

No. 628,738.

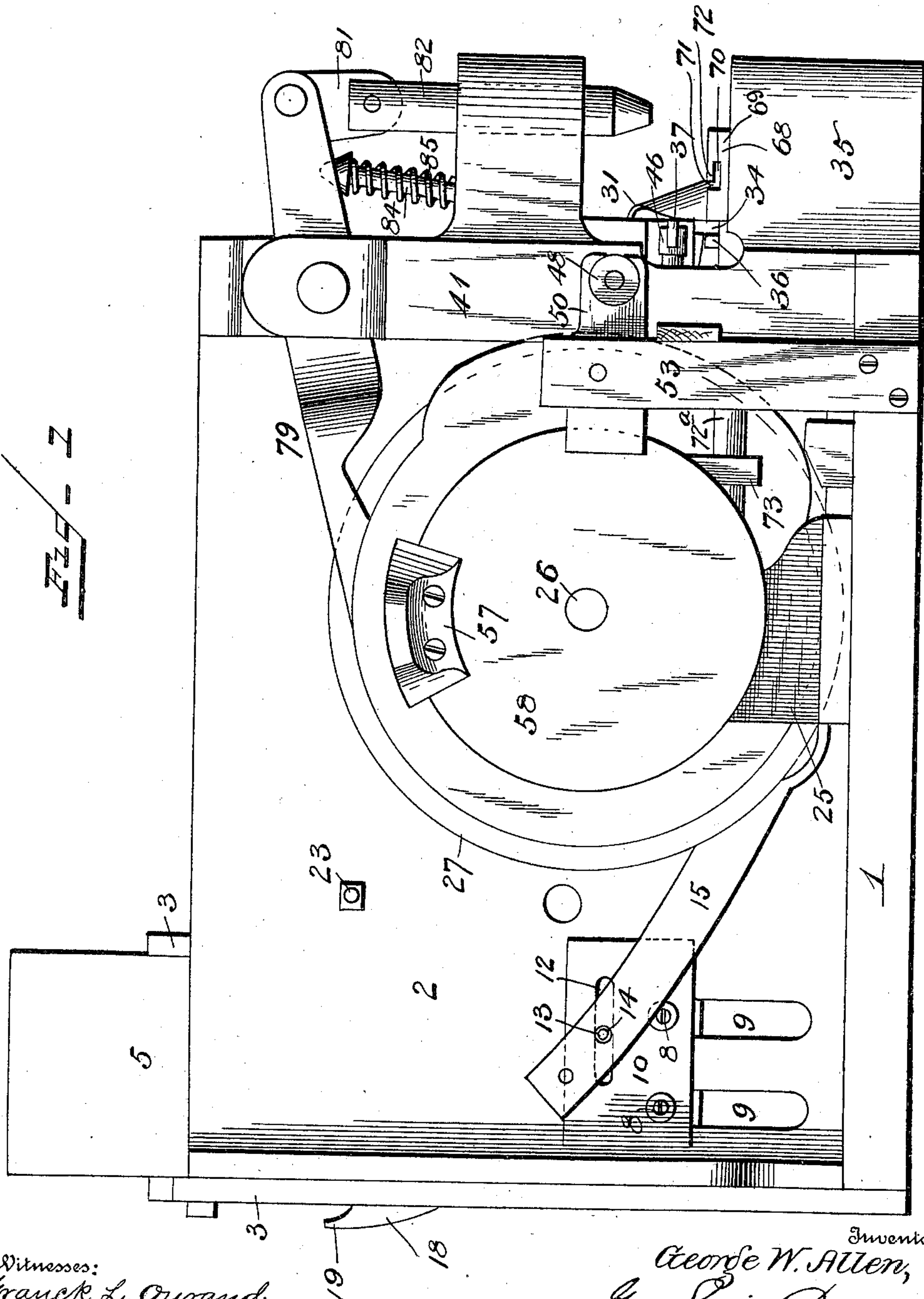
Patented July 11, 1899.

G. W. ALLEN.  
LACING HOOK SETTING MACHINE.

(Application filed Sept. 16, 1898.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:  
Frank L. Ourand  
J. L. Coombs

Inventor:  
George W. Allen,  
J. Louis Payge & Co.,  
Attorneys.

**No. 628,738.**

**Patented July 11, 1899.**

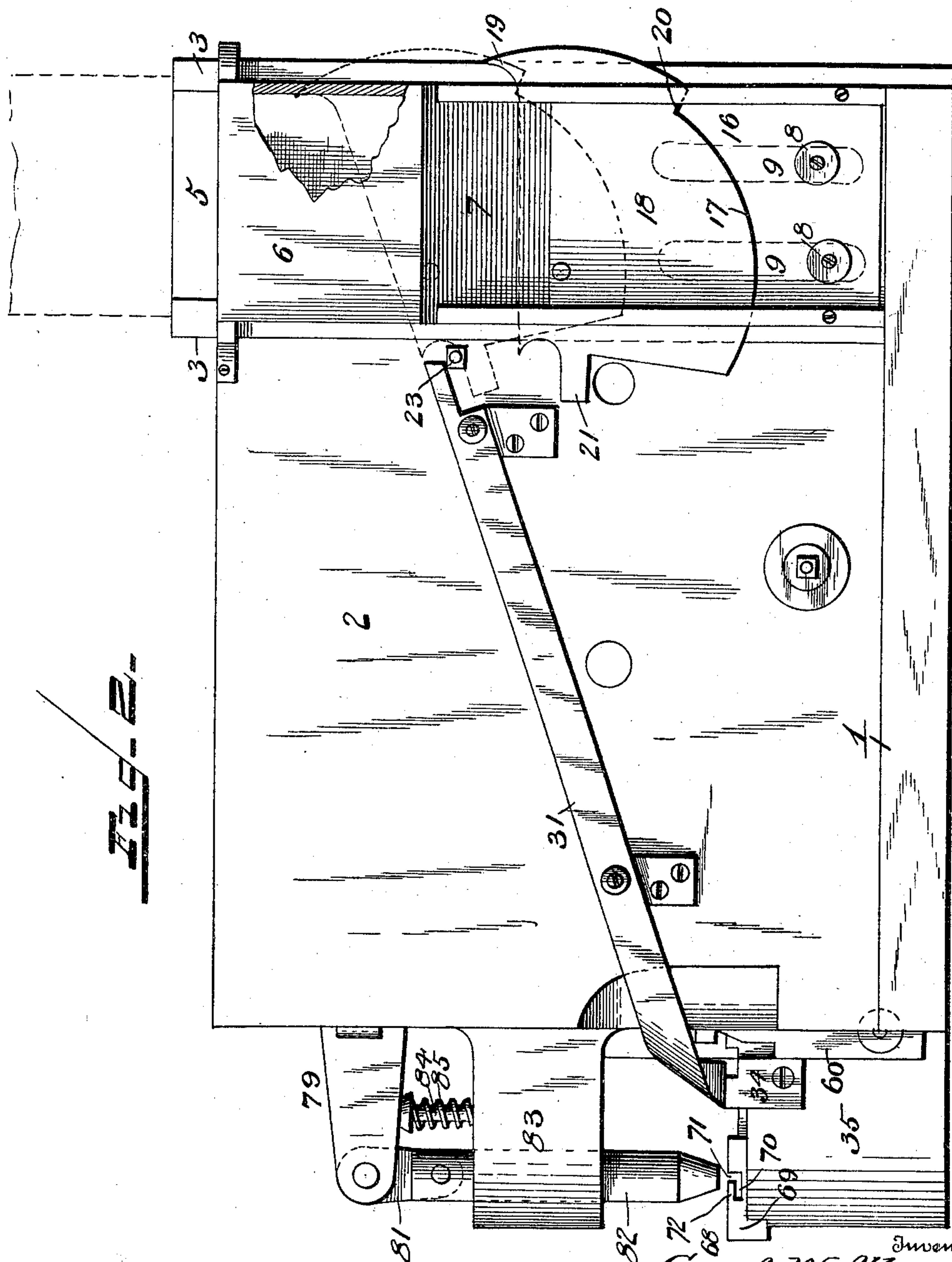
**G. W. ALLEN.**

## LACING HOOK SETTING MACHINE.

(Application filed Sept. 16, 1898.)

(No Model.)

**5 Sheets—Sheet 2.**



Witnesses:  
Frank L. Ourand.  
J. L. Coombs

82 77 68 ☐ Inventor.  
George W. Allen,  
By Louis Bagge & Co,  
Attorneys.

No. 628,738.

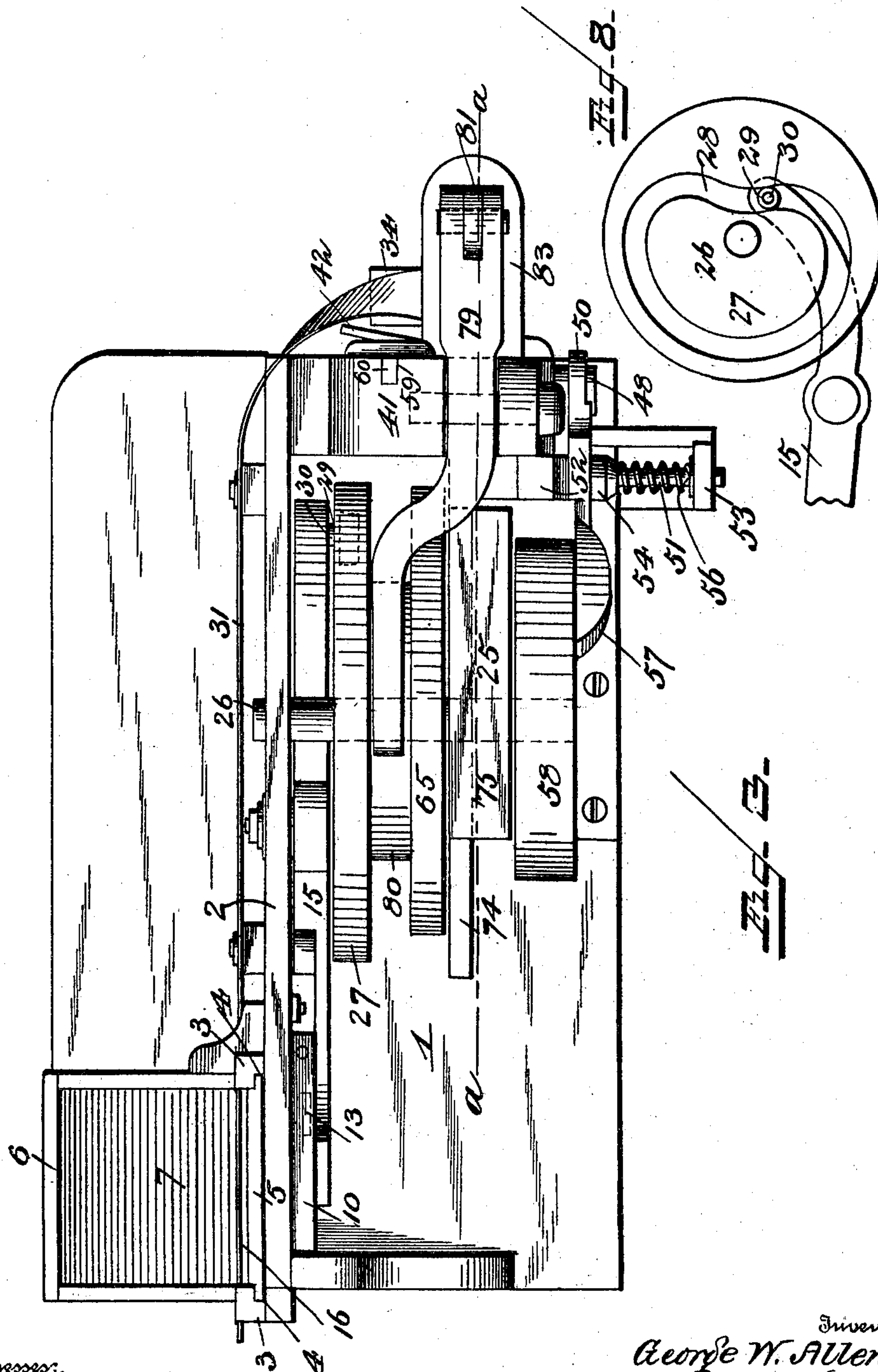
Patented July 11, 1899.

G. W. ALLEN.  
LACING HOOK SETTING MACHINE.

(Application filed Sept. 16, 1898.)

(No Model.)

5 Sheets—Sheet 3.



Witnesses:  
Frank L. Ormand  
J. H. Coombs

Inventor:  
George W. Allen,  
By Sam. Rogers & Co.  
Attorneys



No. 628,738.

Patented July 11, 1899.

G. W. ALLEN.  
LACING HOOK SETTING MACHINE.

(Application filed Sept. 16, 1898.)

(No Model.)

5 Sheets—Sheet 4.

Fig. 4.

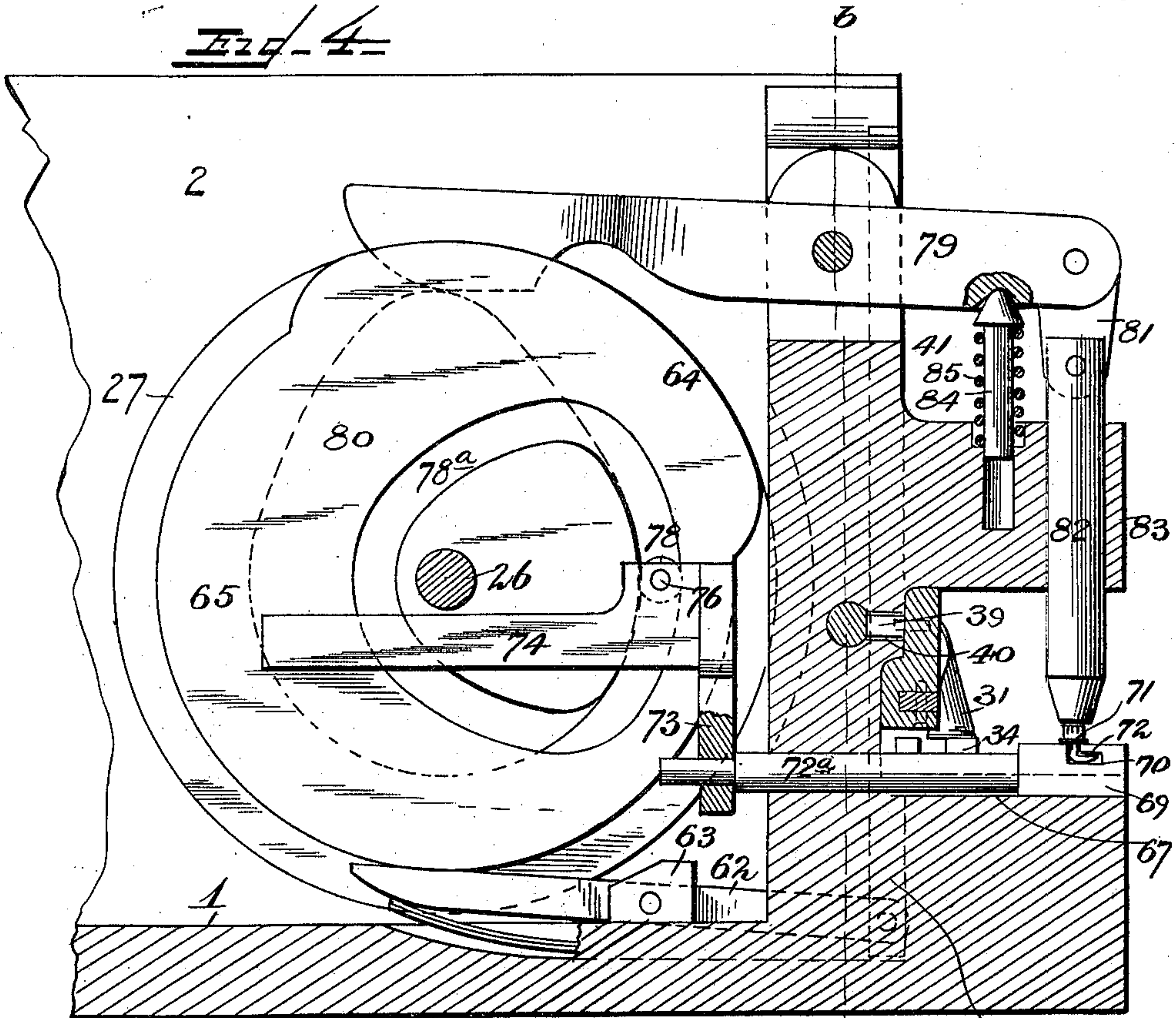
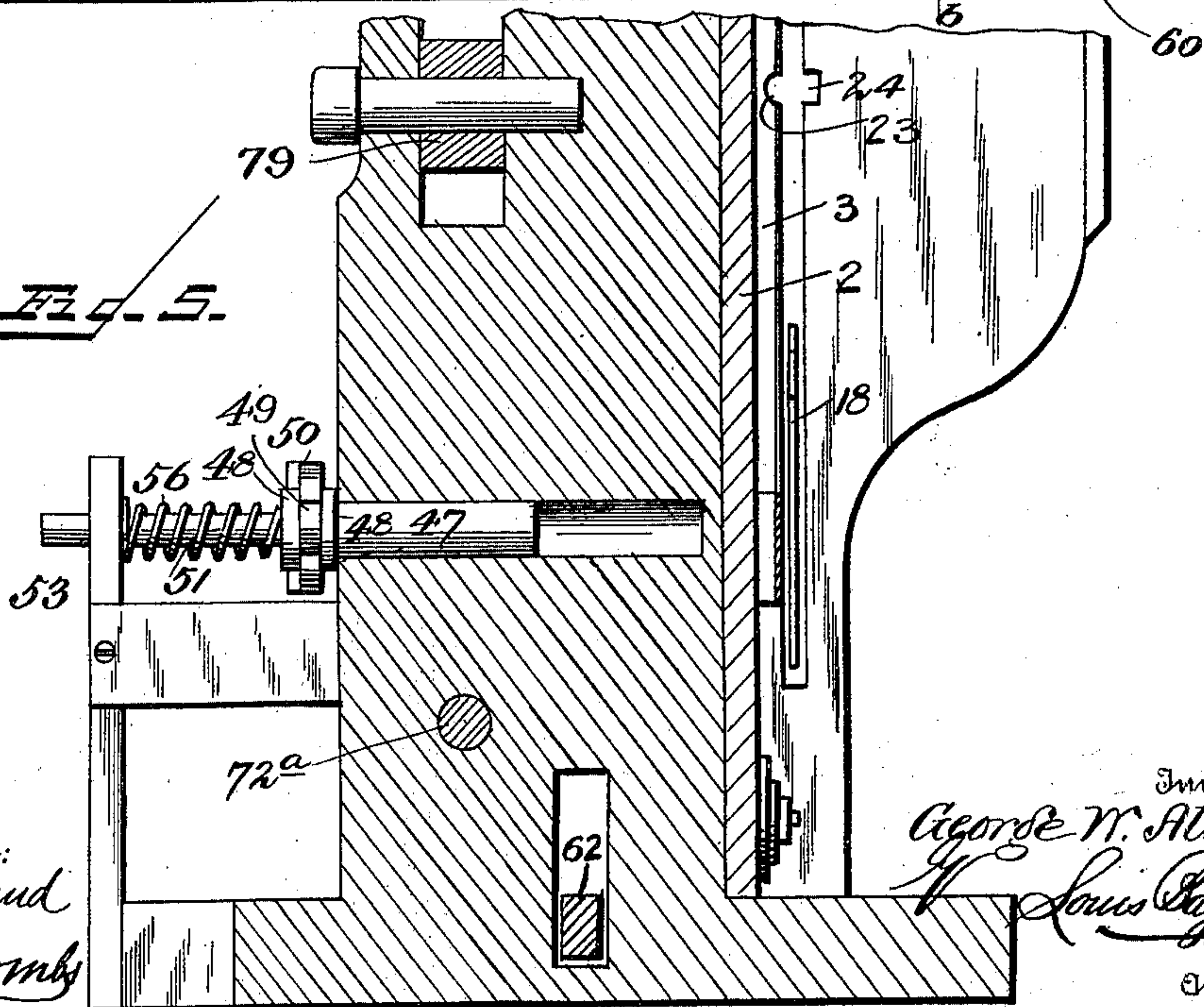


Fig. 5.



Witnesses:  
H. L. Ormand  
J. L. Coombs

Inventor:  
George W. Allen  
Louis P. Rogers  
Attorneys

No. 628,738.

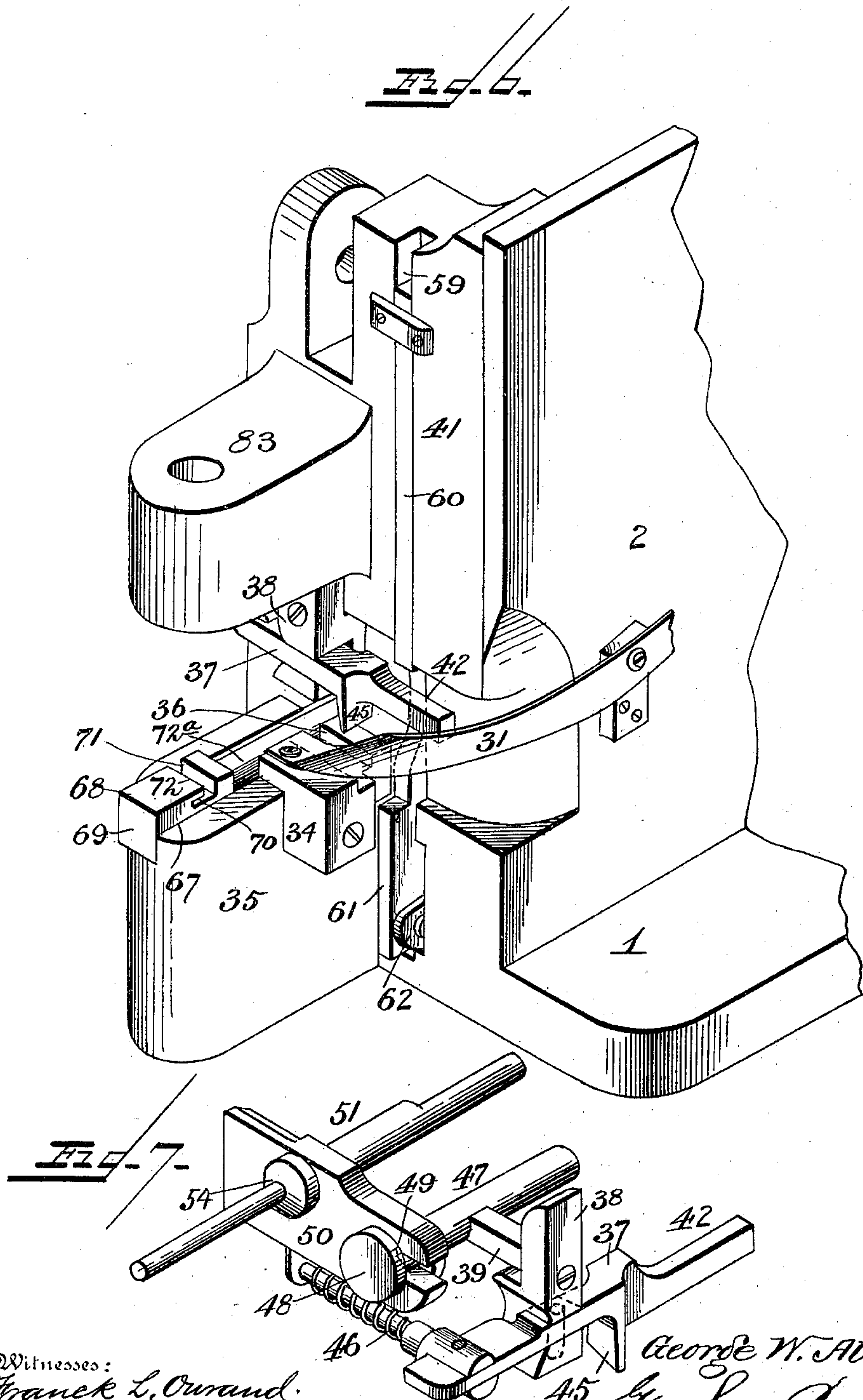
Patented July 11, 1899.

G. W. ALLEN.  
LACING HOOK SETTING MACHINE.

(Application filed Sept. 16, 1898.)

(No Model.)

5 Sheets—Sheet 5.



Witnesses:  
Frank L. Ourand.  
J. L. Coombs

Inventor:  
George W. Allen,  
J. L. Coombs & Co.  
Attorneys.



# UNITED STATES PATENT OFFICE.

GEORGE W. ALLEN, OF TAUNTON, MASSACHUSETTS, ASSIGNOR OF THREE-FOURTHS TO ELIJAH F. LEWIS AND FRANCIS B. PERRY, OF SAME PLACE.

## LACING-HOOK-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 628,738, dated July 11, 1899.

Application filed September 16, 1898. Serial No. 691,058. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. ALLEN, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented new and useful Improvements in Lacing-Hook-Setting Machines, of which the following is a specification.

My invention relates to machines for setting shoe-lacing hooks; and its object is to provide an improved construction of the same which shall possess superior advantages with respect to efficiency in use.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a lacing-hook-setting machine constructed in accordance with my invention. Fig. 2 is a similar view looking from the opposite side, the hopper being broken away and the slide and blade being shown in their elevated positions by dotted lines. Fig. 3 is a plan view. Fig. 4 is a longitudinal section on the line *a a*, Fig. 3. Fig. 5 is a transverse section on the line *b b*. Fig. 6 is a detail perspective view of the front of the machine, showing the receiving-plate, the carrier, and the two-motion lever, and means for operating the same. Fig. 7 is a detail perspective view showing the cross-head and two-motion lever and connections. Fig. 8 is an elevation of the slotted cam-disk, which actuates the slide carrying the blade.

In the said drawings the reference-numeral 1 designates the base of the machine, provided with a vertical wall 2, extending from end to end of the same. Secured to one side of this wall, at the rear end thereof, are two ways 3, consisting of vertical strips secured to the said wall and each formed with a vertical groove 4. Fitting and working in these grooves is a vertically-movable slide 5, which forms the inner or back wall of a hopper 6, having an inclined bottom 7. This slide is of about the same height as the wall and near its lower end is provided with two pins or studs 8, which project through and are movable in slots or openings 9 in the said wall. Secured to these studs is a vertically-movable plate 10, provided with a horizontal slot 12,

with which engages a roller 13, journaled on a pin 14, secured to a lever 15, pivoted to the said wall. This lever is oscillated to elevate the said plate and slide, as hereinafter described. The lower end of said slide 5 is formed with an enlargement 16, the upper side end of which is curved in the arc of a circle, forming a shoulder 17. Located above this shoulder is a segmental blade 18, which is pivoted to and movable with the slide, and its face is flush with said enlargement. The rear end of this blade is formed with a finger 19 and with a shoulder 20, adapted to engage with the upper end of the shoulder 17, which forms a stop for the blade. Upon the inner side the blade is formed with a lug 21, which is adapted to engage with a pin 23, secured to the wall 2 as the slide is moved upwardly, and thus turn the blade on its pivot, so that the upper edge thereof will occupy an inclined position in line with an inclined track hereinafter described. This blade, which is for the purpose of feeding the hooks contained in the hopper to the track, is so located in the hopper that there is a space between its inner side and the inner side of the wall 2 sufficient to allow the cylindrical tube or eyelet of a hook to engage between the same, so that the tube or eyelet of the hook is always presented outwardly or carried along the outer face of the blade. Opposite openings 24 are formed in one of the ways 3 and one of the sides of the hopper for the delivery of the hooks from the blade onto the track.

The numeral 25 designates a standard secured to the base 1, in which is journaled a driving-shaft 26, provided with a disk 27 at the inner end formed with a cam-slot 28, in which works a roller 29, journaled on a pin 30, secured to the lever 15. This shaft is also journaled in the wall 2 and may be driven by any suitable means.

The numeral 31 designates an inclined track secured to the wall 2. This track consists of a rectangular metal or other bar, and its lower end is curved inwardly and downwardly and secured to what I term a "receiving-plate" 34, secured to a forwardly-extending anvil 35. This plate is formed with a rectangular groove 36 in its upper side to receive the hooks as they come from the track. Located above



said plate is a two-motion lever 37, which is transversely movable over the anvil and receiving-plate and which is also capable of an oscillating movement on its pivot. This lever is pivoted to a transversely-movable cross-head 38, provided with a stud 39, which works in a guide-slot 40, formed in the front side of a standard or upright 41, secured to the base 1. The lever 37 is provided with a tailpiece 42 at one end by which it is oscillated, as hereinafter described. Said lever at the junction therewith of the tailpiece is formed with a downwardly-projecting lug 45, which is adapted to engage with a hook in the receiving-plate and carry it to a carrier-plate, which presents it to a plunger, which clenches the eyelet. At the opposite end said lever is provided with a spring-actuated pin 46, which returns the lever to normal position after having been moved outward or turned upon its pivot. At the rear or inner end said pin is supported by a bracket secured to a yoke hereinafter described. Working in a cylindrical recess in the standard 41 is a rod 47, to which the stud 39 is secured. At its outer end this rod is provided with a boss 48, formed with a peripheral groove 49, with which engages a yoke 50. This yoke is carried by a transverse rod 51, which is movable in a plate 52, secured to the standard 41, and in a standard 53, secured to the base 1. Said rod is provided with a collar 54, between which and the standard 53 is interposed a coiled spring 56. The upper rear end of the said yoke is beveled, and adapted to engage therewith is a cam 57, secured to the outer face of a disk 58, secured to the driving-shaft 26.

Vertically movable in a groove 59 in the front side of the standard 41 is a slide 60, provided near its lower end with an offset 61, the upper end of which is beveled and adapted to engage with the tailpiece 42 of the lever 37, by which said lever is turned outward on its pivot. Pivotally connected with the lower end of slide 60 is a horizontal spring-actuated lever 62, which is pivoted to lugs 63, secured to the base 1. The inner end of this lever is adapted to be struck by a cam 64 on the periphery of a disk 65, fixed to the driving-shaft 26, by which said lever is actuated and the slide 60 elevated.

Working in a groove 67 in the upper side of the anvil 35 is a hook-carrier 68, consisting of a rectangular block 69, formed with a transverse recess 70 extending therethrough, with an intersecting slot 71 in its upper side, forming a ledge 72. The slot 71 is adapted to be brought into coincidence with the recess in the receiving-plate and a hook therefrom be fed to the carrier by the horizontally-movable and oscillating lever, the tube or eyelet of the hook engaging with or resting on the ledge and the head thereof seating in the recess 70. Connected with the inner end of the carrier is a rod 72<sup>a</sup>, which is secured to the vertical arm 73, secured to a slide 74, working in a horizontal guide-groove 75 in the inner side

or face of the standard 25. This slide is provided with a pin 76, on which is journaled a roller 78, which works in a cam slot or opening 78<sup>a</sup> in the disk 65, by which the slide and carrier are reciprocated back and forth.

Pivoted to the upper end of the standard 41 is a lever 79, the inner end of which engages with a cam-disk 80, secured to the driving-shaft 26. To the outer end of this lever is pivoted a link 81, which in turn is pivoted to the upper end of a vertically-movable plunger 82, which passes through a guide hole or aperture in a bracket 83, secured to or forming part of the standard 41. A rod 84 is interposed between said bracket and lever, provided with a coiled spring 85, which elevates the plunger after having been depressed by the lever and cam-disk.

The lacing-hooks which I use in connection with my machine are of that class or description which comprise a tube or eyelet adapted to be passed through a hole in the upper of a shoe and be clenched down upon the latter and a head and shank with which the shoe-lacing engages.

The operation of the invention is as follows: The hooks are placed in the hopper and the machine set in motion by the driving-shaft. As said shaft rotates the slide 5 will be vertically reciprocated through the medium of the plate 10, lever 15, and cam-disk 27. Upon the upstroke of the slide 5 the lug 21 thereof will strike the pin 23, causing the blade to turn on its pivot, so that its upper edge will come into alinement with the inclined track, as shown by the dotted lines, Fig. 2. As said blade is thus turned its upper edge will seize the hooks, engaging between their eyelets and heads, and carry them upward, from whence they will slide off through the side of the hopper onto the inclined track, from whence they will be fed by gravity to the receiving-plate 34. As before stated, the space between the said blade and the slide 5 is sufficient to admit the heads of the hooks, but not the eyelets, so that the latter will always point outward when sliding down the track. As the hooks approach the lower bent or curved end of the track the oscillating lever 37 will, by means of the offset 61, vertically-movable slide 60, lever 62, and cam 64, be turned outwardly on its pivot, so that its lug 45 will engage with one of the hooks in the recess of receiving-plate 34. The said lever will now be moved transversely across the carrier 68 by means of the cross-head 38, stud 39, rod 47, yoke 50, and cam 57. As the lever 37 is thus moved transversely its lug will feed the hook into the opening and recess in the carrier. When the cam 57 leaves the yoke, the coiled spring 56 will return the cross-head 38 and lever 37 to normal position. At the same time the slide 60 will be depressed, allowing the tailpiece of the lever to ride off of the offset 61 and the lever 37 to be turned on its pivot to normal position and allow its lug to again engage with a new hook upon the next



movement of the lever. The carrier containing the hook will now be moved outwardly or forwardly by its connections and the cam-disk and be brought under the plunger, when the hole in the shoe-upper will be engaged by the tube or eyelet of the hook. The plunger will then be depressed and the eyelet or tube be clenched to the upper. The hook is now disengaged from the carrier, when the latter will be returned to normal position and the operation will be repeated to engage another hook with the upper.

Having thus fully described my invention, what I claim is—

1. In a lacing-hook-setting machine, the combination with the base, the vertical wall formed with slots near one end, the hopper having an inclined bottom, the vertically-movable slide provided with pins near the lower end projecting through said slots, the plate to which said pins are secured having a horizontal slot, the pivoted lever provided with a pin and roller engaging therewith and the cam-disk for operating said roller, of the segment-plate pivoted to said slide having a lug, the pin with which said lug is adapted to engage and the inclined track, substantially as described.

2. In a lacing-hook-setting machine, the combination with the inclined track having its lower end curved inwardly of the stationary receiving-plate having a recess therein, the oscillating and transversely-movable lever and means for actuating the same, the horizontally-movable carrier having an opening therethrough and an intersecting slot in its upper end and the vertically-movable plunger, substantially as described.

3. In a lacing-hook-setting machine, the combination with the inclined track having its lower end curved inwardly, of the receiving-plate having a recess in its upper side, the pivoted lever having a lug and tailpiece, the vertically-movable slide having a beveled offset adapted to engage with said tailpiece, and means for operating said slide, substantially as described.

4. In a machine for setting lacing-hooks, the combination with the inclined track having its lower end curved inwardly, of the receiving-plate having a recess in its upper side, the pivoted lever having a lug and a tailpiece, the vertically-movable slide having an offset adapted to engage with said tailpiece, the spring-actuated lever with which said slide is pivotally connected, and the disk provided with a peripheral cam for operating said lever, substantially as described.

5. In a machine for setting lacing-hooks, the combination with the inclined track having its lower end curved inwardly, of the receiving-plate having a recess in its upper side, the lever having a lug, the cross-head to which said lever is pivoted, the stud connected therewith, the transverse rod, the grooved boss, the yoke engaging therewith, the spring-actuated rod, the rotatable disk

and the cam secured thereto, and adapted to engage with said yoke, substantially as described.

6. In a machine for setting lacing-hooks, the combination with the inclined track having its lower end curved inwardly, the receiving-plate having a recess in its upper side, the oscillating and transversely-movable lever having a lug and tailpiece, the vertically-movable slide having an offset, the transversely-movable cross-head to which said lever is pivoted, the stud secured thereto, the rod secured to said stud, the grooved boss, the yoke, the spring-actuated rod to which said yoke is secured and the disk and cam, substantially as described.

7. In a machine for setting lacing-hooks, the combination with the inclined track having its lower end inclined inwardly and the stationary receiving-plate having a recess in its upper side, of the horizontally-reciprocating carrier having an opening extending therethrough and an intersecting slot in its upper side, the vertically-movable plunger and means for feeding a lacing-hook to said carrier and means for operating said carrier and plunger, substantially as described.

8. In a machine for setting lacing-hooks, the combination with the inclined track having its lower end curved inwardly, and the receiving-plate having a recess in its upper side, of the carrier having an opening extending therethrough and an intersecting slot, the rod connected with said carrier, the bracket, the horizontally-movable plate to which said bracket is secured and the disk provided with a cam-slot for reciprocating said plate, substantially as described.

9. In a machine for setting lacing-hooks, the combination with the receiving-plate having a recess in its upper side, and the oscillating and transversely-movable lever and means for oscillating and reciprocating the same, of the horizontally-movable carrier having an opening extending therethrough and an intersecting slot, the horizontally-reciprocating plate and connections with said carrier, the pin and roller connected therewith and the rotatable disk formed with a cam-slot with which said roller engages, substantially as described.

10. In a machine for setting lacing-hooks, the combination with the receiving-plate having a recess in its upper side, the horizontally-reciprocating carrier having an opening extending therethrough and an intersecting slot, and the rotatable disk having a cam-slot and the connections between said disk and carrier, of the oscillating lever having a lug and tailpiece, the vertically-movable slide having an offset adapted to engage with said tailpiece, and the cross-head to which said lever is pivoted and means for transversely reciprocating the same, substantially as described.

11. In a machine for setting lacing-hooks, the combination with the receiving-plate having a recess in its upper side, the horizontally-



movable carrier having an opening extending therethrough and an intersecting slot, the rotatable disk having a cam-slot therein and connections with said carrier, of the oscillating spring-actuated lever having a lug and tailpiece, the vertically-movable slide having an offset, the transversely-movable cross-head to which said lever is pivoted, the transversely-movable spring-actuated yoke and connections with said cross-head, the rotatable disk and the cam secured thereto for actuating said yoke, substantially as described.

12. In a machine for setting lacing-hooks, the combination with the horizontally-movable carrier having an opening extending

therethrough and an intersecting slot and means for feeding a hook to said carrier, of the vertically-movable plunger, the lever, the link pivotally connecting said plunger and lever, the coiled spring and the rotatable disk provided with a peripheral cam for actuating said lever to depress the plunger, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE W. ALLEN.

Witnesses:

HOWARD L. PHILLIPS;

ABBOTT W. LEONARD.