

(No Model.)

3 Sheets—Sheet 1.

G. POOLE.
LOOM FOR WEAVING PILE FABRICS.

No. 467,726.

Patented Jan. 26, 1892.

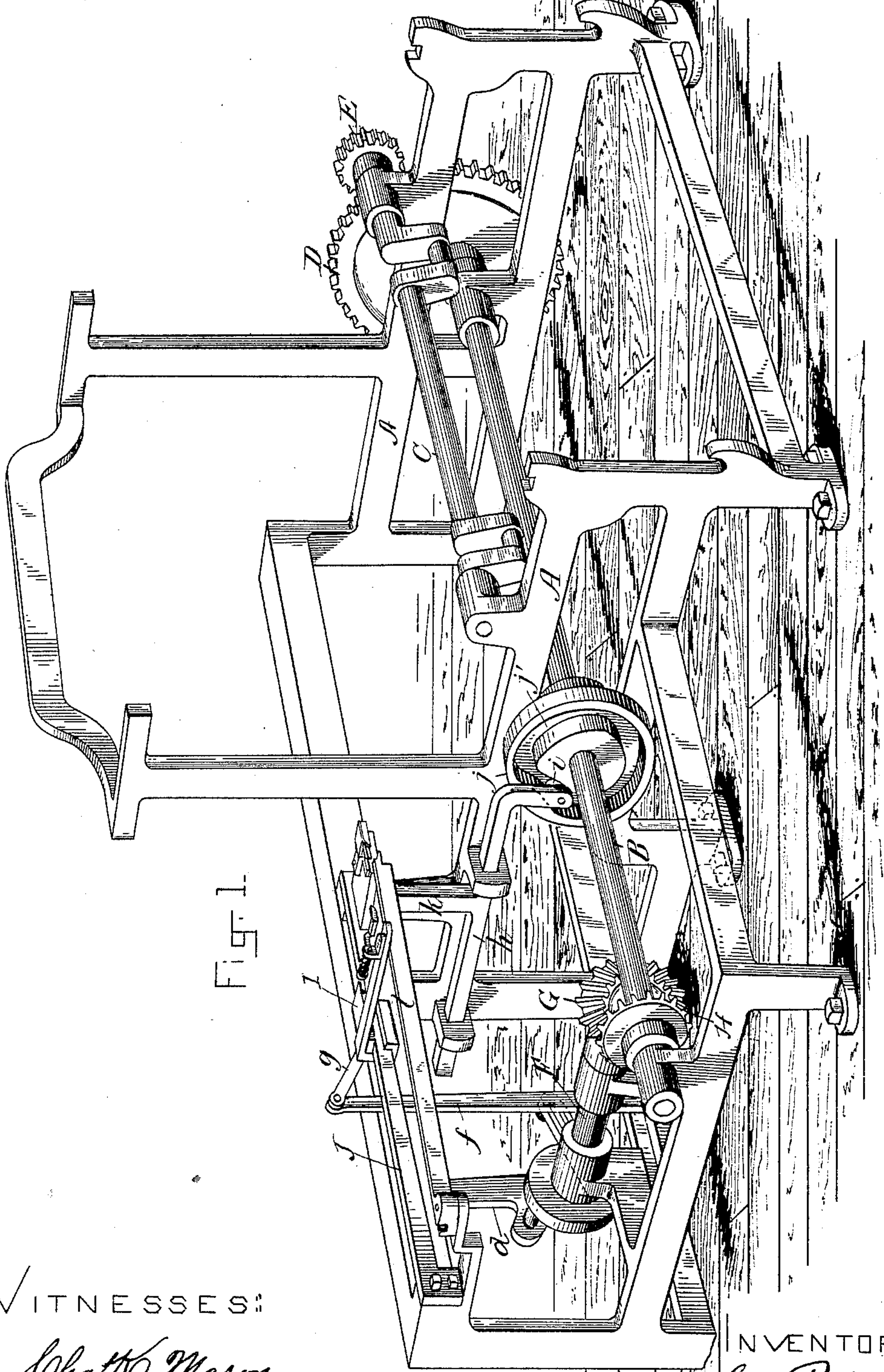


Fig. 1.

WITNESSES:

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H. P. Brown

INVENTOR

Geo. Poole.

by Wright, Brown & Crossley,
Attys.

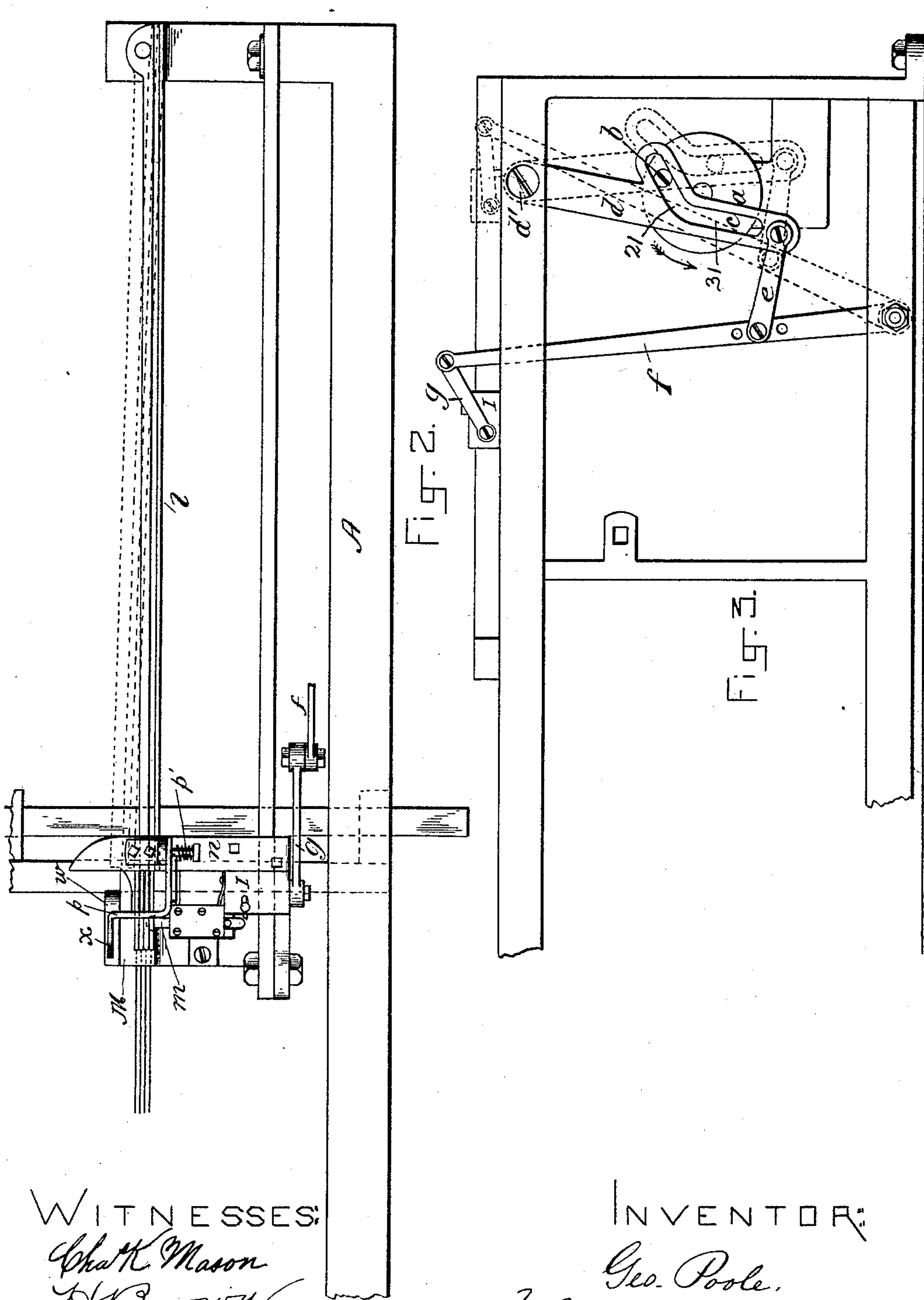
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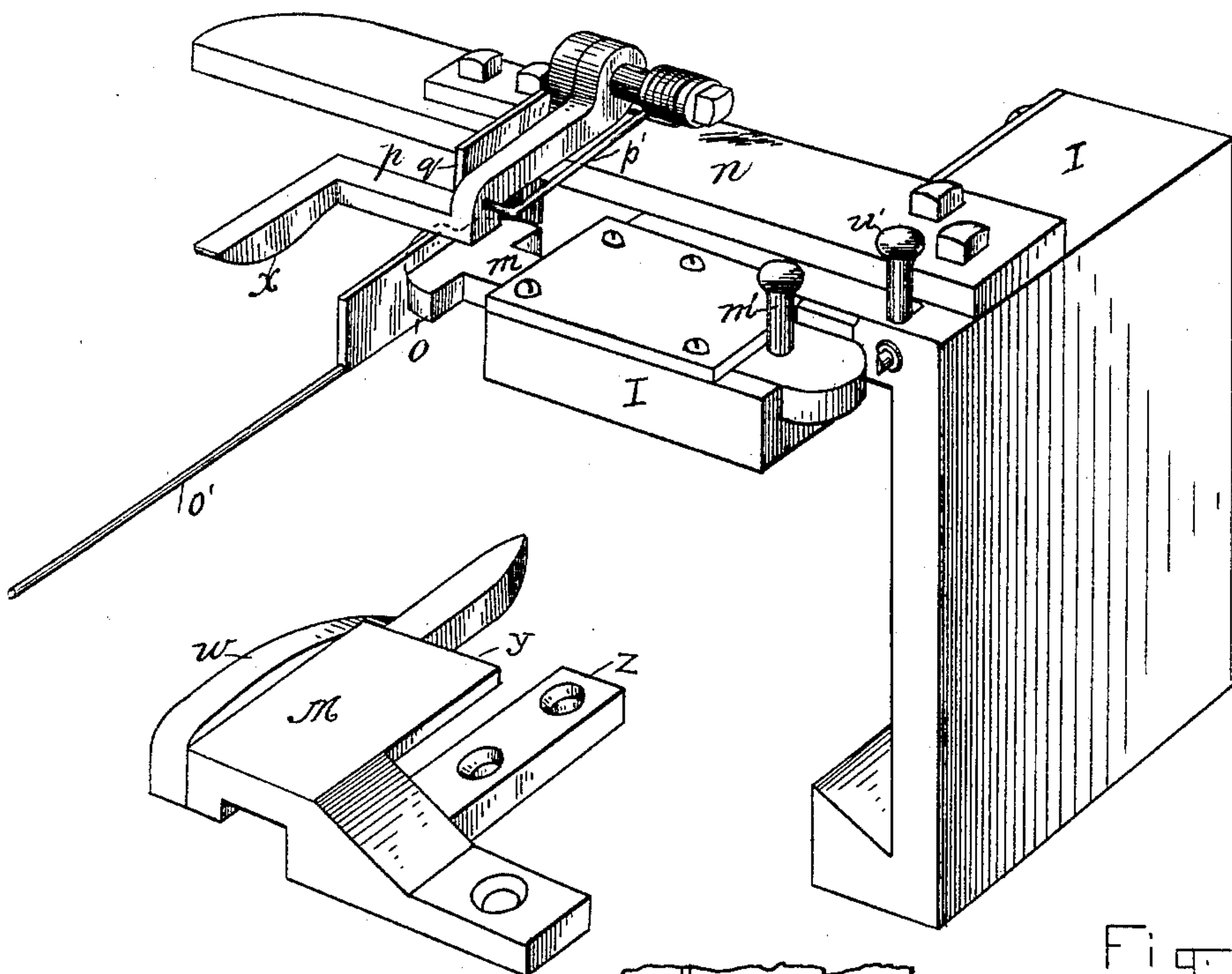


Fig. 5.

Fig. 4.

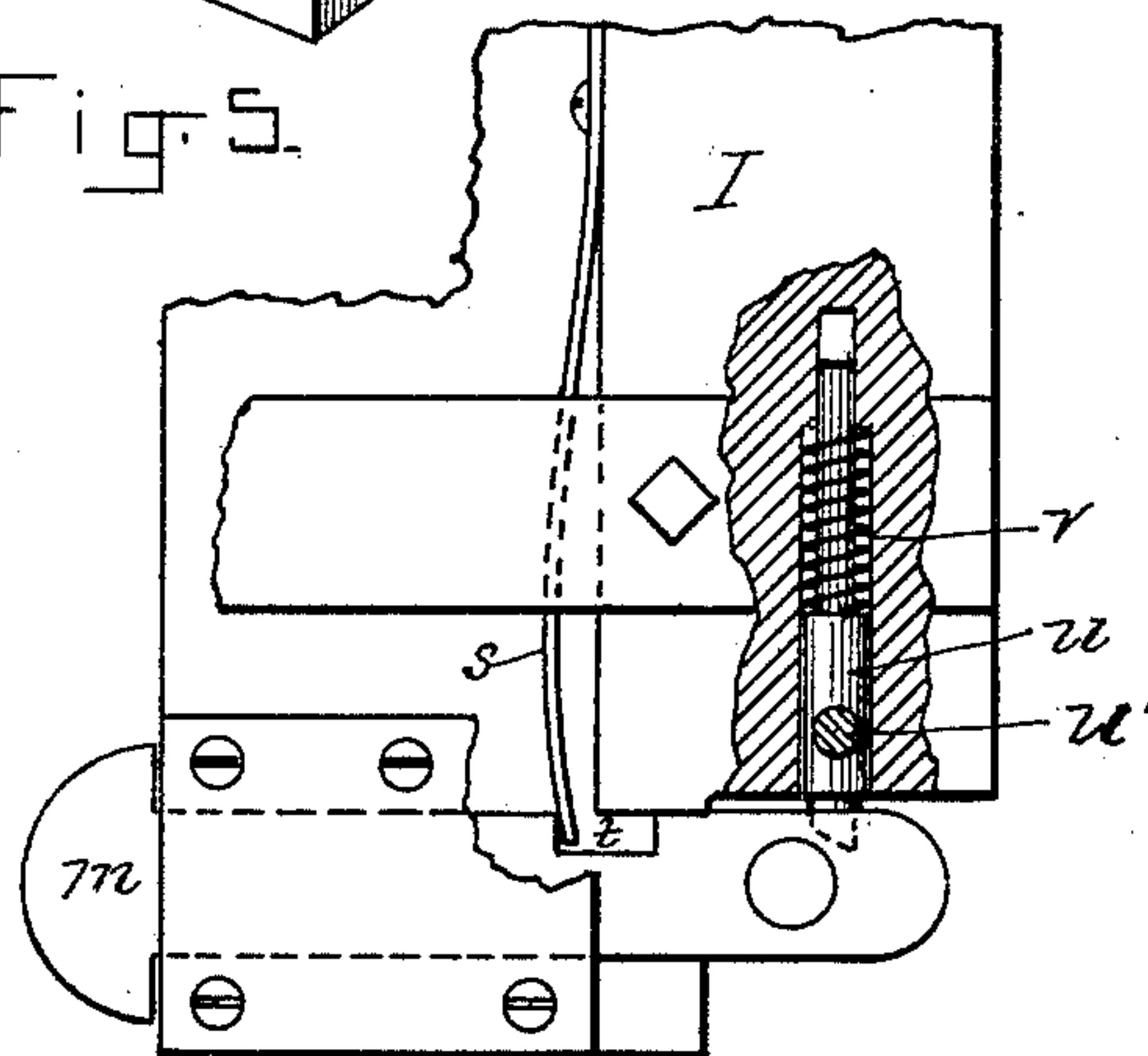


Fig. 6.

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INVENTOR:

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UNITED STATES PATENT OFFICE.

GEORGE POOLE, OF SANFORD, MAINE, ASSIGNOR TO GEORGE B. GOODALL
AND THE SANFORD MILLS, OF SAME PLACE.

LOOM FOR WEAVING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 467,726, dated January 26, 1892.

Application filed October 31, 1887. Serial No. 253,878. (No model.)

To all whom it may concern:

Be it known that I, GEORGE POOLE, of Sanford, in the county of York and State of Maine, have invented certain new and useful Improvements in Looms for Weaving Pile Fabrics, of which the following is a specification.

My invention relates to looms for weaving, and particularly to "pile-wire looms," so called, adapted to weave plush fabrics, velvets, &c.

My improvement I will proceed to describe in connection with the accompanying drawings, forming a part of this specification, particularly pointing out the invention in the claims hereunto appended.

Of the drawings, Figure 1 represents a perspective view of a loom-frame and so much of the operative parts of a pile-wire loom as is necessary for an explanation of my improvements. Fig. 2 represents a plan view of the wire inserting and withdrawing carriage and parts immediately connected and co-operating therewith. Fig. 3 represents a front elevation of the means for operating the carriage and some of the associated parts of such means. Fig. 4 represents a perspective view of the wire inserting and withdrawing carriage on an enlarged scale, a wire head being shown as engaged by the wire-withdrawing hook or device. Fig. 5 is a perspective view, also on an enlarged scale, of the wire-head magazine detached. Fig. 6 is a detail view intended to give a clear understanding of the construction and operation of the wire-withdrawing hook or device, and hereinafter more particularly described.

Similar letters of reference designate similar parts wherever they occur.

It is not deemed necessary to illustrate a loom for weaving pile fabrics in all of its parts, as my improvements may be fully explained without such illustration, and they are, besides, applicable to pile-wire looms of various constructions; but for the sake of convenience in the present description reference may be had to the loom shown and described in Letters Patent of the United States No. 369,028, granted to me the 30th day of August, 1887.

In the accompanying drawings, A designates the loom-frame; B, the lower shaft; C,

the crank-shaft for operating the lay or batten, (not shown;) D E, gears for communicating motion from the lower shaft to the crank-shaft; F, a counter-shaft arranged transversely to the main shaft for operating the wire motion, and G H gears for communicating motion from the lower shaft B to the wire-motion-operating shaft F. These parts may be of usual construction or such as are shown and described in my aforesaid patent.

I designate the carriage, comprising the devices for inserting and withdrawing the wires, which carriage is adapted to be reciprocated, for the purpose mentioned, on the bed or guide rail J. In the loom shown and described in my aforesaid patent I have explained as a means for reciprocating the carriage a pendent lever provided with a curved slot in which operates a wrist-pin secured to a rotating disk on a counter-shaft similar to shaft F of the present drawings, said pendent lever being connected with the carriage by means of a lever and links. While this device has not fully answered the purposes for which it was designed, I have found that it is susceptible of such modification as to suit it the better to meet a proper distribution of leverage and time in the various movements of the carriage to insert and withdraw the wires.

Having reference particularly to Fig. 3, *a* designates a disk on the forward end of shaft F, which disk is provided with a wrist-pin *b*, arranged to operate in an angular slot *c*, formed in a lever *d*, pivoted at its upper end *d'*, to the loom-frame. Lever *d* is connected at its lower end by means of a link *e* with carriage-operating lever *f*, the latter being pivoted at its lower end to the loom-frame and connected at its upper end with the carriage I by means of a link *g*. With this construction we will suppose a wire to have been entirely withdrawn and the carriage just ready to be operated to insert the same in the shed. At this moment the carriage-operating lever and its adjuncts will be in the position indicated by dotted lines in Fig. 3, the wrist-pin *b* on disk *a* being in the angle of slot *c* of pendent lever *d*, said wrist-pin standing at a point substantially on a line horizontal with the axis of the disk *a*, on the further rotation of which latter element in the direction of the arrow the wrist-

pin *b* will be made to strike and travel upward in the angular portion 21 of the slot *c*, and in the next quarter of the revolution of the disk *a*, or while the wrist-pin *b* is traveling to a point substantially perpendicularly above the axis of disk *a*, the carriage will be thrown completely in. On the continued rotation of disk *a* wrist-pin *b* will retrace the angular portion 21 of slot *c* and pass into the parallel portion 31—that is, that portion of slot *c* running parallel with or longitudinally of the lever *d*—the carriage remaining stationary at the extreme inward point of its travel until the wrist-pin arrives at or a little below a point on a line horizontal with the axis of disk *a*, and opposite that at which it stood when the carriage was at the extreme of its outward movement. Disk *a* continuing to rotate will carry wrist-pin *b* down in the parallel portion 31 of slot *c* until said wrist-pin arrives at a point perpendicularly below the axis of the disk, when upon the further rotation of the latter it will rise in the portion 31 of said slot until it arrives at the point where it was considered that it started in the rotation of disk *a*, the carriage being withdrawn while the wrist-pin was traversing and retraversing the parallel portion 31 of the slot *c*.

The result of the operation just recited is to send the carriage in with a quick motion, while the leverage is shortest—that is, while the wrist-pin is moving toward and is nearest the fulcrum-point *d'* of pendent lever *d*—and when but little force or power is required to effect the movement allow the carriage to remain stationary or dwell at the extreme inward point of its movement to give the hook ample opportunity to catch the wire-head and permit the wrist-pin to travel down in the slot *c* to a point where it may exert greater leverage on pendent lever *d*, and then operate to draw the carriage out and withdraw the wire with a somewhat slower movement than that by which it was inserted in the shed. The several steps of this operation are substantially just what they should be to effect good work, preserve smoothness of motion, and maintain a perfect equilibrium of leverage in the wire motion, the greatest amount of leverage being employed when the wire is being withdrawn and operated to cut the pile, and the least when the smallest degree of power is required, as when the wire is being inserted in the shed.

h designates a rod or bar adapted to slide in suitable ways connected with the frame, and provided on its rear end with a bowl or anti-friction roller *i*, arranged to travel in the groove *j'* of a cam-disk *j*, secured on lower shaft B. Extending up from bar *h* is an arm *k*, connected to the forward end of wire bar *l*, which latter device is pivoted at its rear or outer end to the loom-frame.

The construction and timing of the parts just described are such as to move the free end outward from the wire-head magazine when

the carriage is moving forward, so as to insert the wire in the shed and move said free end of the wire bar inward after a wire has been inserted and hold or maintain it in its inward position until a wire has been withdrawn and another is to be inserted.

In my present invention I have somewhat modified the construction of the devices (shown in my patent aforesaid) connected with the carriage I, particularly with reference to the wire-withdrawing hook or device *m*, which improvements will now be explained.

n designates the wire-inserting plate secured to the carriage and adapted to operate against the rear of the wire head *o*, to move the latter and the wire *o'* through the race-way or slot in the wire bar into the shed.

p designates a latch-lever pivoted on the wire-inserting plate *n* and adapted to fall in front of the offset *q* of the wire head *o*, in which position it is normally held by a spring *p'*.

The wire-withdrawing hook *m* consists of a bar adapted to slide in suitable ways formed in the carriage I, and adapted at its forward end to enter the slot or aperture formed in the wire head. Said bar or hook *m* is held normally pressed toward the wire head or wire bar by means of a spring *s*, secured at one end to the carriage and operating at its free end in a notch *t*, formed in the side of the bar *m*.

u designates a pin adapted to move in suitable ways in the carriage and held pressed normally toward bar *m* by a spring *v*, as clearly shown in Fig. 6. The forward end of pin *u* is constructed to engage a notch in the side of bar *m* when said bar or hook shall be drawn back from the wire head against the tension of spring *s* and hold said bar or hook locked in its retracted position until released by moving back pin *u* against the tension of spring *v*.

As a means for retracting bar or hook *m*, I have provided a stud or handle *m'*, extending up from the rearward end of the bar, and a similar stud or handle *u'* is secured to pin *u* for pulling the latter back against the stress of its spring *v* to release the hook.

The devices described afford very convenient and easily-operated means whereby the hook can be quickly thrown out of action and held in such position, so that it shall not catch and withdraw a wire, and as easily and quickly released and returned to operative position.

M designates the wire-head magazine adapted to receive and hold the heads of the wires inserted by the carriage until the same shall be withdrawn by the hook or bar *m*. *w* designates the cam-shaped piece on the side of the wire-head magazine *M*, adapted to engage the arm *x* of the latch *p* and raise said latch as it moves over the wire-head magazine and releases the latch from the wire-head.

It will be seen that latch *p* is brought in front of the offset *q* of the wire head *o'* by the operation of spring *p'* as soon as the wire head is withdrawn from the wire-head magazine M, and as the wire head moves into the magazine the latch *p* is raised over the latter. By the means described the wire will be held steadily and moved in a straight line with the carriage, there being no liability of the tipping up of the forward end of the wire in withdrawing it from the fabric or of said end of the wire plunging downward or shooting upward when being inserted in the shed, or of the wire head of the wire being operated upon leaving the carriage in its movement to and from the magazine, and the latch *p* having no lateral movement, as is common in some constructions, the means connected with the carriage for engaging and releasing the wire head are rendered very simple in construction and arrangement, so as not to be easily disorganized, and they are at the same time certain and efficient in their operation.

As the carriage moves forward and the free end of the wire bar *l* moves outward, as from its full to its dotted line position in Fig. 2, the wire head will be withdrawn from its connection with the hook or bar *m*, and the latter, as it passes into the wire-head magazine M between the top plate *y* and base-plate *z*, will pass around to the side of the most forward wire head in the magazine and withdraw the same in the manner hereinbefore explained, the cam shape given to the operative end of the hook or bar *m* affording means whereby the latter will be made to move around the wire head against the stress of spring *s*.

Although I have been particular to describe the form and arrangement of the several parts constituting my improvements as they are

shown in the drawings, it is obvious that these may be varied without departing from the nature or spirit of the invention.

Having thus described my invention, what I claim is—

1. The wire-inserting carriage, combined with a longitudinally-movable wire-withdrawing hook having its bearings in the carriage, a spring to hold said hook normally pressed forward, a notch in the side of said hook, and a spring-pressed pin to engage said hook in said notch when the hook is drawn back, substantially as set forth.

2. A wire-head magazine provided with a cam-piece *w*, combined with a carriage and means for operating it, a latch pivoted on said carriage and provided with an arm *x*, a spring for holding said latch down in its normal position, a wire-inserting plate, and a wire bar, as set forth.

3. A wire-head magazine provided with a cam-piece *w*, combined with a carriage and means for operating it, a latch pivoted on said carriage and provided with an arm *x*, a spring for holding said latch down in its normal position, a wire-withdrawing hook, a wire-inserting plate, and a wire bar, as set forth.

4. The combination, with the slide, of the hook *m*, provided with a notch *t* and pin *m'*, spring *s*, pin *u*, provided with pin *u'*, and spring *v*, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 20th day of October, 1887.

GEORGE POOLE.

Witnesses:

ARTHUR W. CROSSLEY,
A. D. HARRISON.