

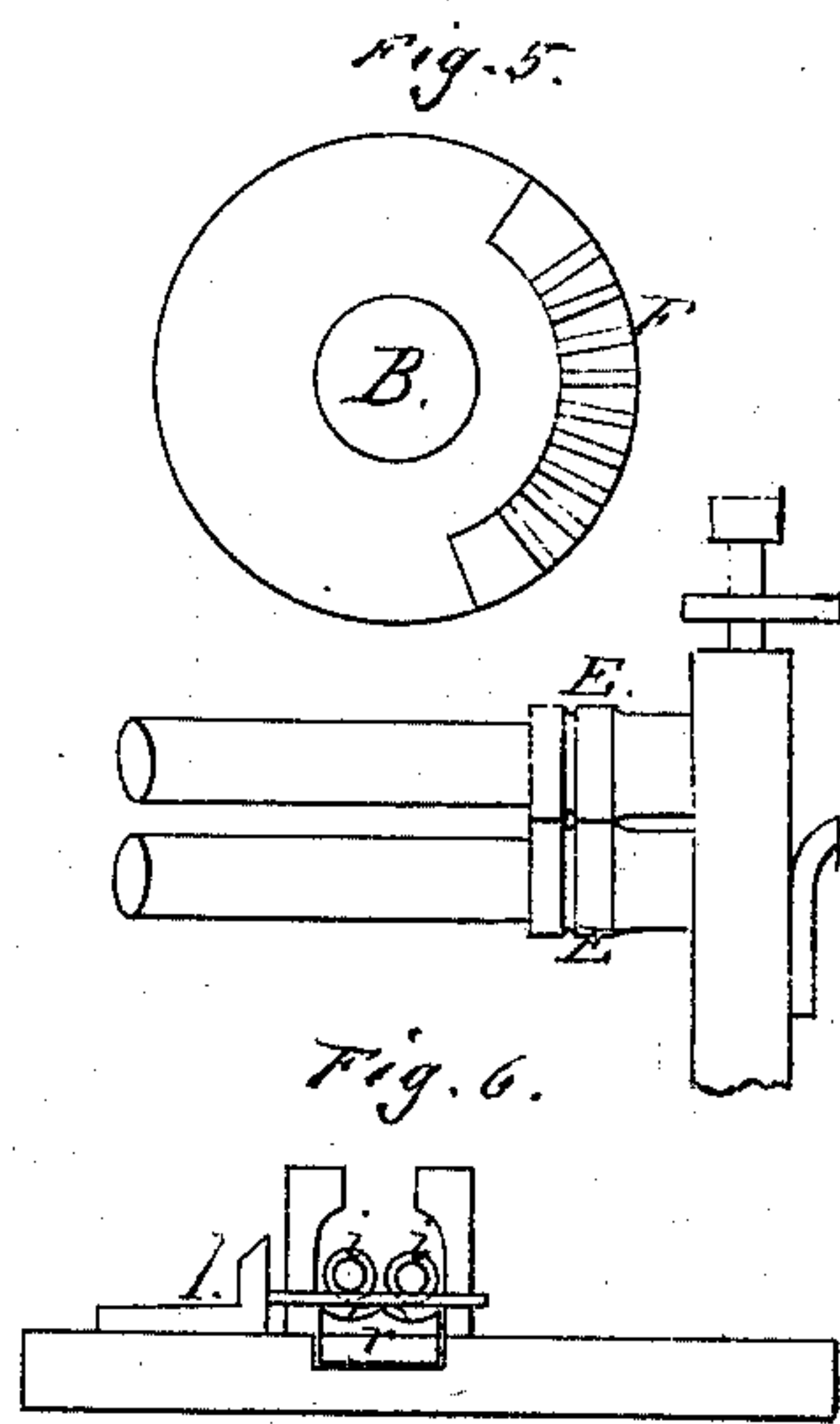
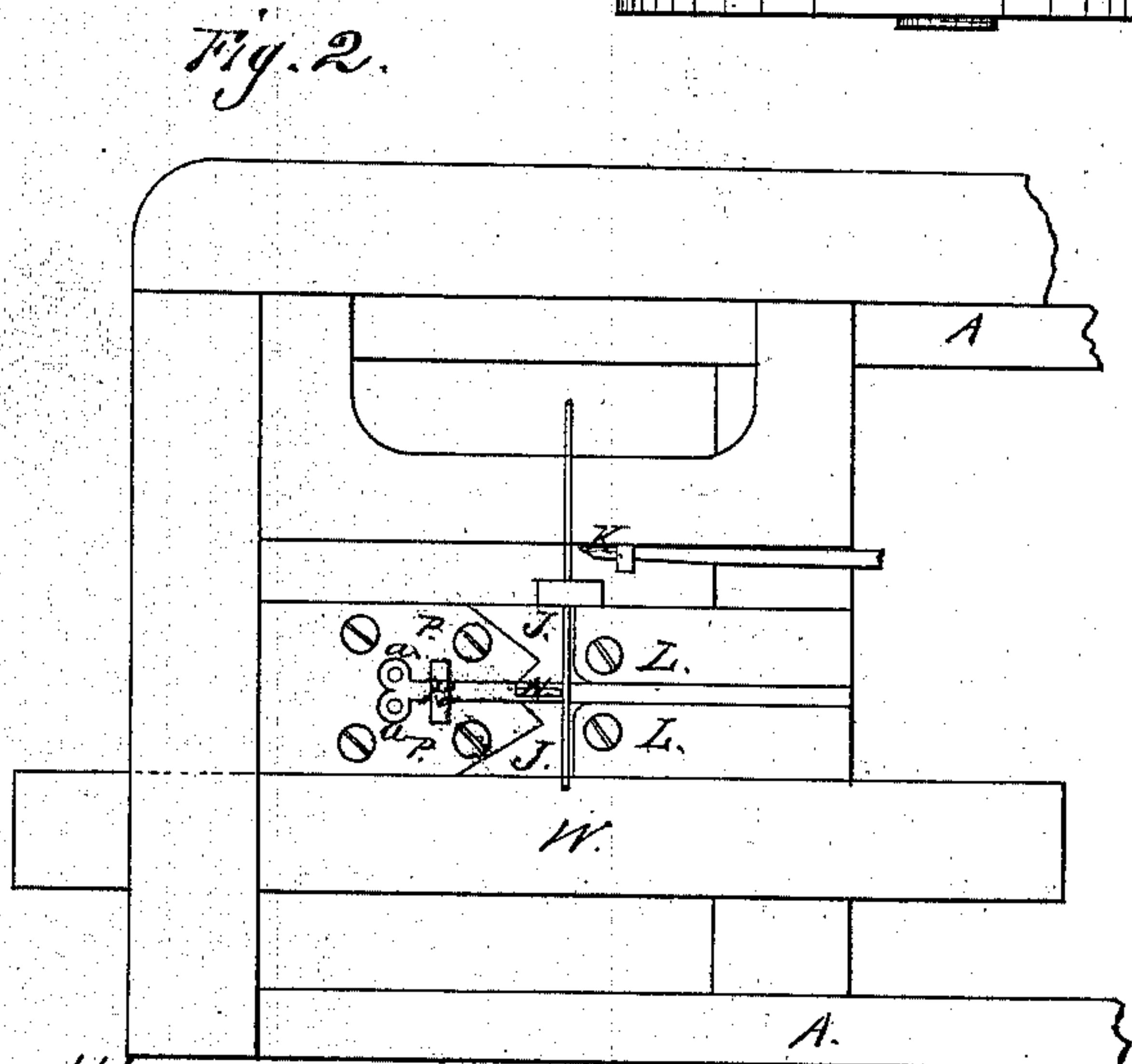
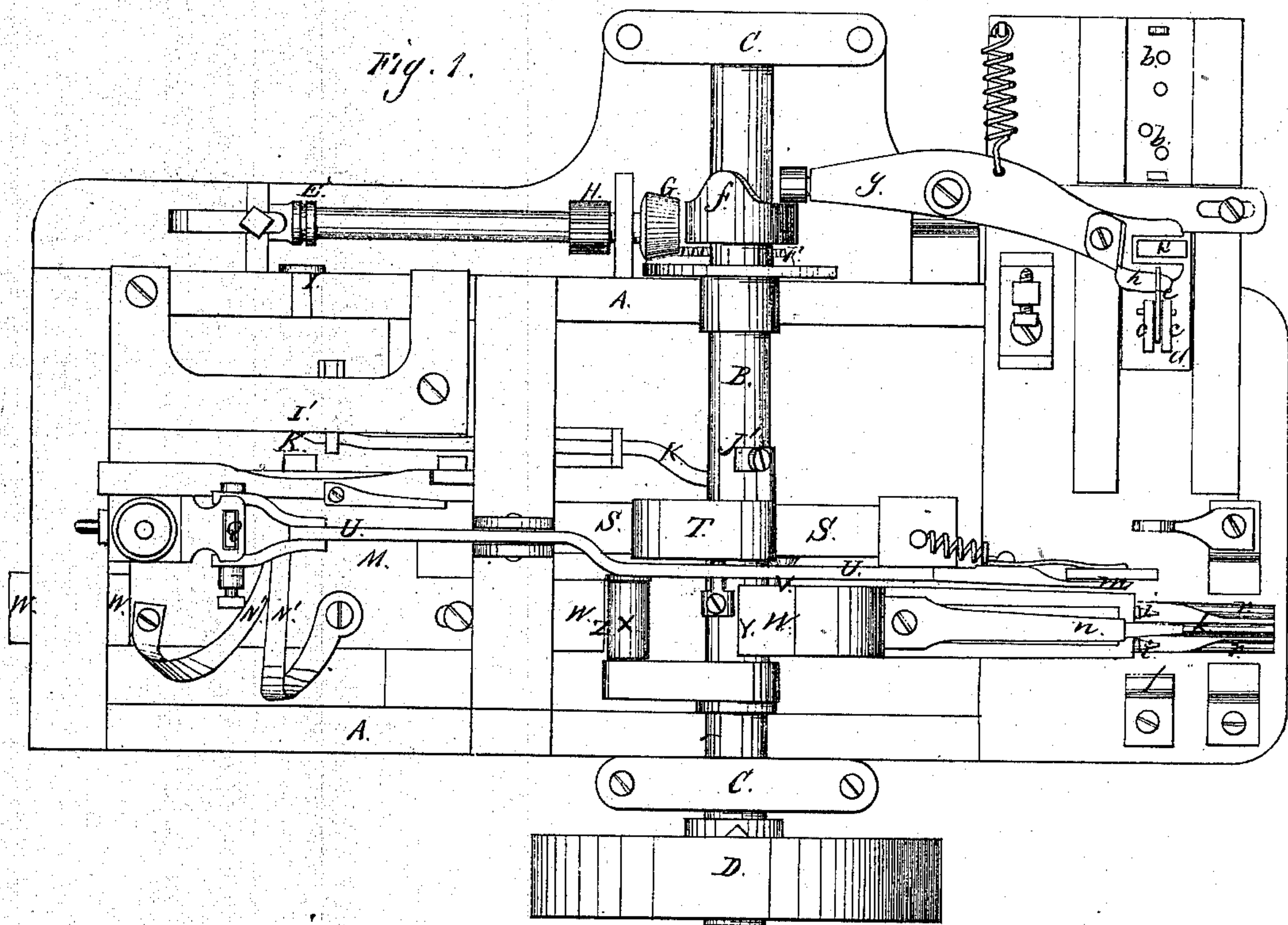
J. T. Ford,

2. Sheets, Sheet 1.

Hook & Eye Machine.

No. 112,331.

Patented Mar. 7. 1871.



Witnesses.
Geo. H. Strong
A. L. Druey

Inventor.
J. T. Ford
By his Attys
Druey & Co

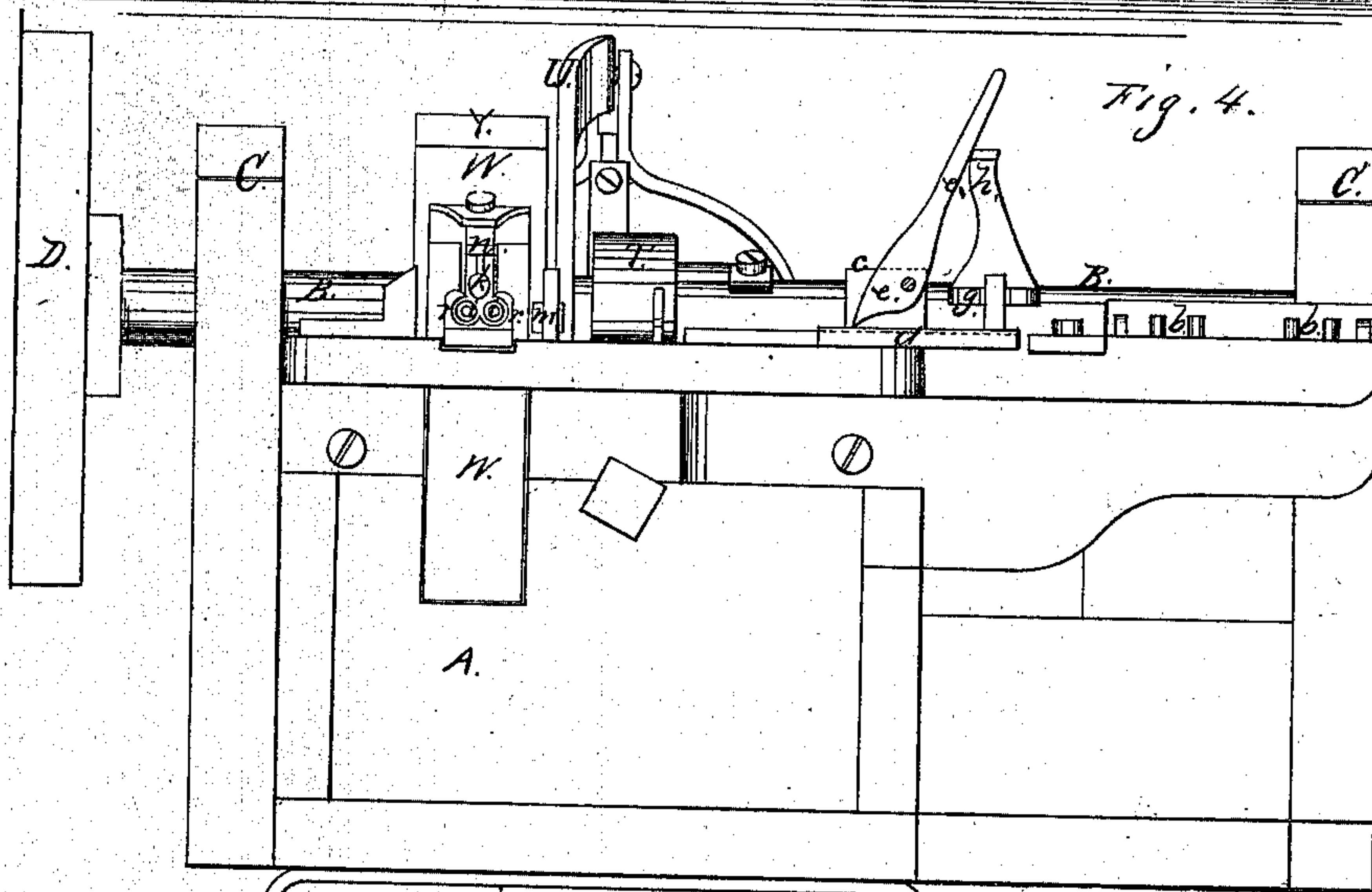
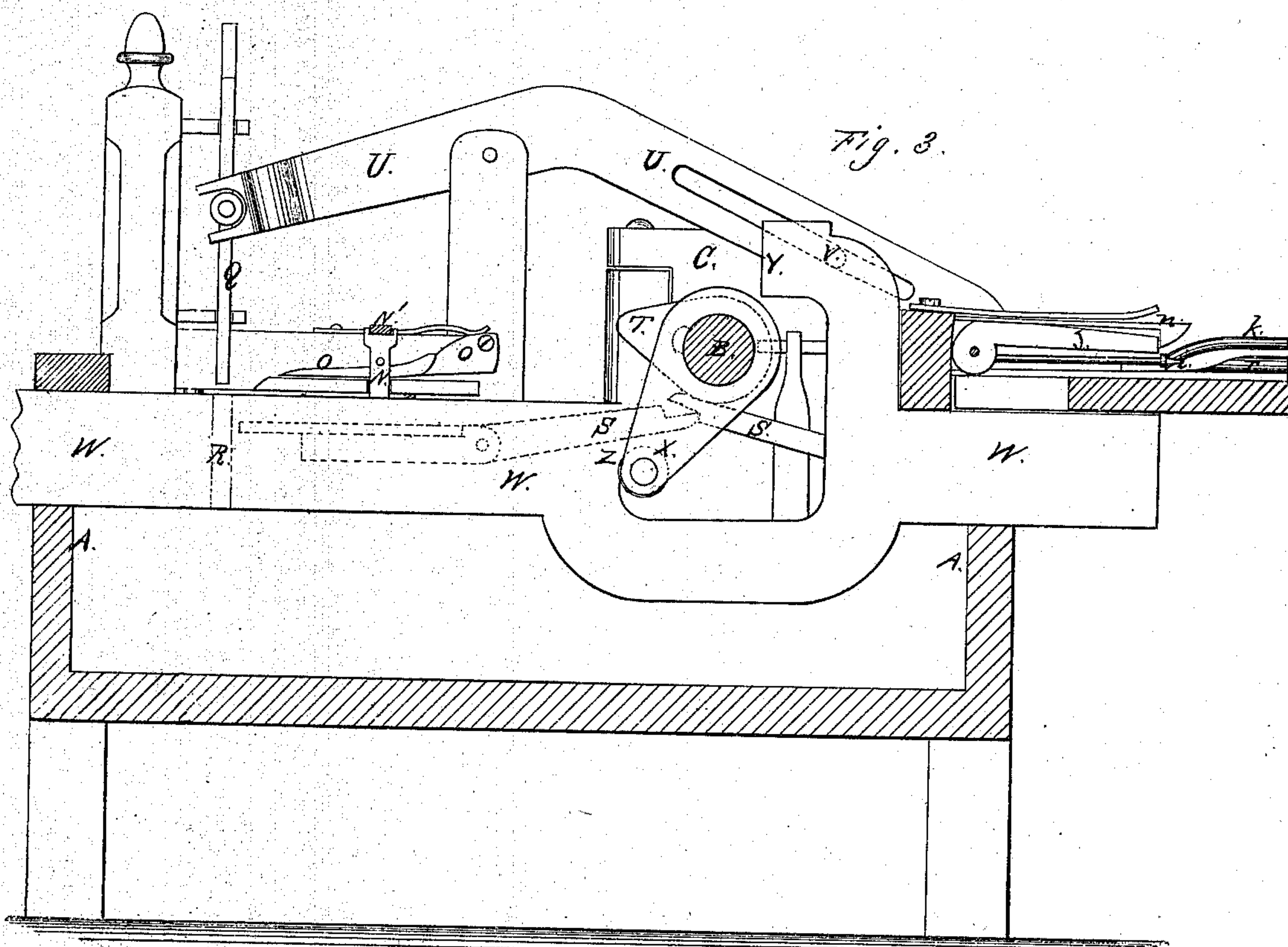
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United States Patent Office.

JEREMY TAYLOR FORD, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 112,331, dated March 7, 1871.

IMPROVEMENT IN MACHINES FOR MAKING HOOKS AND EYES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JEREMY TAYLOR FORD, of the city and county of San Francisco, State of California, have invented an Improved Machine for Making Hooks and Eyes; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

The object of my invention is to provide a machine for making hooks and eyes for toilet use directly from the reeled wire, one of each kind being made at each revolution of the driving-wheel, and completed ready for use.

Referring to the accompanying drawing for a more complete description of my invention—

Figure 1 is a plan view of my improved machine.

Figure 2 is a plan of the bed on which the hook is formed, showing the grooves.

Figure 3 is a side elevation.

Figure 4 is an end view.

Figures 5 and 6 are detailed views of parts of the machine.

A is the frame supporting the different parts of the machine.

B is a shaft extending across the frame, near its middle, and having its ends supported in boxes C C.

A driving-pulley, D, at one end, communicates motion to the shaft, and from this the whole machine is operated.

The wire for forming the hooks is brought from a reel, not shown, and passes between two rollers, E E, which press it sufficiently to feed it forward when they are rotated.

In order to rotate them a mutilated bevel-gear, F, or other equivalent device, is made fast to the shaft B, and the few teeth upon it engage with the pinion G upon one of the rollers E at each revolution, thus turning the rollers E sufficiently to feed forward the quantity of wire necessary for one hook.

Spur-pinions H on each of the rollers insure their rotating in unison.

As the wire is carried forward it passes through eyes or holes at I I, and across a bed or table, J, being previously straightened by suitable devices.

A cutter, K, is moved forward by a cam, J', on the shaft B, and severs the wire, leaving sufficient for one hook lying across the table J.

The middle of the wire lies exactly opposite the narrow space or slit formed between the plates L L, which form a part of the table J, or may be bolted to it.

These plates are sufficiently wide apart to just allow the wire to pass between them, another plate, M, be-

ing arranged to slide over the whole and keep the wire from rising out of the slot or groove before described.

As the machinery moves on, a narrow plate, N, which passes vertically through the horizontally-sliding plate M and rests its lower end on the table J, presses against the center of the wire opposite the groove, and forces the wire to bend, so that the bight thus formed shall be carried backward, and the wire, thus doubled upon itself, will lie in the groove between the plates L at right angles with its former position.

An inclined plane, O, is loosely pinned to the stationary frame, so that a lug at one side of the plate N will move over it, and when the wire has been carried back sufficiently the lug reaches the more abrupt rise in the plane. This raises the plate N till it clears the bight of the wire, and it moves back until it passes beyond the wire, when it drops from the rear end of the inclined plane and again rests upon the table J, but behind the bight of the wire.

The continued motion of the machine causes the plate M to slide forward again, carrying the plate N with it. The lug passes under the inclined plane, as it moves forward, so that the plate N continues to slide with its lower end in contact with the table J, and thus pushes the doubled wire before it.

The plate N is brought down and kept in contact with the table, as it moves, by springs N', as shown.

The ends of the wire move forward and enter another groove, also formed by two thin plates, P P, on the table J, and a short distance from the plate L. The plate M, moving over and in close contact with the plates P and L, prevents the wire from rising out of the groove.

At the forward end of the last-mentioned groove the ends of the wire follow around the curves *a a*, which are there formed in the plates, thus forming the two loops by which the hook is attached to the garment. The plate M is then moved backward again, leaving the partially-finished hook exposed to view.

A punch, Q, is then brought down upon the wires at the proper point to form the loop, and presses the hook through the opening R.

As the punch reaches its lowest point a knee-lever, S, is operated by a cam, T, on the shaft B, and the arm *w* is extended so as to press powerfully against the point of the hook and flatten it sufficiently for service.

The arm *u* is then elevated and the punch Q raised, thus freeing the hook and allowing it to drop into a proper receptacle below.

The punch is forced down and raised by means of a bent lever, U, the opposite end of which is slotted.

A pin, V, enters the slot from the sliding bar W,

and as this bar moves forward and backward it operates the lever U to raise and lower the punch.

The plate M is bolted to the bar W, near one end, and is moved forward and backward by it.

The center of the bar is formed, as shown, so that the cam or arm X on the shaft B will strike the end Y, as it passes above the shaft, to move the bar in one direction, and it presses against the end Z, as it passes below the shaft, to move the bar in an opposite direction.

The devices for forming the eyes are situated, for convenience, at the opposite end of the machine from those which form the hooks, and operated from the same shaft B.

The wire for the eyes is brought from a reel, and passes through and between the posts *b*, by which it is straightened.

Thence it passes through a slot, between two plates, *c c*, which are fixed to a sliding carriage, *d*.

A lever, *e*, is pinned between the plates *c*, so that when it is pressed forward the lower end binds the wire, while the carriage is moved forward, thus carrying the wire with it.

In order to operate the lever and move the carriage a cam, *f*, is made fast to the shaft B.

This cam strikes the end of a horizontally-moving lever, *g*, at each revolution, and the opposite end of the lever slides the carriage *d*.

An arm, *h*, projecting up from the end of the lever *g*, strikes the upper end of the lever *e* just before the carrier begins to move, and thus causes it to bind the wire, as before described.

The wire, being moved forward, passes across in front of a bar, *j*, going beneath two pointed rods, *i i*, one upon each side of a bar, *k*, as shown, the wire passing over this bar.

The end of the wire stops against a post, *l*, when a cutter, *m*, moved by a cam on the shaft B, advances and severs the wire, leaving just enough for an eye.

The bar W, moving forward at this instant, carries with it a spring-bar, *n*, which is attached to it, and this, with the shoulders of the pointed rods *i*, forces the wire along sidewise.

The rod or bar *k* is formed with a gradual elevation, till at the end it takes the position shown in fig. 4. The sides of the bottom plate are gradually turned up, as shown in the same figure, so that as the wire is pushed along its center is raised and curved, forming the eye. The ends are turned over by the curving sides of the plate, so as to form the loops by which it is attached to the garment, and when it reaches the end of the plate and rod *k* the finished eye falls off into a proper receptacle.

Having thus described my invention,

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

1. The combination of the forming-plates L and P with their grooves and the curves *a a*, together with the sliding plates M and N, the incline O, and the punch Q, the whole operated substantially as and for the purpose herein described.

2. The combination of the sliding plate M and the loosely-attached inclined plane O with its springs N', or equivalent device, to raise the plate N and drop it behind the bight of the wire, substantially as herein described.

3. The combination of the sliding carriage *d* with the plates *c* and the peculiarly-shaped lever *e*, together with the vibrating bifurcated arm *g*, lug *h*, stub *h'*, and the cam *f*, operating as described.

4. The combination of the bed-plate *r* with its gradually-curving sides, the pointed shouldered rods *i i*, and the curved rod *k*, together with the spring-bar *n* and bar *j*, for forming the eyes, substantially as herein described.

5. In combination with the main shaft B and the reciprocating-bar W, the two sets of feeding devices and the two sets of forming devices herein described.

In witness whereof I have hereunto set my hand and seal.

JEREMY T. FORD. [L. S.]

Witnesses:

G. FITZGERALD,
WM. GERLACH.