

No. 645,913.

Patented Mar. 20, 1900.

H. W. CRAY.

LOOM.

(Application filed Jan. 4, 1900.)

(No Model.)

Fig: 1..

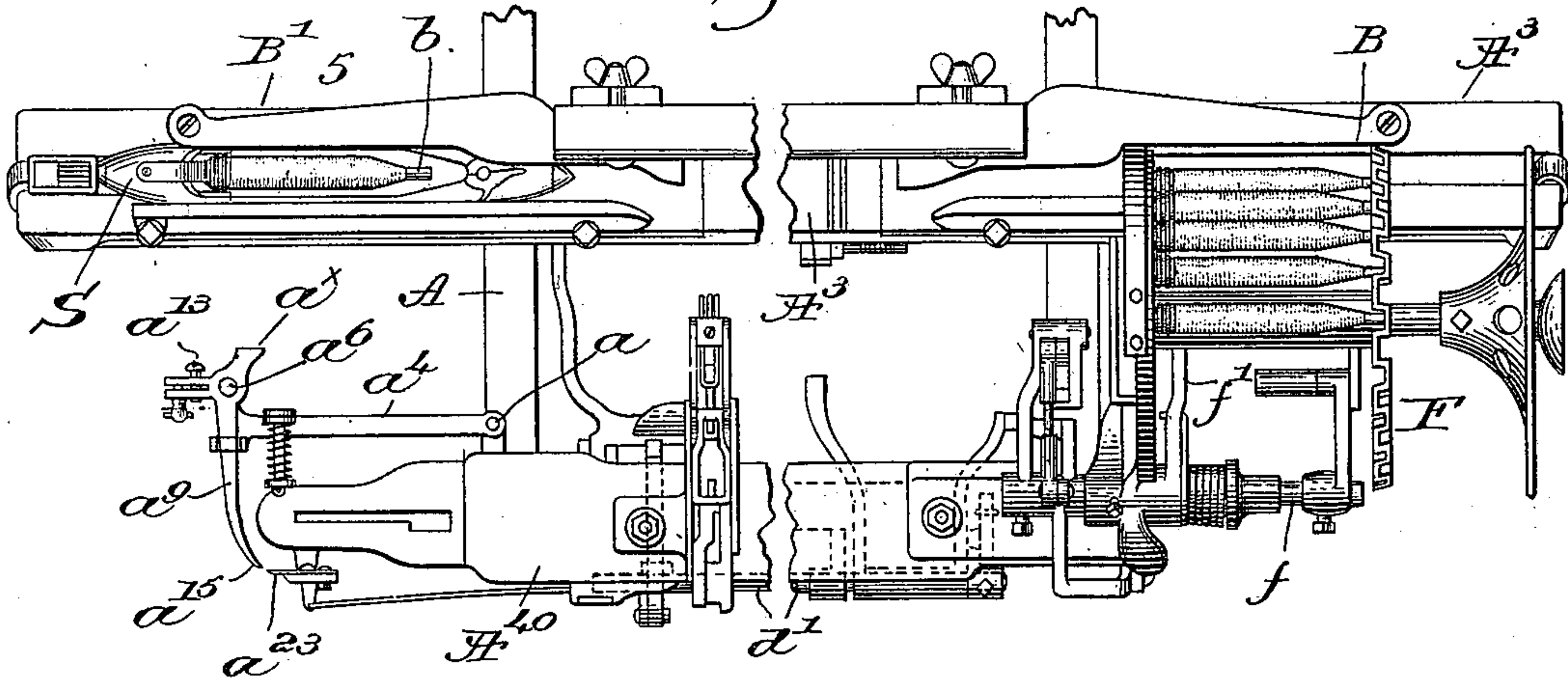


Fig: 3.

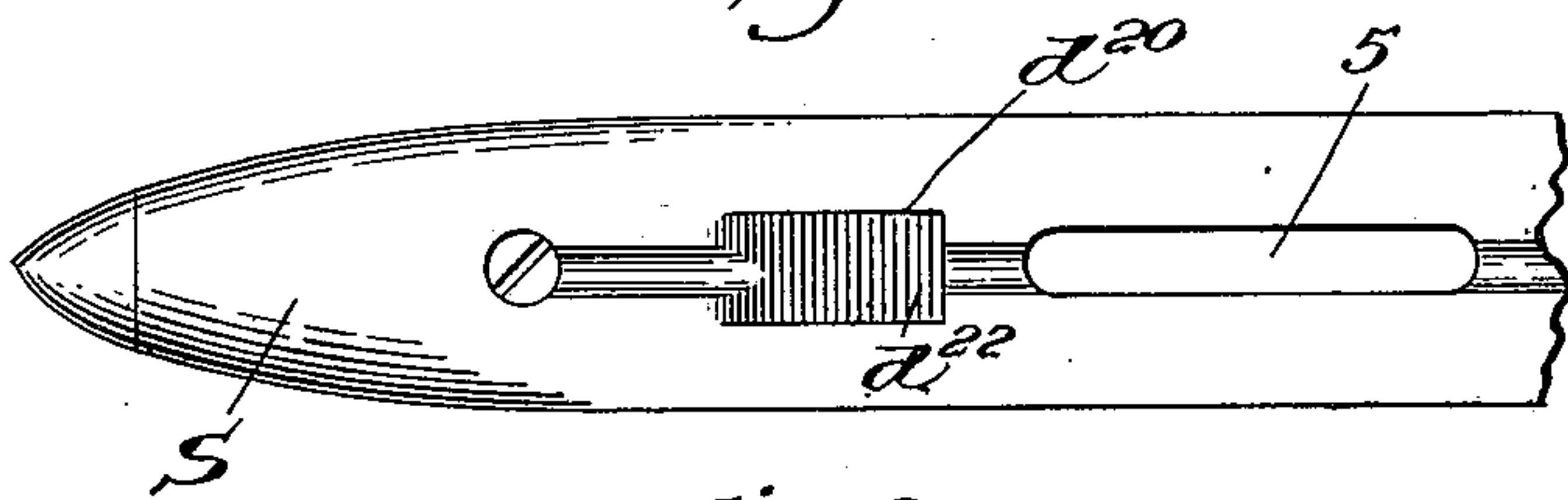
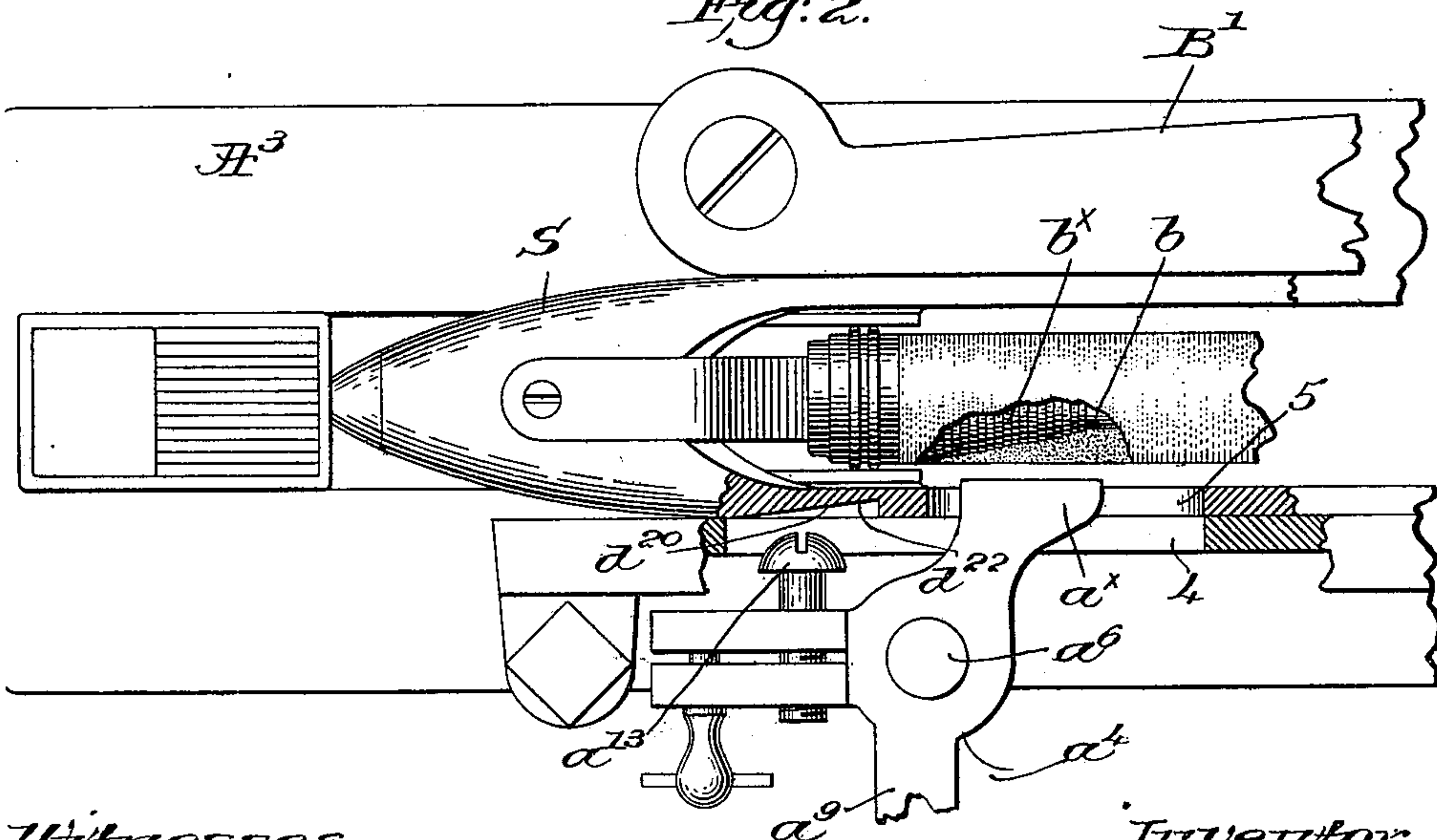


Fig: 2.



Witnesses,  
Edward H. Allen.  
Adolf C. Kaiser.

Inventor,  
Henry W. Cray,  
by Crosby Gregory.  
attys.



# UNITED STATES PATENT OFFICE.

HENRY W. CRAY, OF MAY'S LANDING, NEW JERSEY, ASSIGNOR TO THE DRAPER COMPANY, OF PORTLAND, MAINE, AND HOPEDALE, MASSACHUSETTS.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 645,913, dated March 20, 1900.

Application filed January 4, 1900. Serial No. 376. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY W. CRAY, a citizen of the United States, residing at May's Landing, Atlantic county, and State of New Jersey, have invented an Improvement in Automatic Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to that type of loom provided with filling-supplying mechanism wherein such mechanism is operated automatically when the filling in the shuttle is exhausted to a predetermined extent, the controlling means for the filling-supplying mechanism including an actuator operated by engagement with the shuttle-body and a feeler to feel the filling in the shuttle and govern the operation of the actuator, retaining the latter inoperative until the filling has been exhausted to the desired extent. Such a loom is shown in United States Patent No. 626,187, granted May 30, 1899, and when bobbins or filling-carriers having conical bases are used with such looms it sometimes happens that the shuttle will be boxed in such manner that the feeling movement of the feeler will be great enough to permit operation of the actuator before the filling has been exhausted to the desired extent and the filling change will occur too soon. Such premature action is due to the fact that a smaller portion of the conical base of the filling-carrier is opposed to the action of the feeler than is proper, so that the movement of the feeler is too great when the amount of filling remaining on the filling-carrier is considered. In my present invention I have devised simple and effective means for counteracting the effect of such undue movement of the filling-feeler, so that the operation of the actuator is retarded or prevented, and thereby the filling will not be changed prematurely.

Figure 1 is a top or plan view, centrally broken out, of a loom provided with automatic filling-supplying mechanism to illustrate the nature of my invention. Fig. 2 is a

greatly-enlarged plan view, partly in section, of a portion of the left-hand shuttle-box shown in Fig. 1, with a portion of the shuttle and illustrating clearly one embodiment of my invention; and Fig. 3 is a partial side elevation of the shuttle shown in Fig. 2.

The loom-frame A, breast-beam A<sup>40</sup>, the lay A<sup>3</sup>, the rotatable filling-feeder F, shown at one side of the loom and adapted to transfer a fresh supply of filling to the shuttle S when in the adjacent shuttle-box B, the stud f, transfer-fer f', mounted thereon, the shaft d', adapted to be rocked upon failure of the filling to actuate the transferrer, the feeling mechanism at the other side of the loom and including a feeler-carrier a<sup>4</sup>, pivoted at a on a bracket secured to the breast-beam, the vertical pivot a<sup>6</sup> on the carrier, on which is fulcrumed a laterally-swinging arm a<sup>9</sup>, having at one side of the fulcrum a rearwardly-extended portion a<sup>x</sup> to form the filling-feeler, adapted to pass through an aperture 4 in the front wall of the shuttle-box B' when the lay beats up, a stud or actuator a<sup>13</sup> on the opposite side of the fulcrum to pass through the shuttle-box wall and engage the shuttle-body at times, may be and are all substantially as shown and described in the United States Patent referred to, like parts being herein correspondingly lettered and figured.

I have herein shown the slot 4 in the shuttle-box-front wall as long enough to admit the feeler and actuator, (see Fig. 2,) the latter being shown as having a rounded head.

In accordance with my invention the slot 5 in the side wall of the shuttle-body admits the feeler a<sup>x</sup> when the lay beats up, the lay in Fig. 1 being shown back and in Fig. 2 as having nearly beaten up.

Near the slot 5 and between it and the adjacent end of the shuttle I form an elongated recess d<sup>20</sup> in the wall of the shuttle-body, having a beveled or inclined bottom d<sup>22</sup>, Figs. 2 and 3, which slopes inward from the outer end of the shuttle and substantially in parallelism with the slope of the conical base b<sup>x</sup> of the bobbin or filling-carrier b.

The filling is wound upon the filling-carrier



in the usual manner—first, upon the conical base, and after the desired number of layers are wound thereupon the traverse is increased and the bobbin is filled. At every other pick the feeler enters the shuttle and feels the filling, and so long as the proper amount remains the feeler will be moved before the actuator  $a^{13}$  engages the shuttle-body, so that the arm  $a^9$  will be swung to the left, Fig. 1, and a blade or dagger  $a^{15}$  thereon will be prevented from engaging a pivotally-mounted plate  $a^{23}$ , said plate when engaged operating to rock the shaft  $d'$  to effect filling change, as in the patent referred to. When the filling has been drawn off, however, until there are only a predetermined number of turns on the base  $b^x$  of the filling-carrier, the feeler  $a^x$  moves in so far that the actuator can engage the shuttle-body as the lay beats up, moving the arm  $a^9$  to the right, Fig. 1, and as the beat-up is completed the carrier  $a^4$  is swung on its pivot  $a$  and the dagger  $a^{15}$  engages and swings the plate  $a^{23}$  to operate the rock-shaft  $d'$ , and the filling will be changed. Such operation presupposes the proper positioning of the shuttle in the shuttle-box during feeling movement of the feeler; but sometimes the shuttle will move too far into the box, so that in using conical-base bobbins such a small diameter of the base will be brought opposite the feeler that the latter will move in far enough to permit the operation of the actuator, and the filling will be changed prematurely, resulting in waste filling.

Referring now to Fig. 2, the shuttle is shown as properly boxed, and the feeler will operate properly, the actuator being opposite the bottom  $d^{22}$  of the recess  $d^{20}$  in the shuttle-body and near its outer end. Suppose, however, that the shuttle was moved farther to the left, Fig. 2. Then a smaller diameter of the conical base  $b^x$  of the filling-carrier would be opposite the feeler, and though the filling had not been exhausted to the predetermined extent still the feeler would move into the shuttle so far that the actuator could act; but such movement of the shuttle to the left at the same time brings a deeper part of the recess  $d^{20}$  opposite the actuator, according to the extent which the shuttle is out of position, and when the lay beats up the bottom  $d^{22}$  of the recess will not be engaged by the actuator in time to operate the latter, as described; and the filling will not be changed. I thus provide means to counteract undue movement of the feeler when the shuttle is improperly positioned prior to the exhaustion of the filling to the desired extent and so prevent waste. It will be manifest that such improper positioning of the shuttle will not occur pick after pick, but occasionally and at irregular intervals, so that the means to counteract its effect must be always ready to act.

The parallelism of the recess-bottom  $d^{22}$  and the side of the conical base  $b^x$  makes the delay

in the engagement of the actuator  $a^{13}$  with the part  $d^{22}$  correspond to the increment of movement of the feeler, so that the former counteracts the latter.

The filling-carrier is shown in Figs. 1 and 2 as plentifully supplied with filling; but the operation of my invention will be clear from the foregoing description.

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

1. In a loom, a shuttle containing a supply of filling, filling-supplying mechanism, controlling means therefor, including an actuator operated by engagement with the shuttle-body, and a filling-feeler to govern the actuator and retain it inoperative until exhaustion of the filling to a predetermined extent, and means on the shuttle to prevent premature operation of the actuator due to the movement of the feeler when the shuttle is improperly positioned.

2. In a loom, a shuttle, a filling-carrier therein having a conical base and supporting a supply of filling, filling-supplying mechanism, controlling means therefor, including an actuator operated by engagement with the shuttle-body, and a filling-feeler to feel the filling adjacent the conical base of the filling-carrier and to govern the actuator and retain it inoperative until exhaustion of the filling to a predetermined extent, and means on the shuttle to prevent premature operation of the actuator upon undue movement of the feeler when the position of the shuttle presents an improper portion of the filling-carrier to the feeler.

3. In a loom, a shuttle, a filling-carrier therein having a conical base and supporting a supply of filling, filling-supplying mechanism, controlling means therefor, including an actuator operated by engagement with the shuttle-body, and a filling-feeler to feel the filling adjacent the conical base of the filling-carrier and to govern the actuator and retain it inoperative until exhaustion of the filling to a predetermined extent, and an inclined face on the shuttle-body parallel to the side of the conical base of the filling-carrier, to be engaged by the actuator and prevent its premature operation upon undue movement of the feeler when the position of the shuttle presents an improper portion of the filling-carrier to the feeler.

4. In a loom, a shuttle provided with a feeler-slot and an adjacent recess having a longitudinally-beveled bottom, a filling-carrier having a conical base, the bottom of the recess being parallel thereto, filling-supplying mechanism, and controlling means therefor, including an actuator operated by engagement with the shuttle-body, and a filling-feeler to feel the filling through the slot in the shuttle and to govern the actuator, retaining it inoperative until predetermined exhaustion of

the filling, presentation by the shuttle of an  
improper portion of the filling-carrier to the  
feeler to thereby cause premature operation  
of the actuator bringing such portion of the  
5 recess opposite the actuator as will retard the  
operation of the same.

In testimony whereof I have signed my

name to this specification in the presence of  
two subscribing witnesses.

HENRY W. CRAY.

Witnesses:

LEWIS E. JEFFRIES,  
JOHN E. ISZARD.