gas-pipe *i*.

10 represents an opening leading from the chamber *s* into one of the chambers *u* or *v*.

All three of the passages 8, 9, and 10 are governed by means of a sliding valve 11, which is operated by the movement of the piston-bellows already referred to. The valve 11 is provided with two horizontal portions 12 and 13, adapted to close the passages 8 and 10 at different times, while the central part of the valve closes the passage 9. There are two of these valves constructed exactly alike, one being mounted over the chamber *u* and the other over the chamber *v*, both valves being located in the chamber *s*. The valve 11 is mounted on a valve-rod 14, sliding in brackets 15 16, carried by the partition *w*. The discharge-pipe *i* is provided with an opening 17, leading into the chamber *t*.

Means whereby the movement of the piston-bellows operates the valves 11 will now be described. To the outer face 3 of each of the bellows, which is made of rigid material, are connected brackets 18 and 19, in which is pivotally mounted a rod 20, which carries a flag 21. The other end of the flag 21 is rigidly attached to the flag-wire 22, the lower part of which is mounted in a bearing 23, and which wire extends up through the partition *w*. It is obvious that a movement of the head 3 will carry with it the flag 21 and partially rotate the flag-wire 22.

A U-shaped guide-wire 23^a is pivotally mounted in brackets, such as 24, and the ends extend upward passing through brackets 25, extending outwardly from the bellows-head 3. The construction described is exactly the same on either side of the partition *x*. The flag-wire 22 has rigidly attached to it at its upper end an arm 26, to the outer end of which is loosely pivoted a link 27, which in turn is pivoted to the outer end of a lever 28, fixed to the shaft 29, which operates the valve 11.

In Fig. 6 I have shown the connection between the link 27 and lever 28 as rigid; but it may be made adjustable by having the lever 28 screw-threaded and provided with adjusting-nuts, as shown in the top of Fig. 4.

The valve-rod 14 is connected, by means of a projection 32, secured thereon, an arm 31, and crank 30, to the shaft 29. As said before, the construction on each side of the partition *x* is exactly the same; but the arrangement is such that one of the piston-bellows expands while the other contracts, the effect of which through the connections already described is to cause a continuous slow motion of the shaft 29. From the construction described it is obvious that when the gas is turned on the pressure of the gas will automatically operate the motor, causing a slow motion of the shaft 29, which in turn operates the flash-light device, as hereinafter described. A window 33 is preferably provided in one side of the casing *y*, although this is not strictly necessary.

The means by which the movement of the shaft 29 automatically operates the flash-lights will next be described.

Referring to Figs. 4 and 5, a flat circular disk 34 is secured to the shaft 29 just below the operating-lever 28. This disk has portions cut away, leaving steps 35, 36, 37, and 38 on one face of the cut, the other face being straight, as shown at 39. The steps 35, 36, 37, and 38 operate valves in the pipes 40, 41, 42, and 43, which lead to the various chambers of the illuminated sign. As the disk 34 revolves, these step portions open valves communicating with said pipes 40 43 in the manner illustrated in Figs. 5 and 9.

To the rear end of each of the pipes, such as 40, is attached a valve-casing 44, preferably made in the form of a rectangular box and provided with an opening 45. This opening is normally closed by a valve 46, shown in Fig. 9 as spherical and carried by a rod 47, pivoted at 48 in a bracket 49, carried by the casing 44. Guide-wires 50 and 51 insure the proper seating of the valve 46 when it drops. Rigidly attached to the rod 47 and projecting upwardly therefrom is an operating-lever 52, which is adapted to engage with one of the steps, such as 35, on the disk 34. The operation of this part of the device is as follows: As the disk 34 revolves, the steps 35, 36, 37, and 38 successively engage the arms 52, opening the valves communicating with the pipes 40, 41, 42, and 43, whereupon the lights in the various compartments of the sign are successively lighted by means of the pilot-lights. These lights remain lighted for the desired space of time—say six seconds—and are then extinguished as the levers 52 are released by the disk 34 as it revolves, whereupon the valves 46, which are made of heavy material, seat themselves by gravity. The pipes 40 to 43 communicate with the chamber *t*, which always has a supply of gas in it, which enters through the opening 17.

In Fig. 10 I have shown a modified form of operating device adapted to operate two flashing-lights. In this case the operating-disk 53 is provided with a succession of cut-away portions 54, stepped as shown in Fig. 10. 55 represents a guide through which the edge of the disk 53 runs, which serves to keep it in place. Such a guide is necessary if the operating-disk is made of light material, such as cardboard; but obviously the operating-disk may be made of any suitable material.

In Fig. 11 is shown still another modification in which the operating-disk 56 is provided with a series of projecting arms 57, and in which the gravity-operated valve 58 is mounted on an arm 59, pivotally supported at 60 and provided with an upwardly-projecting lever 61, by means of which the valve is opened at intervals.

In Fig. 14 is shown still another form of

valve provided with an upwardly-projecting arm 62, which is adapted to be struck by a projection on the disk, thereby opening the valve, which is returned to its original position by a spring 63.

Obviously any desired form of valve could be used, whether operated by gravity, by a spring, or positively, and obviously any form of operating cam or device may be used on the shaft 29, whether a disk, cylinder, or any other suitable shape.

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

1. The combination of a casing connected to a source of gas-supply, a series of pipes leading from said casing, a valve for each of said pipes, partitions dividing said casing into chambers, a motor in said chamber operated by the flow of gas therethrough, including a pair of piston-bellows adapted to be alternately filled by and emptied of gas, an operating-shaft, connections between the heads of said bellows and said shaft, whereby the movement of said heads operates said shaft, a series of alternately-acting connecting valves operated by said shaft and controlling the supply of gas to, and the discharge of gas from, said bellows, and means carried by said shaft for operating said valves, substantially as described.

2. The combination of a casing connected to a source of gas-supply, a series of pipes leading from said casing, a valve for each of said pipes, partitions dividing said casing into chambers, a motor in said casing operated by the flow of gas therethrough, including a pair of piston-bellows adapted to be al-

ternately filled by and emptied of gas, an operating-shaft, connections between the heads of said bellows and said shaft, whereby the movement of said heads operates said shaft, a series of alternately-acting connecting valves operated by said shaft and controlling the supply of gas to, and the discharge of gas from, said bellows, and a stepped disk carried by said operating-shaft for moving said valves, substantially as described.

3. The combination of a sign divided into compartments and provided with windows, a casing connected to a source of gas-supply, a series of pipes leading from said casing, one to each of the compartments of said sign, a valve for each of said last-named pipes, partitions dividing said casing into chambers, a motor in said casing operated by the flow of gas therethrough, including a pair of piston-bellows adapted to be alternately filled by and emptied of gas, an operating-shaft, connections between the heads of said bellows and said shaft, whereby the movement of said heads operates said shaft, a series of alternately-acting connecting-valves operated by said shaft and controlling the supply of gas to and the discharge of gas from said bellows, and a stepped disk carried by said operating-shaft for moving the valves governing the flow of gas from said casing to said sign, substantially as described.

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

GEORGE HARVEY DUNKLE.

Witnesses:

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MYRON G. CLEAR.