

No. 658,730.

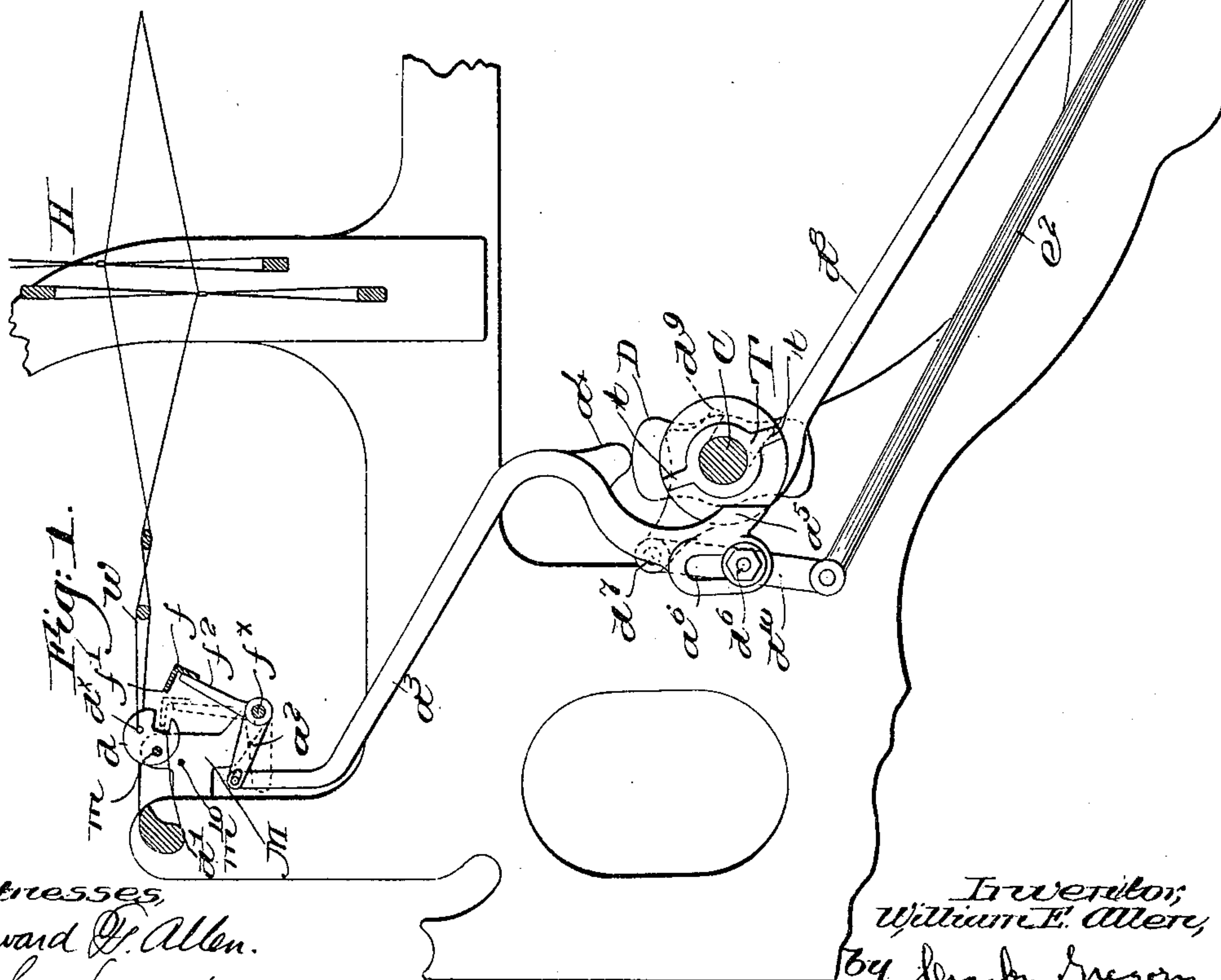
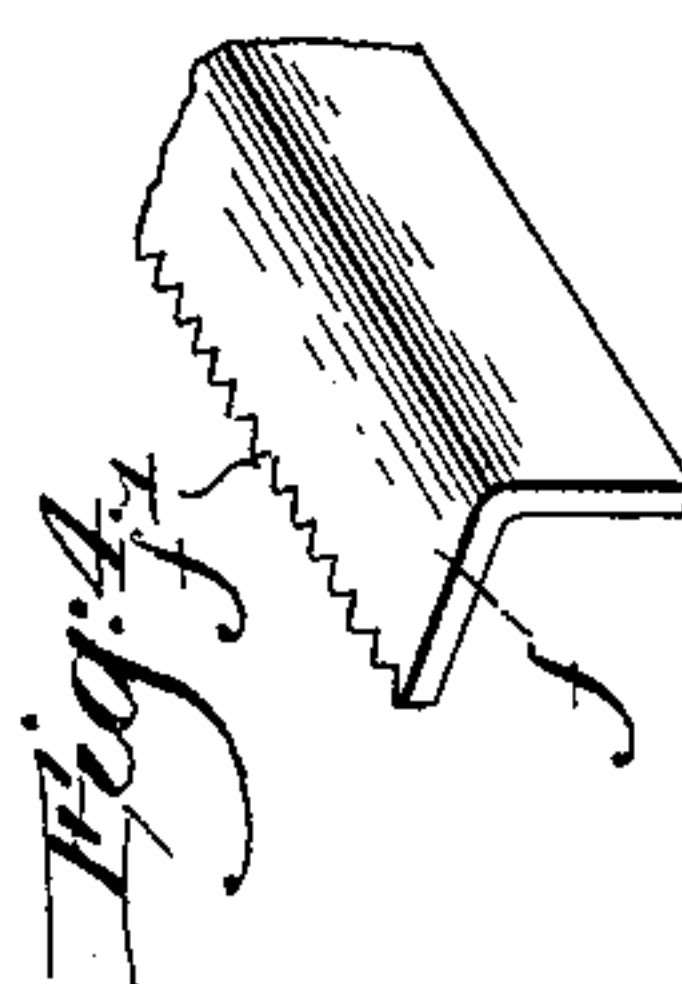
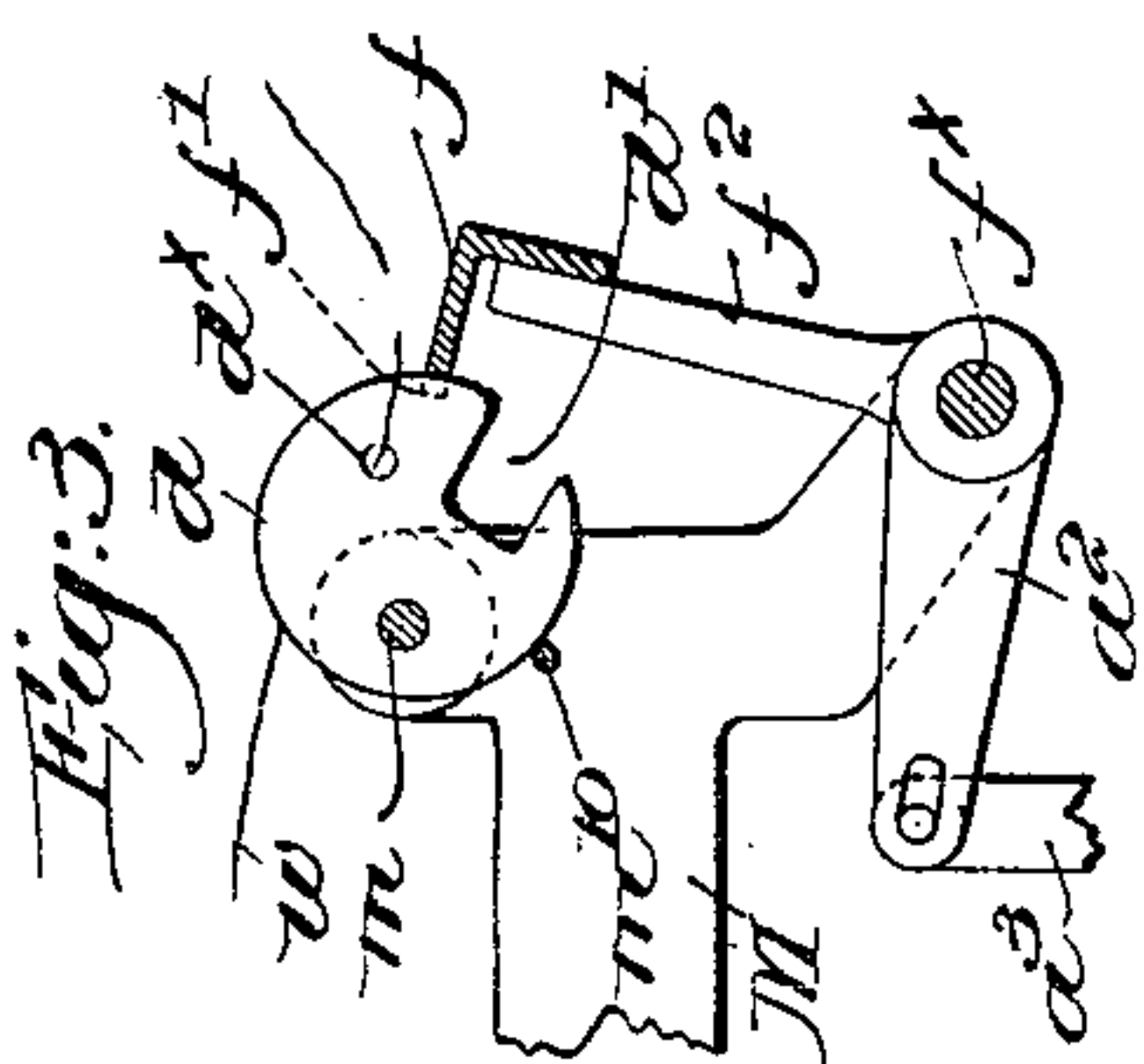
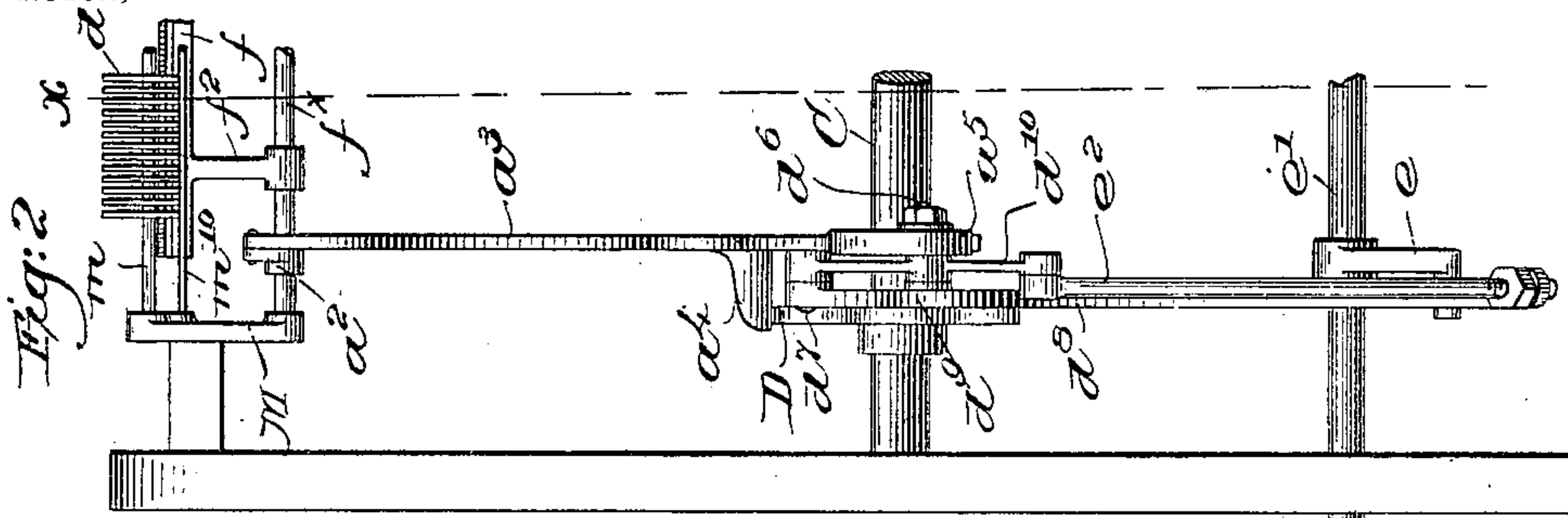
Patented Sept. 25, 1900.

W. E. ALLEN.

WARP STOP MOTION MECHANISM.

(Application filed June 25, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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WARP-STOP-MOTION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 658,730, dated September 25, 1900.

Application filed June 25, 1900. Serial No. 21,401. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ALLEN, a citizen of the United States, and a resident of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Warp-Stop-Motion Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object the production of novel, simple, and effective warp-stop-motion mechanism adapted to effect the operation automatically of suitable stopping means by the abnormal positioning of a detector released by breakage or undue slackness of a warp-thread.

My invention is particularly adapted for use in connection with looms, though it will be hereinafter manifest that it may be also readily employed in other textile apparatus wherein it is necessary or desirable to stop the same automatically when an abnormal condition of a warp-thread occurs.

25 Figure 1 is a longitudinal sectional view of a portion of a loom with one embodiment of my invention applied thereto on the line x , Fig. 2. Fig. 2 is a rear elevation of a portion of the apparatus shown in Fig. 1. Fig. 3 is an enlarged detail of a portion of the mechanism shown in Fig. 1, and Fig. 4 is an enlarged perspective detail of a part of the feeler.

35 The harnesses H , shipper-lever S , and whip-bar W may be and are of any usual or well-known construction in looms, the actuating or controlling detectors of the stop-motion mechanism being herein shown between the whip-bar and harnesses. A fixed rod or detector-support m is extended across the loom below the warp-threads w and held in brackets M on the frame A , and on this support are loosely mounted to move angularly or rock a series of detectors d . These detectors are made, preferably, of thin hardened sheet-steel disks substantially circular in shape and perforated eccentric to their centers of gravity to receive the support m , each detector having a notch or reëntrant portion d' extended inward from its periphery toward its support. A warp-receiving opening or eye d^x is made in each detector and so lo-

cated as under normal conditions to be above the reëntrant portion and the support, so that when the warp-threads are in normal condition the detectors will be held in the position shown in the drawings, the support m then being at one side of the centers of gravity of the detectors. When in such position, the reëntrant portions are in the path of movement of a coöperating feeler f , shown as an angle-iron having its edge f' notched or toothed (see Fig. 4) and connected by arms f^2 to a rock-shaft f^x , mounted in bearings on the brackets M , the path of movement of the feeler preferably intersecting the support m for a purpose to be described, the vibration of the feeler normally moving it in and out of the reëntrant portions d' of the detectors. If now a warp-thread fails or becomes unduly slack, its detector is permitted to turn on its support m by gravity to carry its reëntrant portion out of the feeler-path and to bring thereinto a portion of its circular edge farther from the support than the bottom of the portion d' , as shown in Fig. 3, so that the movement of the feeler toward the support will be arrested when it engages the edge of the detector. As the support m is in the path of the feeler, the former thus acts as a back-stop for the detector when so engaged and takes up the strain due to arrest of the feeler, and the teeth of the latter act to prevent twisting or bending of the detector at such time. The stroke of the feeler toward the detectors is its feeling stroke, and it is upon such stroke that it is engaged and arrested by a released detector, and I prefer to effect this stroke by gravity, the return stroke being effected by any suitable mechanism, one form of which may be briefly described.

90 An arm a^2 on the rock-shaft f^x is extended rearwardly therefrom and has pivotally connected with it a bent arm a^3 , provided with a bunter a^5 and a toe a^4 , normally resting by its weight on an edge cam D , mounted on the cam-shaft C , the bunter being moved by the cam into and out of the path of one or more tappets t of a cam T , also on the shaft C . Upon arrest of the feeler the bunter a^5 is held up in the path of a tappet, engagement thereof with swinging the link or arm a^3 to the rear. This arm is slotted at a^6 to receive a stud d^6

on a short lever d^{10} , pivoted at its upper end at d^7 to a link d^8 , hooked around the cam-shaft at d^9 , and jointed at its other end to an arm e of a rock-shaft e^x , provided with a knock-off arm e' for the shipper-lever. A rod e^2 is jointed at its ends to the arm e and the lower end of the lever d^{10} , respectively, and when the hunter is acted upon by a tappet the link d^8 is moved longitudinally to operate the knock-off arm. The feeling stroke of the feeler is due to gravity, and the reverse stroke is positively effected by the mechanism shown.

In order to limit the rocking movement of a detector on its support when released, I provide a stop shown as a rod m^{10} , mounted in the brackets M, exterior to the detectors, and toward which stop they swing when released, as shown in Fig. 3, this stop also serving to steady the detector when it engages the feeler.

The form of detector herein shown is strong, and it can be cheaply and readily made by stamping the same out of suitable sheet metal, and the parts of the stop-motion co-operating therewith are compact and occupy small space in the apparatus to which they are applied.

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

1. In apparatus of the class described, a series of thin, flat detectors each having a circular periphery interrupted by a reëntrant portion, and a warp-receiving portion above such opening, a fixed support upon which the detectors are rotatably mounted eccentric to their centers of gravity, and stopping means, including a feeler normally vibratable in a path intersecting the said support and movable into and out of the reëntrant portions of the detectors, the latter being maintained by normal warp-threads with such portions in the feeler-path, a released detector turning to bring its circular edge into the path of and to arrest the feeler, to thereby effect the operation of the stopping means, the support serving as a back-stop for the detector when so engaged.

2. In apparatus of the class described, a series of thin, flat disk-like detectors having each a warp-receiving opening and a notch

inwardly extended from its periphery, a fixed support extended loosely through the detectors eccentric to their centers of gravity, stopping means, including a feeler normally vibrating into and out of the notches of the detectors, the latter being maintained in such position by normal warp-threads, a released detector turning to bring its edge into the path of and to arrest the feeler, to thereby effect the operation of the stopping means, and a fixed stop exterior to the detectors, to limit angular movement thereof when released.

3. In apparatus of the class described, a series of thin, flat disk-like detectors having each a warp-receiving opening and a notch inwardly extended from its periphery, a fixed support extended loosely through the detectors eccentric to their centers of gravity, and stopping means, including a feeler normally vibrating into and out of the notches of the detectors, the feeler having a toothed edge, said detectors being maintained by normal warp-threads with their notches in the feeler-path, a released detector turning on its support to bring its periphery into the path of and to be engaged by the toothed edge of the feeler, to stop the latter and thereby effect the operation of the stopping means.

4. In a loom, a series of circular detectors having each a warp-eye and a reëntrant portion extended inward from its periphery toward its support, a fixed axial support extended loosely through the detectors eccentric to their centers of gravity, and stopping means for the loom, including a feeler normally vibratable toward and from the support in the reëntrant portions of the detectors, the latter being maintained by normal warp-threads with their reëntrant portions in the feeler-path, a released detector rotating on its support to bring its circular edge into the path of and to arrest the feeler, to thereby effect the operation of the stopping means.

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

WILLIAM E. ALLEN.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.