

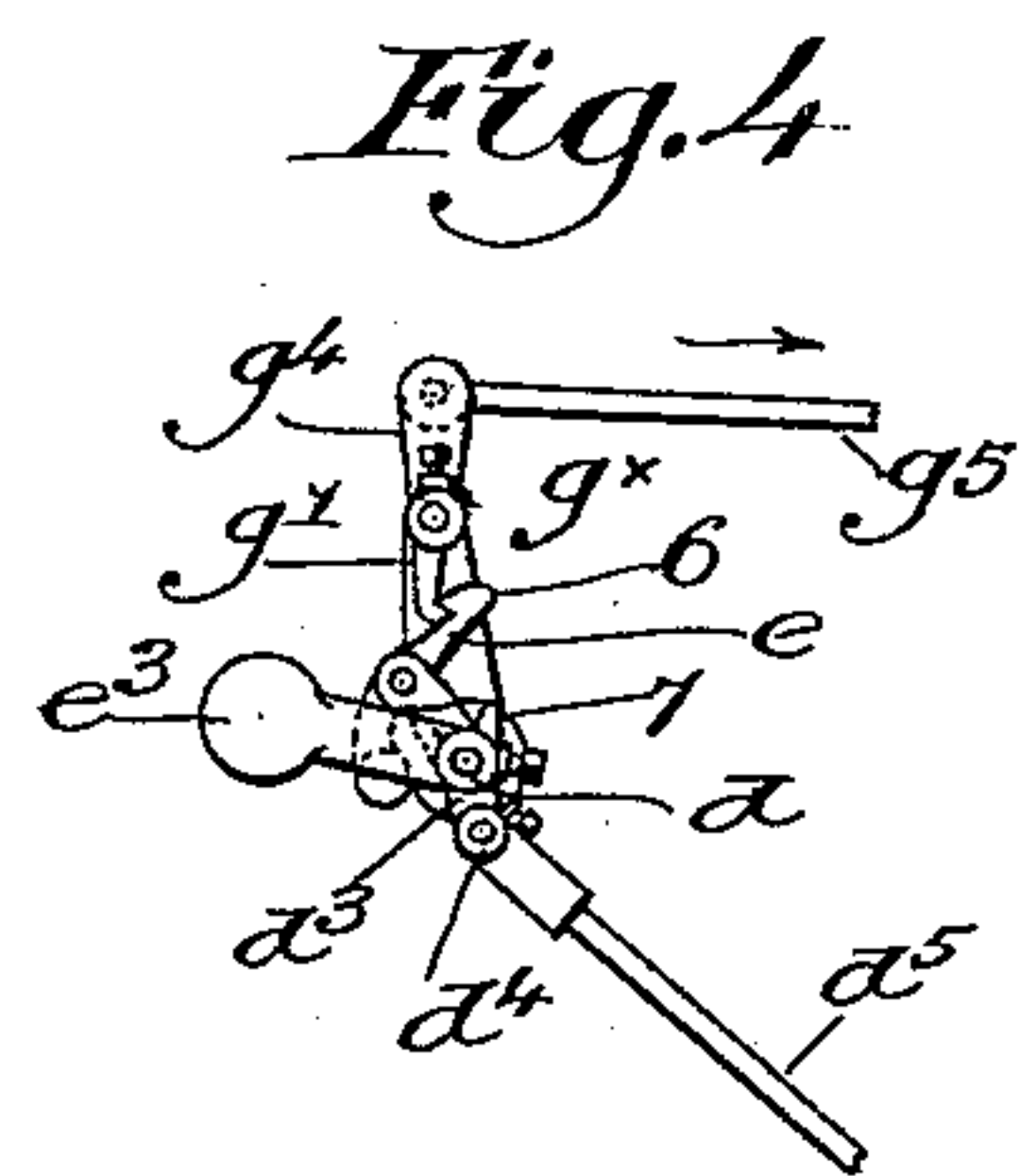
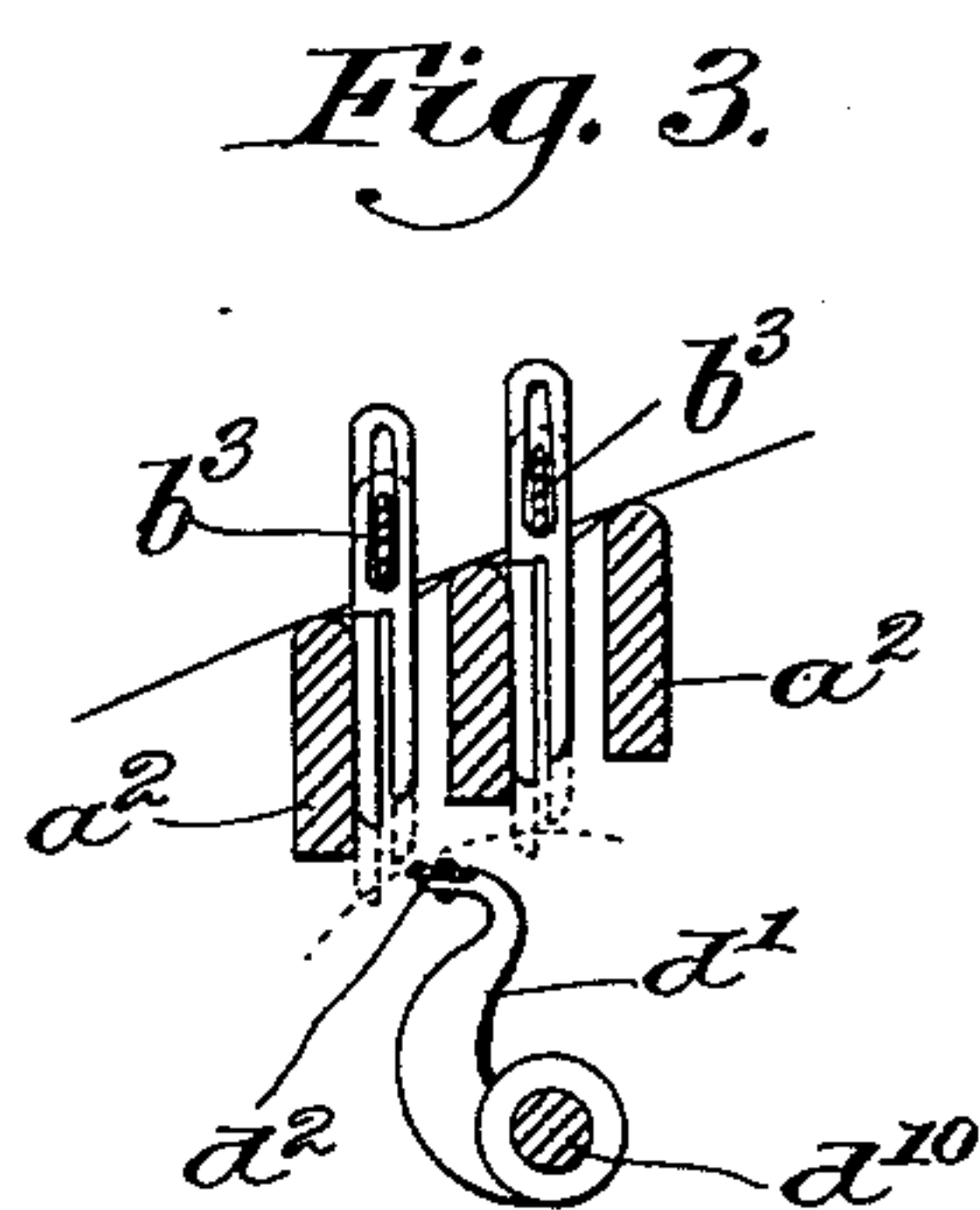
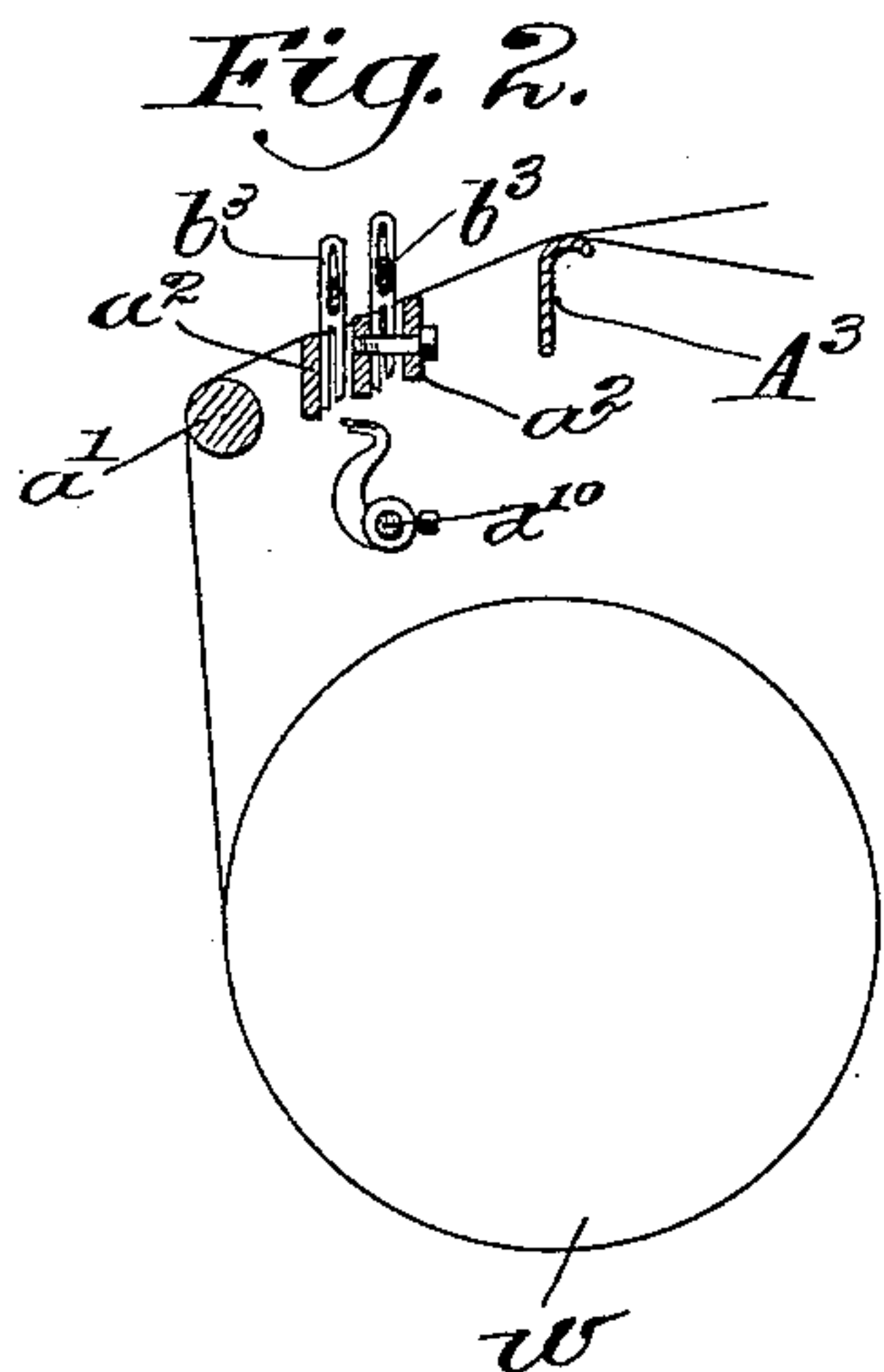
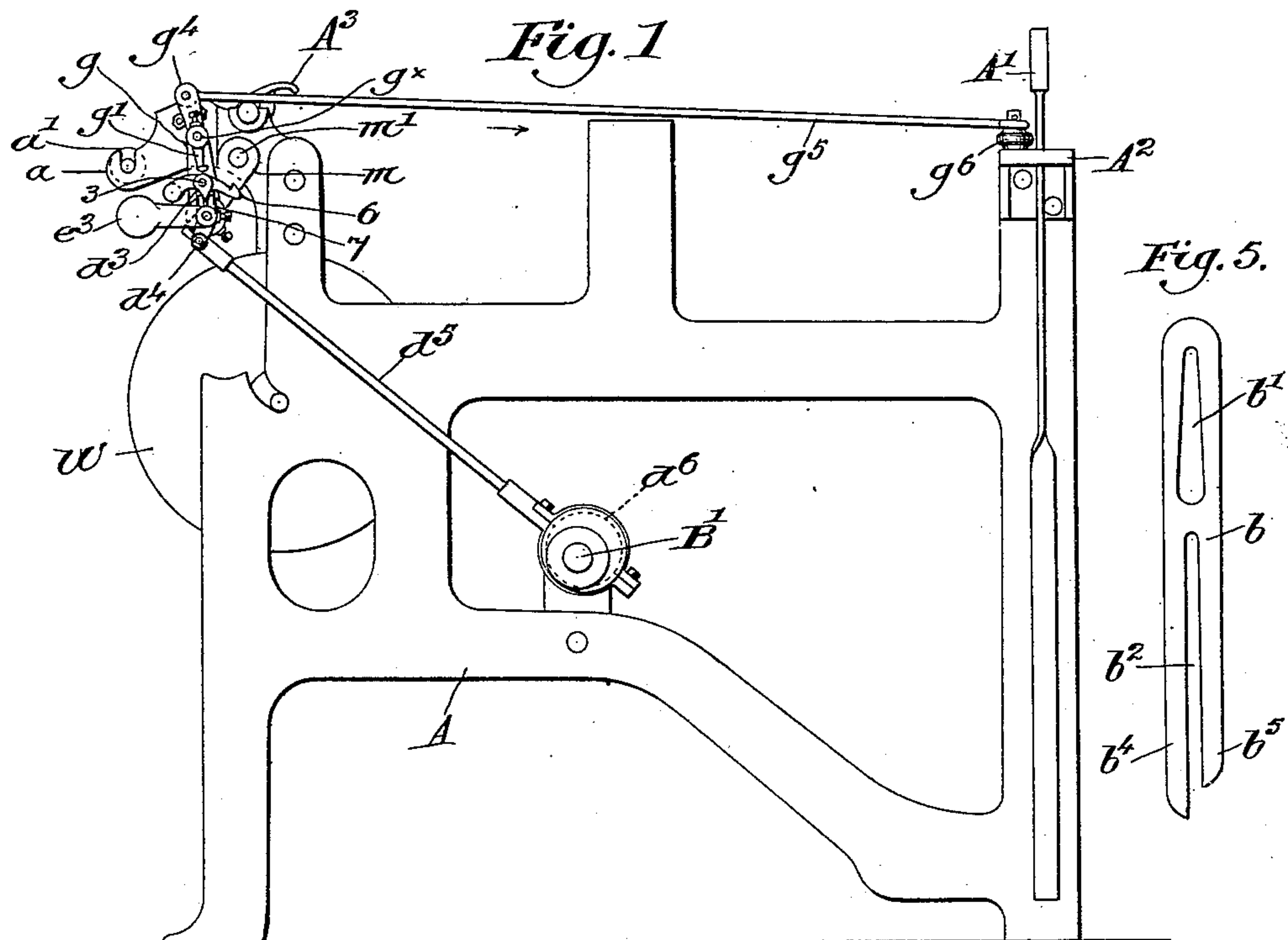
No. 638,593.

Patented Dec. 5, 1899.

J. H. NORTHROP.  
WARP STOP MOTION FOR LOOMS.

(Application filed July 23, 1898.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE  
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## WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 638,593, dated December 5, 1899.

Application filed July 23, 1898. Serial No. 686,674. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. NORTHROP, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention has for its object more particularly the improvement of the actuating-detectors for warp-stop-motion mechanisms for looms; and it relates to the type of stop-motion device shown and described in United States Patent No. 540,596, dated June 4, 1895, to which reference may be had. In the patent referred to the series of detectors are located in the vicinity of and above the warp-beam, the detectors being normally sustained

20 by the warp-threads passed through round eyes therein, each detector having above the eye a slot through which a round guide-rod is passed, and below the detectors a vibrating feeler is mounted to engage and be stopped by a dropped detector upon breakage or undue slackness of its warp-thread. Suitable stopping means for the loom is operated by or through such stoppage of the vibration of the feeler. With the detectors so located

30 they receive little or no movement in actual practice, and it has been found that lint gradually accumulated upon the detectors, rubbing off from the yarn passing through the warp-eyes, and this accumulation of lint was apt to clog the warp-eye sufficiently to present a very material obstruction to the free passage of the warp-thread, and even would hold the detector from dropping when its supporting-thread broke. In my present invention I

40 have entirely overcome this very objectionable feature by forming the thread guiding or receiving portion of the detector as an elongated slot open at its lower end, so that the lint will not accumulate on the detector, but will drop down and out of the slot.

As will hereinafter appear, I have made the parts of the detector at each side of the slot of unequal length, so that the blow of the feeler is received by the edge of the longer

50 leg, thereby greatly reducing the tendency of the detector to twist when so engaged.

My present invention is illustrated in connection with the general construction of warp-stop-motion mechanism forming the subject-matter of the United States patent hereinbefore referred to.

Figure 1, in side elevation, shows a sufficient portion of a loom to be understood with my present invention embodied therein. Fig. 2 is a sectional detail parallel to the warp-threads, chiefly to show the detectors and the coöperating feeler. Fig. 3 is an enlarged similar detail showing in dotted lines the position of a dropped detector. Fig. 4 shows some of the parts illustrated in Fig. 1, but in another position; and Fig. 5 is an enlarged side elevation of one of the detectors to be described.

The loom-frame A, shipper-handle A', the belt-shifting mechanism connected therewith, (not shown,) the whip-roll A<sup>3</sup>, warp-beam W, and cam-shaft B' are and may be all as common in looms now in use, and the stands a, supporting a warp-roll a', containing between them three like bars a<sup>2</sup>, located between the warp and whip rolls, are as in said Patent No. 540,596, the detectors b, one of which is shown separately in Fig. 5, being placed in series between the bars a<sup>2</sup>. One of these detectors is used for each warp-thread, and it has at its upper end an elongated slot b' to receive therethrough a flattened guide rod or bar b<sup>3</sup>, Figs. 2 and 3, the said guide-bars being set on their edge and suitably mounted in the stands a, the width of the bar from top to bottom being such as to permit a limited vertical movement of the detector upon it, the slot decreasing in width from its lower to its upper end. The lower portion of the detector is longitudinally slotted at b<sup>3</sup> to form a warp-receiving opening or part open at its lower end and longitudinally dividing the lower part of the detector to form two separated depending legs b<sup>4</sup> b<sup>5</sup> of unequal length, the longer leg b<sup>4</sup>, as herein shown, extending beyond the end of the shorter leg. The warp-thread is passed through the open slot b<sup>3</sup>, and any accumulation of lint will drop down through the slot and out from its open end, thus preventing clogging of the thread-

The flattened supporting-bars B give a firm



support to the detectors and materially assist in guiding their movements, coöperating with the transverse guide-bars  $a^2$  and firmly holding a dropped detector, as the narrow upper end of the slot  $b'$  then wedges, as it were, on the bar  $b^3$ .

The warp-threads are led from the warp-beam  $W$  over the warp-roll  $a'$ , thence through the open slots  $b^2$  of the detectors, over the whip-roll, and thence through the eyes of the usual harnesses, which latter may be of any usual construction and actuated in any suitable or desired manner to form sheds.

The stopping mechanism for the loom may be of any suitable construction, operated by or through the stoppage of a normally-vibrating feeler, said feeler being herein shown as a bar  $d^2$ , Figs. 1, 2, and 3, connected to suitable arms  $d'$  of a rock-shaft  $d^{10}$ , vibrated in suitable manner, as in the patent referred to.

Guide-bars  $a^2$   $b^3$  are, as will be seen from Figs. 2 and 3, so arranged that a dropped detector in either the front or rear series will assume the dotted-line position, Fig. 3, to thereby bring the projecting lower end of the longer leg  $b^4$  of the detector into the path of movement of the feeler  $d^2$  to stop the latter. The detectors are so arranged on the guides  $b^3$  that their longer legs  $b^4$  will be adjacent the next rearmost guide  $a^2$ , and it will be seen that the point of engagement of the feeler and detector is brought very near the adjacent supporting-bar  $a^2$ , which resists the blow of the feeler, so that any tendency of the detector to twist is practically eliminated.

The connection between the feeler and the stopping mechanism herein shown is the same as that shown in United States Patent No. 540,596. Within the arm  $g$  is a bearing-hub, in which is mounted loosely a short rock-shaft  $g^x$ , provided at its outer end with a catch  $g'$ , the inner end of the rock-shaft having an arm  $g^4$ , to which is loosely jointed one end of a rod  $g^5$ , which in turn is jointed loosely to a pin on the knock-off lever  $g^6$ , which is fulcrumed on the usual notched holding-plate for the shipper-lever. The lever  $d^3$  is also mounted loosely upon the rock-shaft  $d$ , said lever having a hole at one end for the reception of a pin  $d^4$ , by which to join it loosely to a connecting-rod  $d^5$ , having at its other end an eccentric-strap surrounding the eccentric  $d^6$  on the usual cam-shaft  $B'$ . The overbalanced latch  $e$  is pivoted on a stud 3 and is provided with a hook 6, while the outer end of the part  $d$  of the rock-shaft has fixed to it a weighted arm  $e^3$ , provided with a toe 7. Normally the feeler is vibrated by means of the cam  $d^6$  acting through the rod  $d^5$  and the intermediate devices; but if the feeler meets a detector and the movement of the rock-

shaft  $d^{10}$  or the shaft  $d$  in alinement therewith is obstructed the movement of the weighted lever  $e^3$  is also obstructed, while the lever  $d^3$  continues to move, and in its movement the overbalanced latch  $e$  is released to turn upon the stud 3 far enough to cause the hook 6 of the latch to rise and engage the catch  $g'$ , said latch during its further movement by or through the eccentric  $d^6$  turning the rock-shaft  $g^x$ , and thereby moving the connecting-rod  $g^5$  in the direction of the arrow, Fig. 1, to operate the stopping means for the loom.

It will be understood that when the loom is running and the warps are unbroken or under proper tension the detectors will be held in full-line position, shown in Fig. 2 or Fig. 3; but should a warp-thread break or become unduly slack its detector will drop into dotted-line position, Fig. 3, to bring the longer leg  $b^4$  thereof into the path of the feeler  $d^2$  to stop the vibration thereof.

As in the patent referred to, the detectors are arranged in two series, and they are separated properly by the central one of the plates or bars  $a^2$ , while the guide-bars  $b^3$  prevent the detectors from dropping entirely out of place upon breakage of a warp-thread.

My invention is not restricted to the precise construction and arrangement of parts herein shown, as other connections between the feeler and the stopping means for the loom may be used with equal facility, it being obvious that such connecting devices form no part of my present invention.

I have herein shown one practical embodiment of my invention without attempting to show or describe all of the various forms and arrangements of coöperating devices with which my present invention is adapted to co-operate.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a warp-stop-motion detector made of thin, flat material having at its upper end an elongated closed slot, and an open-ended thread-receiving slot below it.

2. As a new article of manufacture, a warp-stop-motion detector made of thin, flat material having at its upper end an elongated, closed slot having downwardly-divergent edges, and an open-ended thread-receiving slot below it.

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

JAMES H. NORTHROP.

Witnesses:

THEODORE B. HASELDEN,  
GEO. OTIS DRAPER.