(No Model.) 4 Sheets—Sheet 1.

W. SIMPSON.

LOOM MECHANISM FOR PRODUCING INTERMEDIATE SELVAGES.

No. 438,781. Patented Oct. 21, 1890.

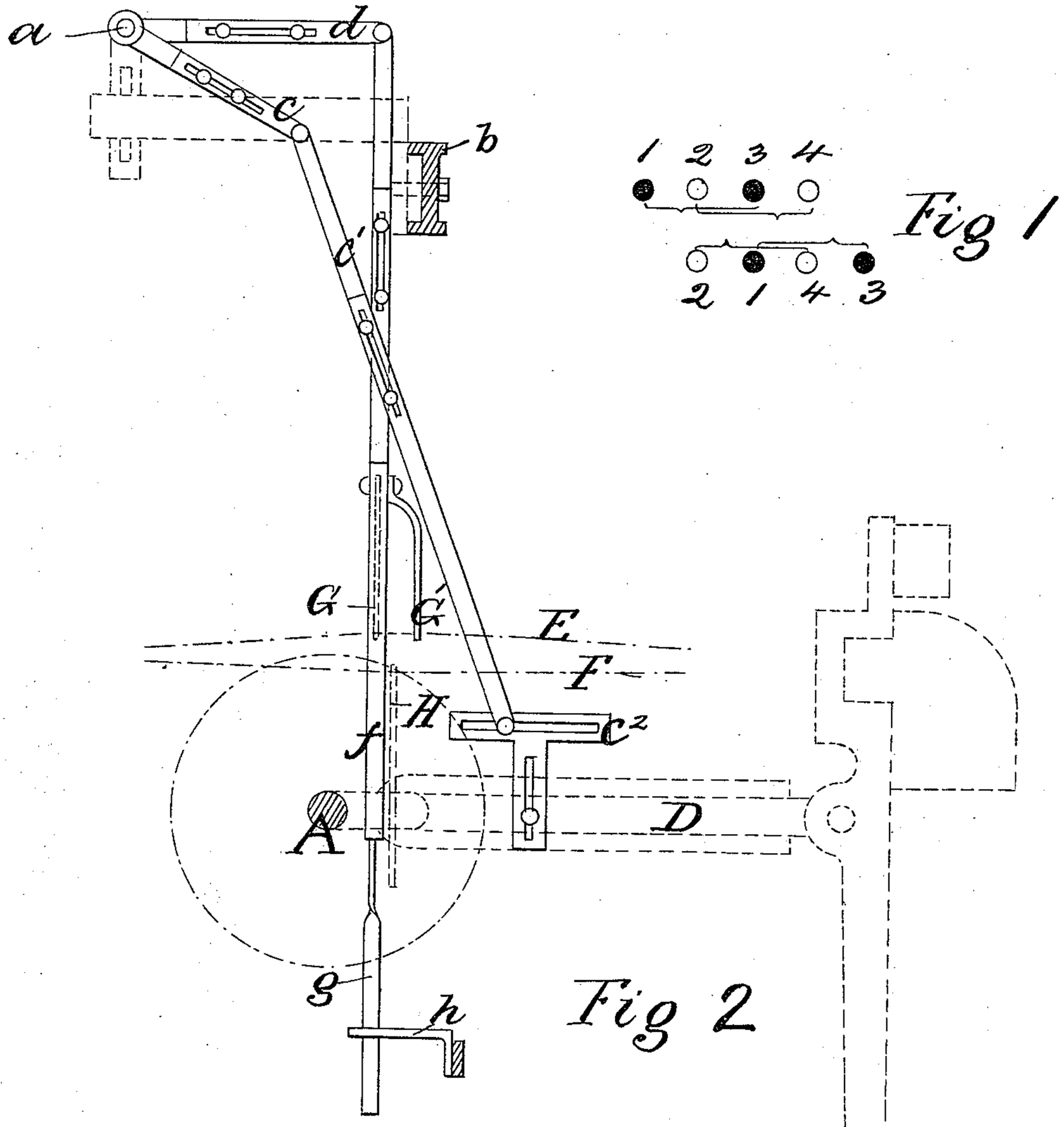

Fig 2

Fig 1

WITNESSES

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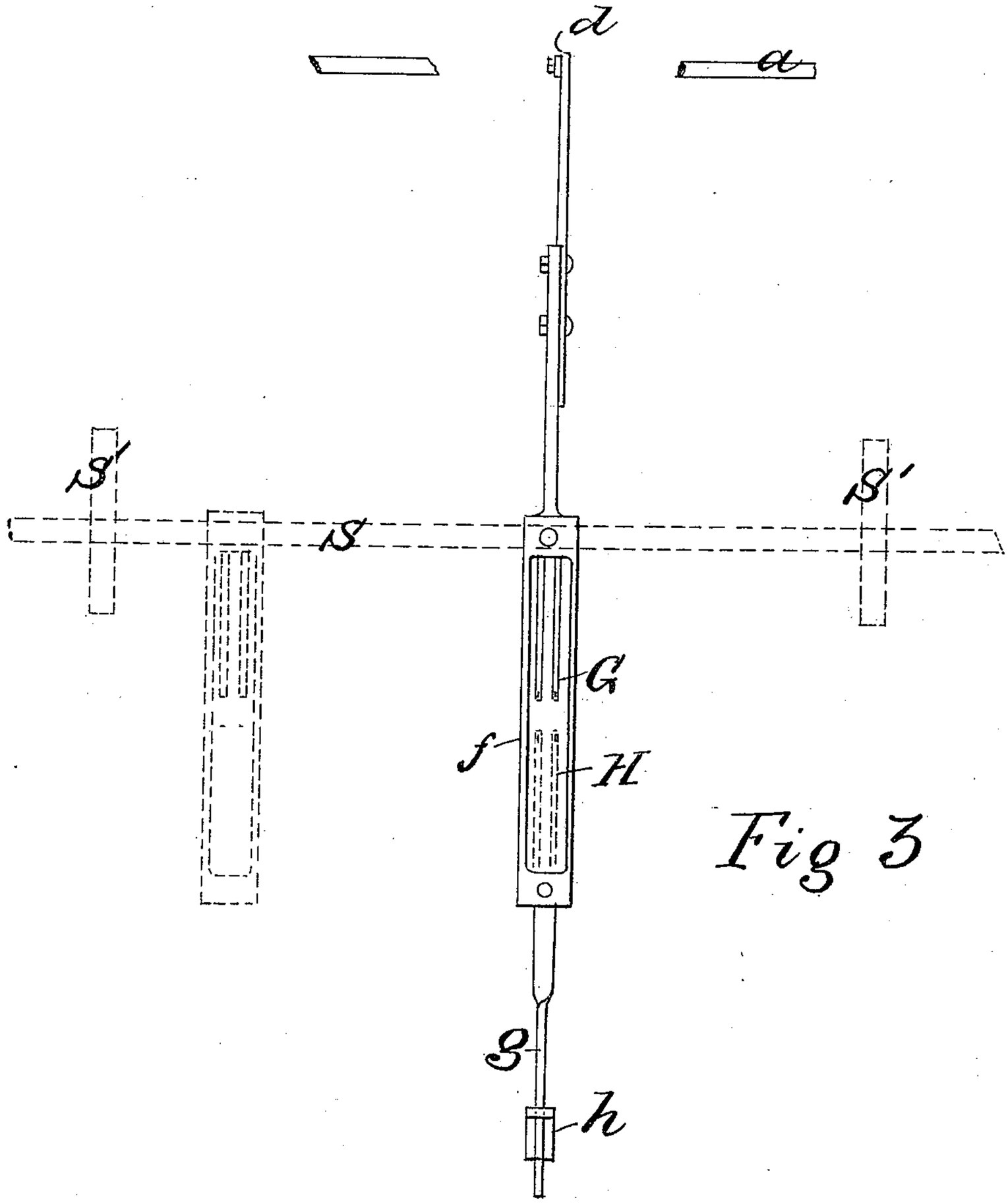

Fig 3

WITNESSES

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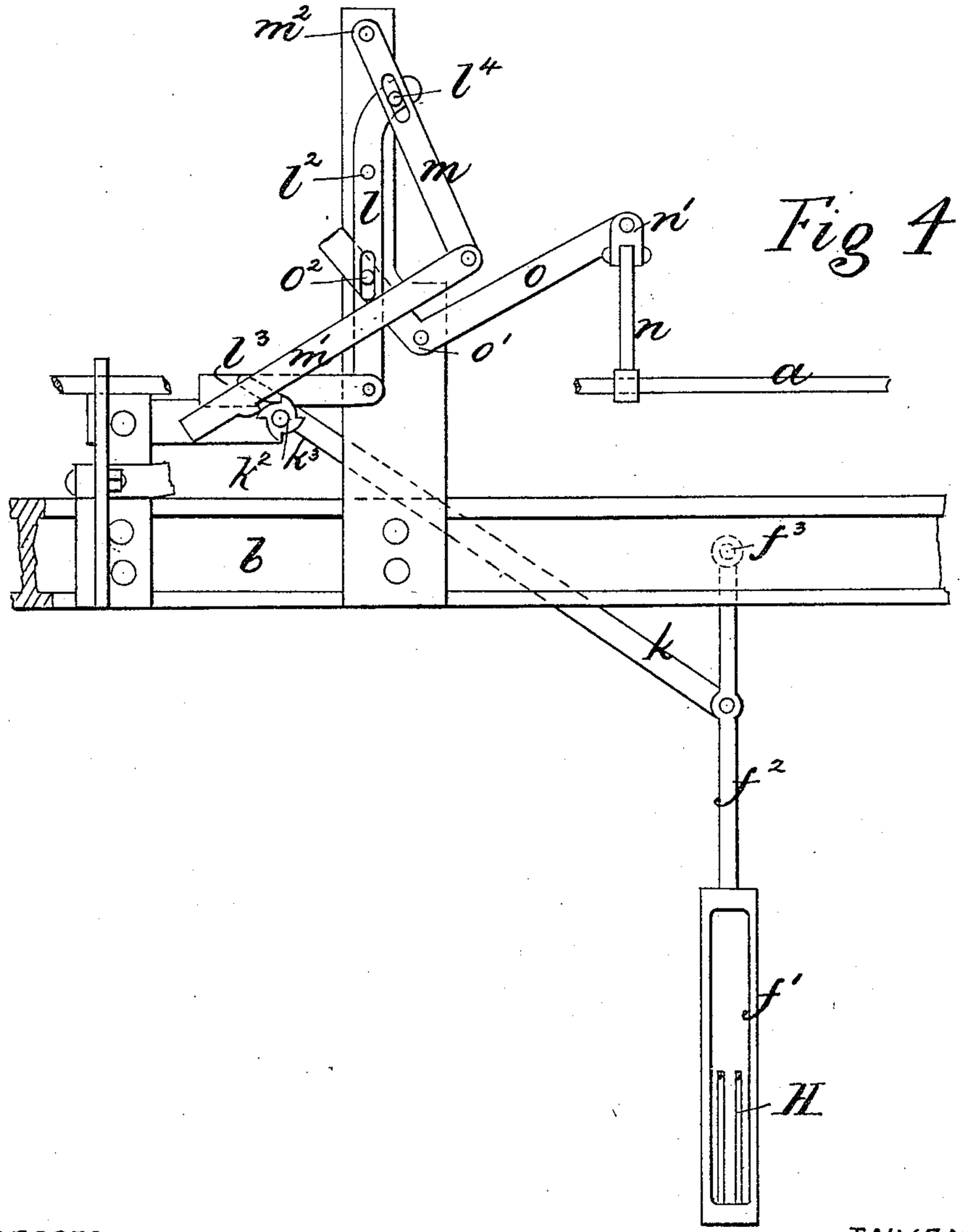

Fig 4

WITNESSES

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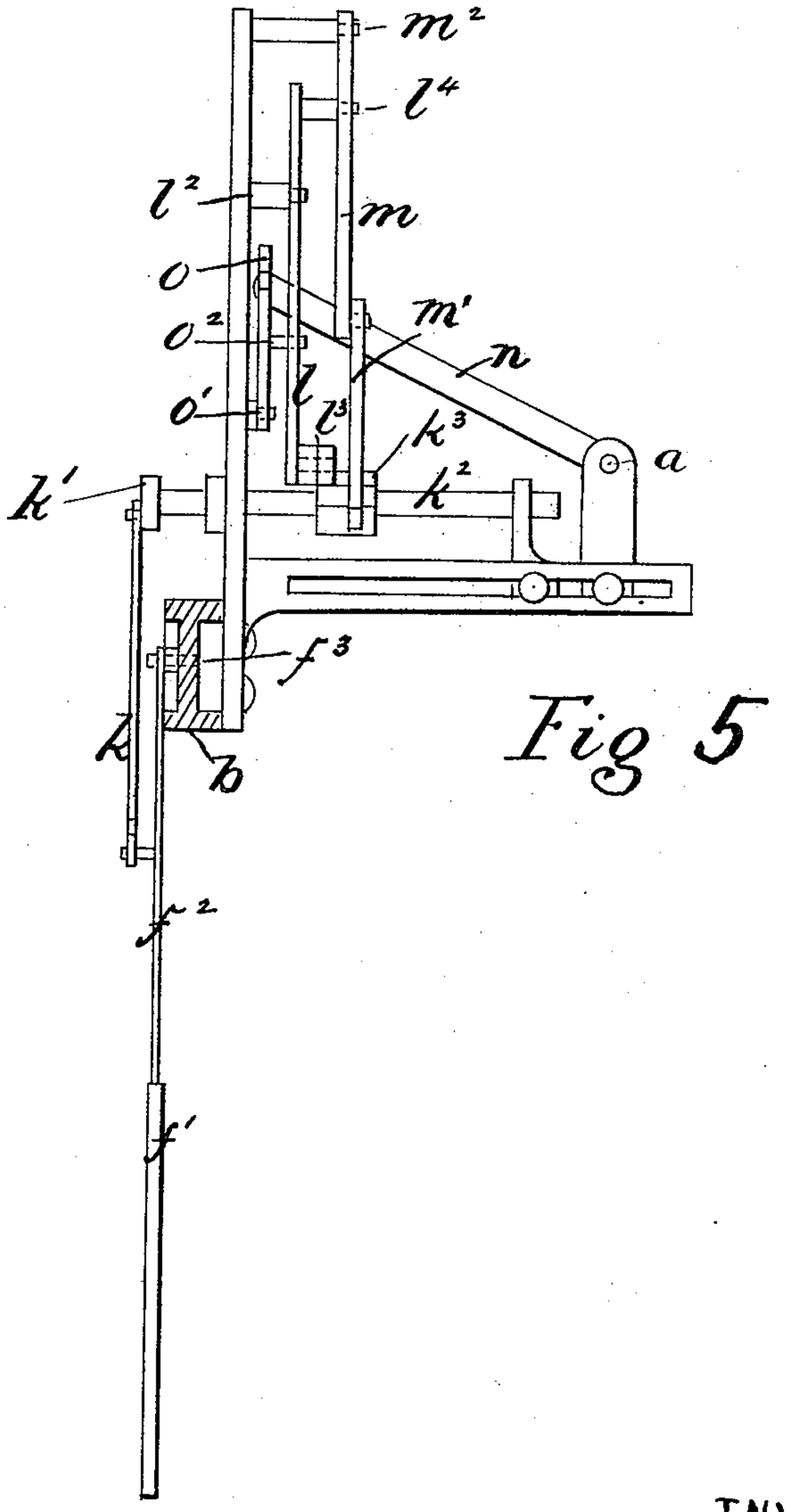

Fig 5

WITNESSES
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UNITED STATES PATENT OFFICE.

WILLIAM SIMPSON, OF SALFORD, ASSIGNOR TO ROBERT MILLER, OF MANCHESTER, ENGLAND.

LOOM MECHANISM FOR PRODUCING INTERMEDIATE SELVAGES.

SPECIFICATION forming part of Letters Patent No. 438,781, dated October 21, 1890.

Application filed January 7, 1890. Serial No. 336,197. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SIMPSON, a subject of the Queen of Great Britain and Ireland, residing at Salford, in the county of Lancaster, England, have invented certain Improvements in Loom Mechanisms for Producing Intermediate Selvages, of which the following is a specification.

My invention relates to mechanism used in a loom for weaving double selvages at an intermediate point or points in the width of a piece of cloth, so that it may subsequently be readily divided into two or more narrower pieces. In producing one such selvage four needles are used, arranged in pairs opposed to each other and held in suitable frames. The bottom pair of needles is placed a short distance before or behind the top pair of needles, so that they may pass each other. The bottom pair of needles has a reciprocating motion in a horizontal or approximately horizontal direction at right angles to the warp. The top pair of needles has a simple up-and-down motion. Each pair of needles carries two warp-threads, (one such thread passing through the eye of each needle,) and when the top needles are in their highest position a shed is formed, through which the shuttle can pass. By means of the mechanism hereinafter described the top pair of needles receives a double movement—that is to say, up and down—during the time the bottom pair of needles receives a single movement to the right or to the left. In consequence of this the relative position of the selvage-threads is changed and they are caused to cross each other each time a shed is formed.

In the accompanying drawings, Figure 1 is a graphic representation of the threads herein referred to as selvage-threads. Fig. 2 is a view of the mechanism for actuating the top needles, as seen from the left-hand side of the loom. Fig. 3 is a view from the back of the loom of a portion of the mechanism shown in Fig. 2. Fig. 4 is a view of the mechanism for actuating the bottom needles, as seen from the back of the loom. Fig. 5 is an end view of the mechanism shown in Fig. 4, as seen from the right-hand side of the loom.

In all these figures the same letters and numerals refer to the same parts.

In order to avoid complication of the drawings and to facilitate the description, I will describe the mechanism for actuating the top needles separately from that for actuating the bottom needles, it being nevertheless fully understood that both sets of mechanism work in unison with each other and derive motion from the same rocking shaft.

Referring to Fig. 1, which shows the effect produced by the mechanism hereinafter described, the black dots 1 and 3 represent the selvage-threads carried by the bottom needles, and the circles 2 and 4 represent the selvage-threads carried by the top needles. Those threads which move parallel with each other are shown connected by brackets. When the selvage-threads are in the order 1 2 3 4, the bottom needles are in their extreme position to the left, and after their passage to the right the order of the threads is 2 1 4 3, as shown in the second line of Fig. 1.

The use of two pairs of needles for effecting the crossing of selvage-threads is not new, and I therefore do not claim such needles. Their function is only referred to in order to more clearly set forth the nature of my invention, which is limited to the mechanism for actuating the needles and to the duplication of the top pair of needles, as hereinafter described.

Referring to Figs. 2 and 3, wherein the mechanism for imparting an up-and-down motion to the top needles is shown, A is the crank-shaft of the loom, giving motion to the sley (indicated in dotted lines) by means of connecting-rods D, one of which is also indicated by dotted lines.

E F are the selvage-threads passing through the eyes of the top and bottom needles G and H, respectively. The position of the bottom needles is indicated by dotted lines at H.

b is a cross-beam at the top of the loom, and in suitable bearings secured thereto is a

rocking shaft *a*, deriving motion from the connecting-rod D by means of a lever *c*, a link *c'*, and a T-piece c^2. These parts are provided with slots and bolts for regulating the extent of the oscillations of the rocking shaft *a*.

Secured to the shaft *a* is a lever *d*, from the free end of which is suspended the frame *f*, carrying the top needles receiving their up-and-down motion from the oscillation of the rocking shaft *a*. A prolongation or tail-piece *g* below the frame *f* slides in a slot of the guide *h* for preventing lateral displacement of the needles. The guide *h* is secured to any convenient fixed part of the loom.

Hitherto only a single pair of top needles has been used, and owing to the continually-varying tension of the selvage-threads during the process of weaving the crossing has been liable to miss taking place and the threads to break. I duplicate the top needles by providing an additional pair of needles attached parallel to and a short distance from the needles G, as shown at G'. This second pair of needles moves simultaneously with the needles G and serves to guide the selvage-threads E in a more certain manner, thus insuring the crossing of the selvage-threads.

The position of the bottom needles is, as already mentioned, indicated by dotted lines at H, Fig. 1, and the mechanism for actuating the bottom needles is fully shown in Figs. 4 and 5, to which I will now refer.

a is the rocking shaft actuated in the manner already described. The bottom needles H are held in a frame *f'*, suspended by a link f^2, pivoted at f^3 to the cross-beam *b*. A pitman *k* connects the link f^2 with the pin of a crank *k'* at the end of the cross-shaft k^2. Secured on the cross-shaft k^2 is a ratchet-wheel k^3, having four teeth and capable of being rotated by the pawls l^3 and *m'*, deriving their motion by a system of levers from the rocking shaft *a*. The lever *n* is secured to the said rocking shaft *a* in such a manner that its free end is raised and lowered by the rocking thereof. A shackle *n'* connects the free end of the lever *n* with the long arm of the bell-crank lever *o*, pivoted at *o'*. A stud o^2 in the short arm of the bell-crank lever *o* passes through a slot in the lever *l*, which is pivoted at l^2. The pawl l^3 is pivoted to the lower end of the lever *l*. When the shaft *a* rocks, so as to depress the lever *n*, the long arm of the bell-crank lever *o* is also depressed, the short arm of the lever *o* takes with it the bottom end of the lever *l*, and at the same time the pawl l^3 is pulled against a tooth of the ratchet-wheel k^3 and causes the cross-shaft k^2 to make a quarter of a revolution. On the other hand, when the lever *n* rises the pawl l^3 will ride over the ratchet-wheel without causing it to turn. In the upper end of the lever *l* is a stud l^4, which passes through a slot in the lever *m*. The lever *m* is pivoted at m^2. The pawl *m'* is hinged to the bottom end of the lever *m*, and, owing to it deriving motion through the lever *m* from the other end of the lever *l*, the effect of the pawl *m'* is contrary to that of the pawl l^3—that is to say, the pawl *m'* rides over the ratchet-wheel when the lever *n* is depressed; but when the latter is raised the pawl *m'* engages with the ratchet-wheel and causes it to make a quarter of a revolution in the same direction as that produced by the pawl l^3.

From the foregoing description of the action of the pawls l^3 and *m'* it is evident that the cross-shaft k^2 will make half a revolution each time the lever *n* is raised and lowered, and that two complete oscillations of the shaft *a* are necessary in order to produce one revolution of the crank *k'*. In this manner the frame *f'*, carrying the bottom needles H, will receive a single movement to the right or to the left, while the top needles G receive an upward and a downward motion.

In the foregoing description I have only mentioned one double selvage; but my invention is equally applicable to the production of any desired number of double selvages in the width of the piece. Any desired number of sets of needles connected by bars working in guides, as indicated by dotted lines at S S' in Fig. 3, may be employed. Such a series of sets of needles is then actuated simultaneously by the mechanism hereinbefore described.

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

1. In combination, a rocking shaft, a cross-shaft with means for rotating the same from said rocking shaft, a pitman actuated and actuating as herein described, and a swinging frame for the bottom needles, the whole working together for the purpose of imparting the proper motions to the bottom needles, substantially as set forth.

2. The combination of the top and bottom needles of a selvage-thread-crossing device with mechanism for giving an up-and-down motion to the top needles, a swinging frame for the bottom needles, a pitman, a cross-shaft, and means for rotating the cross-shaft to impart to the bottom needles suitable motions in relation to the top needles, substantially as set forth.

3. The combination of the top needles of a selvage-thread-crossing device with the crank-shaft and connecting-rod, a T-piece, a lever and connecting-link, a rocking shaft, a lever *d*, and a needle-frame, substantially as set forth.

4. The combination of the vertically-moving needles for crossing warp-threads, and means for carrying and operating the needles, with a second pair of needles moving parallel to and simultaneously with the vertically-moving needles, as and for the purpose set forth.

5. The combination of guide-needles G'

with vertically-moving needles G, a frame *f*, a lever *d*, and a rocking shaft *a*, substantially as and for the purpose set forth.

6. The combination of the bottom needles of a selvage-thread-crossing device with a cross-shaft k^2, a ratchet-wheel and pawls, a train of levers and a rocking shaft to operate the pawls, a crank, a pitman, and a frame carrying the bottom needles to impart an approximately horizontal motion to the bottom needles, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM SIMPSON.

Witnesses:
JULIUS ALLMANN,
EDWARD TURNER WHITELOW.
Both of 70 Deansgate, Manchester.