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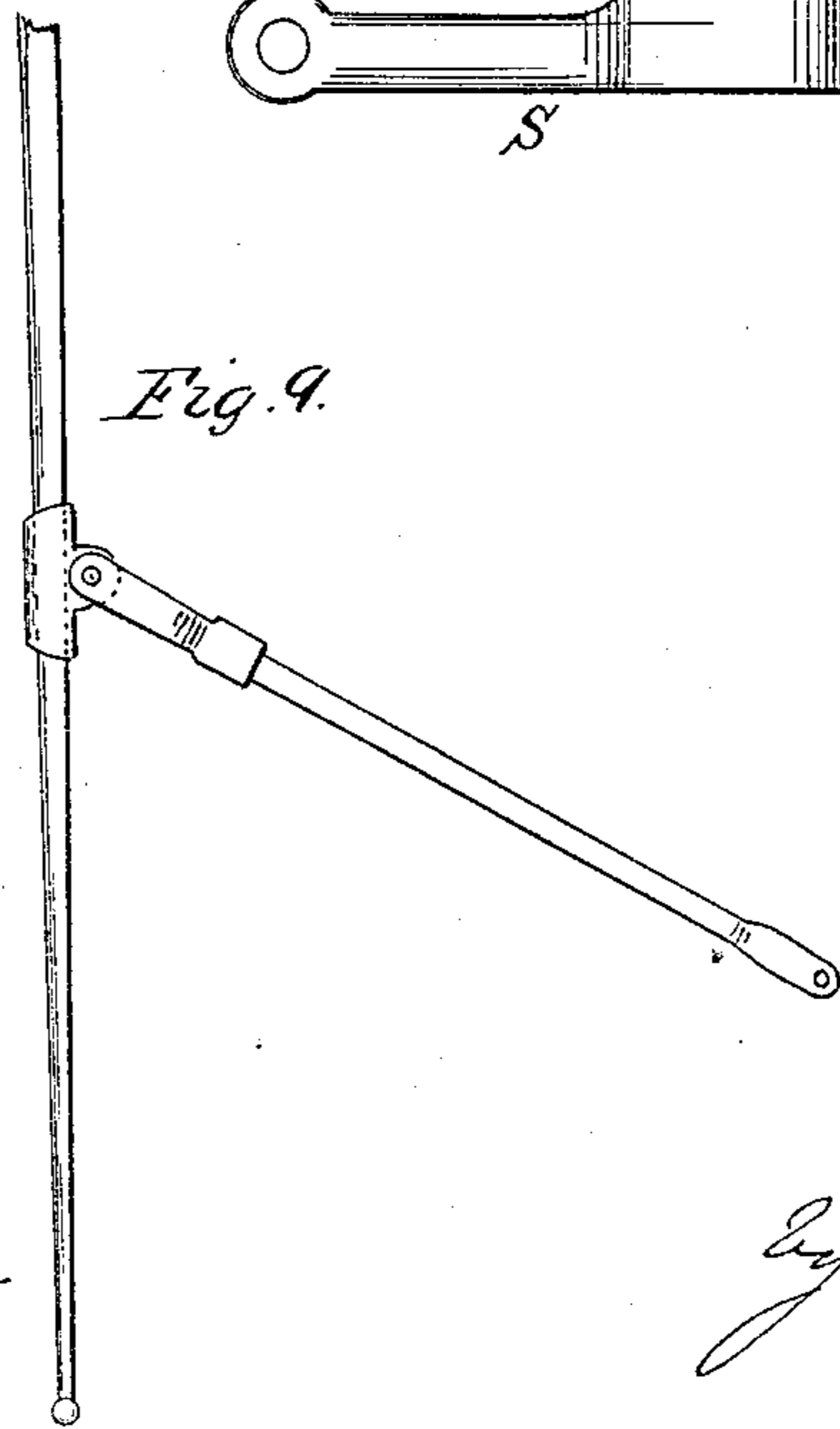
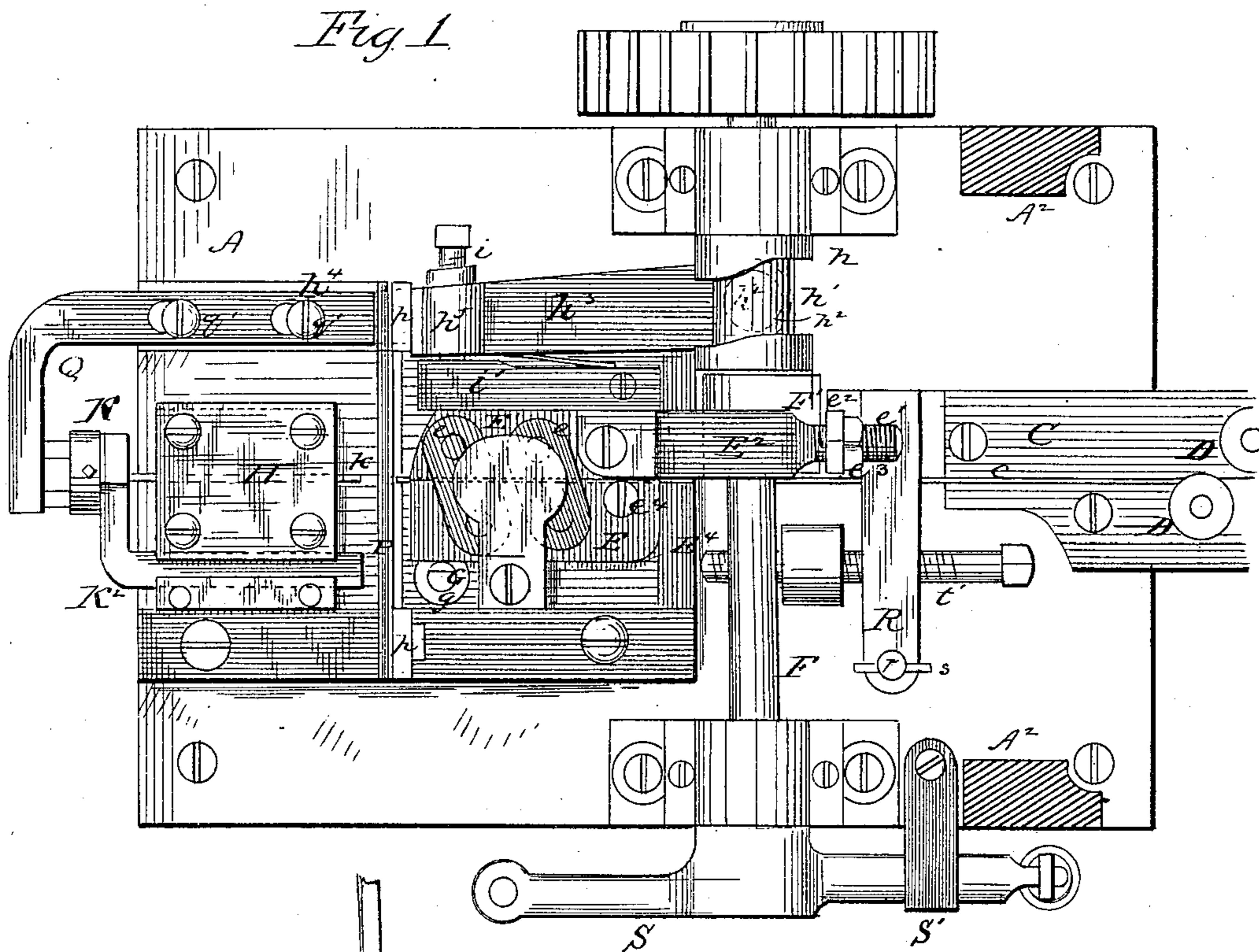
3 Sheets—Sheet 1.

A. LIGIBEL.

MACHINE FOR RIVETING UMBRELLA FRAMES.

No. 321,231.

Patented June 30, 1885.



Witnesses
J. Bacon
Daniel Scott

A. Ligibel
Inventor
By C. M. Connelley
Att'y

(No Model.)

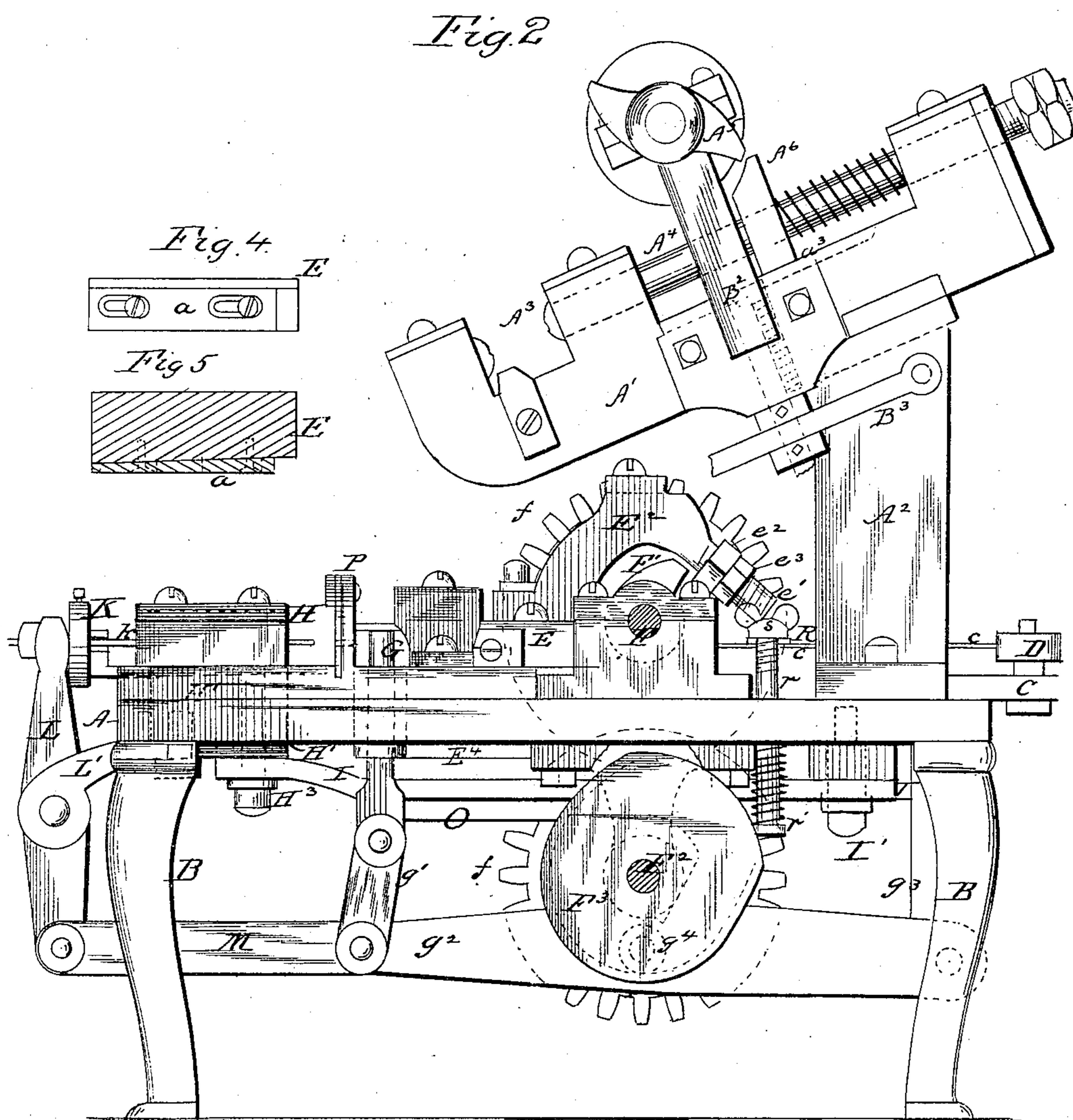
3 Sheets—Sheet 2.

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Fig. 6 *Adolph Ligibel*
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(No Model.)

3 Sheets—Sheet 3.

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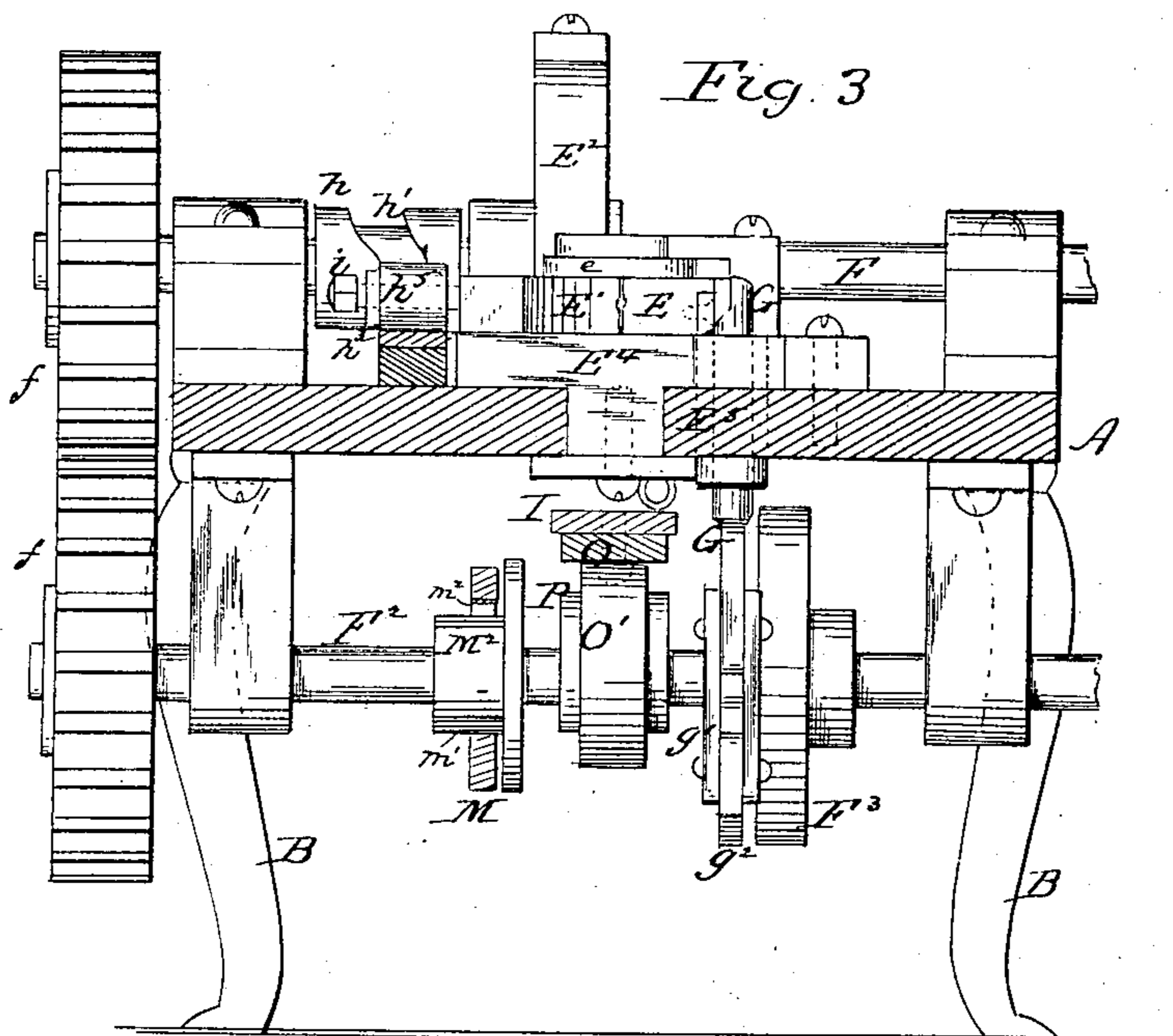


Fig. 7

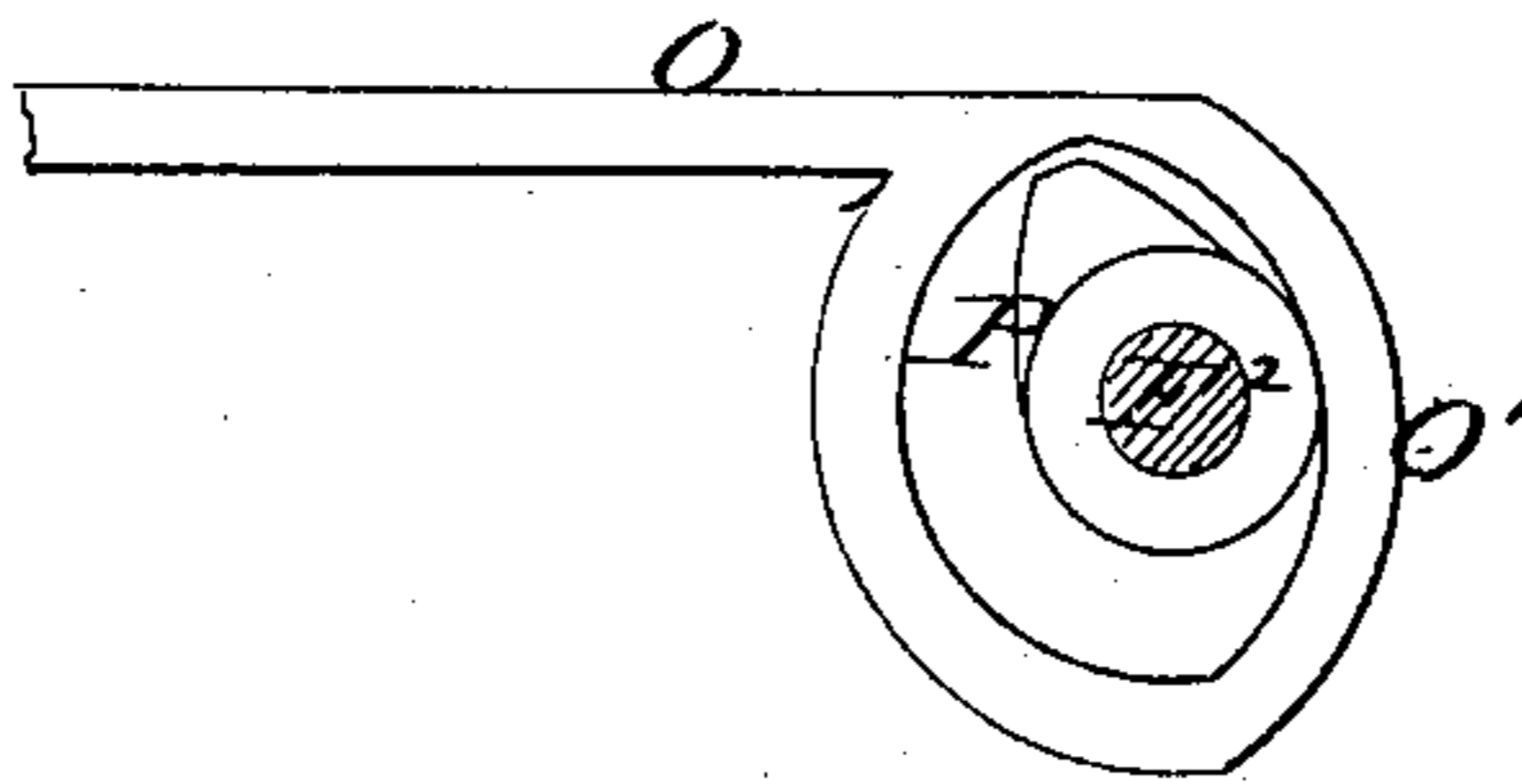
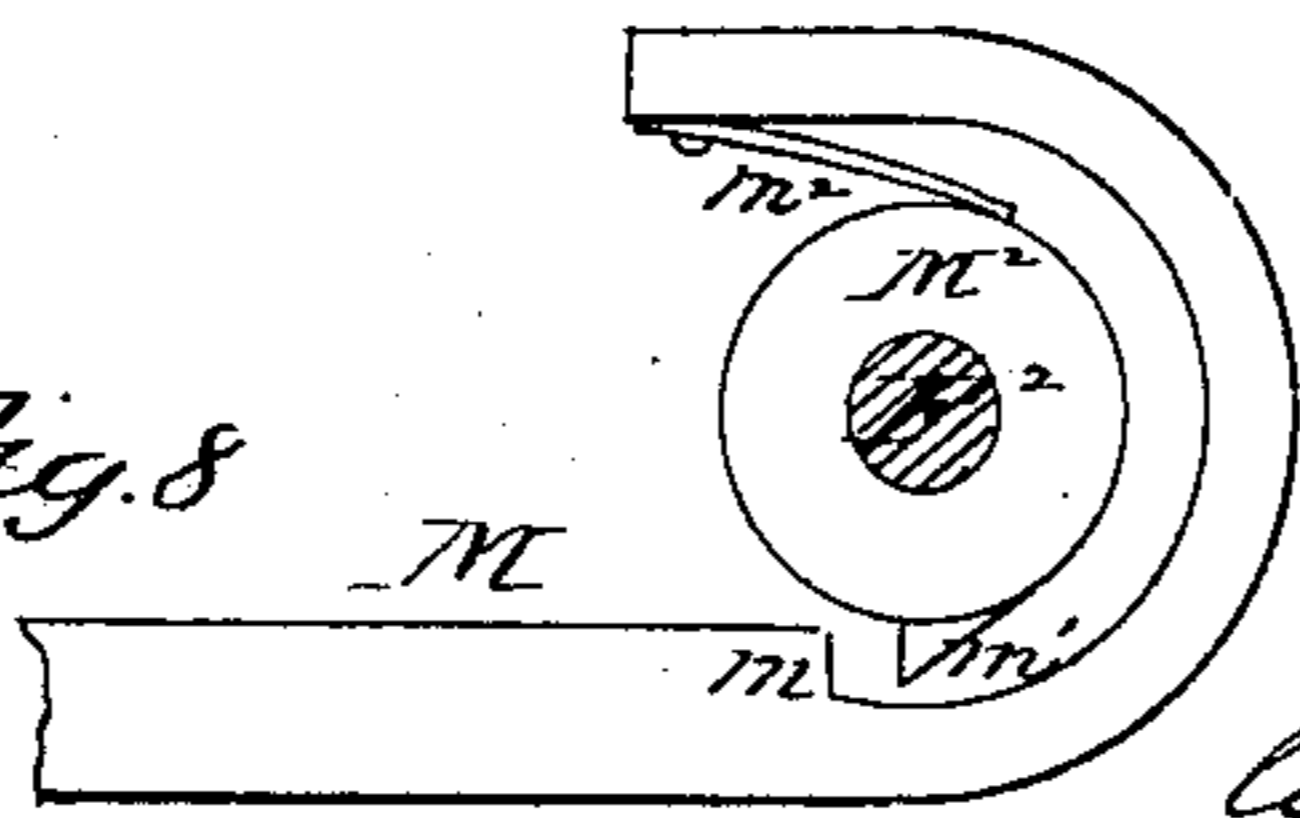


Fig. 8



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UNITED STATES PATENT OFFICE.

ADOLPH LIGIBEL, OF JERSEY CITY, NEW JERSEY.

MACHINE FOR RIVETING UMBRELLA-FRAMES.

SPECIFICATION forming part of Letters Patent No. 321,231, dated June 30, 1885.

Application filed April 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH LIGIBEL, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Machines for Inserting and Heading Pivots, of which the following is a specification.

My invention has relation to machines for connecting together the ribs and stretchers of umbrella and parasol frames after the joint-clips or hinge-pieces have been fitted thereto.

My invention consists in the novel construction, combination, and arrangement of devices, by means of which the wire to form the connecting-pivots is fed to its work, inserted in the connecting-clips, cut off in proper lengths after such insertion, and then rivet-headed or flattened at the ends to insure retention, all as hereinafter described.

The object of my invention is to save labor, and to not only greatly facilitate the work of connecting together the umbrella-ribs and stretchers, but to obtain uniformity and greater accuracy.

The machine embodying my invention comprises a table or frame, upon which are mounted rollers to guide the wire from which the pivots are formed to its work; a guide-rod or mandrel located on a line with the wire and connected with mechanism which will project said rod through the pivot-holes of the rib and stretcher connections, and cause it to hold the latter in position for the reception of the pivot-wire; a pair of clamping, feeding, and wire-severing jaws between which the wire is held while being inserted into the pivot-hole, and by which the wire is cut off in suitable lengths after such insertion; a heading-tool or hammer to flatten or rivet-head the pivots, and suitable mechanism for actuating the different moving parts, and for the adjustment thereof to different lengths of pivots.

Referring to the accompanying drawings, Figure 1 is a plan view of a machine embodying my invention, the pivot-heading attachment being omitted; Figure 2, a side elevation, partly in section; Fig. 3, a transverse section; Figs. 4, 5, 6, 7, and 8 detail views, and Fig. 9 a side view, of an umbrella rib and stretcher.

A designates a table or stand of cast metal

or other suitable material mounted on legs B B, by which the structure may be bolted or otherwise secured to a bench or other support. C designates a plate secured to the top of the table A and supporting a series of rollers, D D, between which the pivot wire *c* is fed from a reel.

E E' designate a pair of jaws grooved on their contiguous faces (one of said grooves being plain and the other serrated) for the passage of the wire, and connected together by parallel pivotal links *e e*. The jaw E is pivoted at its rear end to a slide, E⁴, which moves lengthwise of the table A in a slot, E⁵, while the jaw E' is secured to a curved arm or yoke, E², which terminates in a threaded shank, *e'*, upon which are arranged the adjusting-nut *e*² and jamb-nut *e*³. The yoke E² passes over or embraces a transverse shaft, F, carrying a cam, F', by which motion is imparted to the yoke and through the same to the jaw E', for the purpose of feeding the wire forward.

Upon the shaft F, to which motion is communicated through gearing *f f* from a transverse shaft, F², located below the table-top, is arranged a collar, *h*, having a cam-groove, *h'*, in its periphery engaging a roller, *h*², on the end of a lever, *h*³, having its fulcrum at *h*⁴. A socket is formed at *h*⁵ on said lever, and carries a set-screw, *i*, abutting against an arm or lever, *i'*, lying parallel to and beside the jaw E'. As the collar *h* turns, and through its cam-groove acts on the lever *h*³, the latter operates through the lever or arm *i* to push the jaws E E' sidewise, causing them to turn on the pivotal point *e*⁴.

G is a vertical stop pin or stud, beveled on one side and passing through a steel bushing, *g*, inserted in the table and connected by a link, *g'*, to a lever, *g*², pivoted to a pendant or supporting-arm, *g*³, which is attached to the under side of the table at its rear end. The shaft F² carries a grooved cam, F³, in which rides a roller, *g*⁴, journaled on the lever *g*². Through the action of this cam on the lever *g*² the stop pin or stud G is periodically drawn downward, so as to allow the jaws to be turned laterally, the form of the stud G being such that when the stud is up it will prevent such lateral motion, the jaws then moving only in a rectilinear direction, as required in feeding or carrying the wire forward and through the pivot-holes

and in withdrawing them to obtain a fresh purchase on the wire.

To take up or compensate for wear, the jaw E has a channel or groove in its outer edge, in which lies a wedge-shaped longitudinally-adjustable steel block, a , which may be moved lengthwise, as required, to maintain the proper relationship between the jaw and the stud G.

H designates a block formed with a rabbeted portion or tenon, H' , which enters a slot in the table, and is movable in said slot lengthwise of the table and in the direction of the wire. Said block is bored lengthwise, and so constructed as to constitute a guide to the mandrel rod or wire k , which is keyed in a chuck, K. The chuck K engages with an L-shaped slide, K^2 , which runs in a groove formed in the block H, and is employed, as hereinafter more particularly described, for the retraction of the mandrel-rod after the latter has performed its function. A lever, L, fulcrumed on an arm, L' , extending out from beneath the table A, is connected at its upper end to the chuck K, and pivotally coupled at its lower end to a bar, M, extending horizontally beneath the table and below the shaft F^2 . The free extremity of this bar is curved up and back over the shaft F^2 , and carries a spring, m^2 , which rests on a cam-collar, M^2 , formed on said shaft. A shoulder or notch is formed in the bar M at m , and with said shoulder or notch the cam-projection m' periodically engages, so as to give the bar M a sudden movement and produce a short forcible thrust of the mandrel-wire, for the purpose of forcing said wire through the clips or joint-sections. The block H is connected, through the medium of a bolt or set-screw, H^3 , with a slide, I, slotted at its rear end for the passage of a set-screw, I' , which is fastened to a boss on the under side of the table A.

To the slide I is secured a bar, O, having one end formed as an elliptical yoke, O' . The shaft F^2 passes through this yoke, and a cam, P, carried on said shaft impinges upon the inner surface or edge of the yoke, causing the slide I to reciprocate lengthwise and the block H and mandrel-wire, slightly clamped by the block, to move correspondingly.

Between the block H and the jaws E E' is arranged an eye-plate, P, securely fastened by screws or bolts to standards p , and pierced at its middle point on an exact line with the mandrel-rod and the pivot-wire.

Q designates an L-shaped bar, slotted at V, adjustably secured by screws q' to the bed A, its transverse extension abutting against the outer part of the chuck K. This bar serves as a stop to limit the retractile movement of the chuck and guide or mandrel wire, and it is adjusted according to the required play of the guide-wire, which play depends on the dimensions of the joint-clips or the length of the pivot-socket.

R designates a clamping plate or spring having one end fastened to a cleat on the bed A, above the pivot-wire, and its other end placed upon a vertical post, r , encircled by a spring,

r' , and provided with a thumb-nut, s , screwed upon its upper and threaded end. The purpose of the plate R is to clamp the wire in its movement forward and to keep it properly strained and straight. By loosening or tightening the thumb-screw the pressure of the plate R may be regulated.

The shaft F^2 is intended to perform its work and give motion to the other parts of the machine under a partial revolution given to it by means of a treadle-connection of which the crank S is a part, and S' a stop to limit the movement of said crank.

The several parts of the pivot-inserting machine being constructed and arranged as described, the operation is as follows: The umbrella rib and stretcher to be connected are brought together so that the pivot-holes in their lugs shall coincide. The joint is then laid in the space between the block H and the eye-plate, and the block H moved forward so as to compress and hold the clips and the mandrel-wire forced through said pivot-holes, the treadle being worked so as to turn the shaft F^2 and cause the block H, with the mandrel-wire, to be moved forward through the action of the cam P on the yoke O' until the cam-projection m' comes in contact with the shoulder m on the bar M, when the latter is pushed back, and the guide-wire projected forward and through the pivot-holes of the joint-clips. As the movement of the shaft F^2 continues, the projection m' leaves the shoulder m , and the bar M with the lever L, chuck K, and guide-wire are free to be retracted, as will be presently described. As the shaft F^2 communicates motion to the shaft F, the cam F' on the latter impinges against the yoke E^2 , and by a slight initial movement of the jaw E' causes the wire to be tightly clamped between the two jaws with sufficient of its length projecting to form a pivot. The movement of the yoke E^2 continuing, the two jaws move together, and the wire is forced through the eye in the eye-plate. The slide E^4 , carrying the jaw E, now comes in contact with the bar K^2 and begins to force the same back, thus causing the chuck K and guide-wire to be retracted, while the pivot-wire moves forward through the hole in the eye-plate, entering the pivot-clips, and taking the place of the guide-wire or mandrel. When the pivot-wire has reached its limit, the stud G being now drawn downward, the cam h begins to act on the lever h^3 , and, through the latter and the bar i' , causes a lateral movement of the two jaws and a severance or cutting of the pivot-wire, the operative action of the machine being thus completed. The jaws E E' and slide E^4 are now drawn back to their first position (the wire remaining stationary) by a strong spiral spring, T, connecting the slide E^4 with a stud, t , on the under side of the table, this spring also acting to restrain the movement forward of the jaw E at the initial stage before referred to, so that the jaw E, having an independent movement, will press upon and tightly clamp the wire, and insure its being

fed forward with and by the jaws. The retractile movement of the jaws E E' is limited by an adjusting-screw, *t'*, by means of which the pivotal lengths may be regulated and varied.

5 Having now described the mechanism for inserting and cutting the pivots, it remains to describe the means by which the pivots are fastened by rivet-heading them. The device for this purpose consists of a casting or anvil-frame, A', mounted on standards A², so as to
10 lie directly above and close to the jaws E E'. The anvil-frame is inclined, as shown, so as to bring the recess A³ within ready access of the operator, who transfers the work from the
15 pivoting-machine directly to the heading-tool. A spring-plunger, A⁴, operated by a power-actuated tappet-wheel, A⁵, impinging upon a cross-bar, A⁶, is employed to head the rivets, the connected rib and stretcher being laid in
20 the recess A³, with the rivet on a line with the axis of the plunger. The cross-bar A⁶ plays in a groove, *a*³, and is held out of operative engagement with the tappet-wheel, when not required, by an L-shaped vertically-sliding and
25 spring-controlled stop, B², a treadle-connection, B³, serving as a means of retracting the stop and allowing the cross-bar to come in contact with the tappet.

30 Having now described my invention, I claim—

1. In a machine for inserting pivots, the combination, with the guide-wire *k* and chuck K, of the lever L, bar M, having shoulder *m*, and the shaft F², carrying the cam M², substantially as described.

2. In a machine for inserting pivots, the

combination of the longitudinally-reciprocating jaws E E', connected by links *e e*, the slide E⁴, to which jaw E is pivoted, the transverse shaft F, carrying the cam F', and the yoke E², 40 substantially as described.

3. The combination, with the jaws E E', having longitudinal and lateral motion, of the shaft F', the cam-collar *h*, the lever *h*³, and the pivotal bar *i'*, substantially as set forth. 45

4. The combination, with the jaws E E', of the beveled stud G, link *g'*, lever *g*², shaft F², roller or stud *g*⁴, and grooved cam F³, as described.

5. The combination, with the jaws E E', movable longitudinally and laterally, and the reciprocating stud G, of the adjustable wedge fitted to the jaw E, substantially as and for the purpose described. 50

6. The eye-plate P, in combination with the mandrel or guide-wire, and the devices for moving the latter and feeding the pivot-wire. 55

7. The combination, with an organized machine for inserting and cutting pivots, of a pivot-heading tool comprising a power-actuated plunger and an anvil, said tool being 60 mounted on the frame of the machine and within ready access of the operator, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 11th day of April, A. D. 1885. 65

ADOLPH LIGIBEL.

Witnesses:

GEORGE F. ESCHBACH,

THOS. A. CONNOLLY.