

(No Model.)

6 Sheets—Sheet 1.

T. E. ENJALBERT.  
APPARATUS FOR AUTOMATIC PHOTOGRAPHY.

No. 436,627.

Patented Sept. 16, 1890.

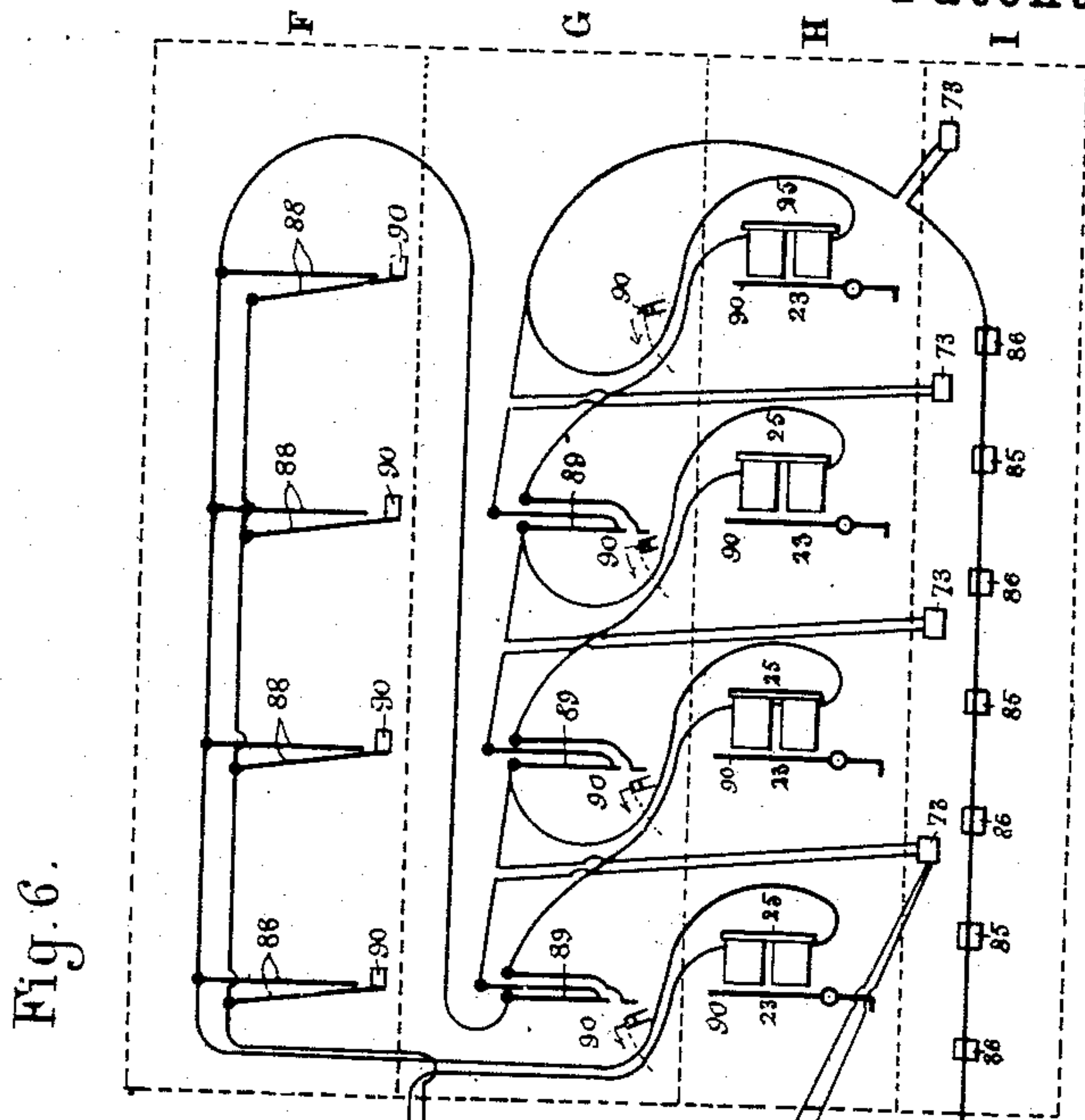


Fig. 8.

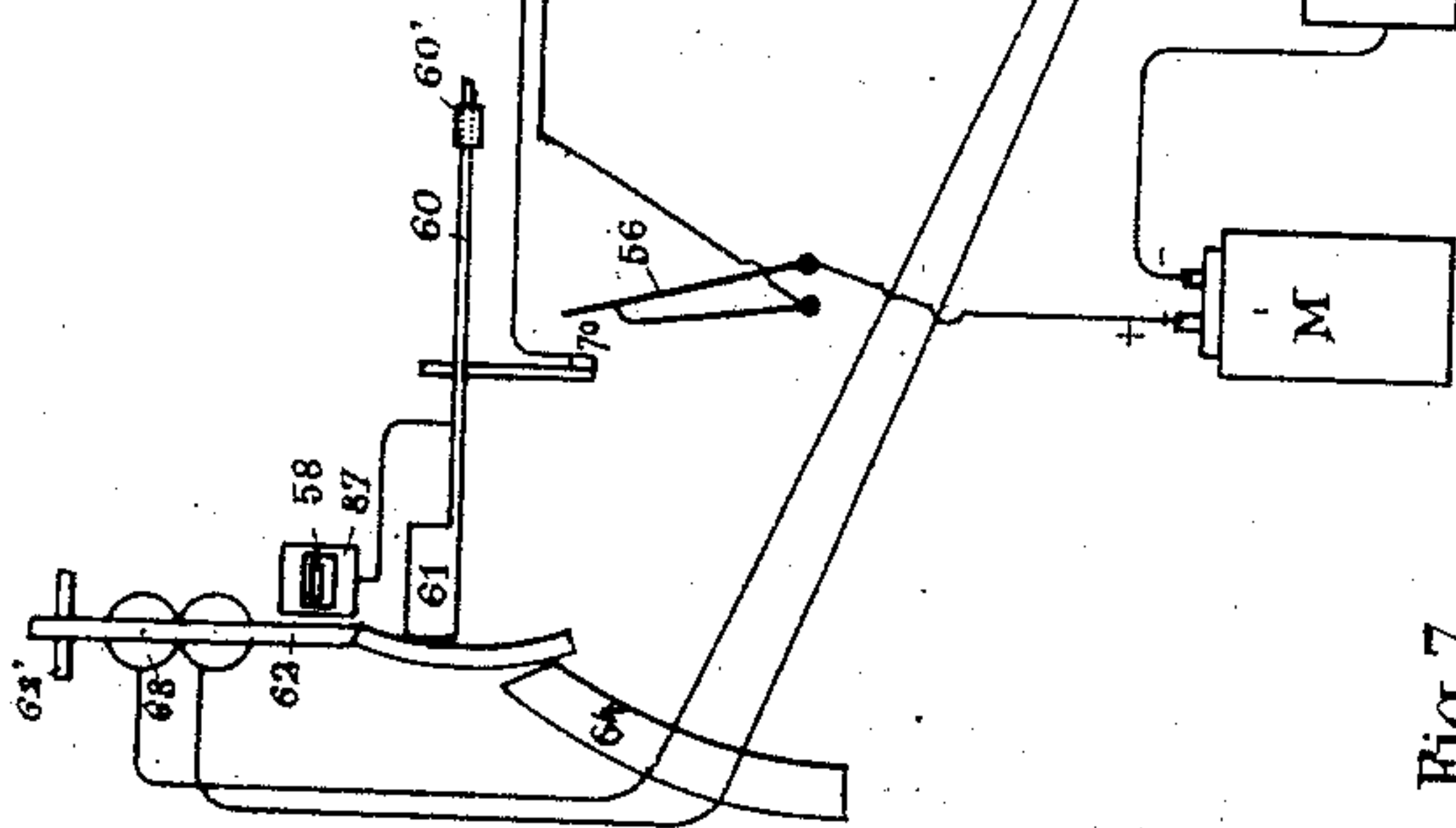
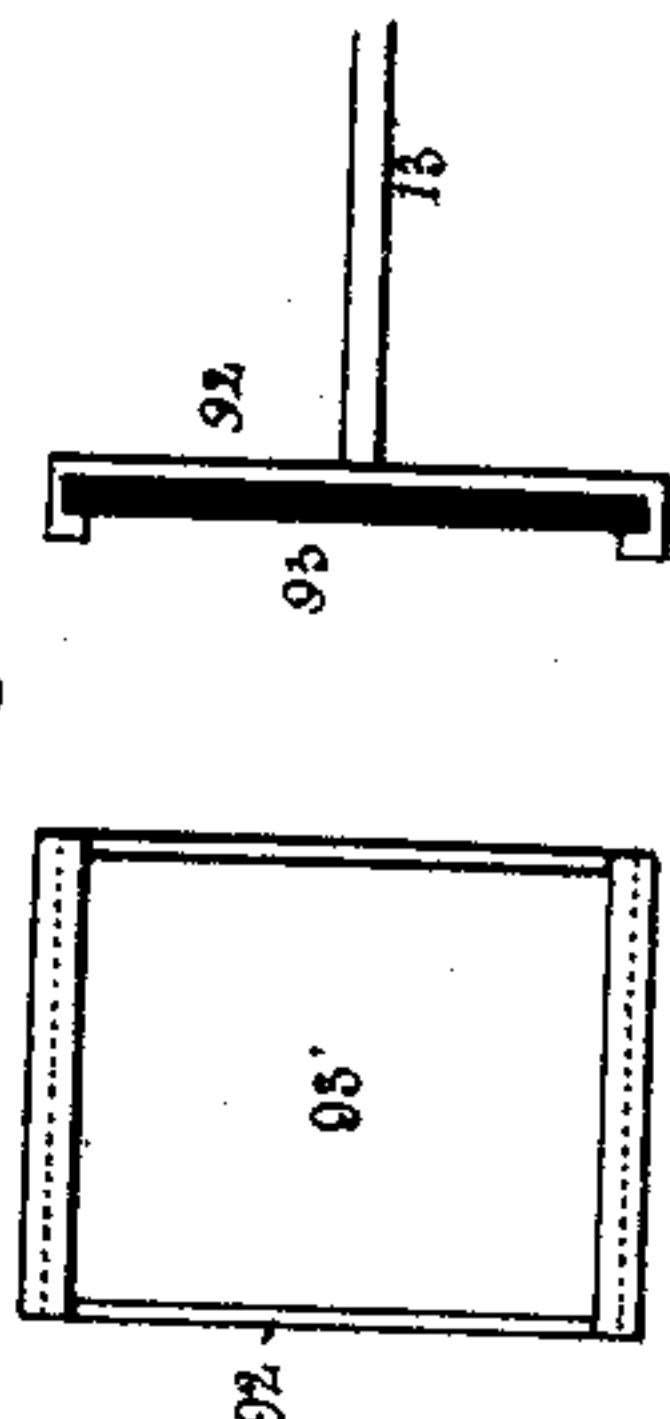


Fig. 7.

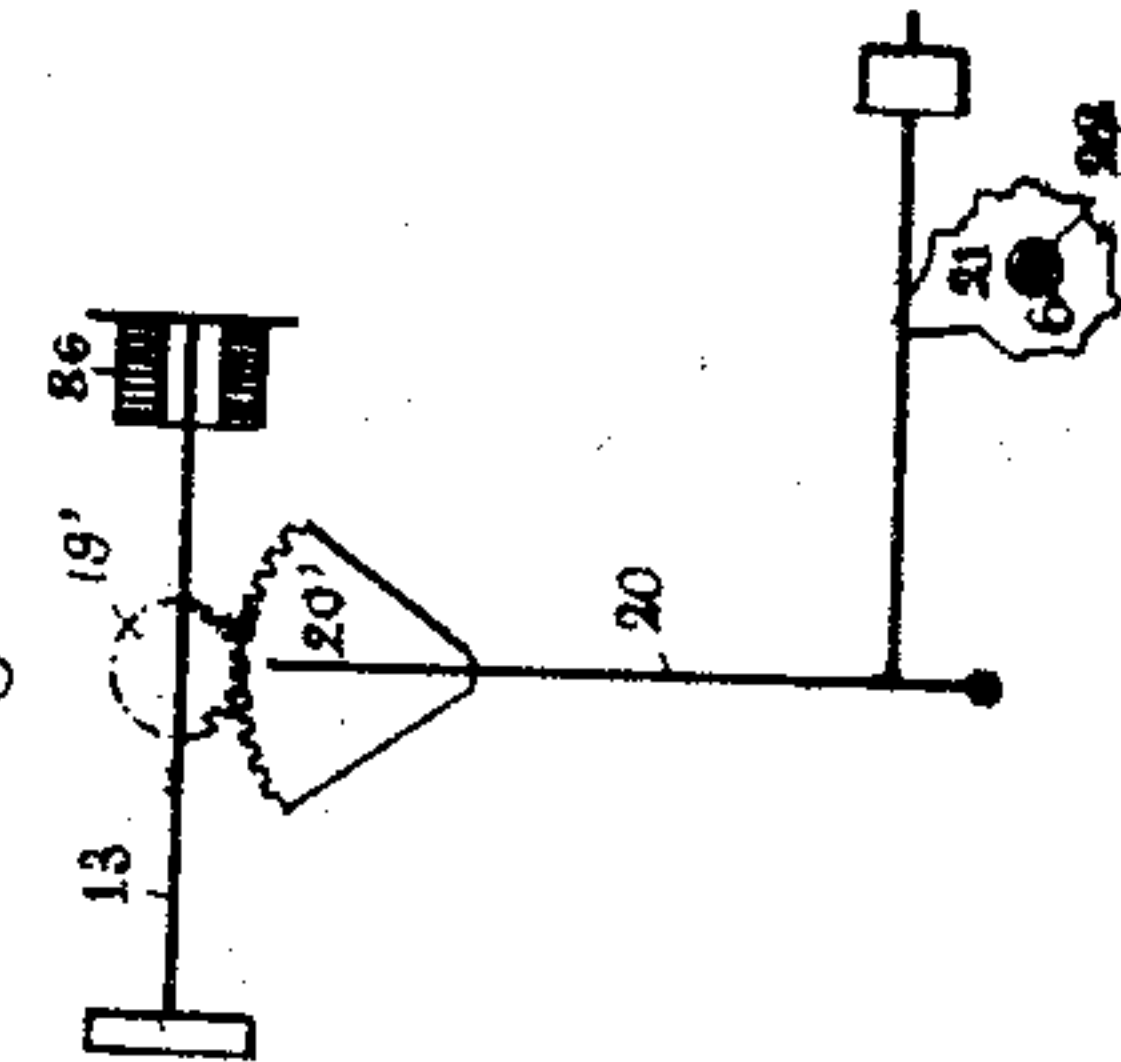
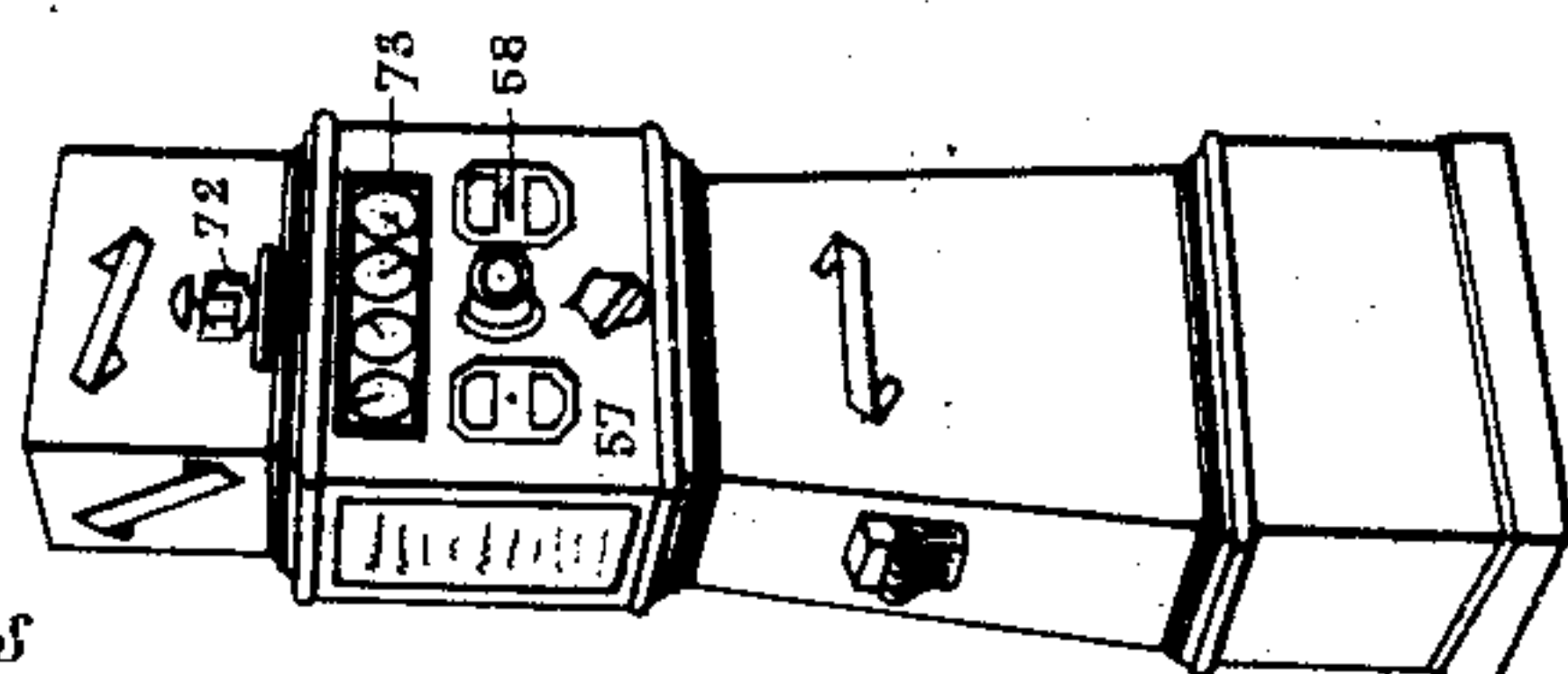


Fig. 1.



Witnesses

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by  
Charles H. Clemens

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(No Model.)

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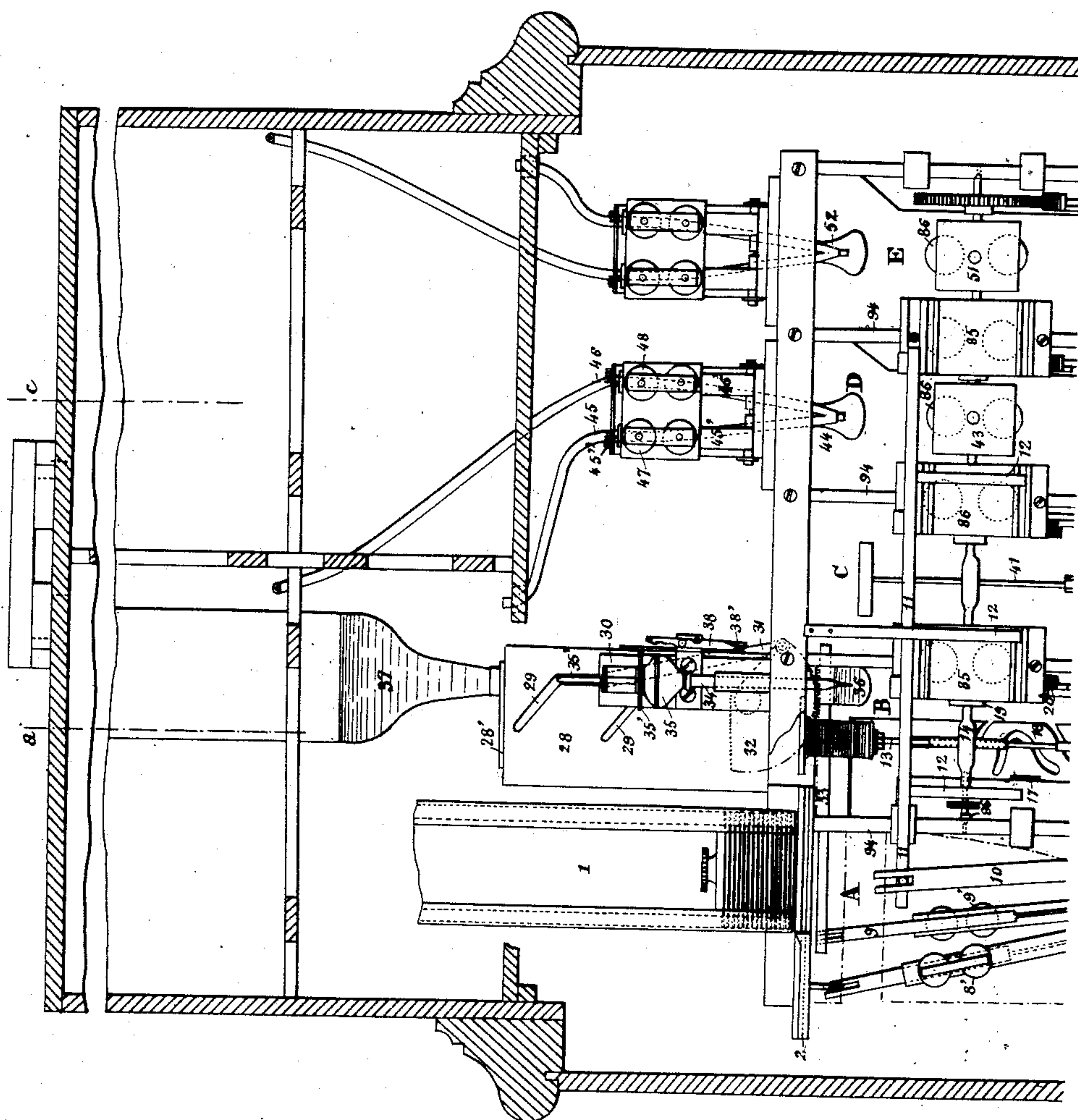
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Fig. 2.



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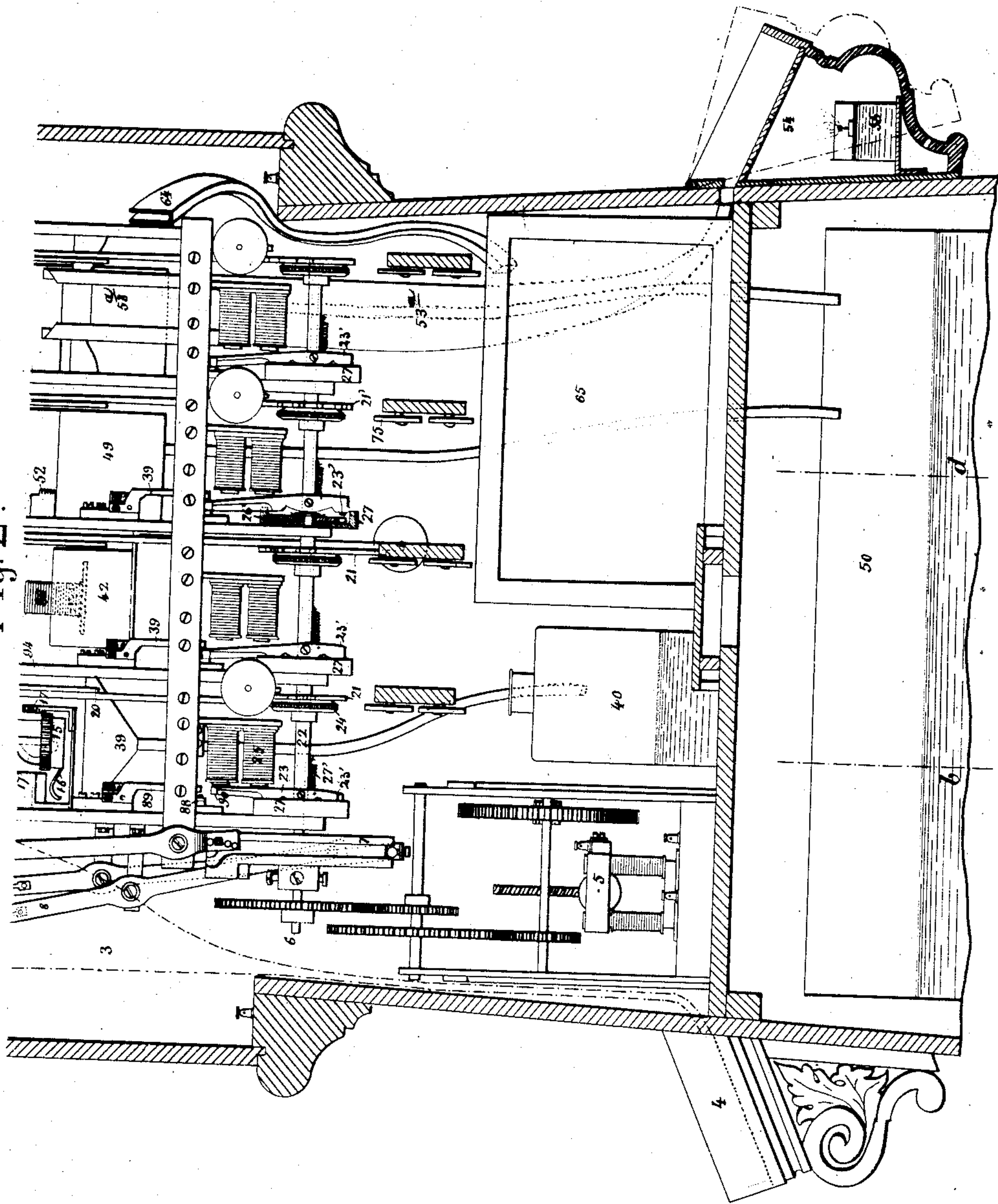
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Fig. 2<sup>b</sup>.



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6 Sheets—Sheet 4.

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Fig. 4.

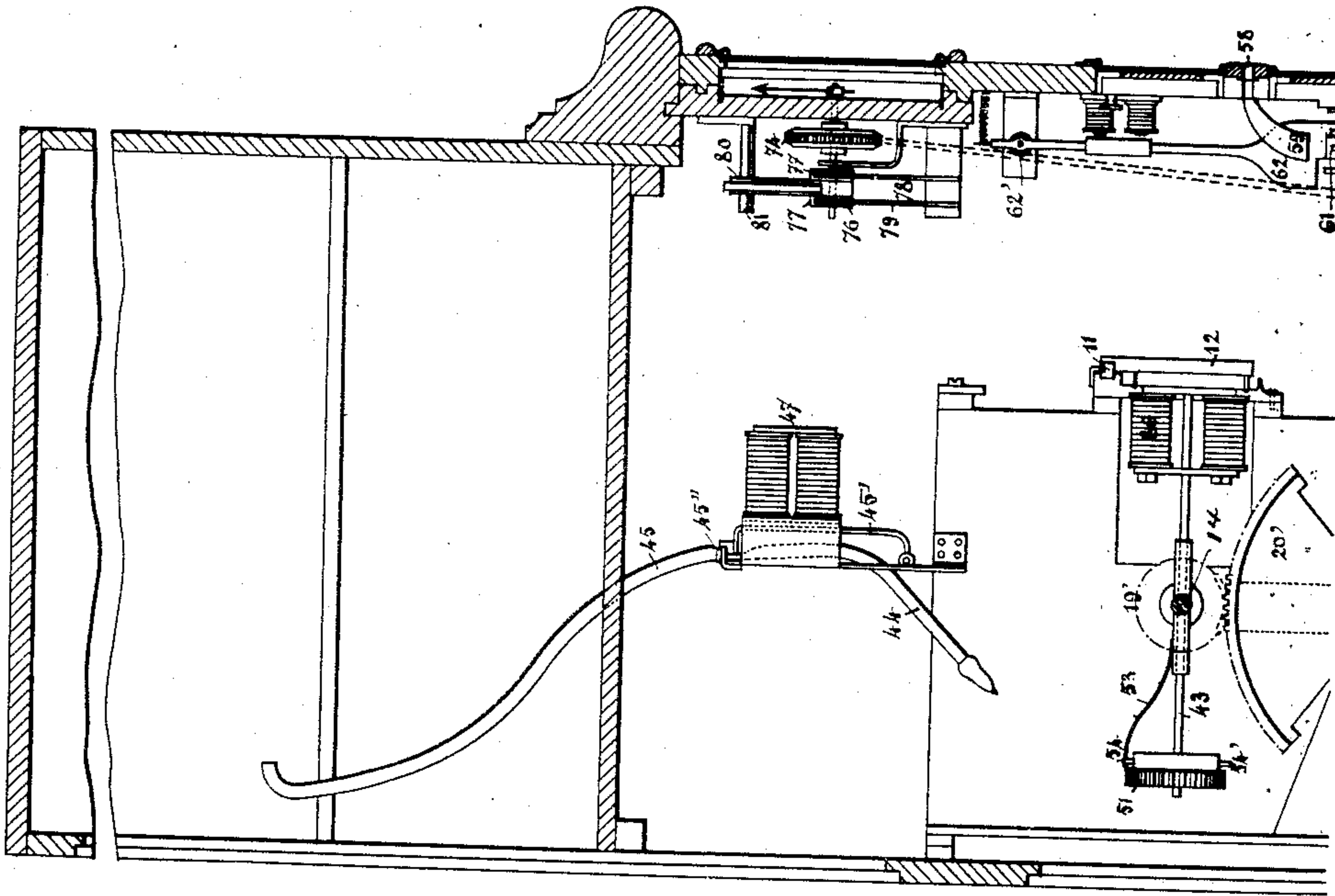
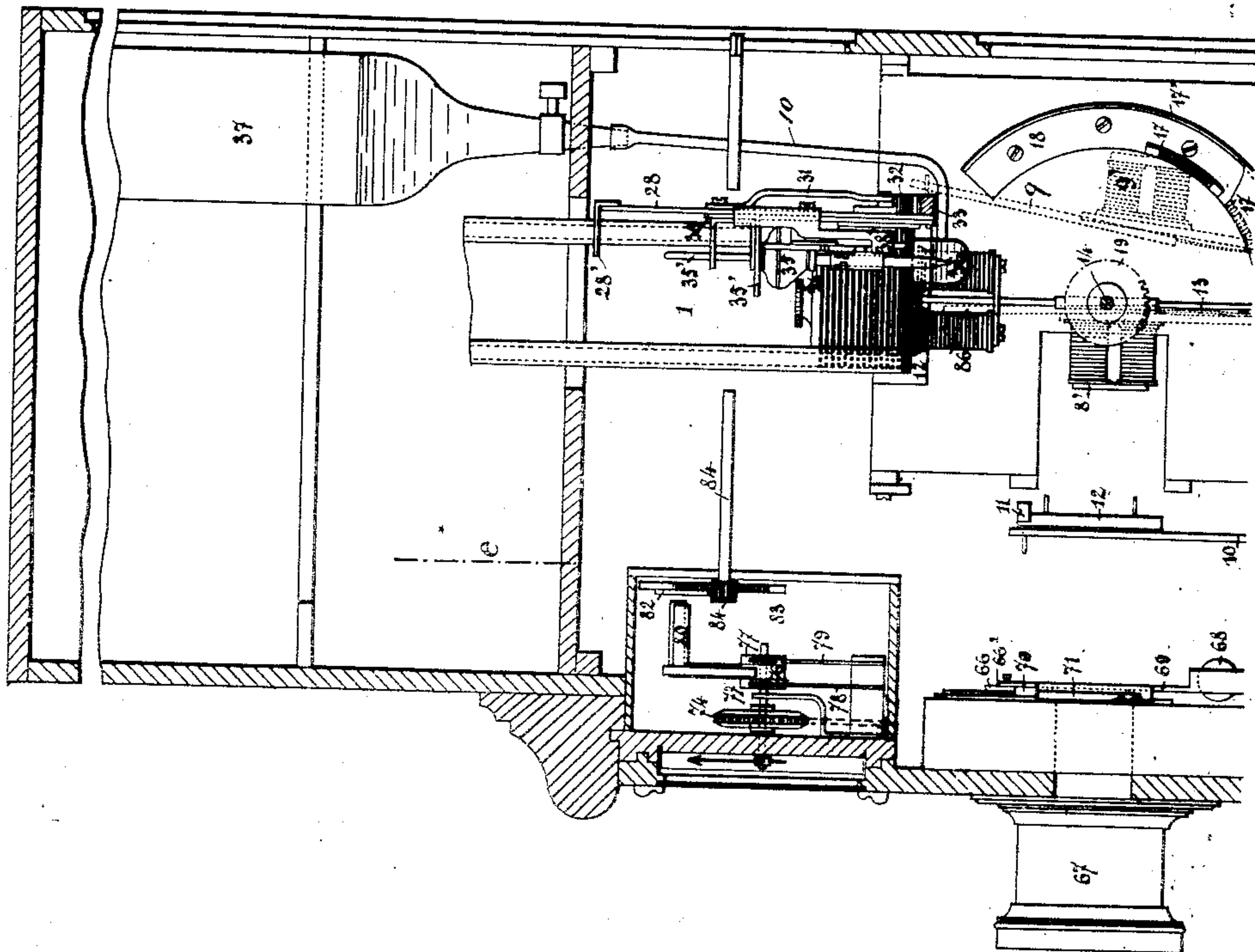


Fig. 3.



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Fig. 4.

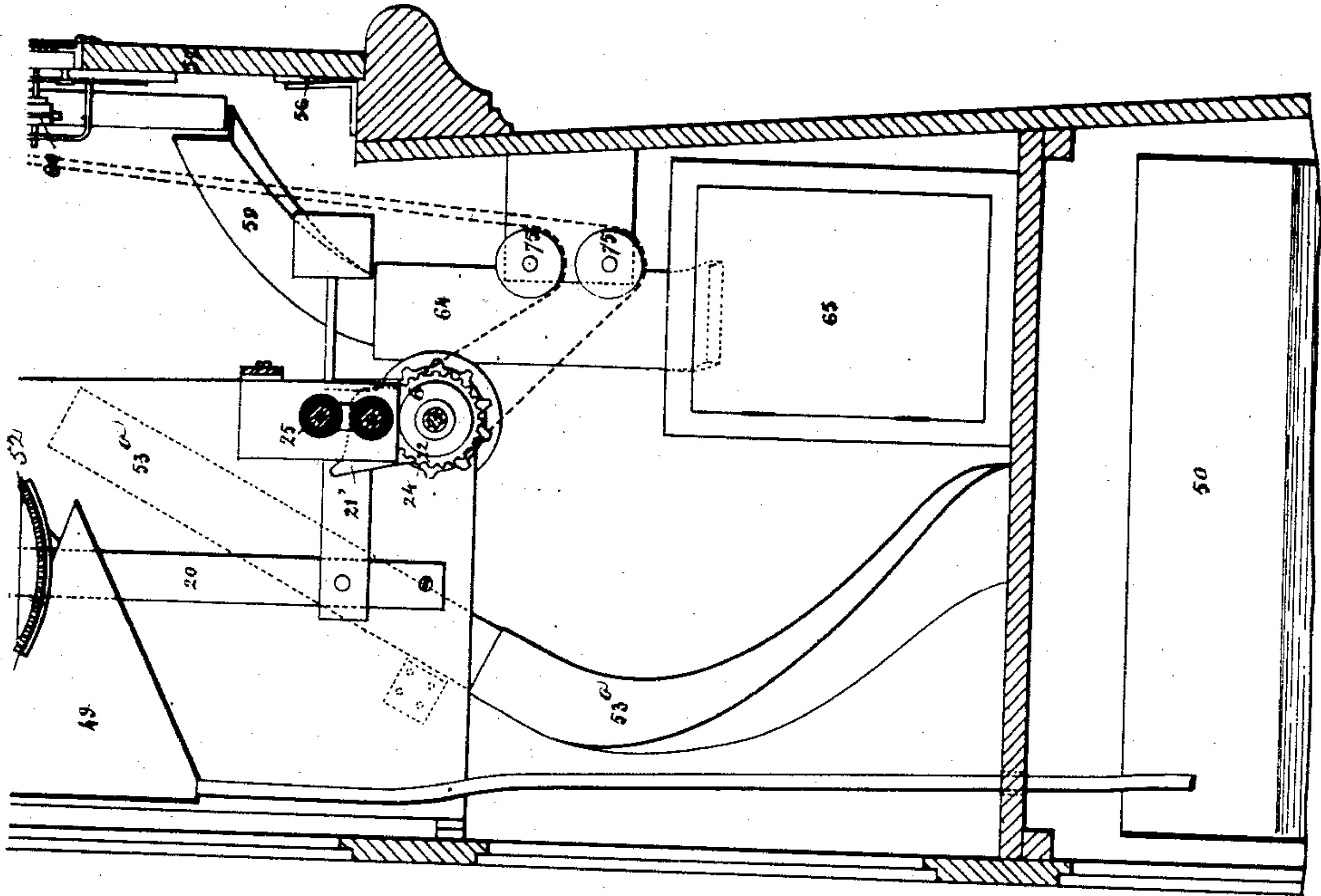
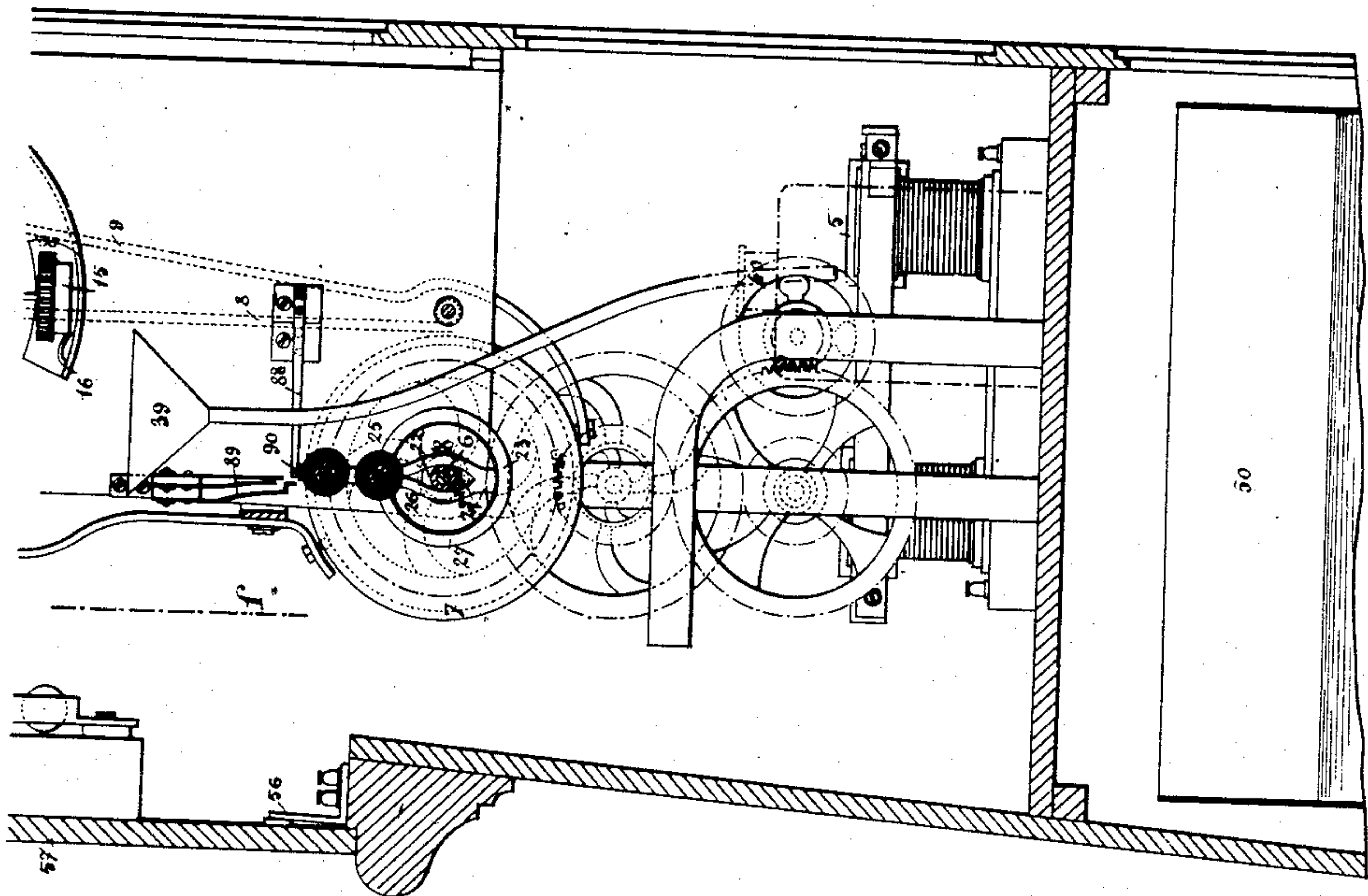


Fig. 3.



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(No Model.)

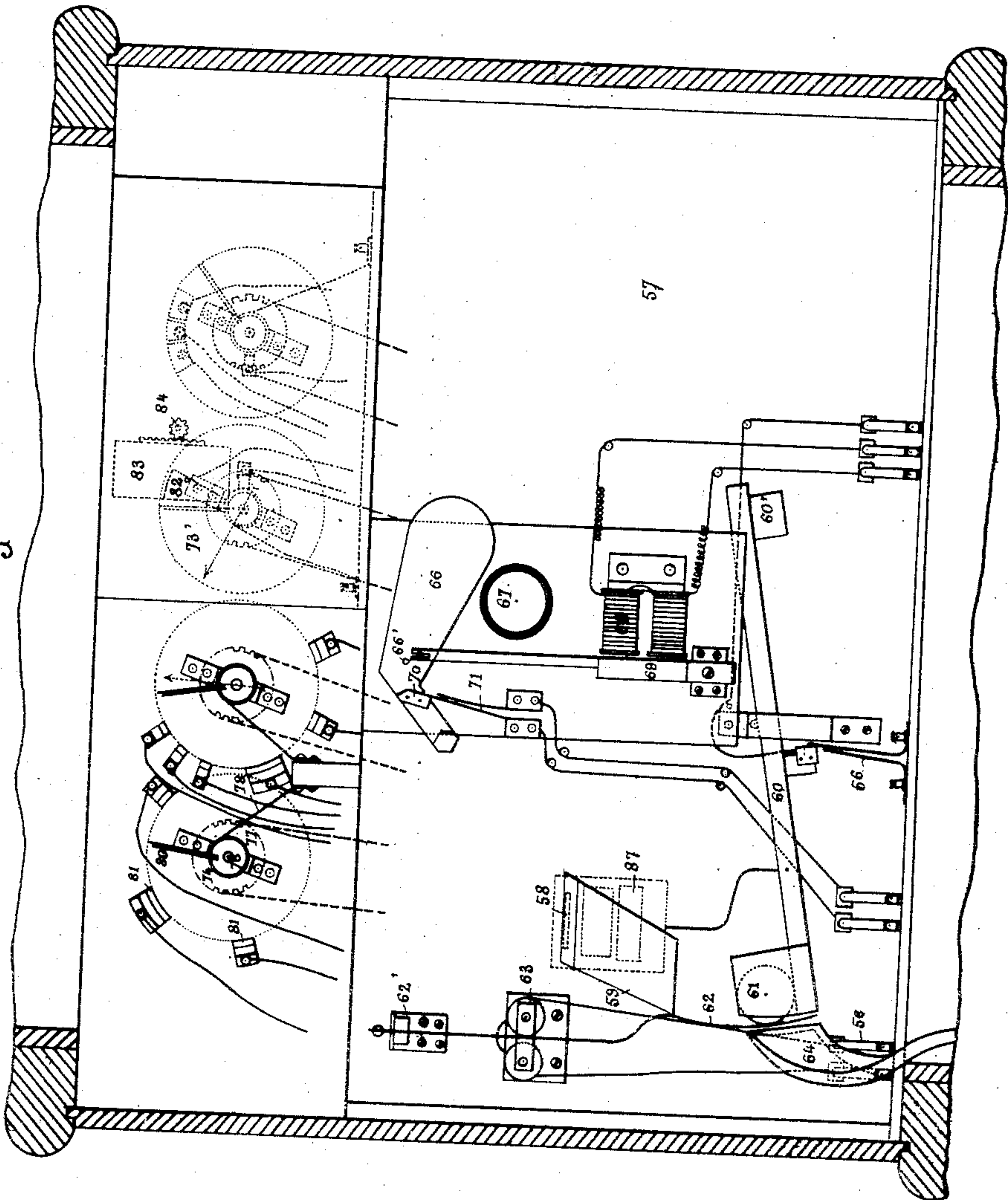
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Fig. 5.



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# UNITED STATES PATENT OFFICE.

THEOPHILE ERNEST ENJALBERT, OF PARIS, FRANCE.

## APPARATUS FOR AUTOMATIC PHOTOGRAPHY.

SPECIFICATION forming part of Letters Patent No. 436,627, dated September 16, 1890.

Application filed October 1, 1889. Serial No. 325,702. (No model.) Patented in France March 4, 1889, No. 196,451; in England August 6, 1889, No. 12,450, and in Belgium August 31, 1889, No. 87,582.

*To all whom it may concern:*

Be it known that I, THEOPHILE ERNEST ENJALBERT, a citizen of the Republic of France, residing at Paris, in France, have invented a  
5 certain new and useful Apparatus for Automatic Photography, (for which I have obtained Letters Patent in France, No. 196,451, dated March 4, 1889; in England provisional specification bearing date August 6, 1889, No.  
10 12,450, and in Belgium bearing date August 31, 1889, No. 87,582,) of which the following is a specification.

The present invention relates to a photographic apparatus by means of which a person by simply introducing a piece of money  
15 can automatically obtain his photograph, which will be produced by the process called "ferro-typography" with damp collodion.

In the accompanying drawings, Figure 1 is  
20 a perspective view of the apparatus; Figs. 2 and 2<sup>b</sup>, a front elevation of the mechanism with the front casing of the apparatus removed. Figs. 3 and 3<sup>b</sup> are sections through *a b* of Figs. 2 and 2<sup>b</sup>. Figs. 4 and 4<sup>b</sup> are sections through *c d* of Figs. 2 and 2<sup>b</sup>. Fig. 5 is  
25 a rear elevation of the front partition of the apparatus, or, in other words, a section through *e f* of Figs. 3 and 3<sup>b</sup>. Fig. 6 shows the arrangement of the electric contacts and currents which work the apparatus and the dis-  
30 engaging or releasing mechanism operated by means of the piece of money. Fig. 7 is a side elevation on a reduced scale of one of the sector-levers which work the movable sup-  
35 ports by means of a cam. Fig. 8 shows in front and side elevation a head of one of the fixed or movable supports as they should be made when glass plates are used.

This system comprises a photographic ap-  
40 paratus which is operated by electricity generated in any suitable battery and a seat placed at a certain distance from the camera for the person who is to be photographed, Fig. 1.

45 All the mechanism is inclosed in a case, the base of which contains the electric battery or it may be accumulators of any suitable construction. This mechanism, the different parts of which are represented in detail in  
50 Figs. 2, 2<sup>b</sup>, 3, 3<sup>b</sup>, 4, 4<sup>b</sup>, 5, 7, and 8, is divided

into five compartments A B C D E, separated from one another by vertical partitions 94, Figs. 2 and 2<sup>b</sup>.

The compartment A contains the guide 1, composed of four vertical standards, and in  
55 which the rectangular plates of polished sheet-iron are introduced, separated from each other by small copper frames placed with reference to the plates crosswise and in such a manner that when a plate from the guide 1 is  
60 moved along by the driver 2 and when that driver has come back again the frame, not being supported any longer, falls into a chute 3, (dotted lines, Figs. 2 and 2<sup>b</sup>), which leads it  
65 outside the apparatus to the bracket 4. This frame will serve to mount the finished proof. At the base of the compartment A is a little electric motor 5, worked by the general cur-  
70 rent, and which by means of suitable gearing causes the horizontal arbor 6 to rotate, which shaft transmits motion to all the operating mechanism. On this shaft 6 is secured a  
75 grooved cam 7, which works the three oscillating levers 8, 9, and 10, the levers 8 and 9 having each at their upper end a little fork  
80 which swings in a plane perpendicular to theirs by means of electro-magnets 8' and 9', fixed on each of these levers. The lever 8 serves to work the driver 2 at the desired moment, and the object of the lever 9 is to work  
85 the system of collodion. The lever 10 governs the slide 11, of which the rods 12 serve to make the plates pass from one cell to another.

In the compartment B is effected the treat-  
85 ment with collodion of the plate which has fixed itself on the poles of the electro-magnet 86 of the support 13 by the help of the driver 2. This support 13 crosses a beam or shaft,  
90 which is incorporated with the horizontal axle 14, which revolves on center points, of which one—viz., that marked 95—can be taken to pieces, in order to take away the movable support, in such a way that this support can  
95 not only oscillate in a vertical plane, but likewise turn in the two directions according to the axis of its rod. This rotary movement on its rod is communicated to the support 13 by a pinion 15, which is at its base and is provided with fingers 16. During the rocking  
100



movement round the axis 14 the pinion 15 encounters the fixed toothed racks 17 and the fingers 16, which penetrate into the helicoidal grooves 17' of a sheet-iron guide 18. The toothed racks and the guide cause the support to revolve on itself while oscillating on its axis 14. On this latter a pinion 19 is fixed and is operated by a sector-lever 20', which the cam 21, Figs. 2, 2<sup>b</sup>, 5, and 7, causes to oscillate. This cam is fixed on the shaft 22, which allows the shaft 6 to revolve freely or is drawn along by it should such be the case. On this shaft 22 the levers 23 and the toothed wheel 24, which is held close against the cup 27 by the spring 27', are likewise fixed. When the electro-magnet 25 attracts the gear-lever 23, the lower end 23' of this lever engages with the disk 26 of the shaft 6, Fig. 2<sup>b</sup>, and in consequence of which the shaft turns. The cup 27, in which the disk 26 is lodged, has a notch on its upper part in which the lever 23 fits when the beam is to be at rest.

The system for treating with collodion comprises a fixed supporting-plate 28, having two grooves 29, partly inclined and partly vertical. This plate has a rectangular bend 28'. On the face of this fixed plate 28 a movable plate 30 slides, which, guided by the grooves 29, moves vertically and obliquely by means of a rod 31, jointed to a sector 32, which is worked by the toothed bar 33 when it is driven by the lever 9. The movable plate carries a drop-measure 34, provided with an india-rubber bottle 35, surmounted by a piston and a rod 35'. This drop-measure plunges into the basin 36, attached to the bottle of collodion 37 by an india-rubber tube 10, which brings the collodion to a uniform height, as in intermittent fountains. The basin 36 is covered with an india-rubber membrane pierced in the center, which only allows the point of the drop-measure to penetrate, and thus prevents any evaporation. The movable plate 30 carries on its side a hook 38, which, as is herein-after explained, serves to arrest the piston 35' after the squeezing of the india-rubber bottle. The catch 38', screwed on the fixed plate 28, serves to disengage the hook 38 at the desired moment. Beneath the support 13 is a funnel 39, which receives the overflow of the collodion and permits it to flow into the bottle 40.

The compartment C serves for washing silver and for the impression of the image. The support 41 is consequently in the axis of the lens. This support 41 receives the plate which has collodion on it by one of the clutches 12, and rocking by the same process as the support 13, but without revolving on its rod, plunges the plate in the silver bath 42 and rises up afterward in order to present this plate to the lens.

The compartment D or 12 serves for developing the image. The support 43 operates like the support 13 by means of the pinion 19' of the sector 20' and of the cam 21', Figs. 4 and 4<sup>b</sup>. This support revolves by means of its pinion 51 and of the toothed rack 52.

When it does not revolve, it is guided and held by the spring 53 and the two buttons 54 and 54', which fit into a notch of the spring. This same support receives the plate by a clutch 12, rises again, and brings it under the cock 44, which terminates at its base with a flattened tip or nozzle. The liquids are conducted by the india-rubber tubes 45 and 46, which become flattened by the jointed levers 45' and 46', driven by a spring 45''. When the electro-magnets 47 and 48 act, the jointed levers are attracted and the liquid flows from the flattened nozzle, which is common to both of them. These liquids having been used flow into a funnel 49 and are conducted into a receiver 50.

The compartment E serves for the fixing and for polishing. Its support 51 receives the plate from the clutch 12 and carries it under the liquids coming out of the cock 52, identical with the cock 44. The operation ended, the lever bends, always by means of a lever-sector and a cam, and the lower edge of the printed plate fastens itself on the edge of the conduit-pipe 53<sup>a</sup>, which leads it to the bracket 54, furnished with a lamp 55.

Having thus described the five compartments which contain the principal portions of the mechanism, the description of the back part of the front of the apparatus—i. e., the casing which supports the object-glass or lens, Fig. 5,—will next be proceeded with. All the operating parts fixed on this partition are moved by the general electric current by means of contacts 56, which allow the partition 57, which carries the object-glass and its accessories, to be removed without detaching any wire. This partition 57 has a slit 58 therein, Figs. 1 and 5, through which a piece of money is introduced into the passage 59. Underneath this passage is an oscillating or rocking lever 60 which has a cup 61, in which the piece of money falls edgewise in order to cause the said lever to rock. The piece of money is prevented from falling by the diaphragm 62, which is jointed to 62', and which the electro-magnet 63 displaces at the desired moment in order to expose or uncover the edge of the cup 61 to enable the money to fall into the passage 64, and thence into the box 65.

The obturator or shutter 66, placed behind the object-glass or lens 67, is composed of sheet-iron, pivoted at 66', and worked by an electro-magnet 68 by help of the armature 69, which forms a lever. When the current passes through the electro-magnet 68, the lever 69 is attracted and raises the obturator, which falls again by its own weight and closes the object-glass as soon as the current is interrupted. When the obturator is opened, it puts in contact the blades 71 by its arm or projection 70, which puts the bell 72, Fig. 1, in motion, which bell is in action throughout the sitting.

Above the partition 57 are four dials, each having an indicator-needle. The four needles indicate outwardly the operations which



are effected in the interior, as well as the movement of the sitting. The axes of these needles bear toothed wheels 74, governed by the wheels 24, Figs. 2 and 2<sup>b</sup>, by chains which pass through the return-pulley 75, Figs. 2, 2<sup>b</sup>, 4, 4<sup>b</sup>, and 5.

Upon each of the axes of the needles is fixed an insulating-block 76, which has two metal rings 77. The current arrives by the contact 78 to return by the contact 79 in consequence of the junction of the contacts 80. When revolving these contacts 80 encounter the terminals 81, which separate them, and which receive the current in order to send it to the different electro-magnets of the apparatus.

The dial 73' is especially destined for the sitting. It has a movable contact 82, which is of a conical or taper form, fixed on a bracket 83, which is raised or lowered at will by the pinion and rack 84. It is evident that the more the contact 82 is raised the shorter will be the time that it is likely to be free from the needle, and therefore so much less time will the sitting last.

On referring to Fig. 6, it will be seen that the current of electricity is supplied to the apparatus by a generator M.

As has been explained above, the releasing mechanism consists of an oscillating lever 60, on one end of which is the cup 61, for receiving the coin, and which is counter-balanced by the weight 60'. This lever bears a plate, on the face of which are written, one above the other, the words "Shut" and "Open," which are seen from the outside through an opening in the front partition. When the lever is lowered the word "Shut" is seen, and the plate 87 at the same time closes the slit for introducing the piece of money. The lever 60 is crossed by a vertical contact attached to a wire. The lever when swinging separates the two contacts 56 and takes the electric current in order to direct it to the first wire coil 25. The motor 5 receives the return-current, and the wire that leads from it proceeds straight to the battery, if a motor other than electric is used. It is evident that the current does not pass through the electro-magnets 85 and 86 if they are replaced by ordinary ones.

The portion of Fig. 6 surrounded by a dotted line represents the entire arrangement of mechanism for working the apparatus. This mechanism is divided into four longitudinal divisions, the letters and numbers corresponding with those of the other figures. The first division F represents a plan of the double contacts. The second division G shows the triple contacts 89 turned off on the horizontal plan. The heads 90 of the levers 23 are of insulating material and move in the direction of the arrow. The third division H shows a front elevation and full view of the levers 23 and of the electro-magnets 25. The fourth division I represents the commutators 73 and the electro-magnets 85 and 86 of the movable

and fixed supports. The whole of Fig. 6 represents the apparatus at rest. The apparatus is completed by an arm-chair 91, Fig. 1, which chair is surmounted by a screen, and the seat of which is inclined to permit persons of all figures to sit comfortably and to lean their heads against the head-rest fixed in the center of the screen.

The operation of the before-described apparatus is as follows: The person wishing to be photographed begins by introducing a piece of money into the slit 58, Fig. 1. This falls through the passage into the cup 61 and by its weight causes the adjacent end of the lever 60 to descend, and thereby cause the plate 87 to shut up the opening 58 and show that the box is closed. The lever 60, by being thus operated, separates the two contacts 56 and communicates with and leads the current into the first electro-magnet 25. This latter attracts the lever 23 at the same time as it puts in motion the motor 5. The lever 23, being attracted by the electro-magnet 25, causes the two contacts 88 to communicate and fixes the first sleeve or clutch 22 on the middle shaft and revolves with it. The first sector-lever 20, drawn along by its cam 21, leads the head of the movable support 13 against the plate-guide or reservoir 1. At this moment the first contact, which is behind the first dial 73, sends the current into the electro-magnet 8' and acts on the forked head of the lever 8, which is just about to catch hold of the hook of the driver 2. The stopper of the cam 7, fixed on the shaft 6, encounters the foot of the lever 8, which pushes away, by help of the driver 2, the first or lowermost plate onto the head of the movable support 13, where it is retained by the electro-magnet 86. The lever 8 returns to its place and uncovers the lower end of the receiver 1, and thus permits the frame, which is no longer supported, to fall into the passage 3, and consequently on the bracket 4. The second contact which is produced in the first dial sends the current into the electro-magnet 63, which attracts the diaphragm 62, which, after disclosing the edge of the cup 61, causes the piece of money to fall into the box 65. The lever 60 returns then to its first position. The third contact of the same dial sends the current to the electro-magnet 9', which acts on the forked head of the lever 9. This fork engages with the rack-bar 33, which raises the drop-measure 34 by the sector 32 and rod 31, and the drop-measure rises vertically from the basin 36, and afterward, guided obliquely by the grooves 29, arrives over the plate. The rod of the piston 35', encountering the horizontal plate 28', causes this piston to press on the india-rubber bottle 35, and thus to cause the collodion to fall from the tip of the drop-measure on the plate. At this moment the hook 38 engages the edge of the piston and keeps it in its place. The lever 9 in returning causes the system to descend again, and when the tip of the drop-



measure is plunged into the collodion the end of the hook 38 encounters a catch 38', which disengages it, and the india-rubber bottle 35, resuming its proper shape, sucks in a fresh charge of collodion. The collodion having fallen on the upper surface of the plate, the cam 21 engages the sector-lever 20 and causes the support 13 to move in such a way as to spread the collodion all over the surface of the plate and to discharge the overflow into the funnel 39. In consequence of the oscillating movement produced by the cam 21 the support 13 rocks several times and by its rotary movement levels while drying the layer of collodion. The support 13 thereupon takes a horizontal position. The cam 7 then engages the lever 10, which drives the rod 11 in such a manner that the first clutch 12 causes the plate to slide from the movable support 13 to the movable support 41 in passing by the fixed support 85. The lever 23 breaks the first current by separating the contacts 89 and sends this current into the second electro-magnet 25, which disengages its lever 23, Fig. 6. The first lever 23 then disengages itself. The plate being on the movable support 41, this latter is plunged into a bath of silver 42 by means of the second cam 21 and a sector-lever. This cam having several bosses or projections, the head of the support is moved in the bath several times. The same cam causes the support to be raised up again horizontally, which presents behind the object-glass or lens the plate that has now become sensitive. The person about to be photographed, warned by the needle of the second dial, which points to the words "Be ready, attention," places himself in the chair and does not stir all the while that the needle is passing under the word "Sitting." At this moment the commutator of the second dial sends a more or less prolonged current into the electro-magnet 68, Fig. 5, which actuates the obturator 66 and sets in motion the bell 72. This obturator having fallen again in consequence of the current ceasing, the cam 7 actuates the lever 10, the rod or triangle 11, and the clutches 12 in such a manner that the plate passes from the support 41 to support 43 in passing by the fixed intermediate support 85, and the third lever 23 disengages itself like the preceding one, in order to yoke the third beam 22 onto the middle shaft. In the latter two compartments D and E the movements are the same as those of the preceding. The movable supports bring the plates under the cocks or jets 44 and 52. The electro-magnets 47 attract the levers 45', in order to allow the liquids to flow at the right moment and for the necessary time onto the plates. In the last place the movable support 51 fastens the lower edge of the plate to the upper edge of the waste-pipe 53', so as to completely detach the plate, which falls into the said conduit-pipe in order to reach the bracket 54, where it is dried by

the lamp 55. The movable support 51 returns to its place and the lever 23 separates the two contacts 88, which, by interrupting all communication, causes the apparatus to stop. In consequence of these combinations the different compartments, being independent of one another, can work simultaneously, so that the proofs can follow without interruption. The electro-magnets of the movable supports 86 and of the fixed supports 85 can be replaced by ordinary magnets which will fulfill their functions.

This apparatus can serve equally well for all photographic processes. The heads of the electro-magnets of the fixed and movable supports where metal plates are not used are replaced by the small tables 92, furnished with grooves, in which slide or rest still the glass plates 93, Fig. 8.

I claim—

1. In an automatic photographic apparatus, the means for releasing the mechanism by a coin, consisting of a rocking lever carrying on its ends a cup, the outer edge of which is closed by a diaphragm on a lever, which, being displaced at the desired moment by an electro-magnet, causes the coin to fall in the passage of a box, this rocking lever having besides a plate which conceals or discloses the slot through which the coins are introduced, substantially as herein described.

2. In an automatic photographic apparatus such as described, the combination, with the casing and a series of oscillating supports adapted to receive the plates in succession, of a motor and a drive-shaft in gear therewith having a series of cams for operating the oscillating carriers and a driver for moving the plates along, substantially as described.

3. In an automatic photographic apparatus such as described, the combination, with the casing and a series of oscillating supports adapted to receive the plates in succession and a driver having a series of arms corresponding to the supports, of an electric motor, a drive-shaft in gear therewith, a cam on said shaft for moving the plate-driver, and a series of cams also on said shaft for oscillating the supports independently, substantially as described.

4. In a photographic apparatus such as described, the combination, with a series of rotary oscillating supports having electro-magnets on one of their extremities for retaining the plate and a toothed pinion on the opposite end, of a drive-shaft having a series of cams thereon engaging the supports to oscillate them and fixed rack-bars gearing with the pinions to rotate the supports, substantially as described.

5. In an automatic photographic apparatus such as described, the combination, with a rotary and oscillating support for the plates and a toothed pinion and guide-finger secured thereto at one end, of a drive-shaft having a cam for oscillating said support, a fixed rack



gearing with the pinion, and a fixed cam with which the finger engages, substantially as and for the purpose specified.

6. In an automatic photographic apparatus such as described, the combination, with a receiver for the superposed plates and frames, a series of movable supports for receiving and manipulating the plates in succession, and reservoirs for the sensitizing and developing material in proximity to said supports, of a drive-shaft having cams thereon for operating the supports to bring the plates into position to receive the sensitizing and developing material, a feeder for moving the plates from one support to the other in succession, a pusher for moving the bottom plate of the column onto the first support, and a cam on the drive-shaft having a sinuous surface for operating said feeder and pusher, substantially as described.

7. In an automatic photographic apparatus such as described, the combination, with the series of movable supports for the plates, a feeder for moving the plates from one support to the other, and a drive-shaft having cams thereon for moving the supports and feeder, of a collodion-dropper above the first support, a segment for moving said dropper into position, a lever for moving the segment, and a cam on the drive-shaft for moving the lever, substantially as described.

8. In an automatic photographic apparatus such as described, the combination, with a movable support for the plates, of a collodion-dropper over the same, consisting of the drop-measure with an elastic bulb, a plate on which said dropper is mounted, having vertical and diagonal slots, whereby it is caused to move vertically and then obliquely over the plate, and a stationary projection or catch for compressing the bulb and ejecting the collodion onto the plate, and a hook for keeping the bulb compressed until the dropper is returned to the cup or reservoir, and a trip for releasing the bulb, substantially as described.

9. In an automatic photographic apparatus substantially such as described, the combination, with a series of movable plate-supports adapted to receive the plates in succession, of a series of cams for moving said supports, a drive-shaft, clutches interposed between said shaft and cams, and electro-magnets controlling said clutches, substantially as described.

10. In an automatic photographic apparatus substantially such as described, the combination, with a series of movable plate-supports adapted to receive the plates in succession, a series of cams for moving said supports,

a drive-shaft, clutches interposed between said shaft and cams, electro-magnets controlling said clutches, and gear-wheels connected to said cams, of a series of dials for indicating the operations taking place, series of contacts arranged around said dials, and electric connections between said contacts and electro-magnets, whereby the magnets are made operative by the movement of the indicators, substantially as described.

11. In an automatic photographic apparatus such as described, the combination, with a series of movable supports, a drive-shaft, and connections for operating said supports in succession, of a chute arranged in proximity to the last support and in the path of the plate carried thereby, whereby the plate will be detached and pass down the chute, substantially as described.

12. In an automatic photographic apparatus such as described, the combination, with the movable carriers and complementary photographic apparatus, as described, of a chute for receiving the plate from the last support, terminating in a bracket or shelf formed by a thin perforated diaphragm, and a lamp located below said shelf, substantially as described.

13. In an automatic photographic apparatus, as described, the combination, with the supports and complementary mechanism, as described, and the lens and obturator, of an electric circuit, including a bell and contacts, operated by the obturator for completing the circuit and ringing the bell, substantially as described.

14. In apparatus such as described, a system of dial-indicators, each having a needle, of which the axis is connected by chains to the principal motor-shaft, these axes being provided with commutators for interrupting or completing an electric circuit, and the needles indicating externally the different phases of the operations, substantially as herein set forth.

15. The combination, with an automatic photographic apparatus such as described, of a chair having a head-rest and an inclined seat, whereby persons of different heights may seat themselves with their heads at the same level, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 11th day of September, 1889.

THEOPHILE ERNEST ENJALBERT.

Witnesses:

JULES FOURIÉ,

R. J. PRESTON.