

No. 667,451.

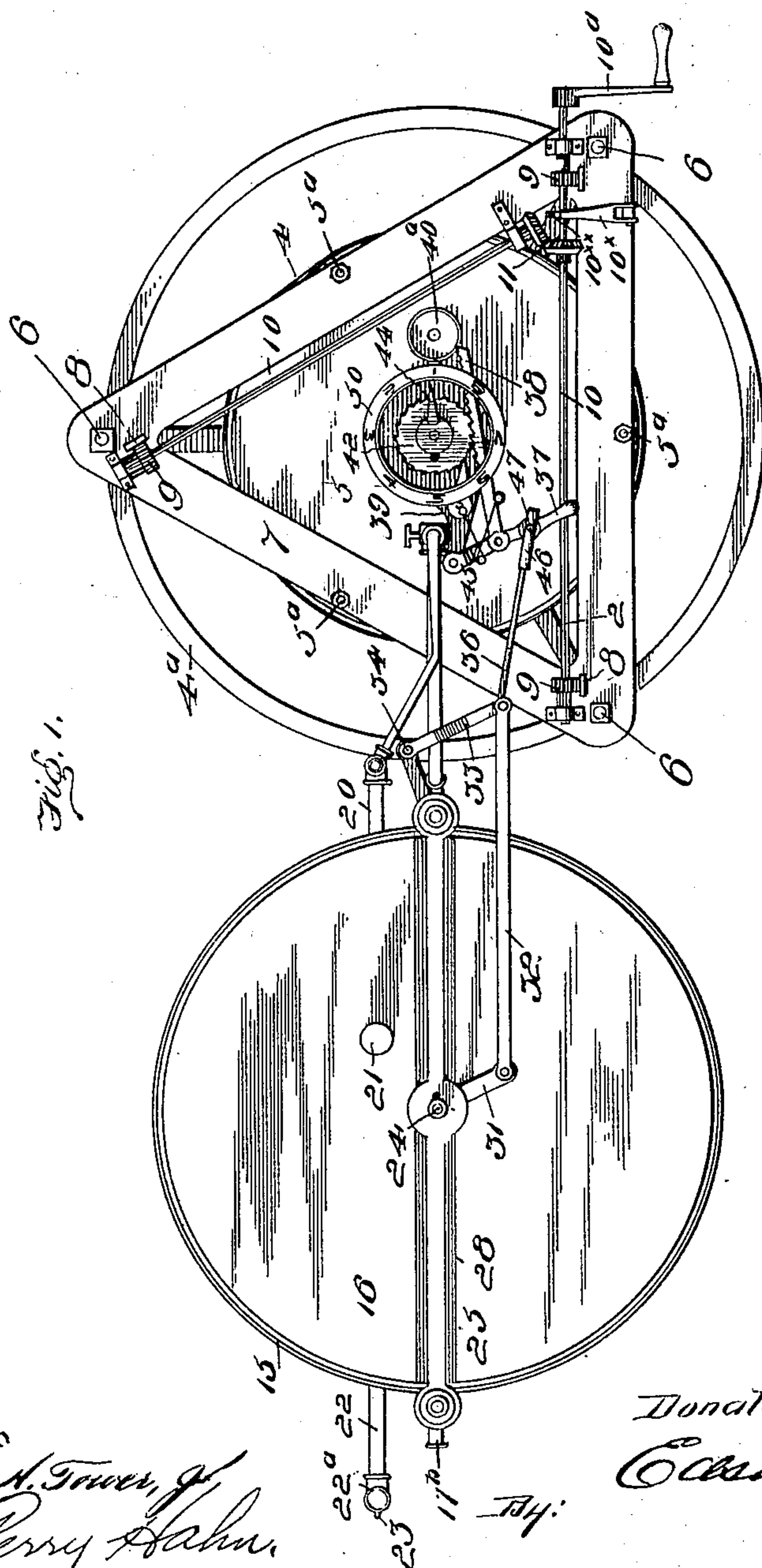
Patented Feb. 5, 1901.

D. H. McPHERSON.
ACETYLENE GAS GENERATOR.

(Application filed Apr. 5, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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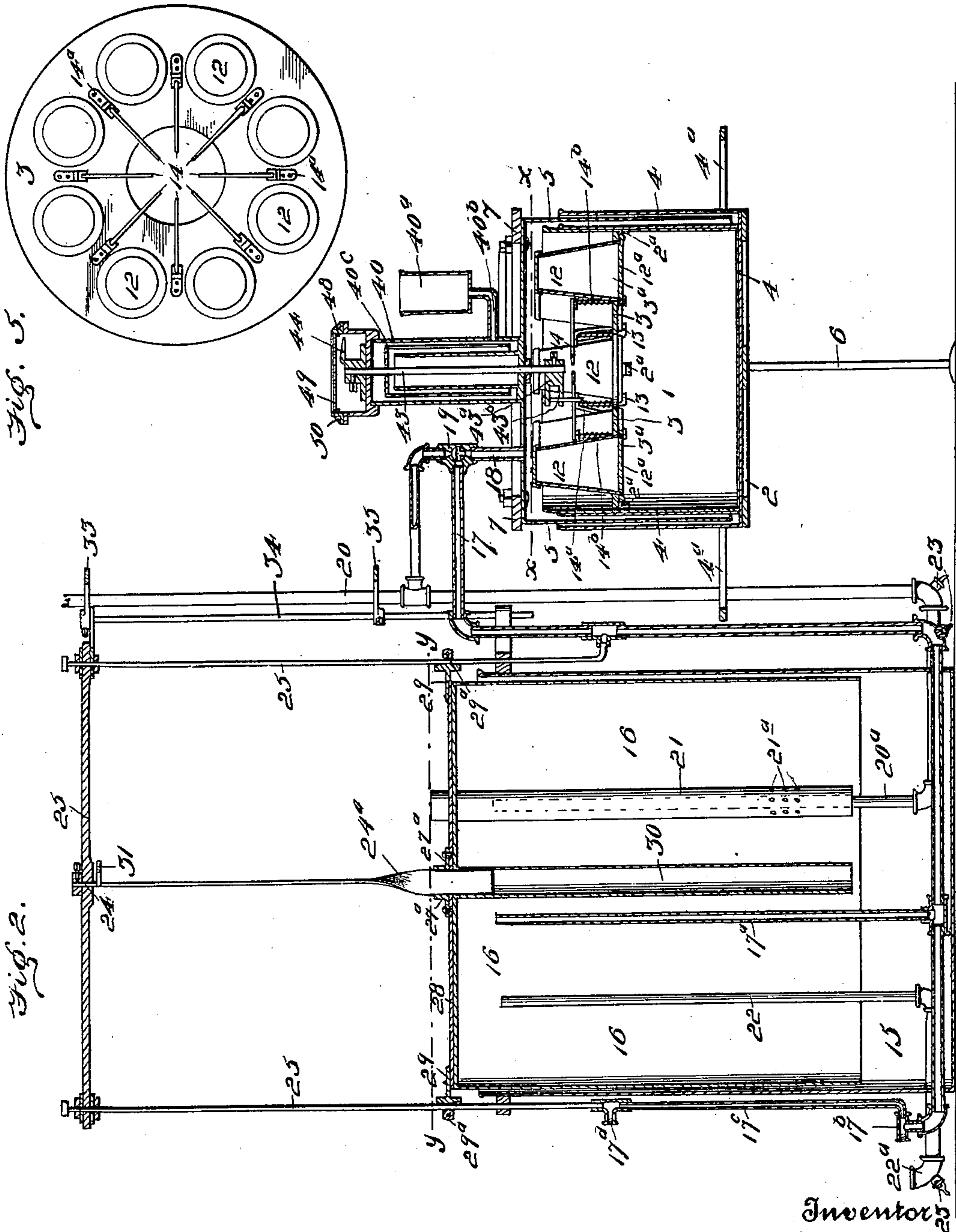
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3 Sheets—Sheet 2.



Witnesses

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Fig. 4.

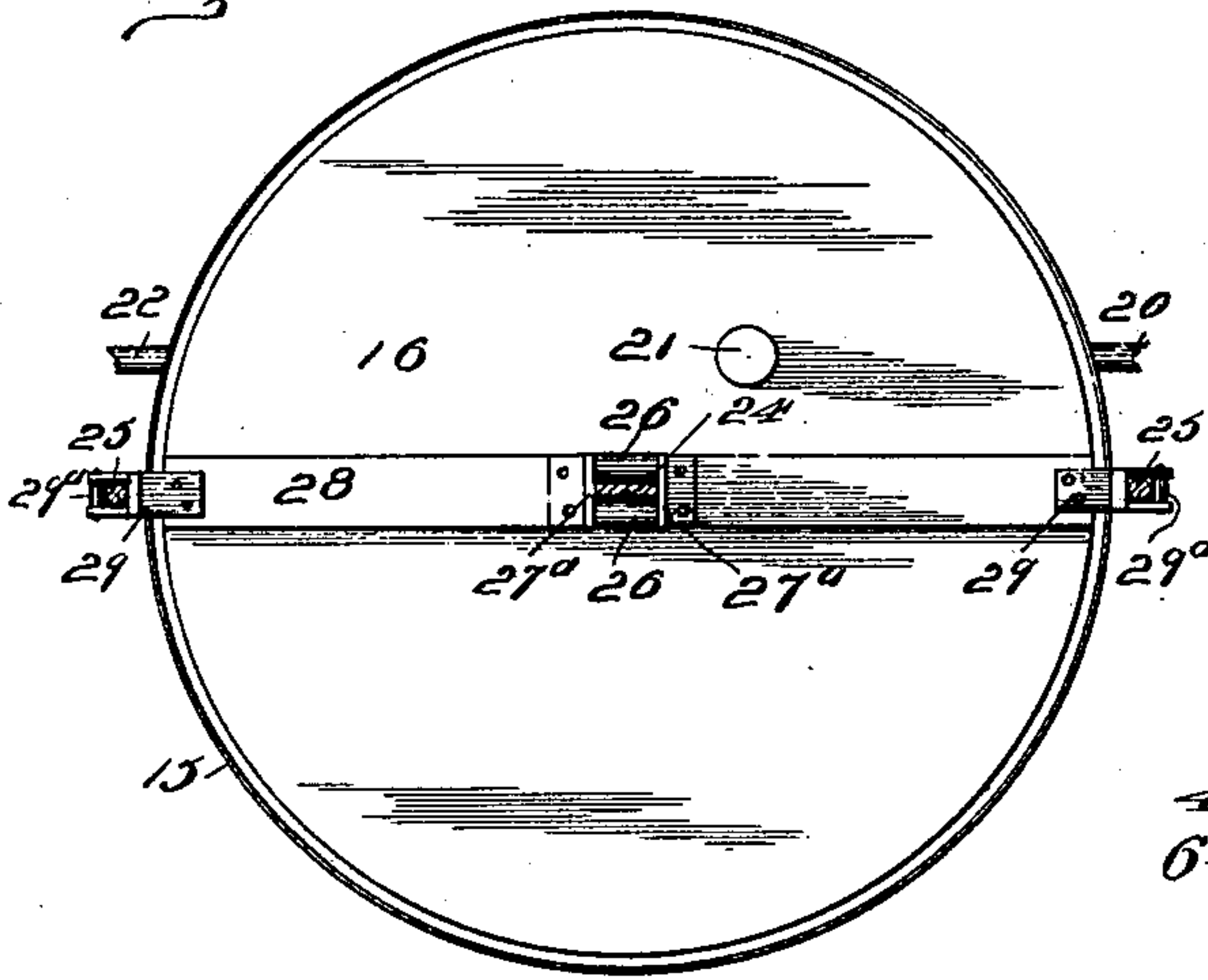


Fig. 5.

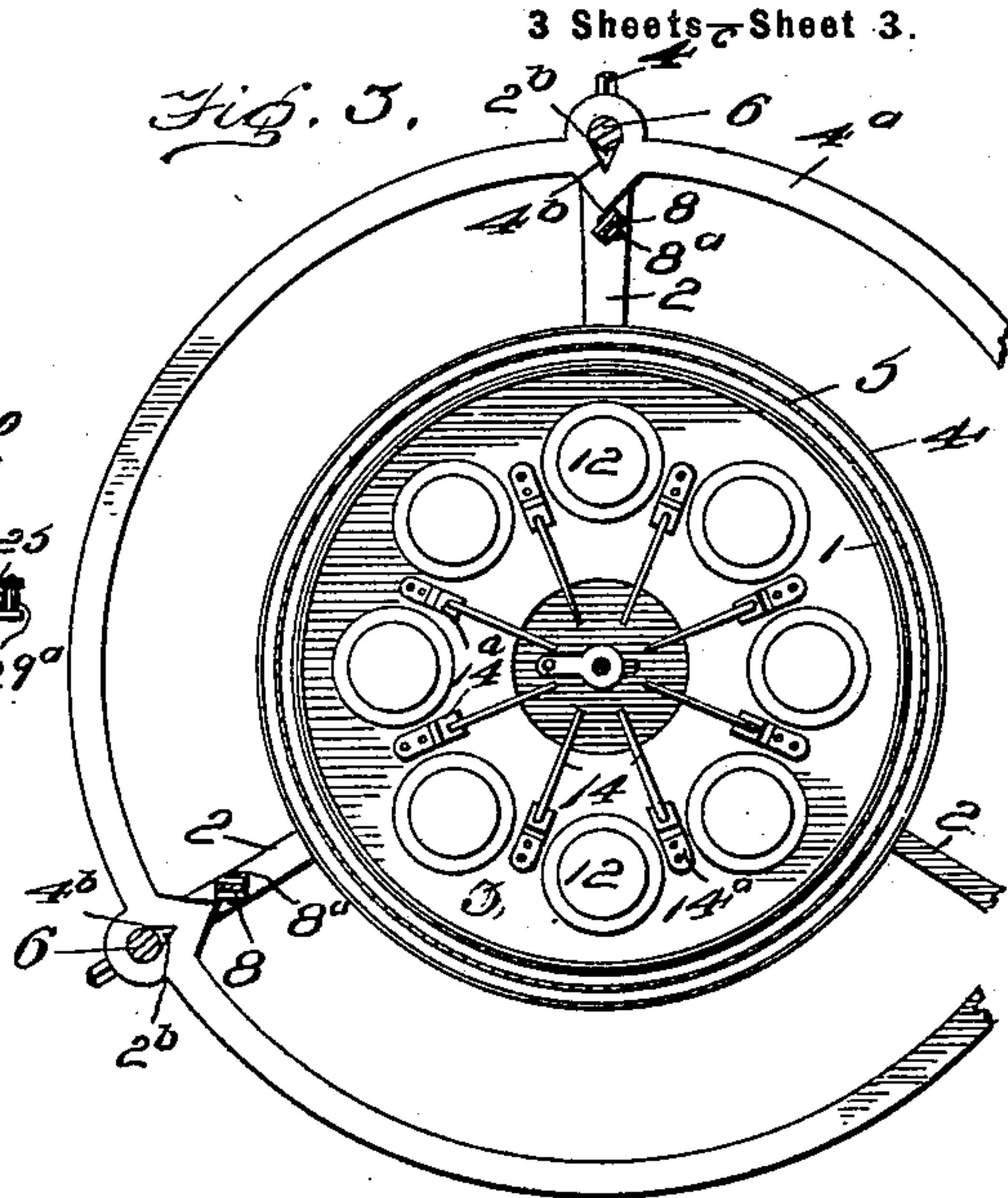


Fig. 7.

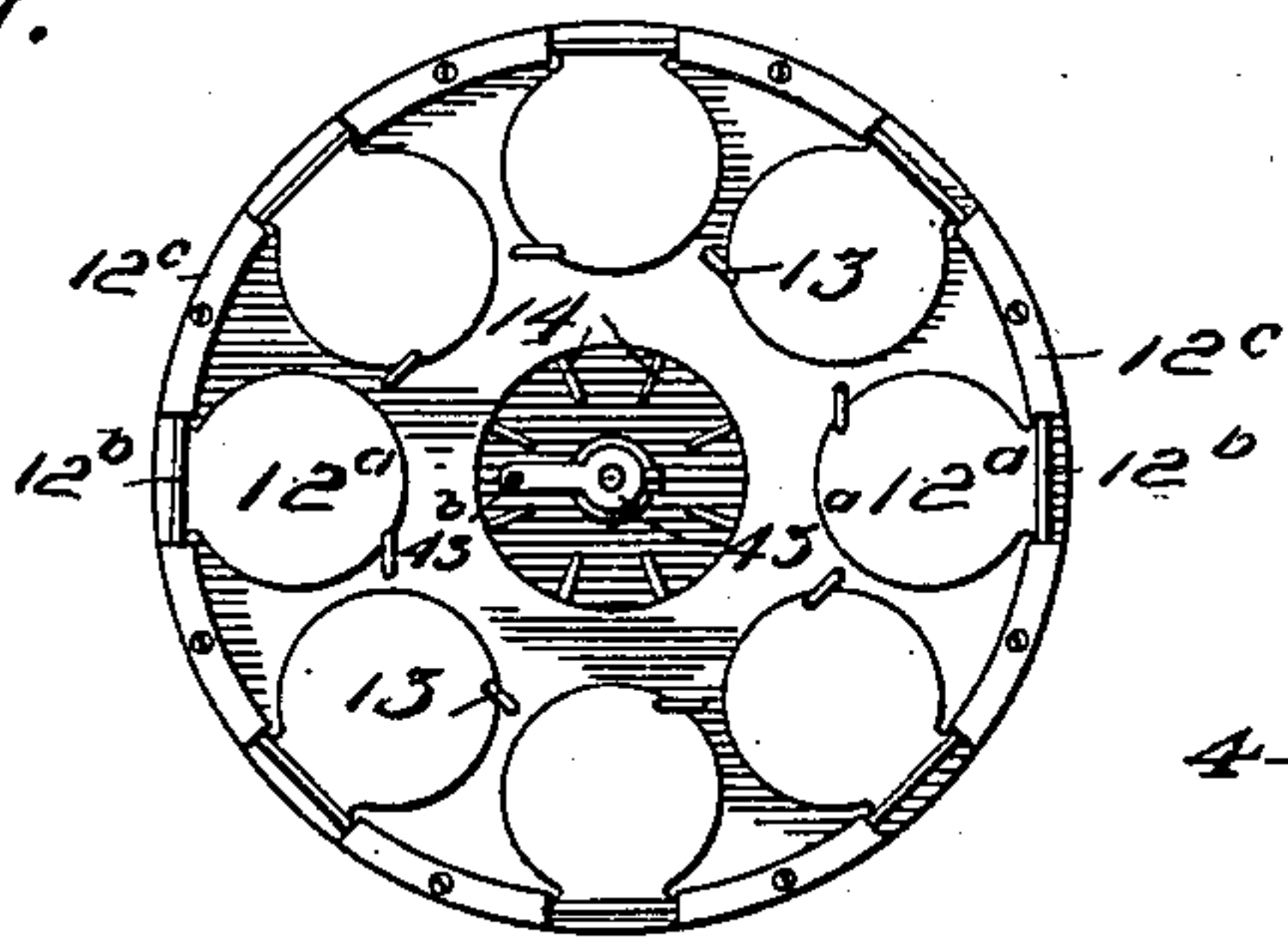


Fig. 8.

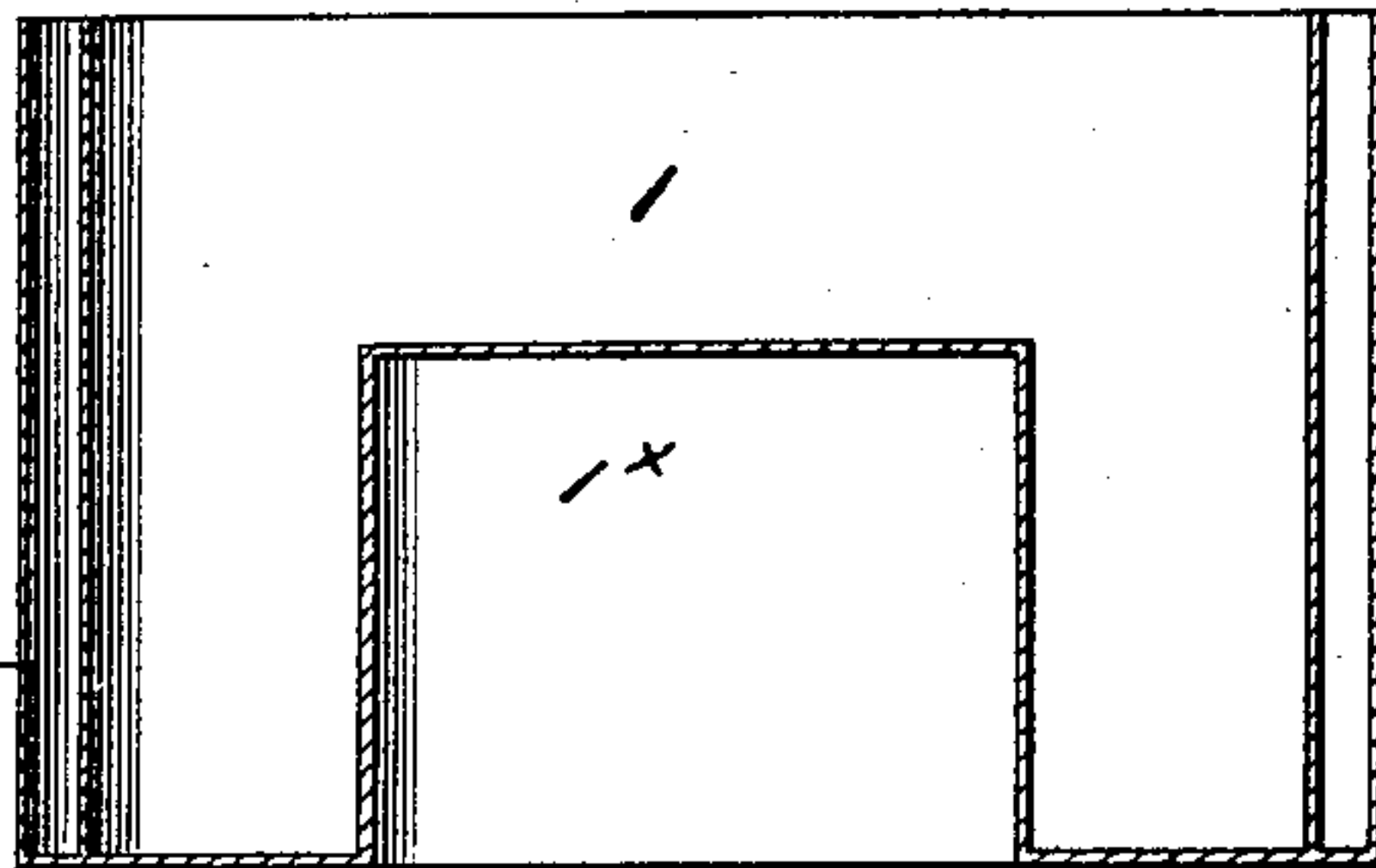


Fig. 6.

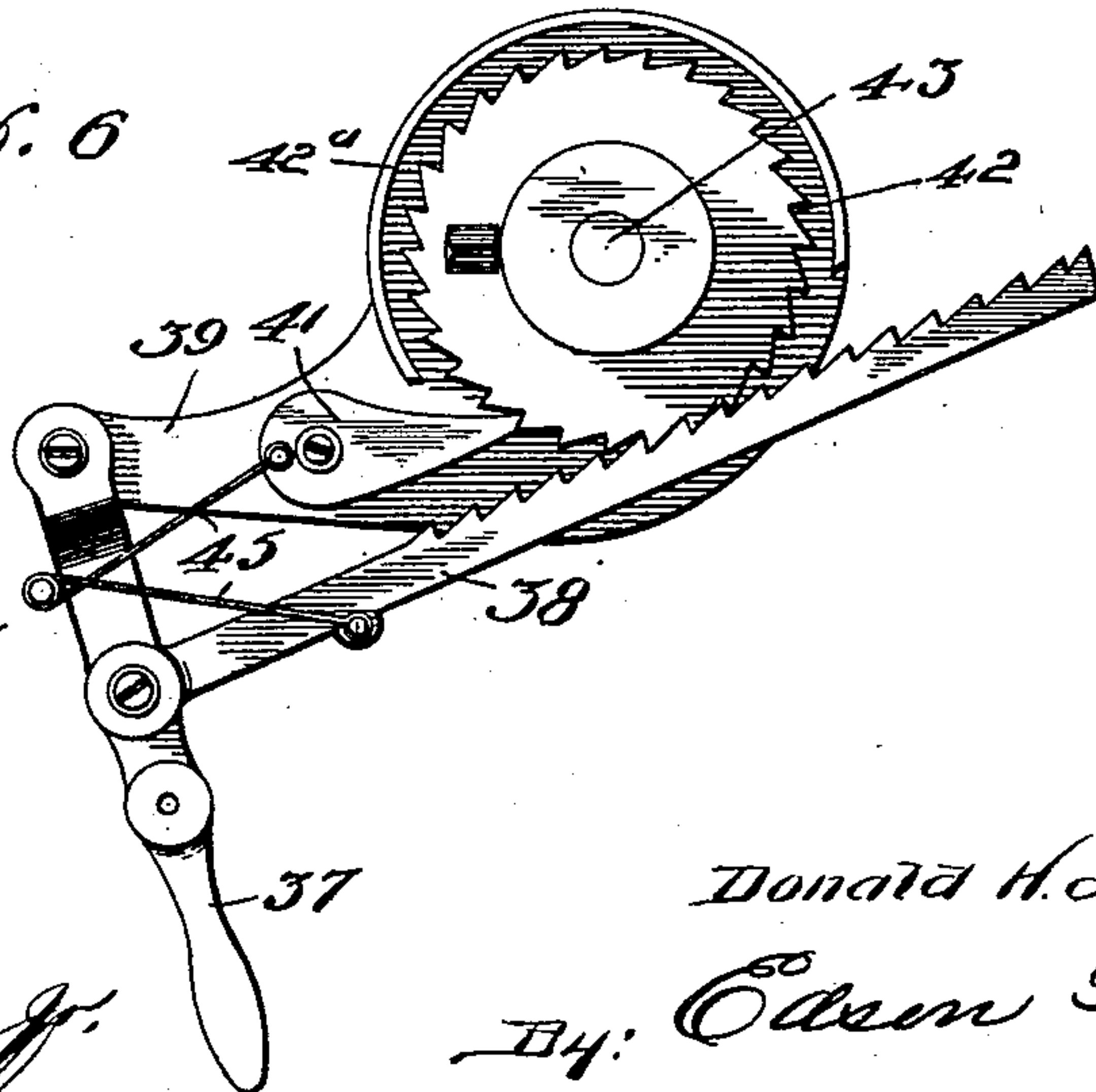


Fig. 9.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 667,451, dated February 5, 1901.

Application filed April 5, 1900. Serial No. 11,726. (No model.)

To all whom it may concern:

Be it known that I, DONALD H. MCPHERSON, a citizen of the United States, residing at Le Roy, in the county of Genesee and State of New York, have invented certain new and useful Improvements in Acetylene-Gas Machines; 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 acetylene-gas machines wherein the carbid is precipitated or dumped into the water in generating the gas.

It has for its objects, among other things, principally to regulate or control the conversion of the carbid into gas, to automatically effect the feeding of the carbid to the generator tank or chamber, to effect such feeding by the movement of the gasometer, to provide for registering the fact of the emptying of the carbid-holders, and consequently of the number of filled and unfilled holders or tanks, to effect the convenient adjustment or actuation of the parts for the ready replenishing of the carbid, and to promote utility and otherwise improve the construction and arrangement of the parts generally.

It consists of the sundry combinations of parts substantially as hereinafter more fully disclosed, and specifically pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figure 1 is a plan view. Fig. 2 is a sectional elevation. Fig. 3 is a section taken on the line *x x* of Fig. 2. Fig. 4 is a similar section taken on the line *y y* of the same figure. Fig. 5 is a detached plan view showing more particularly the arrangement of tripping-levers for releasing the hinged bottoms of the carbid-holders. Fig. 6 is an enlarged detail view showing more fully the ratchet, pawl, and dog mechanism of the means for actuating the tripping-levers aforesaid. Fig. 7 is a similar view from beneath, showing more especially the manner of hinging the carbid-holder bottoms, &c. Fig. 8 is a sectional view of a modification disclosing a form of generator-chamber more particularly designed for large-

sized machines. Fig. 9 is a detail sectional view showing more particularly the coupling between the connecting-rod 36 and the lever 37.

Latitude is allowed herein as to details, as they may be changed without departing from the spirit of my invention and the same yet remain intact and be protected.

In carrying out my invention I provide a suitable gas-generating chamber or tank 1, adapted to hold or contain water, having supported upon brackets 2^a, secured to its inner side, a circular platform 3, having a circular arrangement or series of openings 3^a. Resting upon a spider-like casting 2 is an annular vessel or tank 4, adapted to contain the chamber or tank 1 and water, into which is submerged the open end of a closure or "bell" 5, thus forming a water seal for the generator or chamber 1. Said tank or chamber 1 is adapted to be readily removed when said spider, with the vessel 4, is lowered, as hereinafter disclosed, for recharging or replenishing it with water and the carbid-holders, presently described, with carbid, as further disclosed later on. The spider or support 2 has an opening 2^b through each of its arms, at the outer end, and through the openings 2 pass the legs or uprights 6, suitably planted upon a base and having secured to their upper ends a preferably triangular frame 7. The spider or support 2 is thus permitted to slide upon the legs or uprights 6 to provide for the lowering thereof, as required when it is desired to replenish the contents of the carbid-holders, as will be more fully explained later on. A brace 4^a in the form of a ring is applied to the legs or uprights 6 and has openings 4^b to receive said legs, said openings having inserted through their walls holding-screws 4^c, engaging said legs or uprights to hold the brace thereto. In order to mechanically effect the movement of the spider or support 2, rack-bars 8 are suitably connected thereto at their lower ends, preferably, as shown, by pins or bolts 8^a, passed through notched portions of said ends and perforated lugs on said spider, or rather its arms, said racks or bars being engaged farther up by pinions or cog-wheels 9, carried by shafts 10. The shafts 10 are suitably journaled upon the frame 7 and intergeared, as at 11, one having a crank

10^a for their rotation by hand in effecting the movement of said spider or support 2, as aforesaid. The shafts 10 are held against turning when at rest by suitable holding or retaining pawls 10^x, mounted upon the frame 7 and adapted to engage ratchets 10^{xx} on one shaft. The bell 5 is suitably suspended from the frame 7, preferably, as shown, by means of bolts 5^a, passed through the top of said bell and passed through and nutted to said frame, respectively.

The carbid-holders or receptacles 12 are carried by the platform 3, being arranged over the openings 3^a therein, and preferably have downward-flared sides to facilitate the discharge of their contents, the carbid being dumped or discharged therefrom at their bottoms. The platform 3 is provided with a series of trap-doors 12^a, hinged or pivoted thereto at the edges of the openings 3^a therein, each, preferably by a pintle 12^b on the trap-door, engaging sockets in the ends of cleats or bars 12^c, suitably secured to said platform on its under side. The opposite edges of said trap-doors are engaged and upheld by catches 13, each preferably in the form of a pendent arm of a tripping-lever 14, having a lateral lower end projection or extension adapted to take under a trap-door. The lever 14 is pivoted to a bracket 14^a, suitably secured to the platform 3 and extending horizontally, the series of levers thus being arranged radially within the space centrally of the carbid-holders, as seen in Fig. 5. A spring 14^b is secured to the brackets 14^a and to the lever 14, respectively, to normally hold the catch 13 into forcible engagement with the trap-door.

The gasometer or gas-holder 15, having the bell 16, has connection with the gas-generator by a pipe 17 and a pipe 18, one end of said pipe 17 terminating in the gas-chamber above the water in said gasometer. The opposite end of said pipe is connected with the pipe 18, preferably by a T having a three-way cock 19, and the pipe 18 passes gas-tight through the bell 5 and also has connection with an escape-pipe 20. The pipe 20 extends both upward and downward, its downward extension having a return section or extension 20^a, extending up into the gasometer and telescoping a pipe-section 21, secured to the bell 16 of said gasometer. The pendent pipe-section 21, with its upper closed end secured in the top of the gasometer and preferably extending a short distance thereabove, depends within the bell to a point nearly on a line with the open bottom end thereof and has lateral perforations or openings 21^a there-through near its lower end. This arrangement, it will be seen, provides for the escape through said lateral openings or perforations of excess of gas-pressure upon the arrival of said openings or perforations above the water seal within the gas-chamber, which of course only takes place in event of gas-accumulation. Such excess will pass into the pipe ex-

tension 20^a and therethrough into the escape-pipe 20, thus relieving the bell of the gasometer of undue or dangerous gas-pressure.

The usual service-pipe 22, leading from the gas-chamber of the gasometer, is designed to be connected, as at 22^a, to the house supply-pipe. (Not shown.)

The gasometer supply-pipe 17 has preferably an extension 17^a, extending through the gasometer and adapted to provide for connecting therewith, as at 17^b, of a pipe (not shown) which may lead to an additional gas-holder or gas-holders for additional storage of gas, if desired, as well understood. The pipe 17^a has also an outside upward pipe extension 17^c, to which may be attached, as at 17^d, a house-supply-pipe section, (not shown,) if desired.

The several pipes 17 20 22 are provided with ordinary drip-cocks 23 to draw or drain off the water of condensation accumulating therein.

The three-way cock 19, by suitable adjustment thereof, provides for the drawing off of the gas from the generator 1 when it is desired to replenish the contents or carbid in the carbid-holders, the gas then escaping through the pipe extension 20 to the outside air, and yet the escape of gas from the gasometer will be prevented.

A shaft 24, suitably supported in a frame or support 25, properly secured in place, preferably as shown, has a screw or spirally-bladed portion 24^a, adapted to be engaged, preferably, by parallel rolls 26, hung at their ends between bracket 27^a, secured to a cross piece or bar 28, carried by the gasometer-bell 16. Said cross piece or bar has attached to its ends brackets 29, carrying rolls 29^a, said brackets embracing upright members of the frame or support 25 and said rolls engaging said members. This primarily holds the bell of the gasometer against turning or partaking of the motion or rotation of the shaft 24 and at the same time permits the bell to readily move up and down with the minimum friction.

To provide for the independent movement of the gasometer-bell and yet allow the shaft 24 to extend down thereinto and at the same time to provide a water seal to prevent escape of gas, an open-ended tube or pipe 30 is arranged within said bell to receive said shaft. The upper end of said tube or pipe is secured to the inside of the bell, at its top, around an opening therein, and depends to a point nearly on alinement with the bottom edge of said bell or below that point.

The shaft 24 has suitably connected thereto a crank-arm 31 near its upper end, connected by a pitman or rod 32 to the crank-arm 33 of a counter-shaft 34, suitably supported in position, preferably as shown or otherwise. The shaft 34 has suitably connected thereto, lower down, a second crank-arm 35, in turn connected by a rod 36 to a lever 37, adapted to actuate a serially-toothed actuating-pawl 38. This pawl is suitably pivoted or connected to the lever 37, and said lever is itself pivoted

upon a suitable casting or support 39, secured for convenience upon a water-seal tank or chamber 40, presently more fully referred to. A small supplemental open-top tank 40^a, having a suitable pipe connection 40^b with the closed water-seal tank 40, provides for readily ascertaining the height or amount of water in the latter tank. The lever-support 39 has also pivoted to it a retaining-pawl 41, and both the latter and the actuating-pawl 38, carried by the lever 37, are adapted to engage a ratchet-wheel 42. This ratchet-wheel is preferably arranged above a flanged disk 42^a of the casting or support 39 and secured to an upright shaft 43, carrying a pointer 44, suitably connected thereto. The pawls 38 and 41 are held automatically in engagement with the ratchet-wheel 42 by a spring 45. The connecting-rod 36 of crank-arm 35 is adapted to directly actuate the lever 37 through an end piece having a slot therein to provide for the independent movement therein of the lever 37 when required, as presently described, and suitably secured to said rod, preferably as shown, a pin 47 effecting the connection between said end piece and the lever 37, as shown in Fig. 9. When, however, it is desired to actuate the lever 37 by hand, the pin 47 is withdrawn or removed, disconnecting the lever from said end piece, as is required when the spirally-bladed portion of the shaft 24 is out of engagement or operative relation with the rolls 26 of the gasometer-bell-carried bar 28.

The casting or support 39 has suitably secured thereon a ring or annulus 48, preferably of inverted-T shape in cross-section. Upon the inside of the stem of the T of the ring or annulus 48 is arranged a glass or transparent plate 49, through which is visible or observable the pointer 44, carried by the shaft 43. Upon the outside of said stem of ring or annulus is arranged another ring or annulus 50, bearing numbers or indicia relating to or indicating the number of carbide-holders. As the pointer 44 is turned or revolved by the shaft 43 as it is actuated, as presently seen, the pointer will indicate by pointing to the required numeral or number on said numbered or indicia ring how many of the carbide-holders have been emptied and the number whose contents have not been used.

The water seal, comprising the chamber or tank 40, as above intimated, having an annular chamber to contain the water and a bell 40^c, arranged within said tank, secured to the shaft 43, and reaching down into said annular water-chamber, is designed to prevent the escape of the gas around the shaft 43, passing therethrough. The shaft 43 extends down into the generator and carries at its lower end a crank-arm 43^a, suitably held thereon and having a pendent pin 43^b, so disposed or adapted as to engage the tripping-levers 14, carrying the catches 13, engaging the trap-doors 12^a of the carbide-holder-supporting platform 3.

The spider or support 2 is lowered by properly actuating the shafts 10, through the crank 10^a, when it is desired to fill the carbide holders or receptacles, the generator chamber or tank 1, with the carbide-holder platform 3, all being thus removed from the bell 5 to permit access to said carbide-holders. The covers of said carbide-holders, suitably clasped or fastened in place thereon, having been removed and said holders or receptacles having been filled with the carbide, the covers are replaced and again secured. By removing the pin 47 from the part 46, holding the lever 37 fixedly to the connection-rod 36 of the crank-arm 35 of the shaft 34, said lever is actuated by hand to bring the pointer 44 in alignment or registration with the numeral "1" on the indicia or numbered ring or dial 50. The spider 2, with the generator, is now elevated to its former position by again actuating the shaft 10, thus bringing the pin 43^b into position to engage the lever 14 next to it and in the arc of its movement, when the lever 37 is actuated. By the further actuation of the lever 37 the catch 13, carried by said lever 14, will be disengaged from the trap-door 12^a, held thereby, allowing said trap-door to swing downward and the precipitating or dumping of the carbide or contents of that receptacle or holder into the water below in the generator-tank, thus initiating the generation of the gas therein. The lever 37 is again adjusted fixedly with relation to the connecting-rod 36 by the means aforesaid, thus providing for its automatic actuation through the movement of the gasometer-bell, as above pointed out, and the movement of the pawl 38 at the proper time. The gas-producing qualities of the charge of carbide from the first tank having about been fully utilized or exhausted, the spirally-bladed portion 24^a of the shaft 24 will by the consequent descent of the gasometer-bell be engaged by the rolls 26, carried by the cross-bar 28 on said bell. This will result in actuating the shaft 24, causing through the mechanism above described the actuation of the ratchet-wheel 42, operating the shaft 43, whose crank arm and pin 43^a and 43^b, respectively, will be accordingly affected. Said pin will thus be caused to engage the tripping-lever 14 next thereto and in the arc of its movement, disengaging the catch 13 of said lever from the trap-door opposite the carbide-holder No. 2, and permit the discharge of its contents or a second charge of carbide into the generator-chamber. This operation is repeated until all of the carbide-holders have been emptied, as indicated, as before noted, by the pointer 44 and dial 50. At this juncture the generator, with the carbide-holders, can be again lowered, as above described, and said holders again charged with carbide to provide for the further use of the apparatus. Such charging of the carbide-holders will equip the same for running the machine or generating gas the maximum length of service or time required.

It is to be noted that the pin 43^b of the shaft crank-arm 43^a will readily yield vertically in event of the contact or alinement therewith of any of the tripping-levers 14 and slip by the same back into position, as in returning or elevating the platform 3, with said tripping-levers, to its former or normal position after the refilling of the carbid-holders.

As disclosed by the modification shown in Fig. 8, the generator-chamber, designed more especially for large-sized machines, may have its air-space reduced by employing an airtight compartment, as 1^x.

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

1. A machine of the character described, comprising a generator having a carbid-holder, a gas-holder, a screw or spirally-bladed shaft, means carried by the bell of said gas-holder comprising rolls, adapted to engage the spirally-bladed portion of said shaft, a trap-door and mechanism controlled by said shaft and adapted to trip said trap-door and to discharge the contents of said carbid-holder, substantially as specified.

2. A machine of the character described, comprising a generator having a carbid-holder, a gas-holder, a screw or spirally-bladed shaft, rolls carried by the bell of said gas-holder, adapted to engage the spirally-bladed portion of said shaft, a trap-door, mechanism controlled by said shaft, and a tripping-lever having a catch adapted to engage said trap-door and adapted to be tripped by said mechanism, substantially as set forth.

3. A machine of the character described, comprising a generator, a platform therein carrying a carbid-holder, a gas-holder, a lever having a catch, a trap-door for the carbid-holder adapted to be engaged by said catch, a spirally-bladed shaft operated by the gas-holder by means of parallel rolls hung between brackets carried by the bell of said gas-holder, mechanism comprising a ratchet-wheel and pawl actuated shaft adapted to engage said lever to operate the catch, an intermediate shaft, means connecting said ratchet-wheel and pawl actuated shaft to said intermediate shaft, and means connecting the last-named shaft to said spirally-bladed shaft, substantially as set forth.

4. A machine of the character described, comprising a generator having a carbid-holder, a gas-holder, a trap-door below the carbid-holder, a spirally-bladed shaft rolls adapted to engage said shaft carried by the "bell" of said gas-holder, and mechanism comprising a counter-shaft having crank-arm and pitman connection with a crank-arm upon the first-named shaft, a ratchet-wheel and pawl actuated shaft connected up with said counter-shaft and a tripping-lever adapted to be actuated by said pawl and ratchet-wheel actuated shaft and to disengage said trap-door to drop the contents of said carbid-holder, substantially as set forth.

5. A machine of the character described, comprising a sliding support or spider for the generator, having at its angles upright racks, intergeared shafts gearing with said racks and arranged at an angle one to the other, and a common actuating handle or crank for said shafts, substantially as set forth.

6. A machine of the character described, comprising a gas-generator consisting of a water-sealed tank, with a "bell" depending in said tank, a support for said bell independent of said tank, a spider or support for said tank, the legs of said "bell-support" passing through openings in the arms of said spider, and means for effecting the raising and lowering of said tank, substantially as described.

7. A machine of the character described, comprising a generator having a carbid-holder, a gasometer, a trap-door below the carbid-holder, a shaft actuated by the bell of said gasometer, a lever connected up with said shaft by a connecting-rod and a counter-shaft having crank-arm and pitman connection with a crank-arm upon the first-named shaft, a ratchet-wheel actuated by a pawl carried by said lever, a shaft actuated by said ratchet-wheel and a tripping-lever engaged by a pin carried by a crank-arm of said shaft, said tripping-lever having a pendant arm adapted as a catch to engage said trap-door, substantially as set forth.

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

D. H. MCPHERSON.

Witnesses:

SCOTT W. SKINNER,
F. A. MCPHERSON.