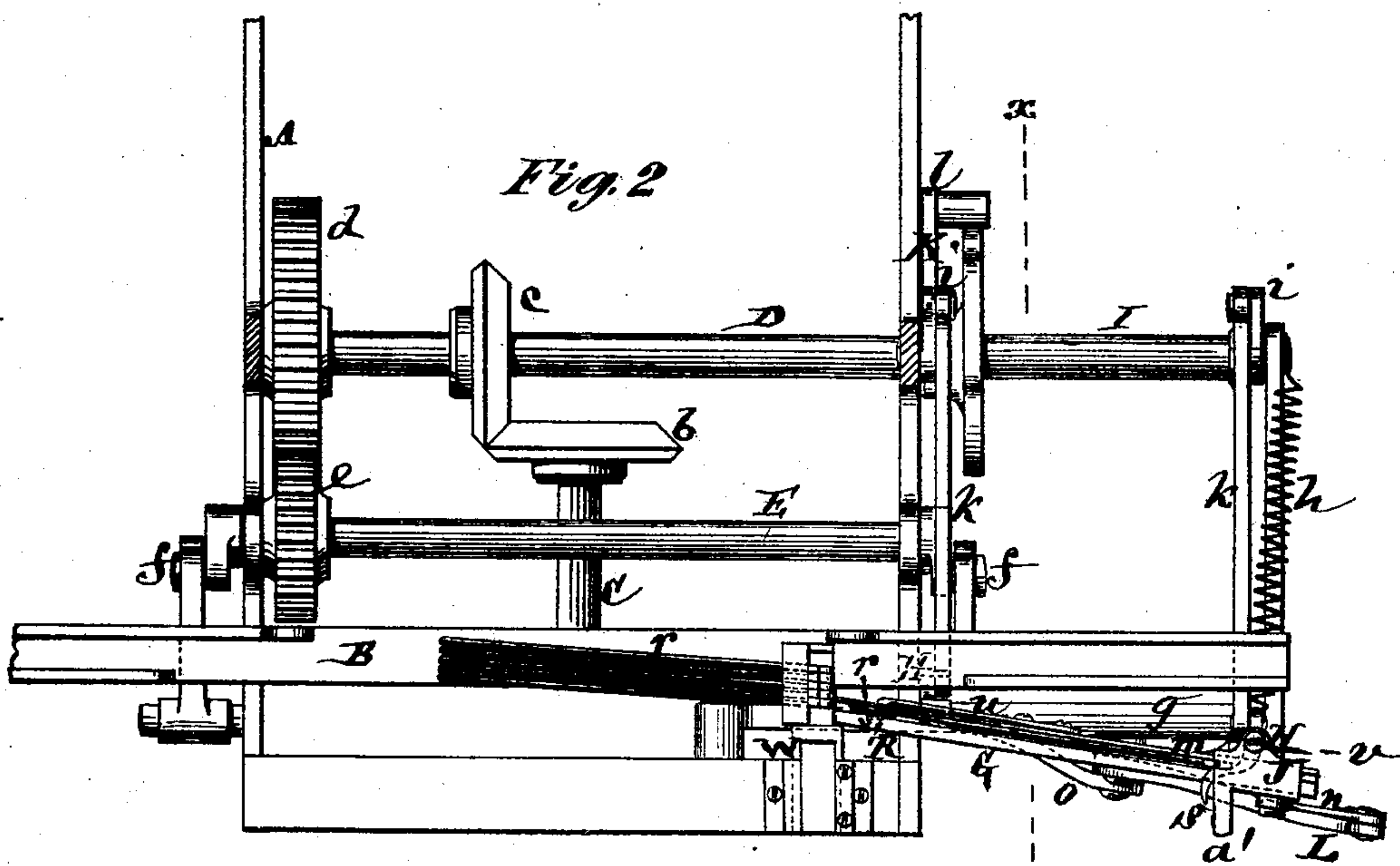
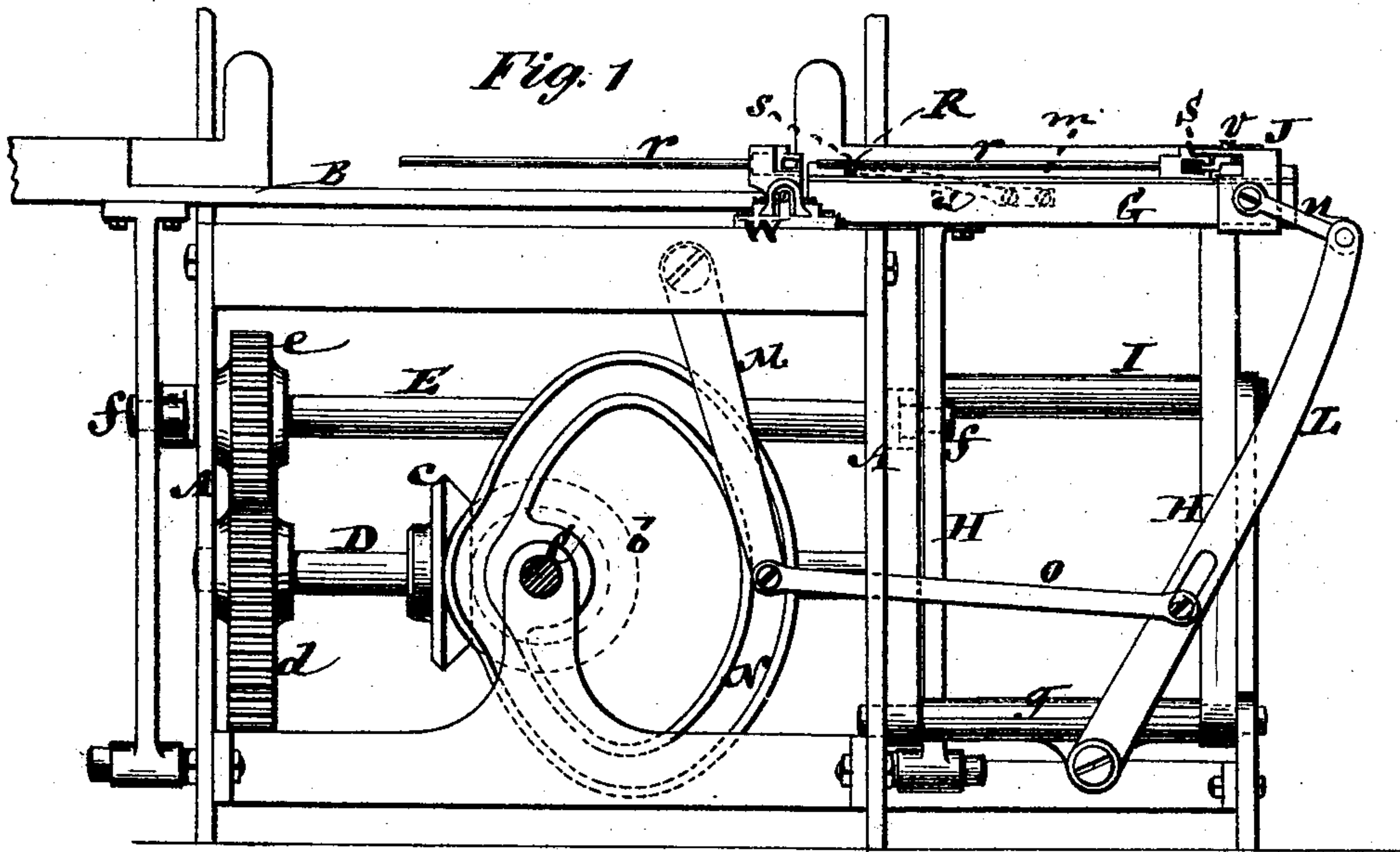


W. B. & J. C. DUCKWORTH.

Wire-Actuating Mechanisms for Looms.

No. 152,088.

Patented June 16, 1874.



Witnesses.

Michael Ryan
Fred. Haynes

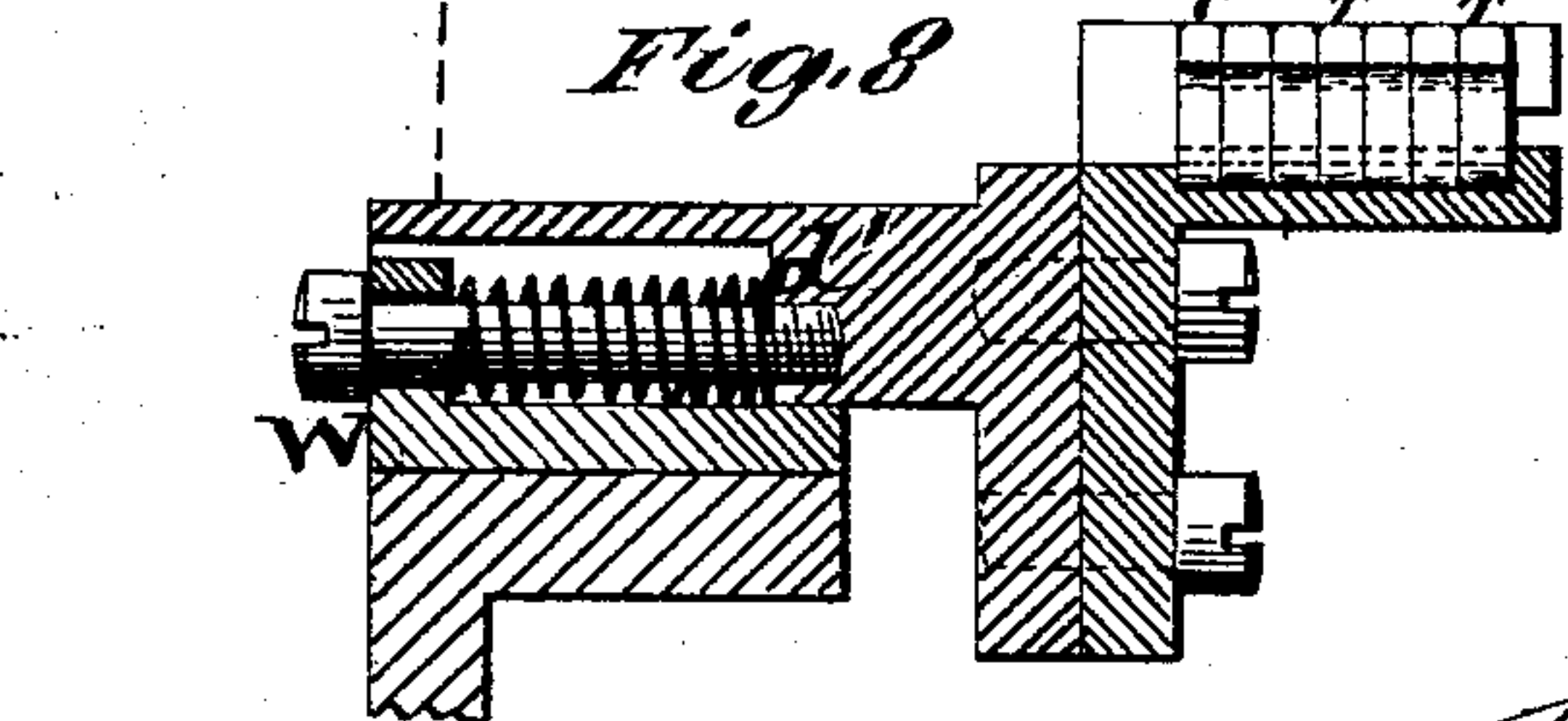
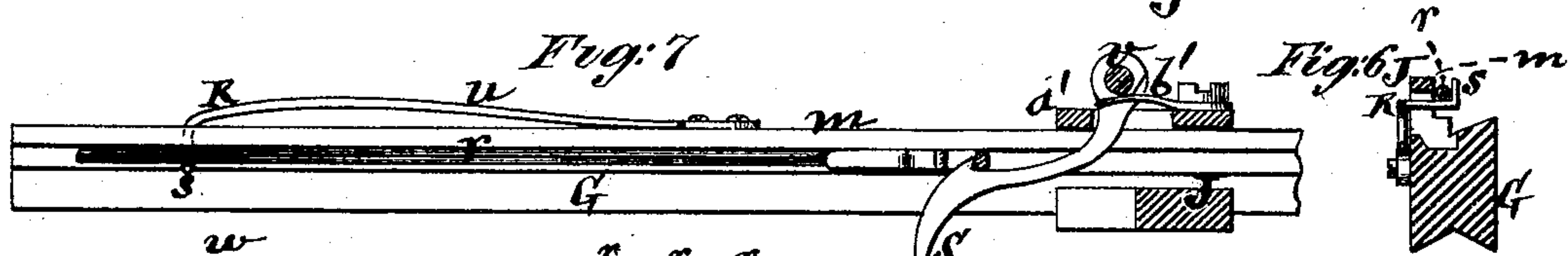
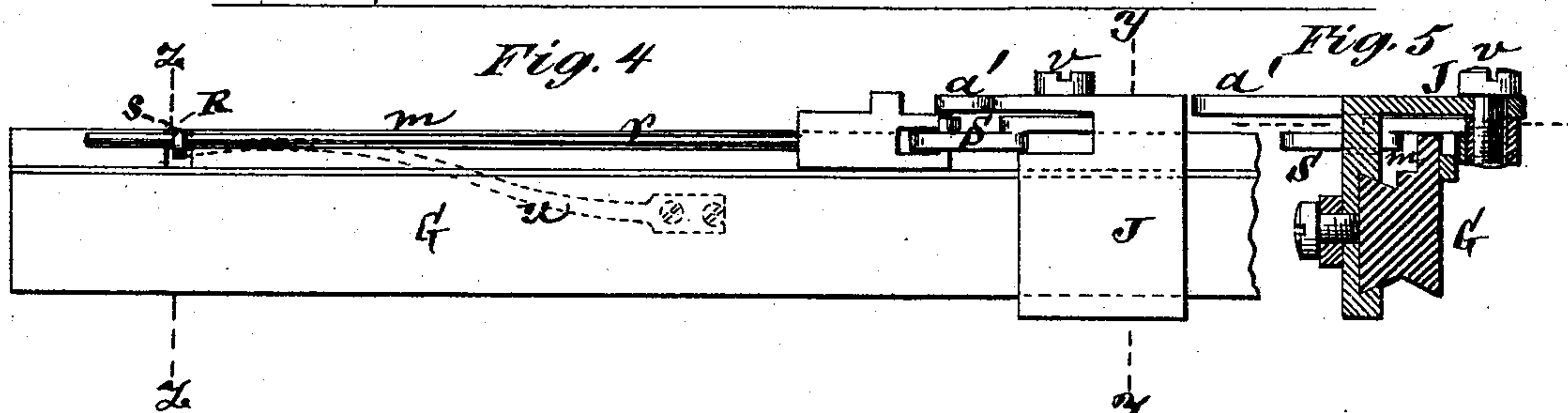
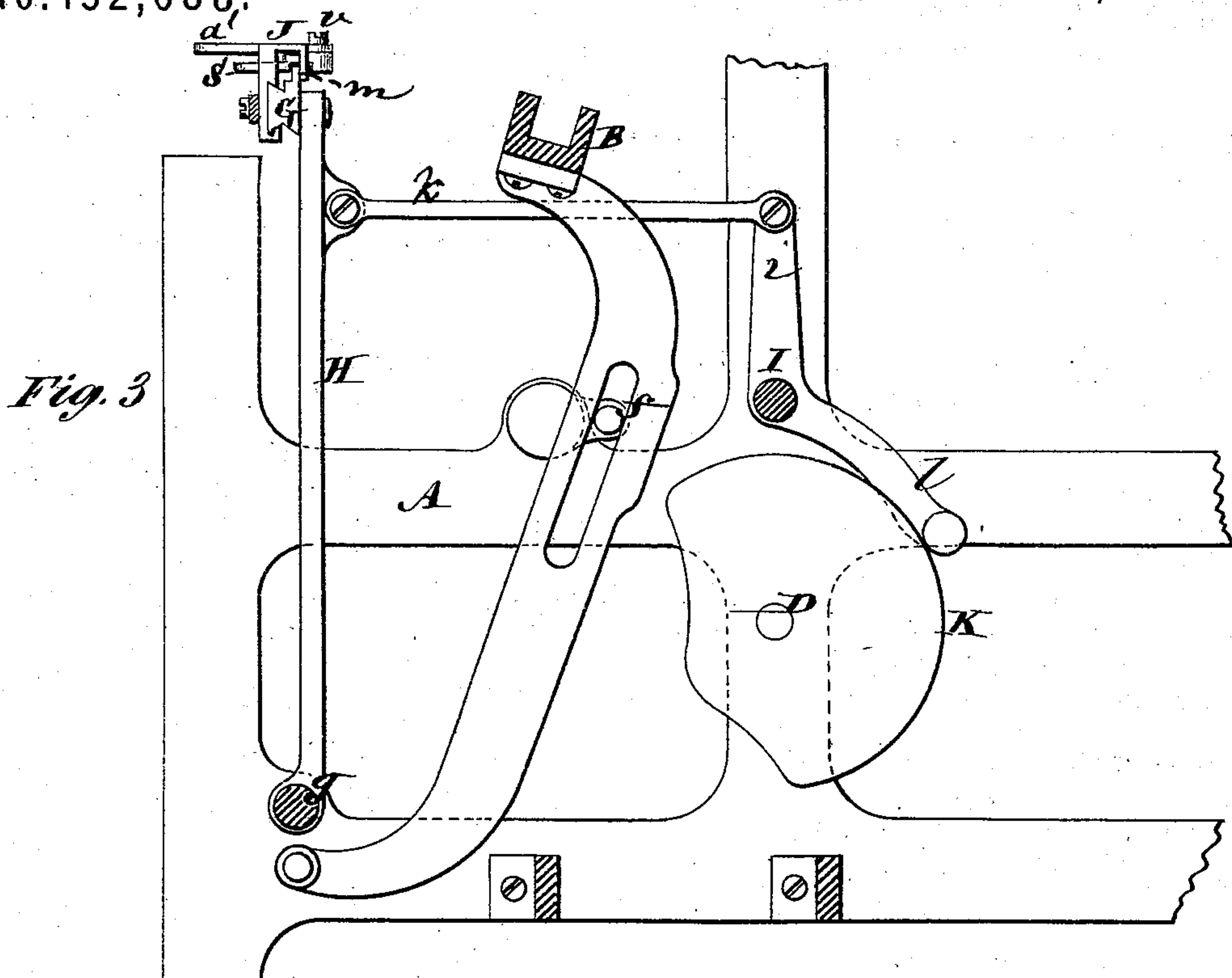
J. C. Duckworth
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Meditation

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UNITED STATES PATENT OFFICE.

WILLIAM B. DUCKWORTH AND JOHN C. DUCKWORTH, OF NEW YORK, N. Y.,
ASSIGNORS TO E. S. HIGGINS & CO., OF SAME PLACE.

IMPROVEMENT IN WIRE-ACTUATING MECHANISMS FOR LOOMS.

Specification forming part of Letters Patent No. **152,088**, dated June 16, 1874; application filed April 11, 1874.

To all whom it may concern:

Be it known that we, WILLIAM B. DUCKWORTH and JOHN C. DUCKWORTH, both of the city, county, and State of New York, have invented certain Improvements in the Wire-Motions of Power-Looms, of which the following is a specification:

These improvements relate to looms in which a pile is formed by inserting wires under a part of the warp during the operation of weaving, and said wires withdrawn after the pile is firmly bound in by the weft, such invention being more particularly adapted to weaving Brussels or tapestry carpet, and in weaving which class of goods it is desirable to give two beats of the lay to each wire insertion.

The invention consists in a combination of an open-fronted vibrating wire-bar and a hook arranged to engage with the head of the wire, and to hold it in front up against the back of the bar, whereby there is ready access to the wire, and the latter is firmly held in place at its head. The invention also consists in a forward wire-support arranged to work vertically instead of laterally, as in the case of a grooved trough, and made with a shoulder to prevent the wire from falling off, said supporter and the wire-hook which takes hold of the wire head in front being necessary adjuncts to the open-fronted wire-bar, although each of these adjuncts may be used independently of one another in connection with proper substitutes. The invention likewise consists in a novel action of the wire support or supporter by the carriage which runs the wires in and out. Furthermore, the invention consists in a novel construction and pivoted arrangement of the wire-hook at the back of the carriage and in rear of the catch part of the hook, so that not only is it moved in a backward direction to hook into the wire head, but is disengaged by moving up against the other wire heads, the pivoting of the hook in rear of its catch effecting the disengagement when the carriage comes up, and said carriage preferably being provided with a projection or piece, which serves to complete the pushing in of the wires after the hook is disengaged, such piece or projection being termed a "closer."

A loom operating upon the principles herein described is what is known as a continuous wire-motion, one inasmuch as the wire is not released during the process of transferring it.

In the accompanying drawing, Figure 1 represents a front view of a loom, in part, having our improvement applied; Fig. 2, a plan of the same; Fig. 3, a sectional side view, in part, mainly on the line *x x* in Fig. 2. Fig. 4 is a front view, on a larger scale, of the vibrating wire-bar and carriage thereon; Fig. 5, a transverse section of the same on the line *y y*; Fig. 6, a transverse section thereof on the line *z z*; and Fig. 7 is a sectional plan of similar parts. Fig. 8 is a longitudinal section, upon an enlarged scale, of the wire-box, taken transversely to the breast-beam of the loom; and Fig. 9, a transverse section of the same on the line *w*.

Similar letters of reference indicate corresponding parts in all the figures.

A is the main frame, and B the lay of the loom. C is a main driving-shaft, having a bevel-wheel, *b*, on it, which gives motion to a bevel-gear, *c*, on a shaft, D, that is fitted with a spur-wheel, *d*, for operating, through a pinion, *e*, a shaft, E, that, by means of cranks *f*, operates the lay. G is the wire-bar on the upper ends of a rocking frame or bars, H H, the center of motion of which is below at *g*, and which is connected by a spring, *h*, with an upper rocking shaft, I, that, by means of a crank or cranks, *i*, rods *k*, and a crank or arm, *l*, actuated by a cam, K, on the shaft D, serves, in connection with the spring *h*, to give the necessary vibrating movement to the wire-bar G. Said wire-bar is not of the usual trough shape, but is constructed with a ledge, *m*, for the wire, when being transferred, to rest or slide within, so that such wire-bar is of open construction facing the breast-beam, which facilitates getting at the wire when required. J is the wire-carriage, which reciprocates along the vibrating wire-bar G, to insert the wires under a part of the warp, and to withdraw the same after the pile is bound in by the weft. This carriage is actuated by a lever, L, link *n*, and a lever, M, in gear with a grooved cam, N, on the shaft C, and connected with the lever K by a rod, *o*. R is the wire-

support, near the inner end of the wire-bar G, for holding up and guiding each wire *r* of the series during its insertion and withdrawal. This wire-support, instead of working laterally, as in the case of a grooved trough for the wires, is operated vertically, and made with a shoulder, *s*, to prevent the wire from falling off during its reciprocating movement along the ledge *m* of the wire-bar, but said support dropping or working below the ledge when, in the forward beat of the carriage J, the latter is required to pass over it to take hold of a wire. This wire-support, in connection with the hook which takes hold of the wire in front, is indispensable to the open-fronted wire-bar.

The carriage J is made to operate the wire-support R as follows: The wire-support is held up to its retaining position of the wire in the ledge by a spring, *u*, which the carriage, as it comes up to insert a wire, when the wire-bar G is back, and subsequently, too, when the carriage commences its return stroke, slides over and depresses, and thus is at liberty to pass over the wire-support. S is the wire-hook, of angular or internally-beveled shape at its catch portion, to take a firm hold of each wire head. Said hook is pivoted at *v* behind the carriage, and in rear of the catch part of the hook, and moves in a horizontal plane, so that it not only moves in a backward direction to hook onto the head of a wire when withdrawing the latter, but so that it is disengaged from such wire after the latter has been transferred, and when inserting in rear of the other wires by the forward or catch portion of the hook S, as the carriage J beats forward when the wire-bar G is back, moving up against the other wire heads, and then, as the wire-bar G beats forward again, such disengaged wire and the several other wires in front of it are pushed up to their places in or through the wire-box W by a projection or closer, *a'*, arranged to slide against and across

the shoulders of the wire heads, the hook S, during such movement, remaining open, and not engaging with a new or forward wire till clearing the several wire heads, after which, and the wire-bar G having completed its outward stroke, the catch of the hook S, by its spring *b'*, engages with another wire to withdraw the same in the next back movement of the carriage J, for transfer, as before. The wire box or carrier W is made with a spring-box, *d'*, and fitted to slide in guides across the breast-beam, so that in case of the lay failing to beat fully up, or the shuttle failing to box, the wire carrier or box will yield to conform to such irregularities, and thus avoid breakage or permanent stoppage.

We claim—

1. The combination of the open-fronted wire-bar and a hook arranged to engage with the head of each wire in succession, and to hold it up in front against the back of the bar, substantially as specified.

2. The forward wire-support R, arranged to work vertically within or through the wire-bar, and made with a front shoulder, *s*, in combination with the open-faced wire-bar, essentially as described.

3. The vertically-moving wire-support R, in combination with the carriage J, for operation by the latter, substantially as specified.

4. The wire-hook S, pivoted in rear of the carriage, and back of the catch portion of the hook, as at *v*, to the carriage, whereby it is disengaged from the entering wire by coming in contact with the heads of the wires previously inserted in the warp, essentially as described.

WILLIAM B. DUCKWORTH.
JOHN C. DUCKWORTH.

Witnesses:

M. RYAN,
A. GREGORY.