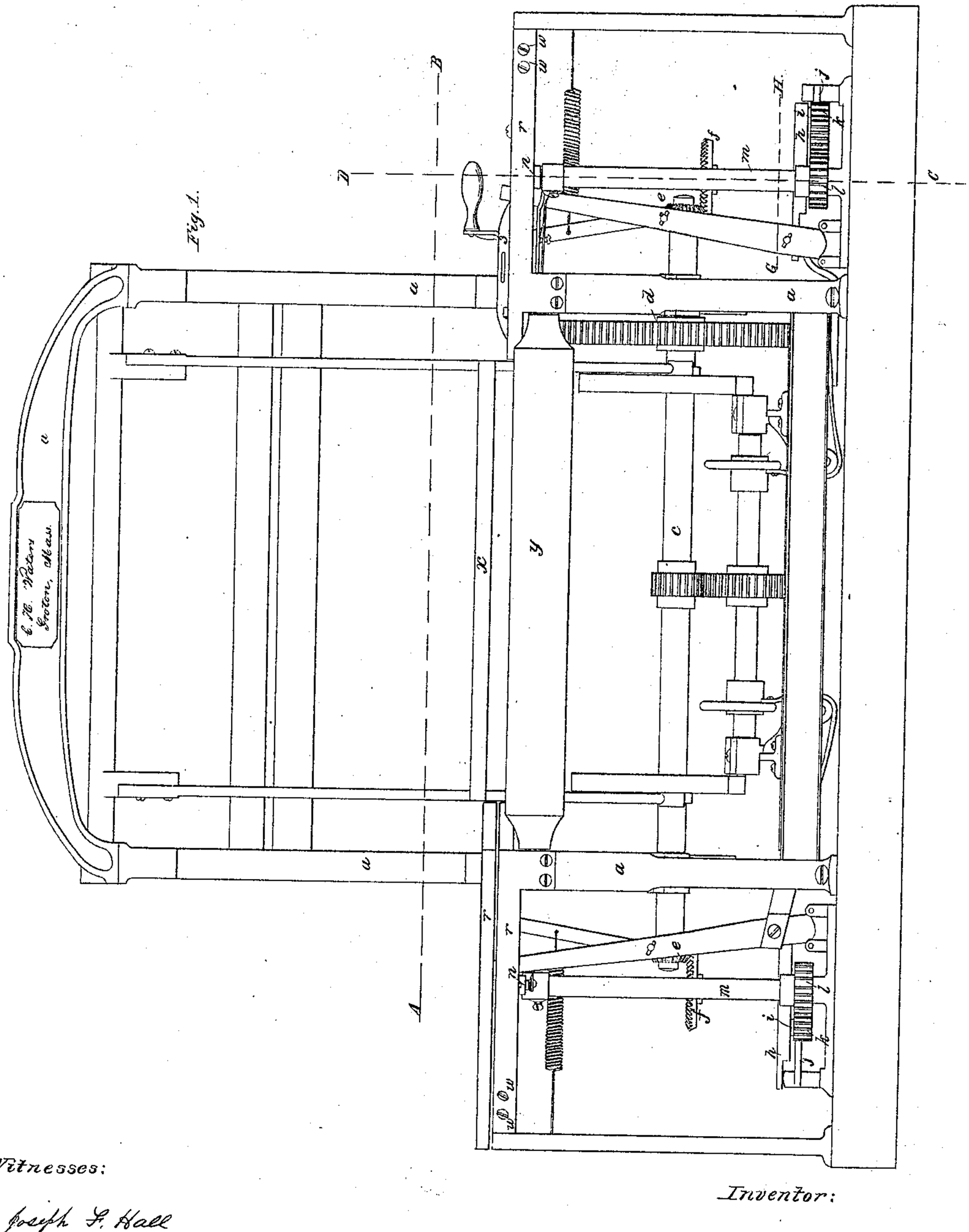
3 Sheets—Sheet 1.

C. H. WATERS.

LOOM FOR WEAVING WIRE CLOTH.

No. 36,377. Patented Sept. 2, 1862.

Fig. 1.



Witnesses:

Joseph F. Hall
Charles Gennish

Inventor:

Charles H. Waters.

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C. H. WATERS.

LOOM FOR WEAVING WIRE CLOTH.

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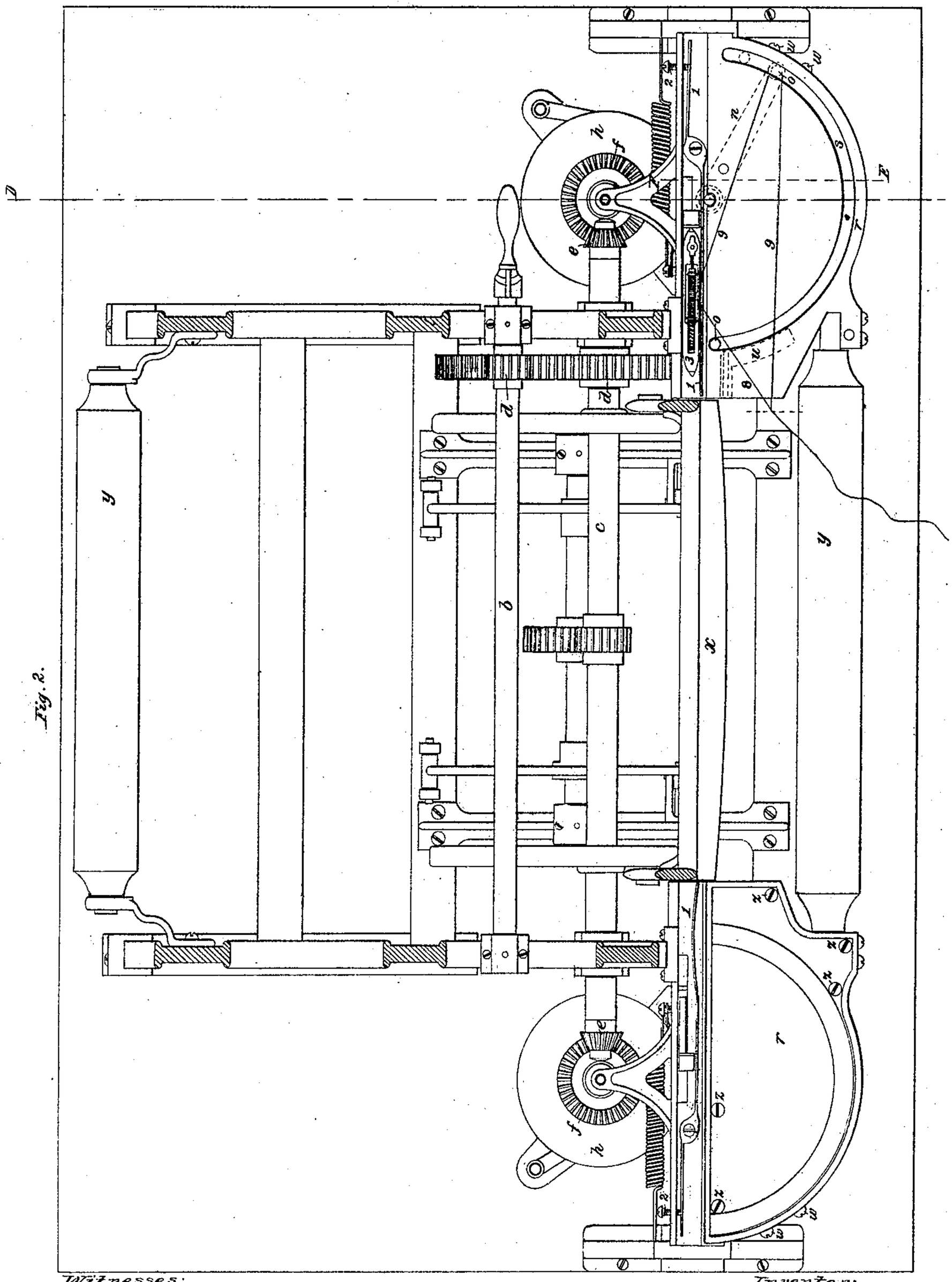

Fig. 2.

Witnesses:

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3 Sheets—Sheet 3.

C. H. WATERS.

LOOM FOR WEAVING WIRE CLOTH.

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Fig. 7.

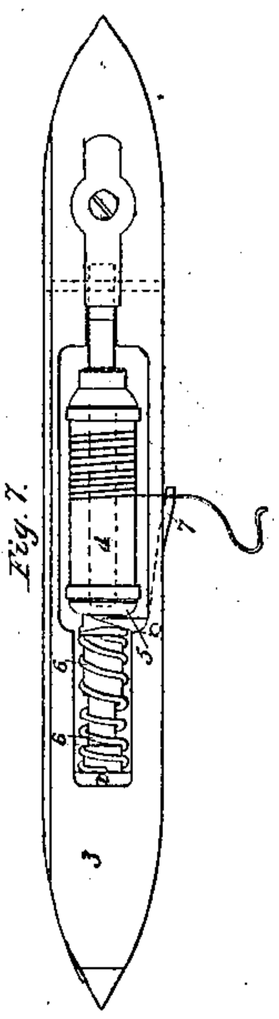


Fig. 8.

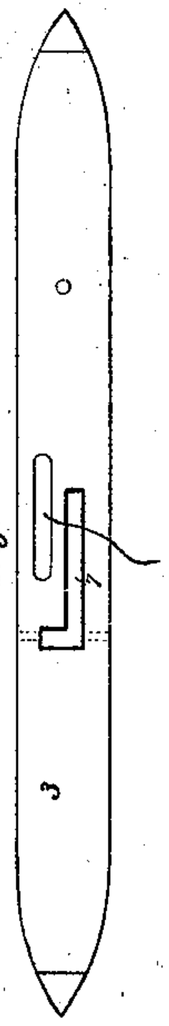


Fig. 6.

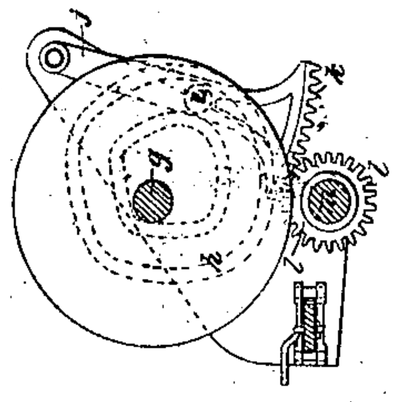


Fig. 3.

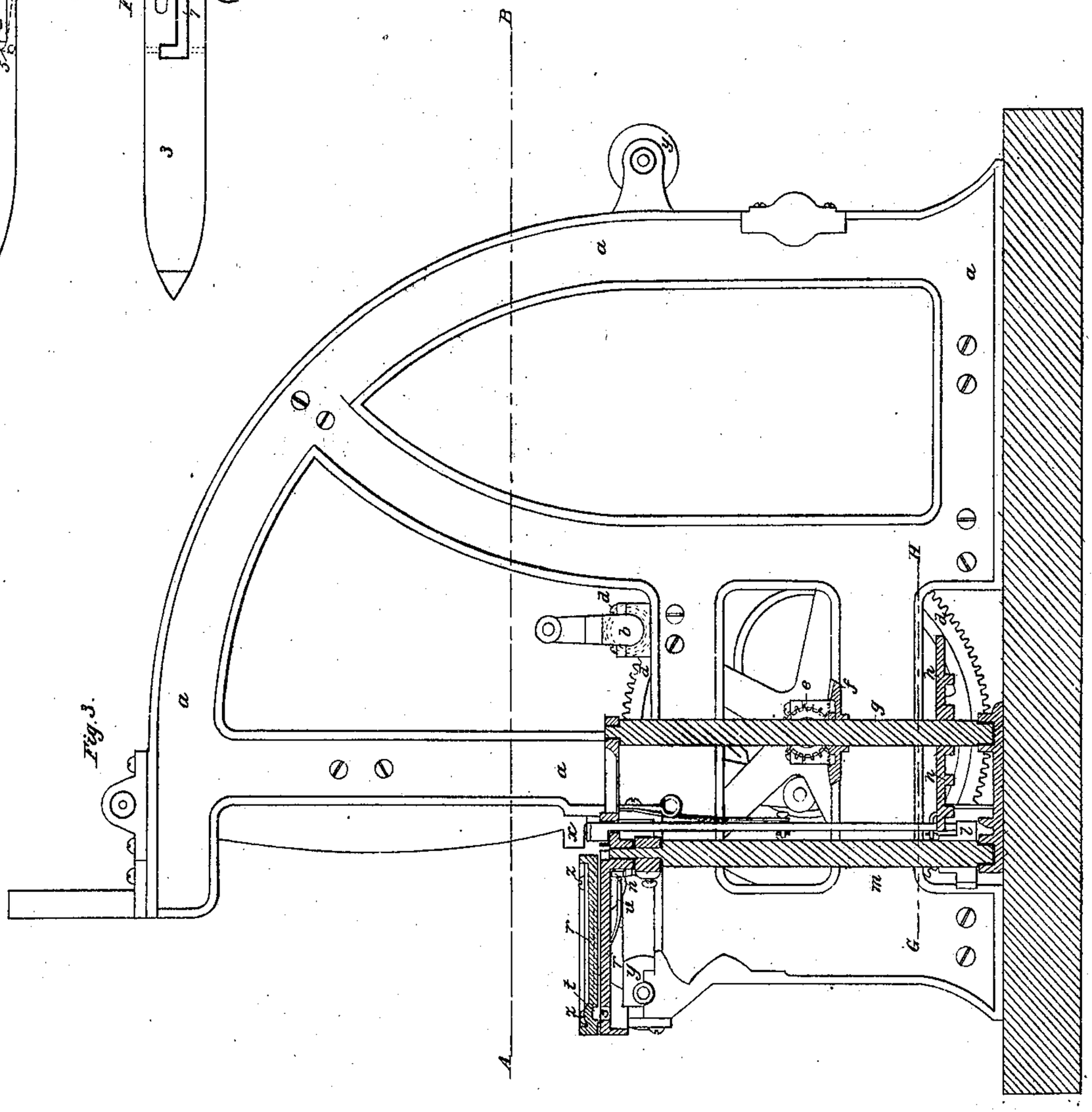


Fig. 5.

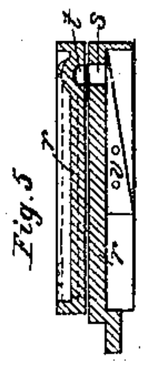
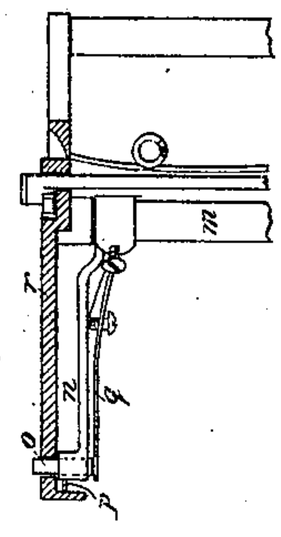


Fig. 4.



Witnesses:

Joseph H. Bell

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Inventor:

Charles H. Waters

UNITED STATES PATENT OFFICE.

CHARLES H. WATERS, OF GROTON, MASSACHUSETTS.

IMPROVEMENT IN LOOMS FOR WEAVING WIRE-CLOTH.

Specification forming part of Letters Patent No. **36,377**, dated September 2, 1862.

To all whom it may concern:

Be it known that I, CHARLES H. WATERS, of Groton, in the county of Middlesex and Commonwealth of Massachusetts, manufacturer, have invented certain new and useful Improvements in Power-Looms for Weaving Wire-Cloth, by which accuracy and greater speed are obtained; and I do hereby declare that the following description, with the accompanying drawings, forms a full specification thereof.

The fly-shuttle power-loom as heretofore constructed and used is not suited to the weaving of wire-cloth because of the rigid and inflexible character of the wire. When wound upon a bobbin, the filling-wire becomes set to such a degree that the pull required to draw it off and straighten it arrests the movement of the shuttle or deflects it from its proper course. The wire also, as it is suddenly unwound from the bobbin by the throw of the shuttle, is liable to break or to twist or kink, and thus make imperfect work.

The nature of my invention therefore consists in preparing the filling-wire for each throw of the shuttle—that is to say, drawing off from the shuttle-bobbin and straightening the required length for the chute when the shuttle is in its box and holding the chute of wire thus drawn off between surfaces in such a manner as to prevent all twisting, kinking, or breaking, and at the same time allow it to yield readily to the draft of the shuttle, thus relieving the shuttle in its transit from all drag upon the wire other than what is necessary to draw the prepared chute into the shed of the warp, the rendering of the wire from the bobbin being checked during the flight of the shuttle.

The drawing off of the filling-wire is performed by a lever and pin, having a suitable vibratory motion, which straightens the wire as it draws the chute from the bobbin preparatory to a throw of the shuttle. Motion is given to the lever by a cam of proper form operating through a cam ball and lever, with a segment gear in its end which engages with a pinion placed upon a shaft that carries the draw-off lever. The draw-off lever has a vertical movable stud in its end, held in place by a spring operating against the lower end of said stud.

The holding of the chute of filling-wire is performed by the aid of surfaces or disks made of iron or wood, semicircular in form, with their opposing faces lying parallel, their edges being slightly scarfed to form or make a flaring mouth. For coarse wire the inner surfaces or faces of the disks may be covered with elastic cloth or with bristles or other pile fabric, like a brush, more effectually to hold the chute of wire and prevent it from kinking, and at the same time allow it to be easily drawn out by the shuttle when thrown.

The shuttle is constructed with a brake, which operates on the head of the bobbin, and is held in position by the pressure of a spring, which is released by a lever having a head standing outside of the front plane of the shuttle, so that when the shuttle is in the box of the loom the lever is depressed by the shuttle-binder and the bobbin is left without any friction and the wire may be drawn off freely; but when the shuttle has left its box the pressure on the lever is suspended and the brake takes a firm hold upon the head of the bobbin and the rendering of the wire is checked during the passage of the shuttle through the warp.

The accompanying drawings represent a power-loom embodying my improvements.

Figure 1 is a front view of the principal parts of the loom. Fig. 2 is a sectional plan view on horizontal plane A B of Figs. 1 and 3, the upper holding-surface on the right-hand end being removed to show the draw-off movement. Fig. 3 is a vertical sectional end view, looking left, taken on vertical plane C D of Figs. 1 and 2, the upper holding-surface being replaced. Fig. 4 is a detail vertical section of the lower holding-surface and adjacent parts in vertical plane E F of Fig. 2, looking left, showing the construction and arrangement of the draw-off lever and stud. Fig. 5 is a detail vertical section through both holding surfaces in the same vertical plane as Fig. 4, looking right, showing the cam by which the draw-off stud is depressed to liberate the chute of filling-wire at its greatest elongation. Fig. 6 is a detail horizontal section on horizontal plane G H of Figs. 1 and 3, showing the mechanism for vibrating the draw-off lever. Fig. 7 is an enlarged top view of the shuttle, showing its bobbin with the check-brake. Fig. 8 is an enlarged front view of the shuttle.

The same letters represent the same parts in the different figures.

a represents the frame of the loom; *b*, the driving-shaft, which engages the main shaft *c* by the cogged pinions *d d*.

On the ends of the main shaft are bevel cog-wheels *e e*, which engage with the cog-wheels *f f* on the perpendicular shaft *g*. On the lower end of the shaft *g* is the cam *h*, which is inverted and receives the cam-ball *i*, which is attached by a stud to the lever *j* and operates the same. The cam *h* is of such form as to give the lever *j* a vibratory motion. On the end of the lever *j* is a segment-gear, *k*, which engages with the cogged pinion *l* on the lower end of the draw-off shaft *m*, which receives a vibratory motion given to it by the segment-lever *j*. On the upper end of the shaft *m* is the draw-off lever *n*, which, being made fast to the shaft *m*, also receives a vibratory motion.

In the outer end of the draw-off lever *n* is the stud *o*, which has a pin, *p*, running transversely through it working in a slot in the head of the draw-off lever *n*, and which pin is used to depress said stud when coming in contact with the fixed cam *v* to release the drawn chute of filling, and also when coming in contact with the latch-cam *u* to depress said stud to allow it to pass under the filling and re-engage it for another draft. The stud *o* is held in position by the spring *q*.

The holding-surfaces are represented by the letters *r r*. The lower surface has a concentric slot, *s*, through it, in or through which the stud *o* vibrates. The upper surface has a corresponding concave channel, *t*, in which the head of the stud *o* vibrates, so that the wire cannot escape from the drawing-stud till depressed.

u represents the latch-cam which acts on the pin *p* to depress the draw-off stud *o* to allow it to pass under the filling and re-engage it for another draft.

v represents the fixed cam held in place by the screws *w w* for depressing the stud *o* to release the chute of filling when drawn off.

x represents the lathe; *y*, the front and back rollers.

The mode of driving the lathe and shuttle is that ordinarily used.

z are the set-screws for adjusting the holding-surfaces at different distances from each other. These semi disks or surfaces may be adjusted to the filling-wire by set-screws or springs or other suitable means, allowing the drawn chute freely to obey the fly-shuttle.

1 represents the shuttle-binder held in position by the screw 2. 3 represents the shuttle in its box; 4, the bobbin; 5, the friction head or brake, held in place by the spring 6. 7 represents a lever turning on its pin at its angle, with its outer end standing outside of the front plane of the shuttle.

When the shuttle has entered its box, the shuttle-binder acts on the head or projection of the brake-lever, and the brake on the head of the bobbin is released and allows the filling to be drawn off freely, and when the shuttle leaves its box the brake acts on the bobbin and prevents the rendering of the wire from the bobbin during the flight of the shuttle.

In starting the loom the shuttle is to be put into its box and its wire drawn by the hand into the position shown by the red line 8, Fig. 2. The draw-off stud engages it, and in its vibration carries it into the position indicated by the blue line 9, Fig. 2. When the draw-off stud is depressed by the fixed cam *v*, and the chute is left between the holding-surfaces to obey the draft of the fly-shuttle, the draw-off lever vibrates back to the point of starting, bringing the pin of the draw-off stud in contact with the latch-cam *u*, as seen in Figs. 2 and 3, to depress the stud and allow it to pass under the filling and re-engage with it for another draft.

The same process is carried on upon the opposite end of the loom, the construction of the two ends being the same.

It will be apparent that many of the parts of the improvements herein described may be changed in form of construction, position, or order of arrangement, or some of the parts may be omitted altogether, without changing or altering the essential character of the improvements themselves. For example, the shuttle may be constructed with a brake or friction collar, which shall act upon the head of the bobbin, being actuated by a spring with greater or less power, according to the size of wire used, and which shall be self-adjusting; or, instead of using disks of the form described, plain surfaces or disks of other forms may be substituted; or the upper disk or the lower disk, or both of them, may be dispensed with and automatic fingers or cylindrical surfaces used in their places; or the drawing off of the chute of filling-wire may be performed by drawing the shuttle in a rectilinear line until a chute shall have been drawn off; or the drawing off may be accomplished by the agency of levers moving at any angle with the line of the shuttle-warps. Therefore I do not confine my claims to the specific details herein described.

I claim—

1. The drawing off of a chute of filling-wire while the shuttle is in its box, substantially as described.

2. The holding of the chute of filling-wire after it has been drawn from the bobbin until it is drawn or thrown into the open shed of the warp by the shuttle, substantially as described.

3. The use of the fly-shuttle in throwing a chute of filling-wire after it has been drawn and held, substantially as described.

CHARLES H. WATERS. [L. S.]

Witnesses:

CHARLES GERRISH,

JOSEPH F. HALL.