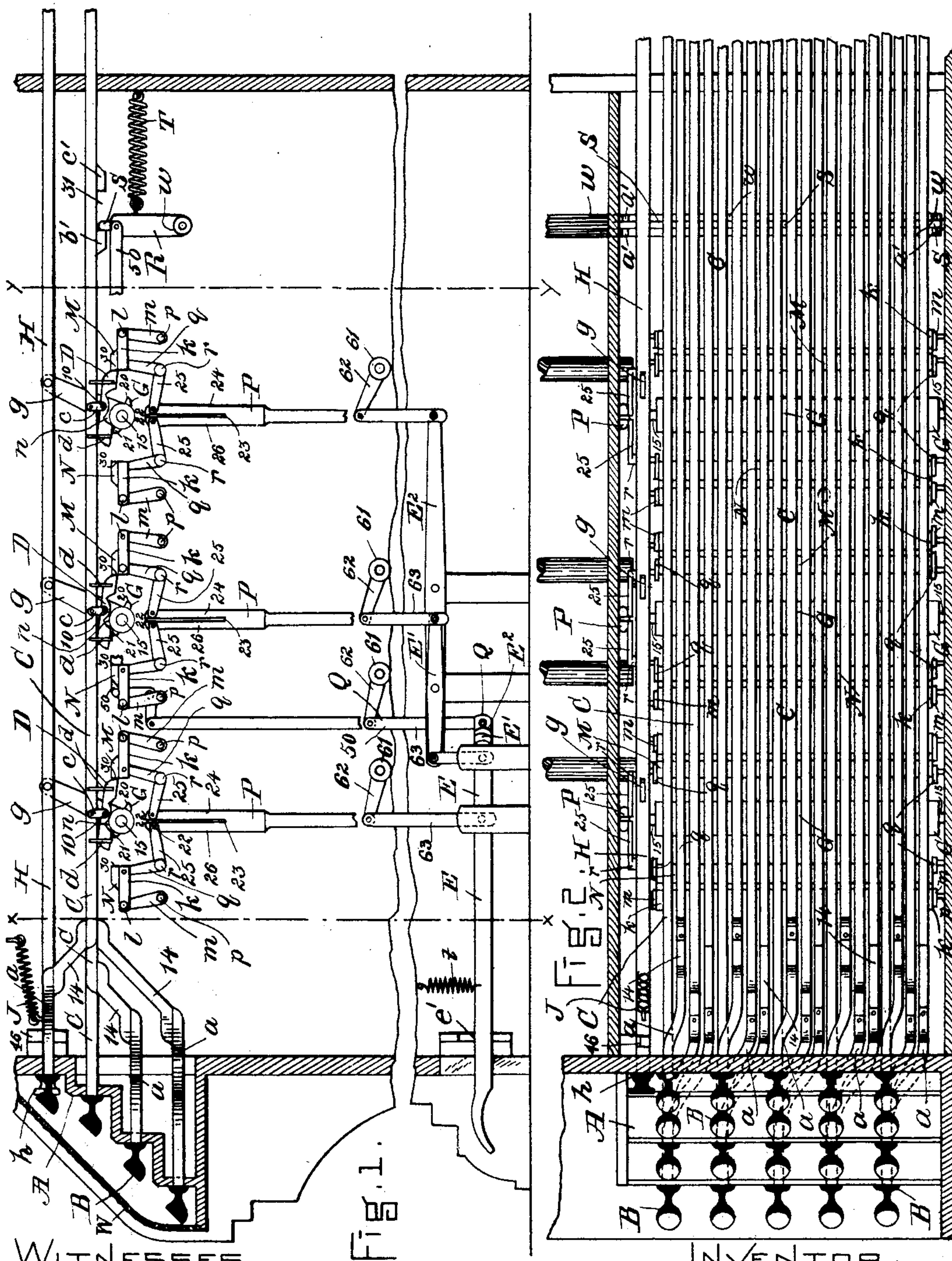


J. WOODBERRY.
COMBINATION ORGAN STOP ACTION.

No. 481,089.

Patented Aug. 16, 1892.



WITNESSES.
Henry Marsh.
Henry H. Aiken.

INVENTOR.
Jesse Woodberry
By J. E. Teschemacher
Atty.

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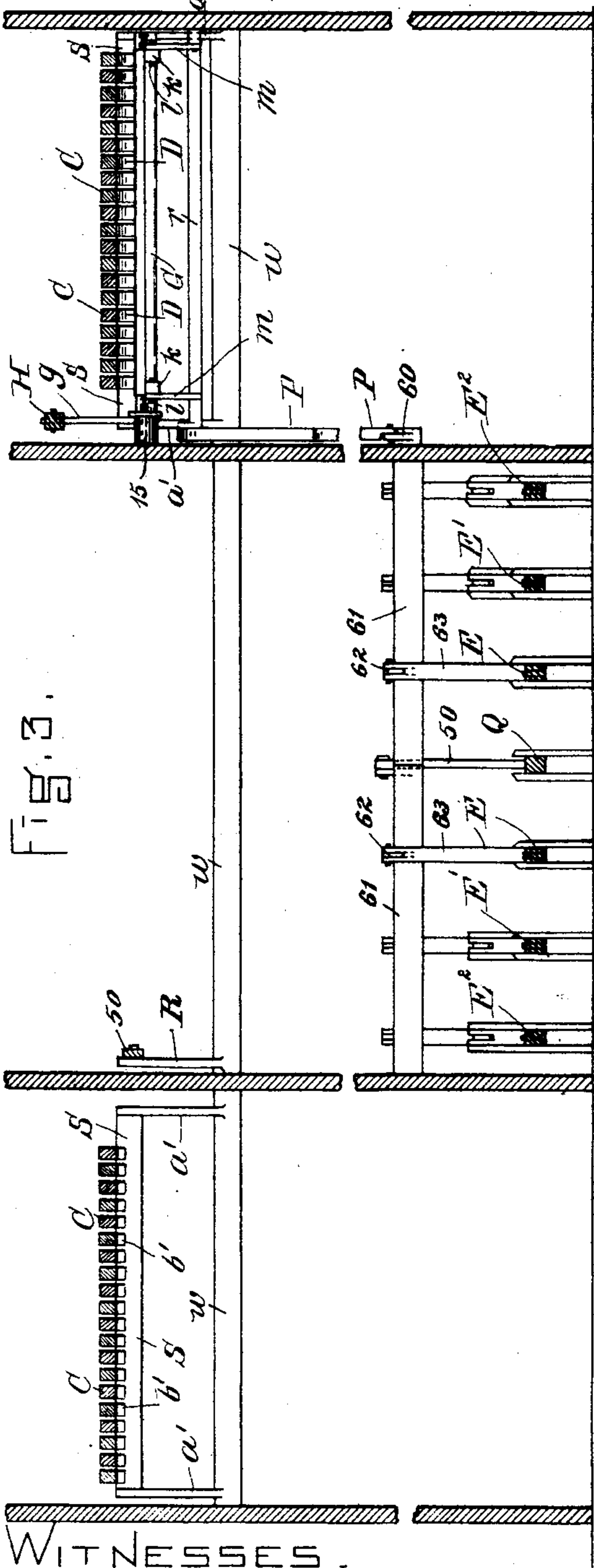


Fig. 3.

WITNESSES.

R. Henry Marsh.
Harry H. Aiken.

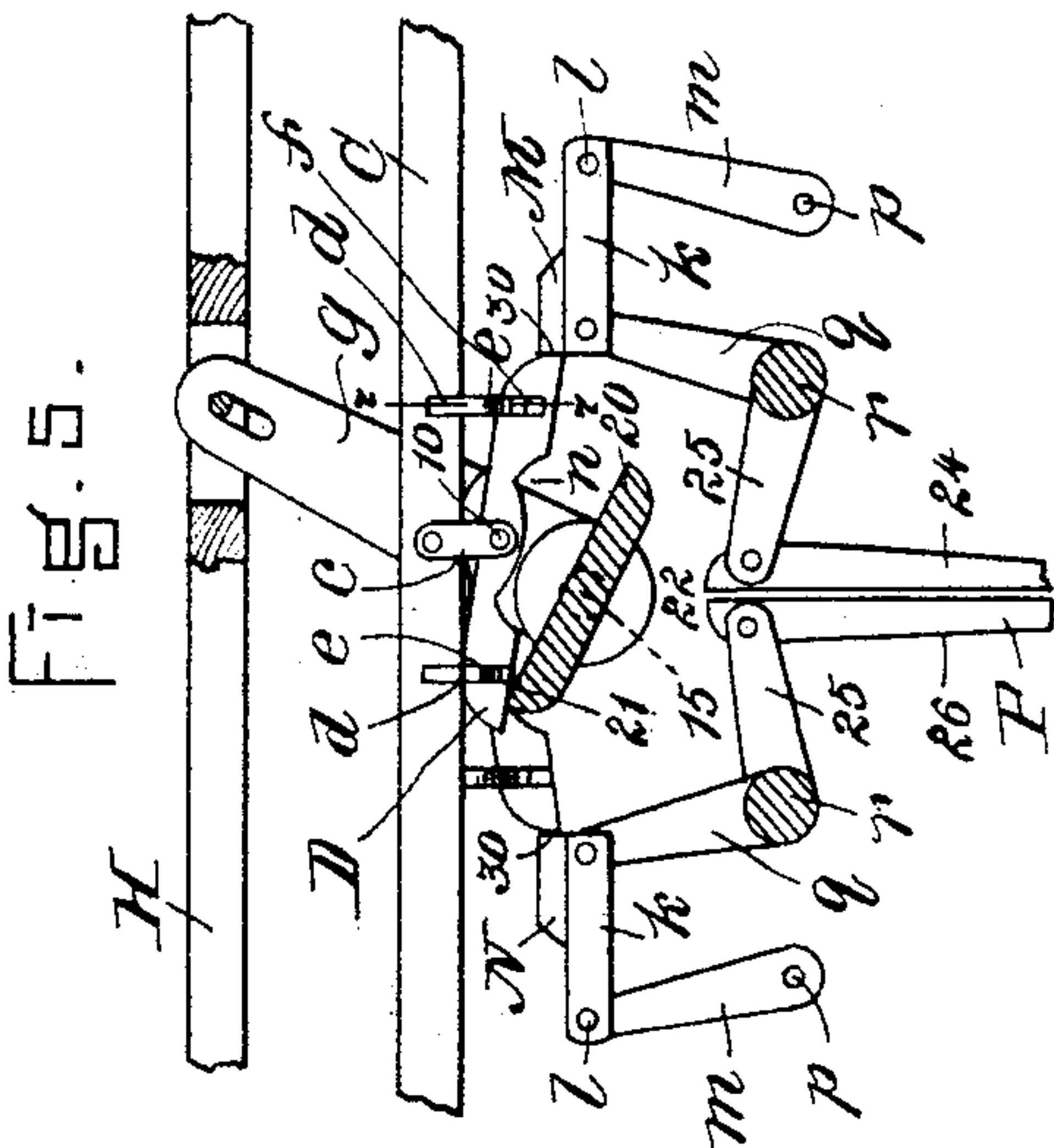


Fig. 5.

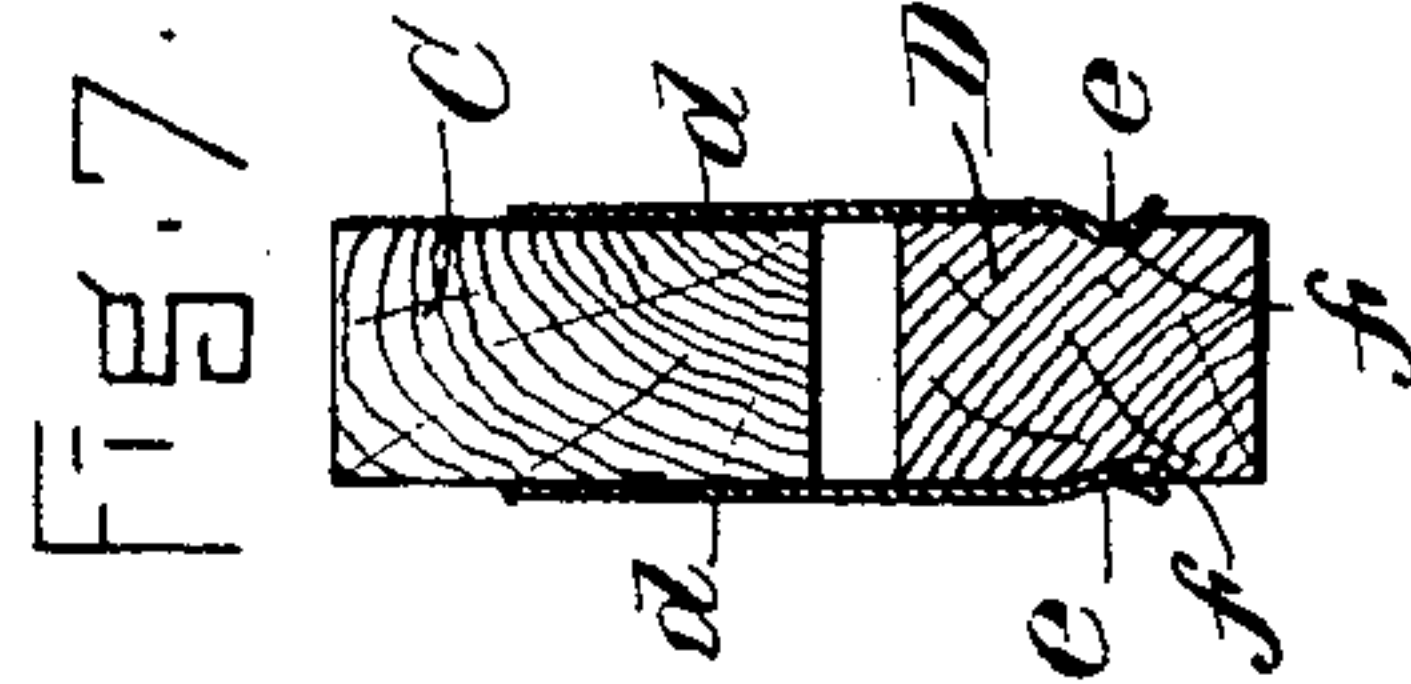


Fig. 7.

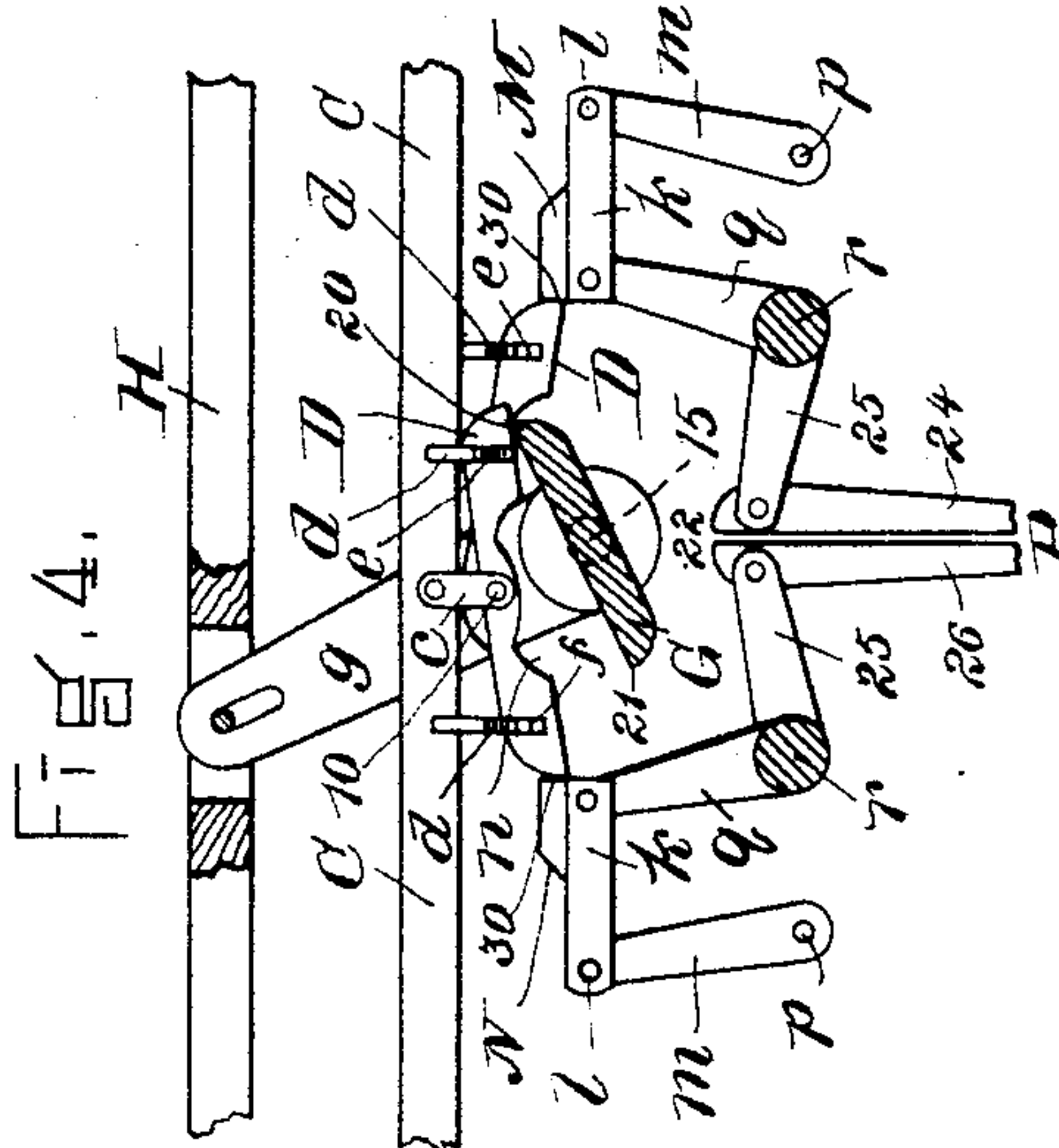


Fig. 4.

INVENTOR.

Jesse Woodberry
by J. C. Schumacher
Att'y

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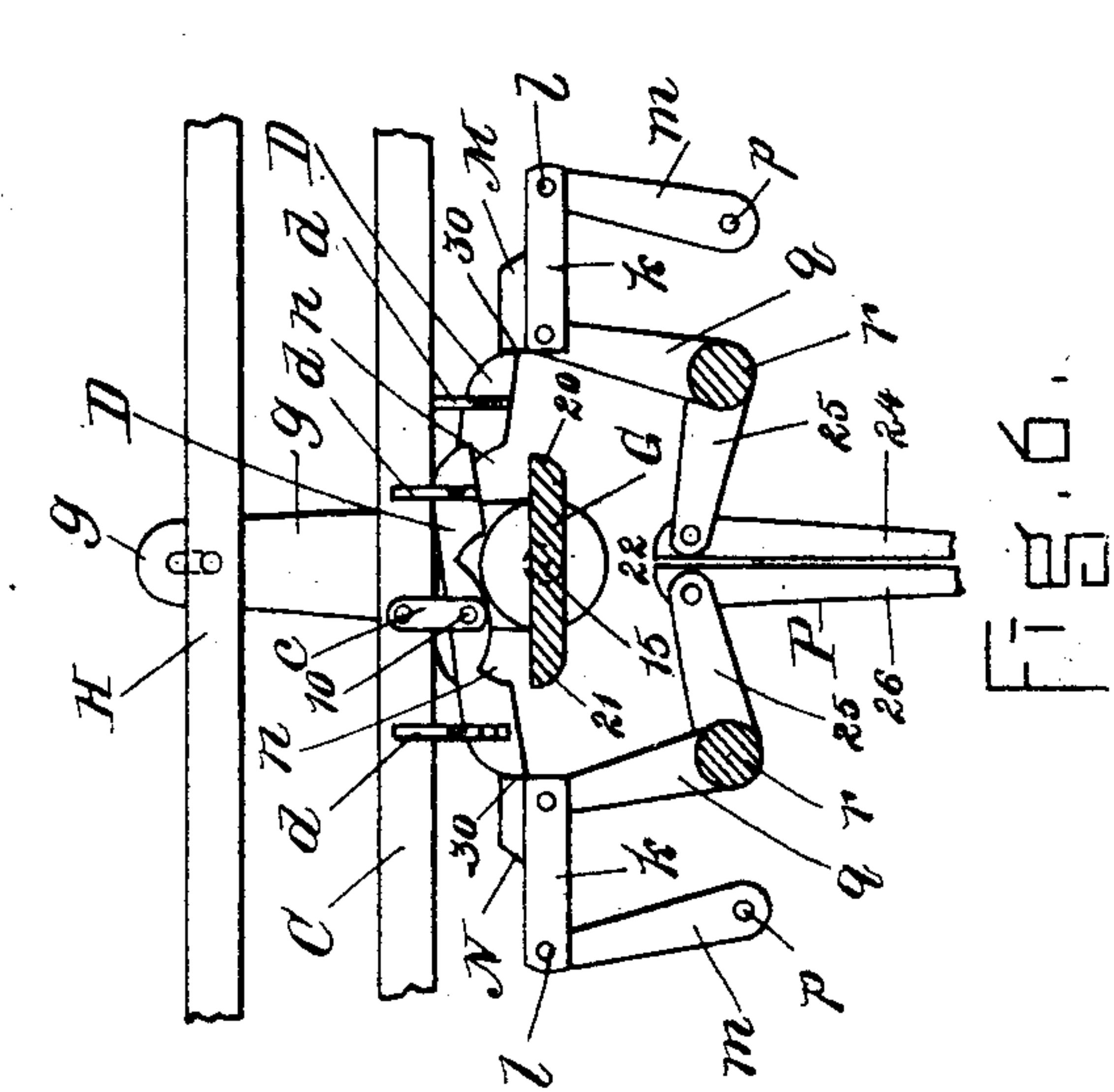


FIG. 6.

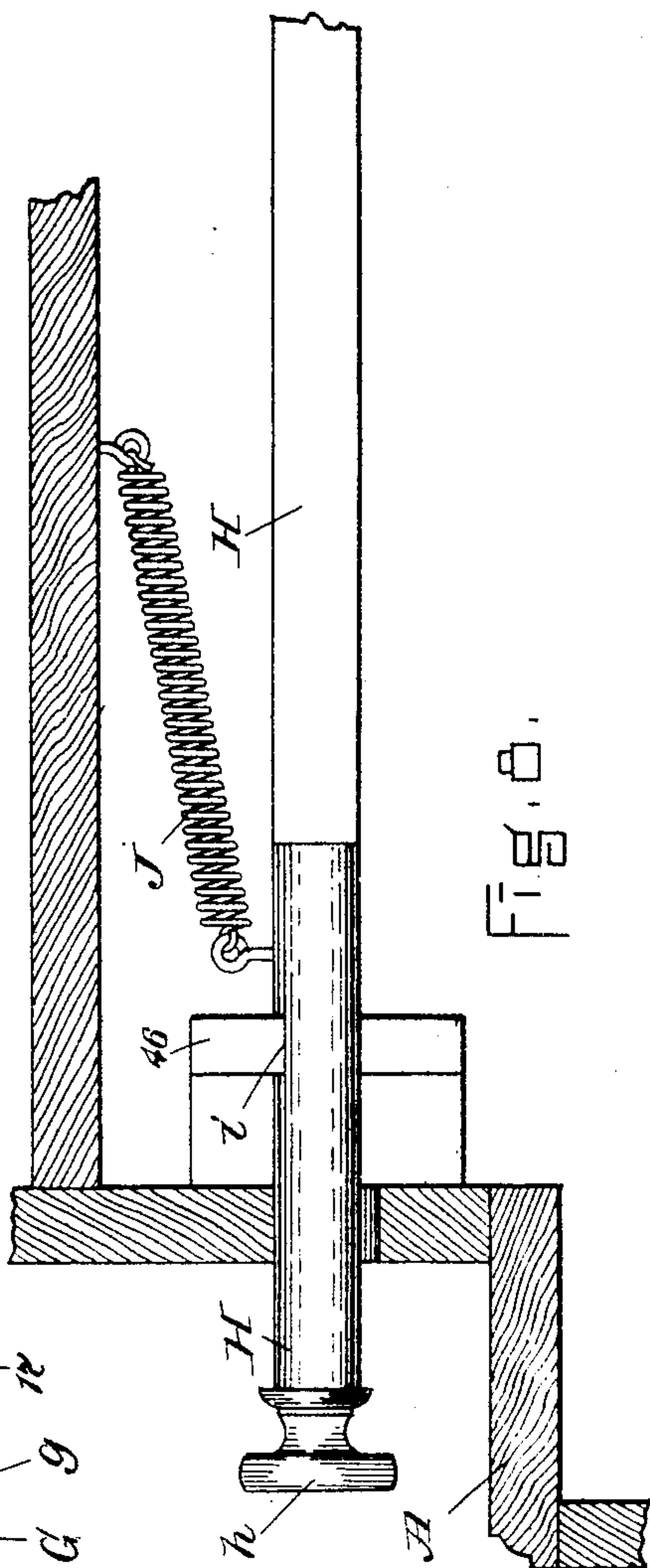


FIG. 7.

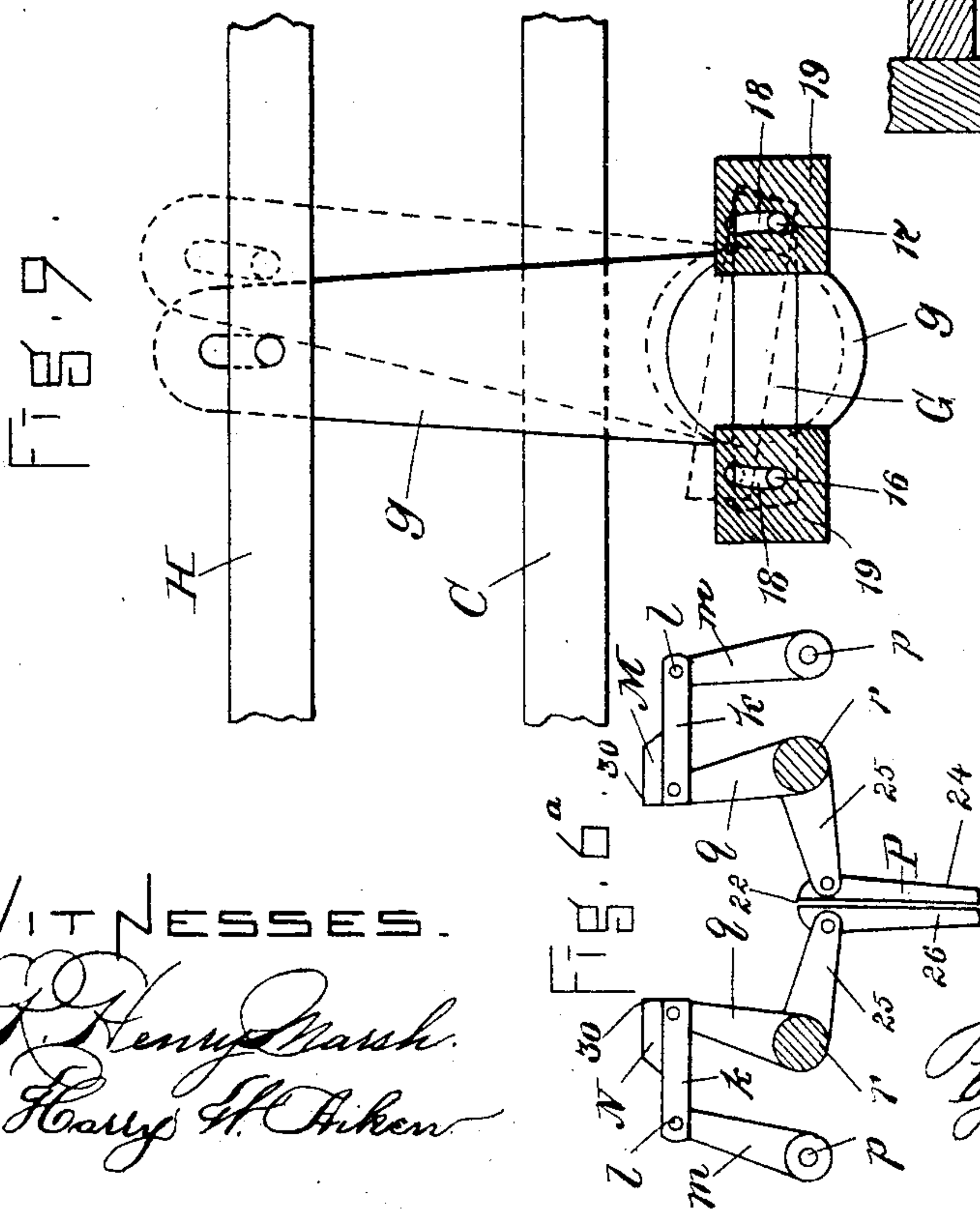


FIG. 8.

WITNESSES.

Henry Marsh
Henry H. Aiken

INVENTOR.

Jesse Woodberry
by J. E. Tschernach

UNITED STATES PATENT OFFICE.

JESSE WOODBERRY, OF BOSTON, MASSACHUSETTS.

COMBINATION ORGAN STOP-ACTION.

SPECIFICATION forming part of Letters Patent No. 481,089, dated August 16, 1892.

Application filed May 31, 1892. Serial No. 435,054. (No model.)

To all whom it may concern:

Be it known that I, JESSE WOODBERRY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Combination Organ Stop-Actions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making
10 part of this specification, in which—

Figure 1 is a sectional elevation of my improved combination organ stop-action. Fig. 2 is a sectional plan of the same. Fig. 3 is a transverse vertical section of an organ having
15 my improvements applied thereto, the right-hand portion being taken in a plane indicated by the line *xx* of Fig. 1 and the left-hand portion in a plane indicated by the line *yy* of Fig. 1. Figs. 4, 5, 6, and 6^a are views of a portion of the stop-moving mechanism, representing it in different positions. Fig. 7 is an enlarged sectional detail on the line 7 7 of Fig. 5. Fig. 8 is an enlarged sectional detail of the front end of the setting-rod and parts adjacent thereto. Fig. 9 represents a modification of my invention to be referred to.

My invention relates to adjustable combination stop-actions for pipe-organs, whereby
30 any previously-selected combination of stops upon any combination-pedal may be simultaneously brought into effect by the organist at any desired time and as often as may be required; and my invention has for its object to simplify the construction of the mechanism
35 by which this result is accomplished and reduce the friction of the working parts to a minimum.

To this end my invention consists in a novel mechanism for setting any required combination of stops so that they may be "drawn on" simultaneously by the proper pedal, and also in a mechanism of peculiar construction connected with the combination-pedals for moving the register-rods or stop-bars in or out in
45 order to bring into action such combinations of stops as may have been previously determined upon and set by means of the setting mechanism.

My invention also consists in providing the
50 register-rods or stop-bars at their front ends with bent or inclined portions arranged in groups or series and extending from the com-

mon level of the said register-rods to their knobs or handles arranged in a vertical plane, thus economizing space and enabling me to
55 dispense with the lever mechanism hitherto employed for connecting the register-rods with their knobs or handles.

My invention furthermore consists in certain novel features and details of construction, as hereinafter specifically set forth, and pointed out in the claims.

In the said drawings, A represents the keyboard of a pipe-organ, and B a portion of the ordinary stop-handles connected, as usual, with the ends of the horizontal sliding register-rods or stop-bars C, which control the stop-action, the stops being "thrown on," as usual, when their handles B are drawn out. The slides or valves with which the rods C are
60 connected are not shown in the drawings, as they are well known and form no part of my present invention. The register-rods C are arranged, as usual, parallel to each other and in the same horizontal plane, as shown in Figs. 1 and 3, and each successive group of four rods C have their knobs or handles B arranged in the same vertical plane, which is rendered possible by providing three of the four rods of each group at the front end with
70 a laterally-curved portion *a*, and also with a portion 14, inclined either upward or downward, as the case may require, to the common level or horizontal plane in which the register-rods are placed, as shown clearly in Figs. 1, 2, and 3, by which construction I am enabled to dispense with the lever mechanism hitherto employed for connecting the stop-handles with their respective register-rods, thereby greatly simplifying the mechanism,
75 facilitating its operation, rendering it less noisy, and reducing the friction to a minimum.

Each of the sliding register-rods C is provided on its underside with a series of rocker-levers D, (in the present instance three,) one for each of the combination-pedals E E' E². These rocker-levers D are each fulcrumed at the center at 10 between ears *c*, projecting down from the rods C, said levers being so
80 arranged as to be capable of being placed in two positions, as seen in Figs. 4 and 5, and being frictionally held in either of these positions by flat friction-springs *d*, having pro-

jections *e*, which enter suitably placed rounded notches or recesses *f*, Fig. 7, in said rocker-levers. The positions of these rocker-levers are changed to set the combinations in the following manner: Beneath each series of rocker-levers *D* is placed a long flat bar *G*, pivoted at its opposite ends at 15, whereby it is adapted to be oscillated on its longitudinal axis, said bar extending beneath the entire series of register-rods *C* on one side of the keyboard, as seen in Fig. 2, and having at one end an upwardly-extending arm or lever *g*, which is connected at its upper end by a slot and pin with a sliding rod *H*, arranged above and parallel with the register-rods, and provided at its front end outside the keyboard with a knob or handle *h*, and having a retracting-spring *J*, which draws it in when released, said rod *H* having near its front end a notch *i*, adapted to engage the edge of a block 46, as seen in Fig. 8, whereby said rod may be drawn out half-way against the stress of its spring *J* and retained in said position, for a purpose to be hereinafter explained, said spring *J* being arranged to exert an upward draft on the end of the rod *H* to hold it in engagement with the block 46. The levers *D* can thus be rocked to tilt either their front or rear ends downward by means of the flat bars *G*, which can be brought into contact with either end of the said levers, as seen in Figs. 1, 4, and 5, according as the register-rods *C* may be drawn in or out. Thus if when a register-rod *C* is pushed in the setting-rod *H* is drawn out to its full extent by means of its handle *h* each bar *G* connected therewith will be rocked in a direction to bring its rear or right-hand edge 20 into contact with the rear or right-hand end of the lever *D* thereover, as seen in Fig. 4, thus tilting the front or left-hand end of said lever downward. If, on the other hand, the setting-rod *H* is pushed in, the front or left-hand edge 21 of the bar *G* will contact with the front or left-hand end of the lever *D*, as seen in Fig. 5, and tilt the rear or right-hand end of said lever downward, and in this manner by means of these setting mechanisms the three rocker-levers *D* of each register-rod *C* can be set to produce any desired combination of stops upon any desired combination-pedal. The central portion of each lever *D* is cut away at *n* to enable the edge of the bar *G* thereunder to clear it while moving a lever *D*, tilted in the opposite direction of another register-rod not in the same position.

Instead of supporting the oscillating bars *G* centrally at their ends on pivots 15, as above described, they may be supported at each end on two pivot or fulcrum pins 16 17, projecting from opposite sides of the end of the bar *G*, as seen in Fig. 9, said pins entering slots 18, formed in stationary supporting-blocks 19, by which arrangement when the setting-rod *H* is drawn out the bars *G* will be rocked on the pivot-pins 16 as a fulcrum, while when the rod *H* is pushed in, as shown in dotted lines

in Fig. 9, the said bars *G* will be rocked on the pins 17 as a fulcrum, and it will be obvious that by this construction a much less movement of the arms *g* and rod *H* will be required to tilt the levers *D* than where the bars *G* are oscillated on centrally-arranged pivots, as first described.

The mechanism connected with each of the combination-pedals *E E' E²* for actuating the register-rods *C* in accordance with the combinations previously determined upon and set by means of the mechanism above referred to will now be described.

M N represent two pusher-bars extending transversely beneath the register-rods *C*, as seen in Figs. 1 and 2. Each of these bars is supported at each end upon a short horizontal rod *k*, pivoted at *l* to a link *m*, the latter pivoted at its lower end at *p* to a suitable support, as shown in Fig. 1. To the front ends of two opposite rods *k k* are pivoted two arms *q q*, projecting from rollers or rocker-shafts *r r*, extending transversely beneath the rods *C*, as seen in Fig. 3, said rollers *r r* being also provided with lateral arms 25 25, pivoted at their outer ends to the upper end of a vertical rod *P*, which is connected at its lower end with an arm 60, Fig. 3, projecting from a roller or rocker-shaft 61, provided with an arm 62, Figs. 1 and 3, the latter being pivoted to a rod 63, connected at its lower end to one of the combination-pedals, said pedal and the mechanism connected therewith being returned to its normal position when released by means of a suitable spring *t*. Two rollers 61 are provided, arranged in line with each other, one for each set of combination-pedals *E E' E²*. The upper end of the rod *P* is split or divided vertically for a portion of its length from 22 to 23, forming two separate portions 24 26, to each of which is pivoted one of the arms 25, whereby as the rod *P* is raised or depressed and the two arms describe arcs of circles its two portions 24 26 will separate or approach each other, according to the positions of the said arms, thus rendering it unnecessary to employ slots at the points where the arms are connected with the rod, and thereby reducing the friction and wear to a minimum. When a pedal *E, E', or E²* is depressed against the influence of its retracting-spring *t*, its rod *P* is drawn down, which causes the upper ends of the arms *q* to approach each other simultaneously, thereby forcing the bar *M* to the left or toward the front and the bar *N* to the right or toward the rear, bringing them into the position shown in Fig. 6^a, while when the pedal is released the rod *P* will rise, thereby causing the bars *M N* to recede from each other into the position shown in Figs. 4, 5, and 6. When, therefore, the pedal is depressed, the bar *M* as it is forced to the left or toward the front will be brought into contact with all of the levers *D* which have their rear or right-hand ends depressed, thus moving out or to the left all the register-rods *C* belonging thereto and throwing on the stops connected

therewith as desired, while simultaneously therewith the bar N is forced to the right or toward the rear and by contact with such of the levers D as have their front or left-hand ends depressed will close or shut in the register-rods C belonging thereto, thus taking off the stops connected therewith at the same time that the others are thrown on. The pedals E E' E² are thus each connected by a suitable system of levers and rods with a stop-operating mechanism, as described, each mechanism operating upon the series or row of levers D arranged thereover, as seen in Fig. 1. By means of the short rods *k* and links *m* the upper surfaces of the bars M N are kept in parallelism with the register-rods C, thereby insuring their edges coming squarely into contact with the ends of the levers D and preventing any liability of their slipping past the same without operating them in case of any wear or shrinkage of the wood or any other slight variation in the relative positions of the moving parts. After each combination has been set by pushing in the setting-rod H the latter is drawn out half-way and secured in that position by means of its notch *i*, which will leave all three of the flat bars G in a horizontal or middle position, as seen in Fig. 6, so as not to interfere with the movement of the stops by hand.

Q is the "full-organ" pedal, by means of which all of the stops on both sides of the instrument may be thrown on simultaneously. This pedal is connected by suitable lever mechanism 50 with an arm R, projecting from a roller *w*, the latter extending entirely across the instrument and carrying four arms *a'*, as shown in Fig. 3, upon which arms are secured two long wooden bars S S, which extend under the register-rods C, one bar S under each series of register-rods on one side of the keyboard.

T is a strong spring connected with the arm R, whereby the lever mechanism of the pedal Q is returned to its normal position when released.

The bars S S are adapted to engage blocks *b' c'*, secured to the under side of each register-rod C, as seen in Fig. 1, said blocks having a space 31 between them to allow of the independent movement of the register-rods by hand in a well-known manner. When the pedal Q is depressed to the bottom of its slot, all of the stops in the instrument will be thrown on at once by the movement of the bars S S toward the front of the organ, which will bring them into contact with the blocks *b'*, after which the pedal is partially released and brought back half-way, in which position it is held by engaging a notch *e'*, Fig. 1, in the side of its slot, when the bars S S will be in a position to leave the register-rods free to be moved by hand or by the combination-pedal mechanism before described. When, however, the pedal Q is released, the spring T will force the bars S S backward, which will bring them into contact with all the blocks

c' and simultaneously close in all the stops at a single movement, thus performing this operation automatically and facilitating the labor of the organist, as in all organs hitherto constructed with which I am acquainted two full-organ pedals have been employed—one to throw all the stops out and the other to close them all in. The keyboard is provided with a flexible cover W, similar to that of a roll-top desk.

The operation of my improved stop-action is as follows: In setting the combination, assuming that the stops are all closed in and that a combination of eighteen stops (out of twenty) for the forte-pedal should be required, the setting-rod H is first pushed in, which movement tilts downward the rear or right-hand ends of all the levers D, after which the setting-rod H is brought back to its normal or middle position, where it is held by its notch *i* and spring J. The two stops that are not wanted are then pulled out by hand, after which the setting-rod H is pulled out, which depresses the front or left-hand ends of the front or left-hand levers D of the two rods C, which have been pulled out. The levers D are thus left in such position that when the forte-pedal is depressed the eighteen stops required will be simultaneously thrown on by the movement toward the front of the bar M against the ends of their front levers D, and if the other two stops should happen to be on at the time they will at the same time be pushed in by the movement to the rear of the bar N against the front or left-hand depressed ends of their two front levers D. This sets one combination, after which the rod H is pushed in half-way and held by its notch *i* in that position. If now another combination is required—say ten stops—for the mezzo-pedal, the ten stops not wanted are pulled out, after which the setting-rod H is also pulled out, which will simultaneously depress the front or left-hand ends of the ten levers D of the middle or central row, which belong to the ten register-rods which have been pulled out, the central levers D of the other ten register-rods which have not been pulled out being in a position to be acted upon by the mezzo-pedal, which when depressed will throw on these ten stops and simultaneously draw in such of the other ten (not wanted) which may happen to be out at the time. The setting-rod H is then pushed in half-way and secured, as before, and if another combination—say four stops for the piano-pedal is wanted—the sixteen stops not wanted are pulled out and the rod H then pulled out, as before, which will then tilt downward the front or left-hand ends of the sixteen levers D of the innermost or rear row, which belong to the stop-rods pulled out, leaving the four levers D of the stop-rods not pulled out in a position to be acted upon by the piano-pedal.

In the operation of setting the combinations the one (forte-pedal) having the greatest number of stops must be set first, then

the one having the next largest combination, and, finally, the one having the smallest number, and when these combinations are set they can be brought into use by means of their respective pedals at any time during the performance of the piece and as often as may be desired.

I am aware of the United States patents granted to S. Duval December 3, 1889, No. 416,158, and George S. Hutchings April 28, 1891, No. 451,380, and make no claim to any of the mechanism or devices therein shown or described, as my invention differs materially therefrom, and has for its object to simplify the construction and render the parts less liable to get out of order.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an organ stop-action, the combination, with the adjustable register or stop-rods C, each provided on its under side with a series of centrally-pivoted rocker-levers D, of a setting mechanism consisting of the rocker-bars G, located beneath the levers D and adapted to depress or raise the same at either end by the contact of their edges therewith, said bars being provided with arms or levers *g*, and the sliding rod H, located above the register-rods and connected with and adapted to actuate the arms *g* and bars G to rock the levers D and set the same in different positions to be acted upon by pushing devices connected with the combination pedals, substantially as and for the purpose set forth.

2. In an organ stop-action, the combination, with the register-rods provided on the under side with rocker-levers D, of the pusher-bars M N, mounted upon horizontal rods *k*, the rollers or rocker-shafts *r*, provided with lateral arms 25 and with arms *q*, connected with said rods *k* and adapted to move the same simultaneously in opposite directions to contact with the ends of the levers D, the vertical rod P, connected with a pedal and having the outer ends of the arms 25 of the rocker-shafts *r* pivoted thereto, and the links *m*, pivoted at their upper ends to the rods *k*, whereby the pusher-bars are kept in parallelism with the register-rods as they are moved back and forth in opposite directions by the mechanism connected therewith, substantially as set forth.

3. In an organ stop-action, the combination, with the adjustable register-rods C, each provided on its under side with a series of centrally-pivoted rocker-levers D, of the pivoted rocker-bars G, located beneath the levers D and adapted to depress or raise the same at either end, said bars being provided with arms *g*, the sliding setting-rod H, located above the register-rods and connected with and adapted to actuate the arms *g* and bars G to rock the levers D, the pusher-bars M N, mounted upon the horizontal rods *k*, the rocker-shafts *r*, with their arms *q* 25, said

arms *q* connected with the rods *k*, the vertical rod P, connected with a pedal and having the arms 25 of the rocker-shafts *r* pivoted to its upper end, and the pivoted links *m*, connected at their upper ends to the rods *k*, whereby the bars M N are kept in parallelism with the register-rods C as they are moved back and forth in opposite directions by the mechanism connected therewith, all operating substantially as set forth.

4. In an organ stop-action, the combination, with the register-rods C, provided on the under side with the rocker-levers D, of the pusher-bars M N, mounted upon horizontal rods *k*, the rocker-shafts *r*, with their arms *q* 25, and the vertical connecting-rod P, split or divided at its upper end to form two separate portions, and having one of said arms 25 pivoted to each portion, substantially as and for the purpose set forth.

5. In an organ stop-action, the combination, with the register-rods provided with the rocker-levers D, the pusher-bars M N, mounted upon the rods *k*, and the mechanism for actuating the same, of the full-organ-lever mechanism consisting of the arm R, roller or rocker shaft *w*, arms *a'*, bars S S, extending beneath the register rods, said rods being each provided on the under side with blocks *b' c'*, having a suitable space between them, the pedal Q and suitable connections between said pedal and the arm R, and the spring T, connected with said lever mechanism and adapted to retract the same on the release of the pedal to simultaneously draw in the entire series of stops, substantially as set forth.

6. In an organ stop-action, the register-rods C, having their front ends provided with portions *a* 14, curved or inclined in horizontal and vertical planes to connect them in groups or series, with their knobs or handles arranged in a vertical plane, substantially as set forth.

7. In an organ stop-action, the combination, with the adjustable register or stop rods C, each provided on its under side with a series of centrally-pivoted rocker-levers D, of the rocker-bars G, located beneath the levers D and each provided at each end with two fulcrum-pins 16 17, the supporting-blocks 19, having slots 18 for the reception of the said fulcrum pins 16 17, the arms or levers *g*, secured to the bars G, and the sliding rod H, connected with said arms *g*, whereby said bars G are rocked in one direction upon the fulcrum-pin 16 and in the opposite direction upon the fulcrum-pins 17, substantially as and for the purpose set forth.

Witness my hand this 27th day of May, A. D. 1892.

JESSE WOODBERRY.

In presence of—

P. E. TESCHEMACHER,
HARRY W. AIKEN.