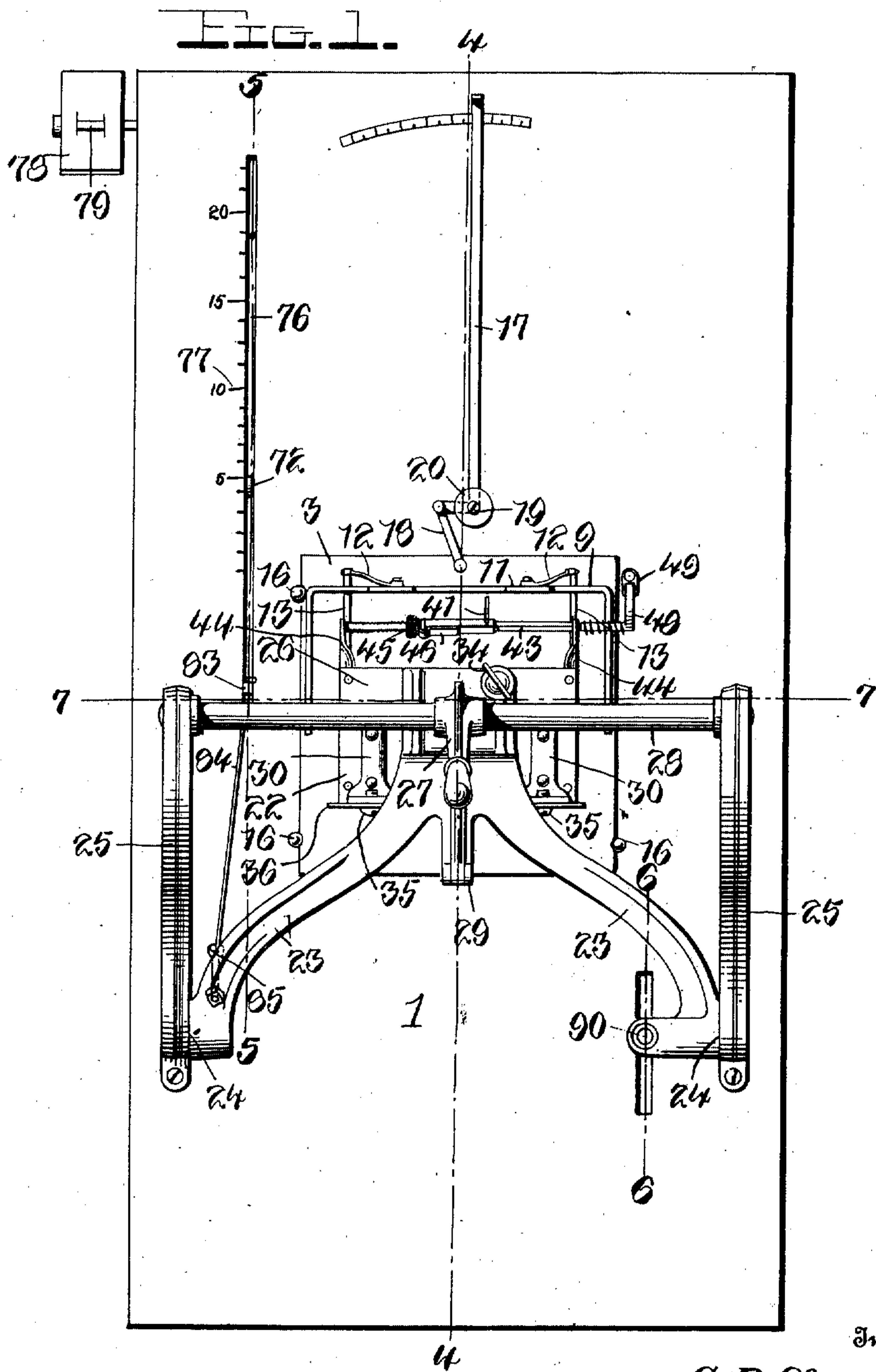


G. R. OLSON.
 PHOTOGRAPHIC PRINTING MACHINE.
 APPLICATION FILED JUNE 29, 1910.

994,271.

Patented June 6, 1911.

7 SHEETS—SHEET 1.



Inventor

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Witnesses

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 A. F. Garvey.

By

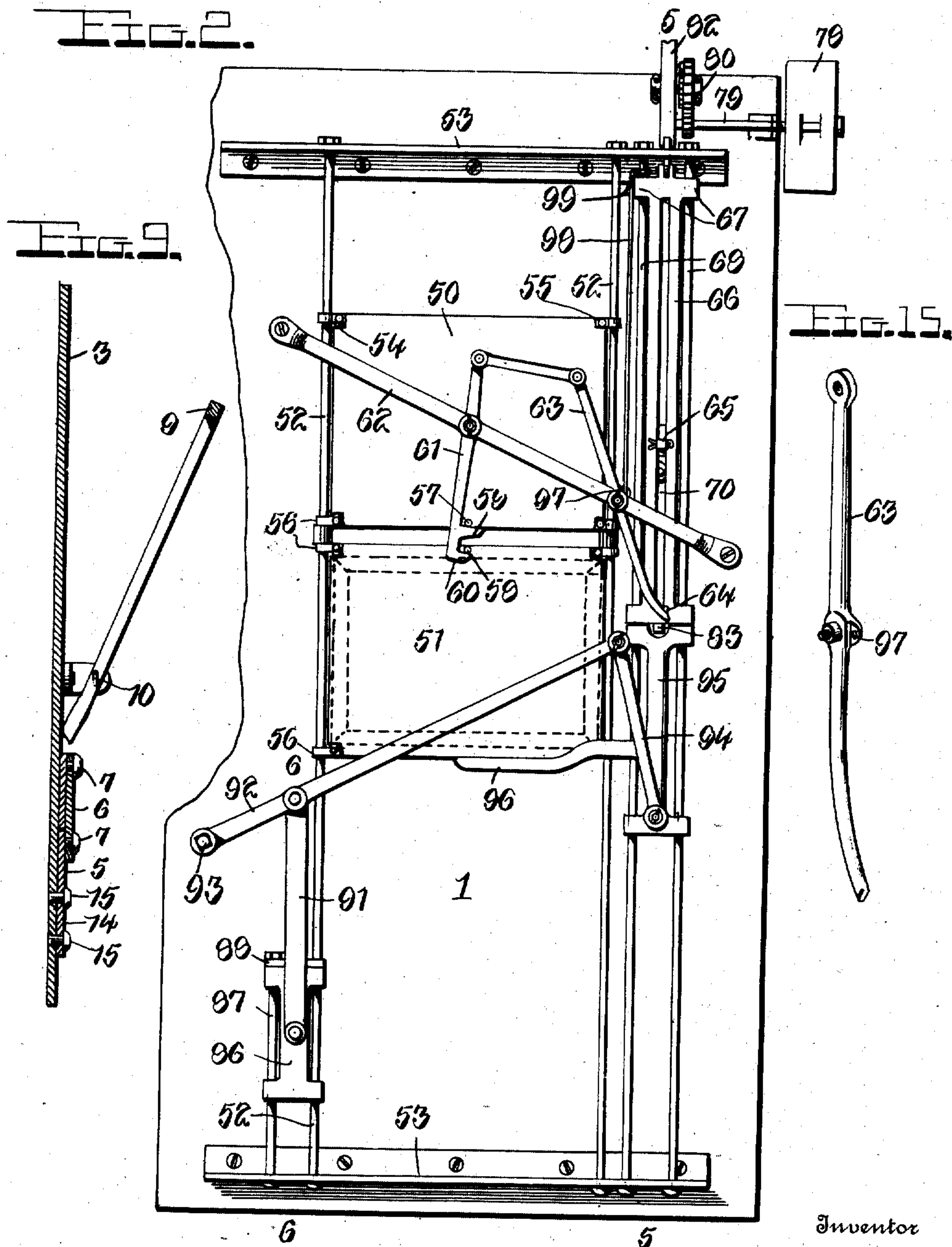
Watson & Coleman.
 Attorneys

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7 SHEETS-SHEET 2.



Witnesses

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7 SHEETS—SHEET 4.

Fig. 4.

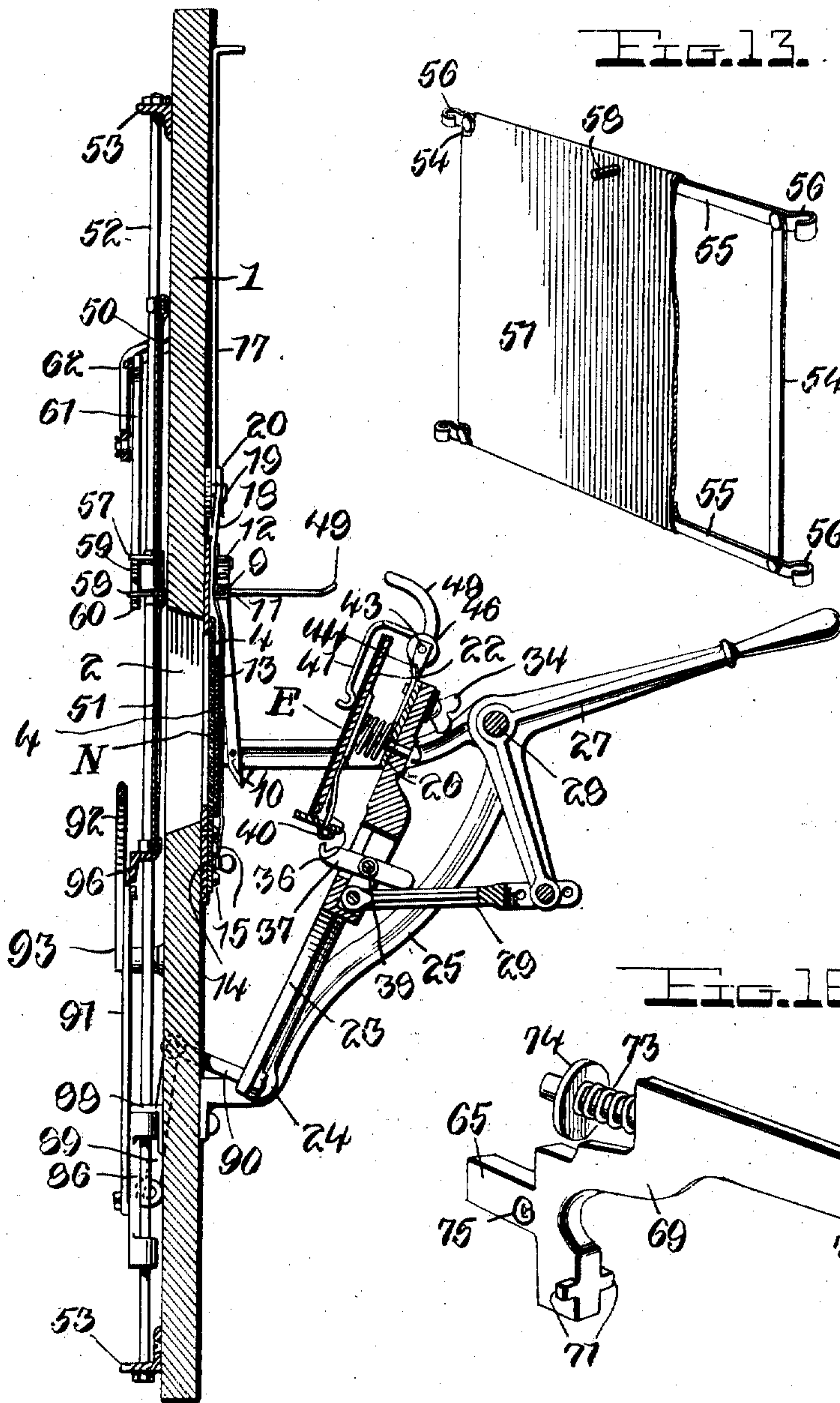


Fig. 16.

Witnesses
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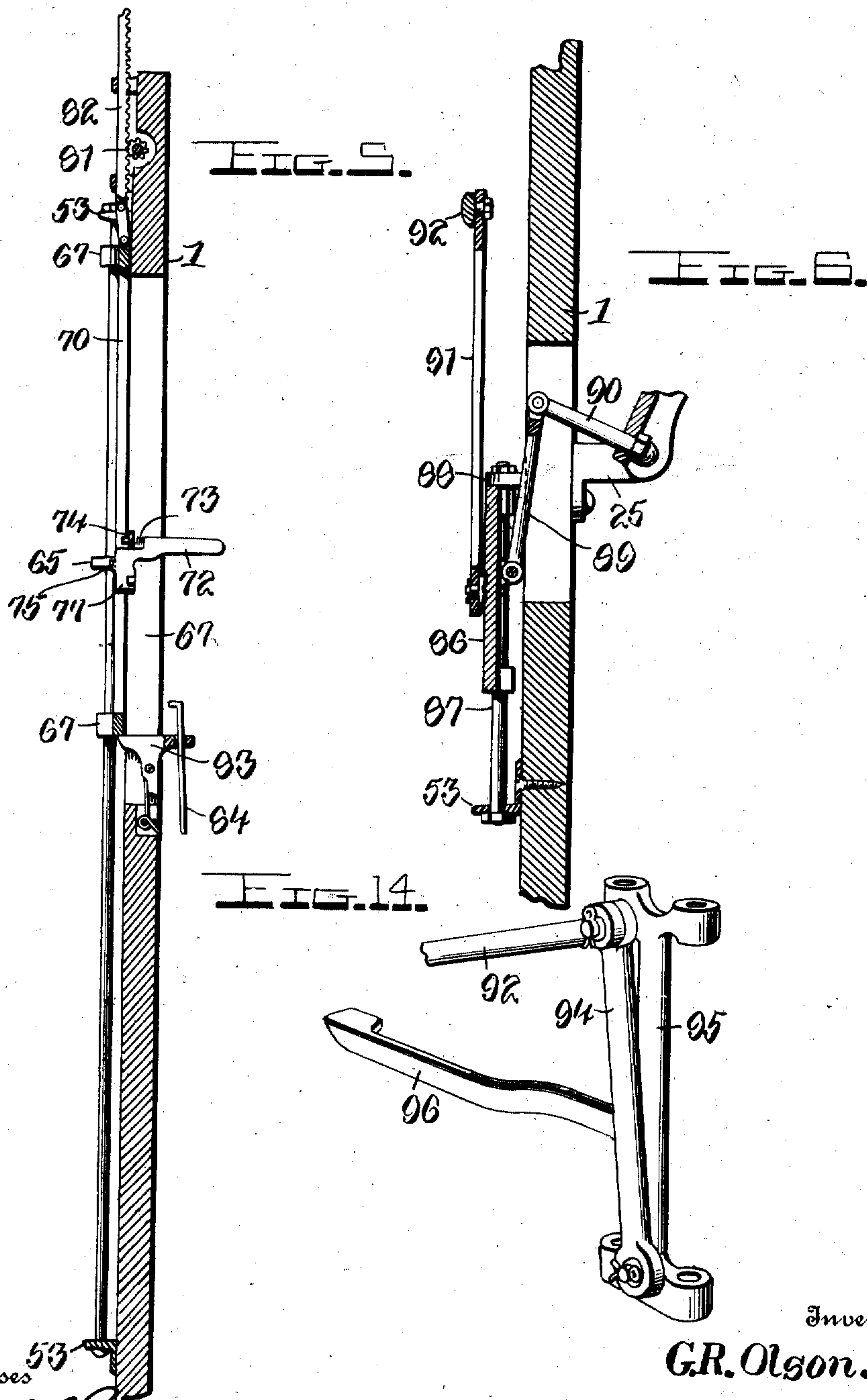
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7 SHEETS—SHEET 5.



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7 SHEETS—SHEET 6.

FIG. 11.

FIG. 12.

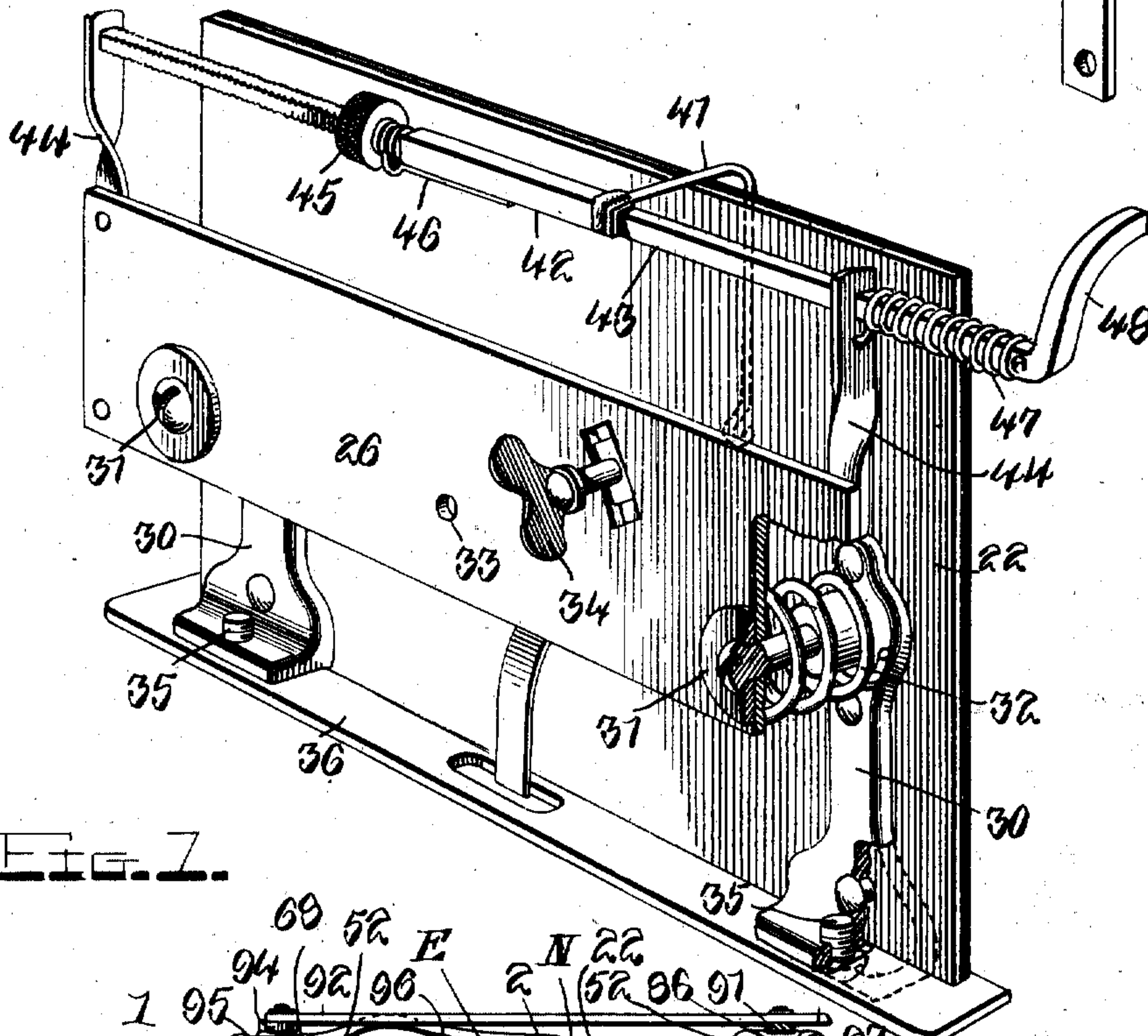
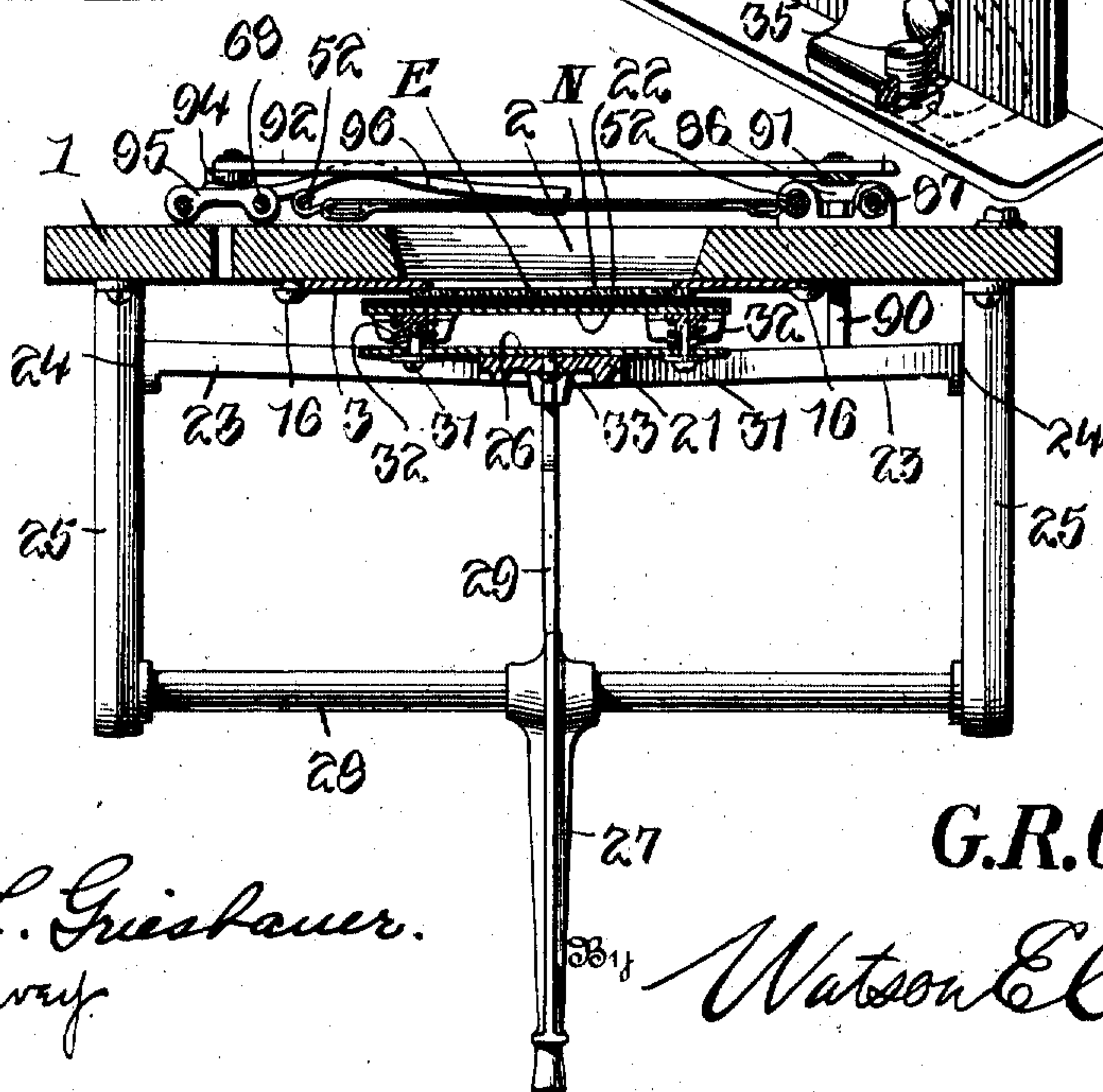


FIG. 7.



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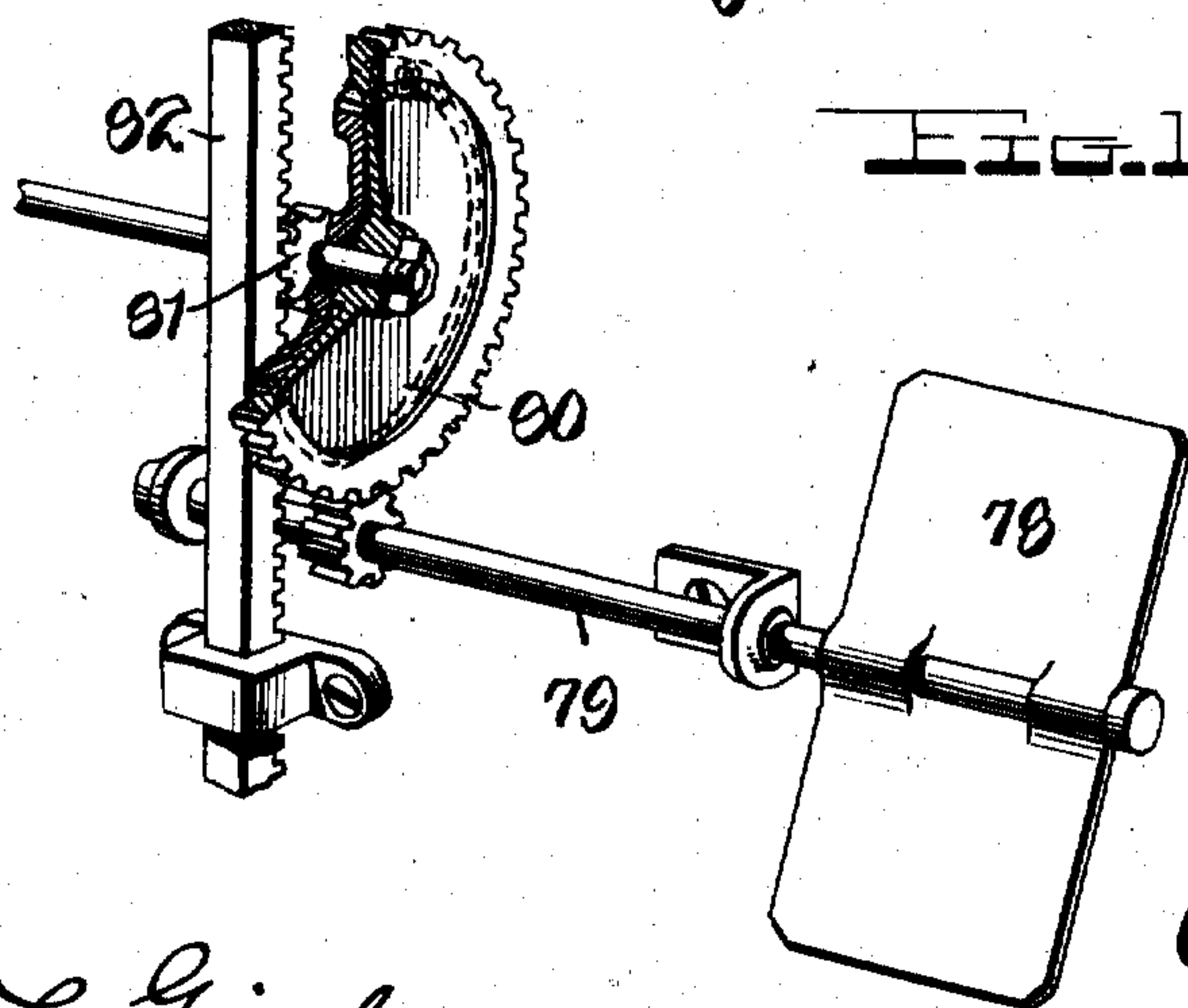
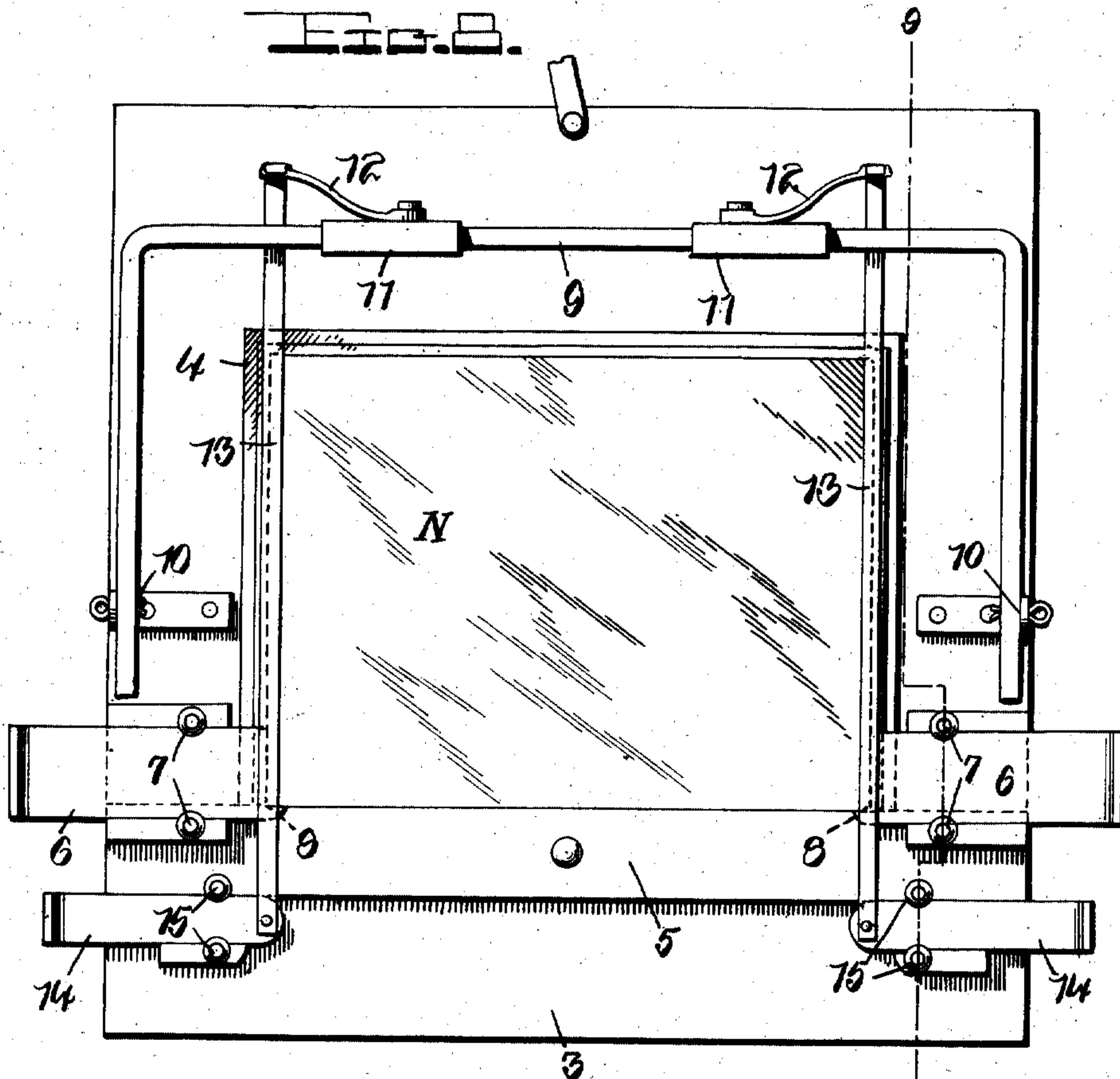
Watson E. Coleman.
 Attorney.

G. R. OLSON.
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994,271.

Patented June 6, 1911.

7 SHEETS—SHEET 7.



Witnesses

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UNITED STATES PATENT OFFICE.

GUSTAVE R. OLSON, OF PLATTSMOUTH, NEBRASKA.

PHOTOGRAPHIC-PRINTING MACHINE.

994,271.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed June 29, 1910. Serial No. 569,585.

To all whom it may concern:

Be it known that I, GUSTAVE R. OLSON, a citizen of the United States, residing at Plattsmouth, in the county of Cass and State of Nebraska, have invented certain new and useful Improvements in Photographic-Printing Machines, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to improvements in photographic printing machines or apparatus of that class used for printing a number of photographs from the same negative with a uniform exposure, and it relates more particularly to improvements in the machine set forth in a pending joint application by Gustave R. Olson and Demmie Hiatt, bearing Serial Number 476,509 and dated February 6, 1909.

20 The objects of the present invention are first, to provide improved means for supporting and adjusting the negative; second, to simplify and improve the construction of the shutters and their supporting and guiding means; third, to improve and simplify the timing mechanism and the trip mechanism for controlling the shutters; fourth, to improve the construction and operation of the support and stop for the sensitized sheet and to further improve and simplify other parts of the machine whereby the latter is rendered stronger and more durable and effective.

35 With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

40 Figure 1 is a rear view of a photographic printing machine embodying my improvements; Figs. 2 and 3 are front views showing the parts in different positions; Figs. 4, 5 and 6 are vertical sectional views taken respectively, on the planes indicated by the lines 4—4, 5—5 and 6—6 in Fig. 1. Fig. 7 is a horizontal section taken on the plane indicated by the line 7—7 in Fig. 1. Fig. 8 is a detail view of the negative holder. 50 Fig. 9 is a sectional view taken on the plane indicated by line 9—9 in Fig. 8. Fig. 10 is a detail view showing the retarding fan. Fig. 11 is a perspective view of the pressure back and coacting parts, and Figs. 12 to 16 inclusive are detail views of parts.

In the drawings, 1 denotes a suitable sup-

port preferably in the form of a flat upright member or plate having an opening 2 through which light is admitted to a negative N. The negative is carried by a vertically adjustable holder 3, in the form of a rectangular plate mounted for sliding movement and having an opening which may be covered by the negative or by a glass plate 4. When the negative is of sufficient size to cover the opening in the slide or holder, 3, the plate 4 may be dispensed with, and the negative may be placed on a horizontal supporting ledge 5, formed on the plate or holder 3, by securing thereto a strip of metal. When smaller negatives are placed in the machine, they are supported on adjustable slides 6, as shown in the drawings, and they rest against the glass plate 4, which latter is then supported on the ledge 5. The negative supporting slides 6 are arranged for horizontal sliding movement in under-cut guides 7, and their inner corners are notched as shown at 8 for the reception of the lower corners of the negative. The negative, or both the negative and the plate 4 are held in position by a spring retaining device consisting of an inverted U-shaped member 9 having its arms pivoted adjacent their ends as shown at 10, in angle brackets on the holder 3, whereby the extremities of said arms will serve as stops to limit the swinging movement of the member 9. The upper cross bar of the latter has slidably mounted on it, two sleeves 11, carrying springs 12 for two retaining strips 13, which are adapted to extend across the end portions of the negative or plate, and retain the same in position. The springs 12, are secured at one end and have their other free ends notched to receive hooks or eyes on the upper ends of the retaining strips 13. The lower ends of these strips are connected to two adjusting slides 14 arranged in under-cut guides 15, on the lower portion of the holder 3. The slides 14, are arranged for horizontal sliding movement, and have at their outer ends finger pieces whereby they may be moved inwardly or outwardly to position the retaining strips or springs 13, opposite the end portions of the negative.

The negative holder or slide 3 is retained and guided on the support or body 1 by having its side edges slidably engage with headed guide lugs 16 as shown in Fig. 1. The slide is adjusted and supported by a

lever 17 in the form of a bell crank fulcrumed at its angle on the central or upper portion of the support 1 and having its short arm connected by a link 18 to the slide 3.

5 The long upwardly projecting arm of the lever 17 is bent to provide a handle and it co-acts with scale graduations provided on the support 1 for the purpose of indicating the adjustment of the negative holder or
10 slide 3. The lever 17 is frictionally retained in adjustable position by making its fulcrum in the form of a clamping screw 19 beneath the head of which is arranged a friction plate or washer 20 adapted to bear
15 against the angular portion of the lever.

21 denotes a movable platen for supporting a piece of photographic printing paper or any other sensitized sheet or element E and holding the same against the negative
20 during the exposure. This platen is pivoted for swinging movement and carries a pressure back 22 on which the sensitized element is supported. This platen is composed of an inverted Y-shaped casting
25 formed with outwardly and downwardly diverging arms 23 which are pivoted at 24 in two brackets 25 which are secured to the support 1. The small upper portion of the Y-shaped member or casting has secured to
30 it a transverse plate 26 adapted to support the pressure back 22. The platen is actuated by a hand lever 27 in the form of a bell crank fulcrumed at its angle on a transverse pivot rod 28 supported by the brackets 25.
35 The short depending arm of the lever 27 is connected by a link 29 to a slotted portion of the member or casting 21.

The pressure back 22 is in the form of a metal plate having secured on its outer face
40 two angular brackets 30 the upper portions of which receive supporting and guiding pins 31 in the form of screws. These pins or screws 31 extend through and slide in the end portions of the cross plate 26 and surrounding them are coil springs 32 which
45 yieldably support the pressure back away from the main portion of the platen. In order to adjust the pressure back angularly with respect to the main portion of the
50 platen, the cross plate 26 is pivoted at 33 to the casting 21 and a clamping screw 34 is carried by the latter and works in an arcuate slot formed in the cross plate 26. The lower ends of the angle brackets 30 carry
55 headed supporting and guiding pins 35 in the form of screws which work in slots in a retractable support 36 adapted to project beyond the plane of the inner face of the pressure back to form a horizontal ledge on
60 which the bottom edge of the sensitized element E is supported. The support 36 is adapted to be retracted when the platen is swung away from the negative so that the exposed element E may drop out of the machine and in order to retract said support
65

a latch lever 37 is fulcrumed intermediate its ends at 38 in the slotted portion of the casting or member 21. The inner end of the lever 37 is hook-shaped, for engagement
70 with a shoulder 40 on the support 36 which latter has a limited movement on the spring supported pressure back 22. The rear end of the lever 37 is disposed above the link 29 so as to be actuated by the latter when the platen is swung away from the negative.
75 Owing to this construction it will be seen that when the hand lever 27 is thrown downwardly the platen will be swung toward the negative and when the pressure back is in an operative position the support 36 will be
80 shifted so that its shoulder 40 engages the hook-shaped end of the latch lever 37; and when said lever 27 is swung upwardly the platen will be retracted and when the rear or outer end of the lever 37 engages the link
85 29 the latter will shift said lever 37 to retract it from engagement with the shoulder 40.

41 denotes a retractable side stop carried by the platen and against which one vertical edge or end of the sensitized element is placed when said element is applied to the pressure back and dropped on the support or ledge 36. This side stop 41 is in the form
90 of a swinging arm fixed to a sleeve 42 slidable on a flat faced portion of a rock shaft 43 journaled in brackets 44 on the ends of the cross plate 26. The sleeve 42 is shiftable longitudinally of the shaft 43 for the purpose of positioning the stop arm 41 at different
95 points across the length of the pressure back and this adjustment is preferably effected by screw threading a portion of the shaft 43 to receive a nut 45, which latter has a swiveled connection with the sleeve 42 by
100 securing to said sleeve a hook-shaped strip 46 adapted to extend around one side of the milled nut 45. The rock shaft 43 is actuated in one direction by a coil spring 47 which is arranged upon it, as shown in the drawings,
110 and said shaft is actuated in the other direction or against the tension of the spring 47 by an arm 48 one end of said shaft adapted to engage a stationary cam 49 in the form of a bracket arm projecting from the
115 support 1. These parts are so constructed and so operate that when the platen is retracted or away from the negative, the spring 47 presses the side stop arm 41 against the inner face of the pressure back and when
120 the platen is swung toward the negative the arm 48 swings against the stationary cam or arm 49 which causes said arm 48 to rock the shaft 43 against the tension of the spring 47 and in a direction to retract the stop
125 arm 41.

My improved shutter mechanism comprises two superposed shutters 50, 51 mounted for independent sliding movement on upright guide rods 52 having upper and lower
130

ends secured by nuts in outwardly projecting flanges of angle metal plates 53 secured to the upper and lower portions of the support or plate 1. The shutters 50, 51 may be of any form and construction but I preferably make them from opaque fabric or sheet material arranged over a rectangular frame composed of upright side strips 54 having their ends secured to upper and lower horizontal strips 55 the extremities of which latter are bent to form guide eyes 56 which slide upon the guide rods 52. The frames of the shutters 50, 51 have pins 57, 58 which contact with upper and lower hooks 59, 60 on a shutter supporting lever 61 which is fulcrumed intermediate its ends on a U-shaped bracket 62 secured to the support 1 and arranged in a downwardly inclined position across the upper portions of the guides 52. The lever 61 has its upper end connected by a link to a trip lever 63 which is fulcrumed intermediate its ends on the bracket 62. The lower end of the trip lever is curved to contact with two trip pins or lugs 64, 65. The pin 64 is carried by the lower end of a slidable member 66 in the form of a slotted bar having at its upper and lower ends apertured lugs 67 to receive and slide upon parallel upright guide rods 68 the upper and lower ends of which are secured in the angle plates or strips 53. The trip pin or lug 65 is adjustable longitudinally of the slidable member or bar 66 by making it in the form of a reduced end of a lever 69 arranged for sliding movement in the longitudinal slot 70 of the slide or bar 66. This lever is in the form of a substantially triangular-shaped plate and has the lug or pin 65 at one angle, oppositely projecting pivot lugs 71 at another angle and a finger piece 72 at its third angle. A coil spring 73 is arranged between a shoulder on the inner portion of the finger piece 72 and a flexible sheet metal plate 74 carried by the central portion of the lever 69 and arranged to slide against one side of the member or bar 66. A transverse pin 75 is arranged in the lug 65 to bear against the opposite side of the bar 66 whereby the spring 73 will hold said pin 75 and the pivot lugs 71 in engagement with the opposite sides of the bar to frictionally lock the lever and hence the trip lug 65 in adjusted position. When it is desired to shift the position of the trip lug 65 on the bar 66, which latter it will be noted serves as a timing member or bar, it is only necessary to press the finger piece 72 inwardly to cause the lever 69 to rock on its pivot studs or lugs 71 and move the pin 75 away from contact with the opposite side of the bar 66, and to then slide the lever longitudinally on the bar. When the lever is released the spring 73 serves to retain it in adjusted position. By thus adjusting the trip lug or pin 65 toward and from the stationary lower trip pin 64,

the interval between the contact of the two trip lugs with the curved lower end of the trip lever 63 may be varied to determine the length of exposure, as hereinafter more fully explained. The finger piece 72 projects through a vertical slot 76 in the support 1 and scale graduations 77 are provided along said slot to indicate the adjustment of the upper trip lug or pin 65.

The downward movement of the timing slide or bar 66 is retarded by any suitable retarding means, the same preferably consisting of a rotary fan 78 having its shaft 79 projecting laterally from one side of the support 1 and connected by a train of gears 80 to a pinion 81 which meshes with a vertically extending rack bar 82 having its lower end secured to the upper extremity of the slide or bar 66. The train of gears 80 is arranged in a recessed portion of the support 1 and includes a pawl and ratchet device whereby the rack bar 82 may be readily moved upwardly without rotating the fan 78 when the timing member or bar 66 is reset.

The movement of the timing member or bar 66 is controlled by the movement of the platen 21 and this control is effected by providing in the lower portion of the slot 76 a pivoted spring pressed lever 83 one end of which engages and supports the member or bar 66 when in its elevated position and the other end of which is connected by a link 84 to an arm 85 carried by one of the branches or members 23 of the casting 21. Owing to this construction it will be seen that when the platen swings toward the negative the dog 83 will release the timing member or bar and allow the latter to descend by gravity under the control of the retarding fan 78. The movement of the platen also actuates means for resetting the shutters and the controlling member or timing bar. This means comprises a slide 86 similar to but shorter than the slide or bar 66 and arranged for movement on the lower end of one of the guide rods 52 and a similar shorter guide rod 87. The latter is arranged parallel with the lower portion of said rod 52 and has its lower end secured in the lower angle plate 53 and its upper end mounted in an angle bracket 88 which latter also supports said rod 52 and serves as a stop to limit the downward movement of the lower shutter 51. The slide 86 is arranged opposite a vertical slot in the support 1 and is connected by a link 89 to an arm 90 which extends through said slot and is carried by one of the branches 23 of the casting 21. Pivoted to the slide 86 is the lower end of an upstanding link 91 the upper end of which is connected to the intermediate portion of a lever 92 fulcrumed at one of its ends as shown at 93 on the support 1. The other end of the lever 92 is connected by a depend-

ing link 94 to a slide 95 which is similar to the slide 86 and arranged on the guide rods 68 beneath the slidable member or bar 66. Projecting laterally from the slide 95 is an arm 96 adapted to engage the bottom of the lower shutter 51. The slide 95 in its upward movement elevates the timing member or bar 66 and the latter in turn is adapted to reset the trip mechanism for supporting and releasing the shutters. This is effected by forming on the pivoted central portion of the trip lever 63 a laterally projecting apertured lug or arm 97 to which is connected the lower end of a wire or rod 98. The upper end of the latter is shaped to provide a loop or eye 99 which slides on one of the guide rods 68 and is adapted to be engaged and actuated by the upper end of the member or bar 66.

The operation of the invention is as follows: Assuming the shutters to be elevated and supported by the lever 61 so that the lower shutter 51 is opposite the negative, and also assuming the platen is in its retracted position or away from the negative, a piece of photographic paper or any other sensitized element is placed on the pressure back and engaged with the projecting support or bottom rest 36 and against the side stop arm 41, which latter is in contact with the pressure back when the platen is in retracted position. After the paper has been placed in position the handle end of the lever 27 is swung downwardly to move the platen toward the negative and when this happens the arm 48 engaging the cam or bracket arm 49 will cause the shaft 43 to be rocked to swing the stop arm 41 upwardly and out of the way. The inward movement of the platen causes the arm or member 89 to allow the slide 86 to move downwardly and consequently the slide 67 will move downwardly, the two shutters being supported by the lever 61. When said platen moves inwardly it also retracts the lever or dog 83 so that the timing member or bar 66 is released and when the pin 64 passes the trip lever 63 the latter is actuated a distance sufficient to cause the lower hook 60 to disengage the pin 58 thereby permitting the lower shutter 51 to drop and uncover the negative. It will be noted that the hook 59 on the holding lever 61 is of greater length than the hook 60 whereby the upper shutter will be held elevated until there has been a further movement of the trip lever 63 under the action of the upper adjustable trip lug or pin 65. It will be further observed that as the platen is actuated to bring the sensitive paper or element against the negative, the adjustable trip member 65 is positioned a distance from the pin or lug 64 corresponding to the length of exposure desired. As the timing member or bar 66 descends, the upper trip lug 65 will engage and actuate the lower or cam-

shaped end of the trip lever 63 a distance sufficient to disengage the hook 59 of the lever 61 from the pin 57 whereupon the upper shutter 50 will drop to cover the negative. The exposure having thus been completed, the handle end of the lever 27 is swung upwardly to retract the platen. As the platen moves outwardly the catch or latch lever 37 will hold the bottom support 36 in retracted position so that the sensitized paper will drop from the pressure back into a suitable receptacle and after the platen has moved outwardly to a predetermined distance said lever 37 will engage the link 29 and be retracted so that it will release the bottom support 36. This outward movement of the platen also allows the arm 48 to disengage the bracket 49 so that the side stop 41 swings into operative position against the pressure back. The outward movement of the platen causes the arm or member 89 to move the slide 86 in an upward direction and thereby swing the lever 92 upwardly so that the slide 95 is elevated. This slide 95 causes its arm 96 to lift the two superposed shutters and the engagement of the upper end of the slide 95 with the timing member or bar 66 causes the latter to be elevated until its lower end is brought under the holding dog or lever 83 and its upper end engages the loop 99 at the top of the trip wire 98 to actuate said wire upwardly and thereby cause the two hooks on the holding lever 61 to be swung under the pins on the shutters.

I claim:

1. In a photographic printing machine the combination of an upright support having an opening, means for supporting a negative at said opening, a movable platen having means for supporting a sensitized element, upper and lower brackets on said support, upright guide rods fixed in said brackets on opposite sides of the opening in said support, superposed shutters having eyes at their ends to slidably engage said guide rods, means for supporting said shutters, and means for successively releasing said shutters.

2. In a photographic printing machine, the combination of an upright support having an opening, means for supporting a negative at said opening, a movable platen having means for supporting a sensitized element, guides, superposed shutters slidable on said guides, a supporting means for the shutters, a trip for actuating said shutter supporting means to successively release said shutters, a slidably mounted timing member carrying means to successively engage and actuate said trip, means for elevating said shutters, means actuated by the last mentioned means for resetting the timing member, and means actuated by said timing member for actuating the trip to cause the

latter to move the shutter holding means in position to support the shutters in elevated position.

3. In a photographic printing machine, the combination of an upright support having an opening, means for supporting a negative at said opening, a movable platen having means for supporting a sensitized element, guides, superposed shutters slidable on said guides and carrying pins, a shutter supporting lever having hooks to engage said pins, a pivoted trip lever operatively connected to said holding lever, a slidably mounted timing member having means to engage and actuate said trip to successively release the shutters, means for elevating the shutters, means for elevating said timing member, and means connecting the timing member to the trip lever and actuated by the timing member for restoring the trip lever and shutter holding lever to initial position.

4. In a photographic printing machine, the combination of a support having an opening, a negative supporting slide at said opening, a lever connected to said slide to support and adjust said slide, a screw pivotally mounting said lever on said support, and a friction plate on the screw to engage the lever and frictionally retain it in adjusted position.

5. In a photographic printing machine, the combination of a negative holder having an opening, a supporting ledge adjacent the opening, a swinging frame on the holder, and a retaining strip connected to said frame and adjustable across the negative holder.

6. In a photographic printing machine, the combination of a negative holder having an opening, a supporting ledge adjacent the opening, a swinging frame on the holder, slides upon said holder, slides upon said frame, springs carried by the last mentioned slides, and retaining strips between said springs and the first mentioned slides.

7. In a photographic printing machine, the combination of a support having an opening, means for supporting a negative at said opening, a platen movable toward and from the negative, a rock shaft carried by the platen, a stop arm on said shaft, a spring for actuating said shaft in one direction, a stationary cam on said support, and an arm on said shaft to engage said stationary trip when the platen is moved toward the negative, whereby the stop arm will be retracted.

8. In a photographic printing machine the combination of a support having an opening, means for supporting a negative at said opening, a platen movable toward and from the negative, and a rock shaft carried by the platen and having a threaded portion and a flat faced portion, a sleeve slidable on the flat faced portion of the platen and car-

rying a stop arm, a nut arranged on the threaded portion of the platen, and having a swiveled connection with said sleeve, a spring for actuating the rock shaft in one direction, a stationary trip on said support, and an arm on the rock shaft to co-act with said strip.

9. In a photographic printing machine, the combination of a support having an opening, means for supporting a negative at said opening, means for holding a sensitized element against the negative, shutters movable across the opening in said support, means for holding one of said shutters over said opening and the other shutter above said opening, and for releasing said shutters to cause the first to uncover and the other to cover said opening, the last mentioned means including a trip, a longitudinally slotted timing bar, slidably mounted, a stationary trip on said timing bar to co-act with the first named trip, and a trip lever adjustably mounted in the slot in said timing bar to co-act with the first named trip.

10. In a photographic printing machine, the combination of a support having an opening, means for supporting a negative at said opening, means for holding a sensitized element against the negative, shutters movable across the opening in said support, means for holding and releasing said shutters, the last mentioned means including a trip, a longitudinally slotted timing bar slidably mounted, a stationary trip on the timing bar to co-act with the first named trip, a lever arranged for sliding and swinging movement in the slot in the timing bar, and having stop and pivot lugs to engage opposite sides of said bar, and also having a trip lug to engage the first named trip, and a spring carried by the lever for rocking it on its pivot lugs and frictionally retaining it in adjusted position.

11. In a photographic printing machine the combination of a support having an opening, means for supporting a negative at said opening, means for holding a sensitized element against the negative, shutters movable across the opening in said support, means for holding and releasing said shutters, the last mentioned means including a trip, a slidable timing member carrying trips to co-act with the first named trip, a spring pressed dog to engage and support said timing member, said dog having an apertured end, and a rod connected to and actuated by said means for holding a sensitized element against the negative, said rod having a hook-shaped end arranged in the apertured end of said dog.

12. In a photographic printing machine, the combination of a support having an opening, and a slot, scale graduations adjacent said slot, means for supporting a negative at said opening, a swinging platen

having means to support a sensitized element against the negative, shutters movable across the opening in said support, shutter holding and releasing means including a
5 trip, a longitudinally slotted timing bar mounted for sliding movement on a support at its slot, a stationary trip carried by said timing bar to co-act with said first named trip, and a trip lever adjustably fulcrumed
10 in the slot in said timing bar and having a

trip end to co-act with the first named trip, and a hand end projecting through the slot in said support and co-acting with said scale graduations.

In testimony whereof I hereunto affix my 15 signature in the presence of two witnesses.

GUSTAVE R. OLSON.

Witnesses:

GEORGE TAITSCH,

RUPERT O. WATERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
