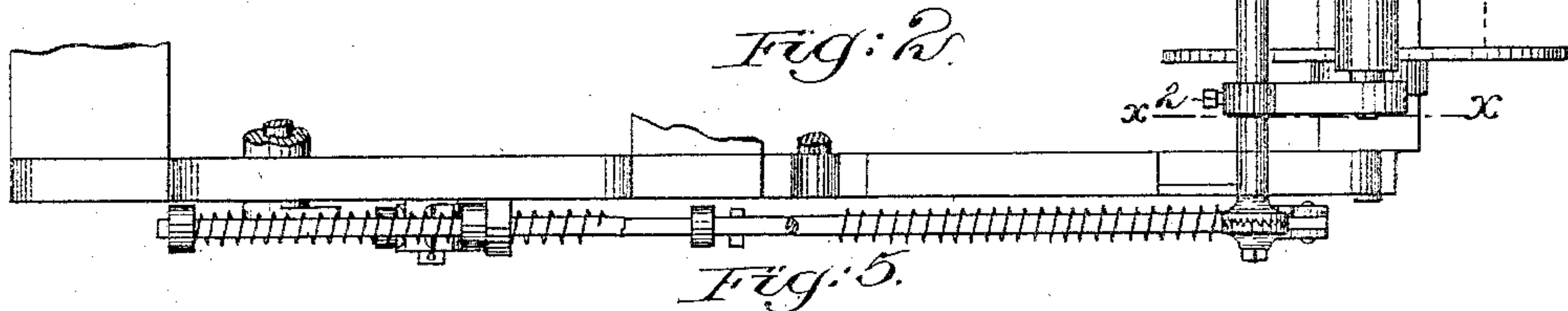
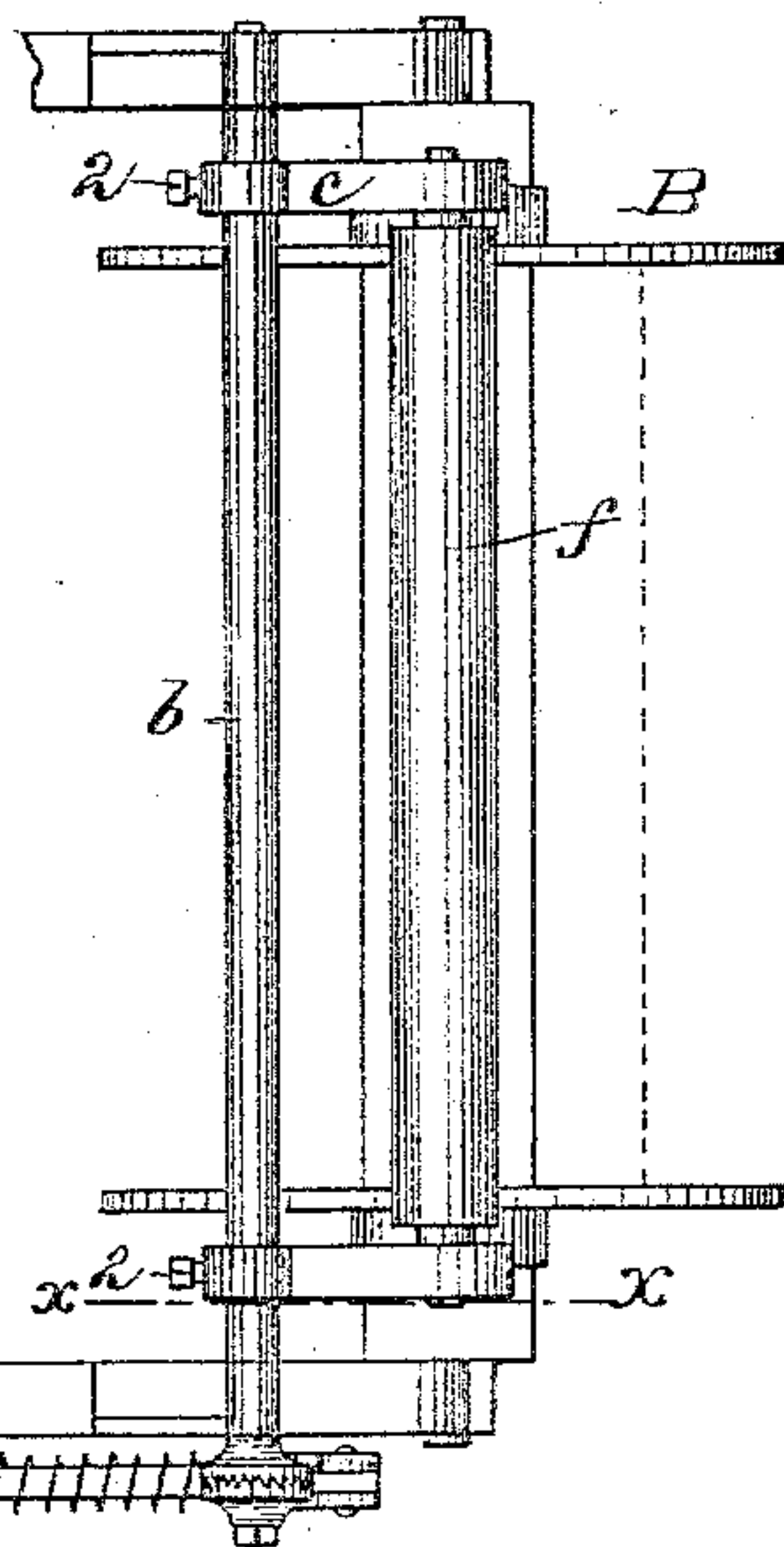
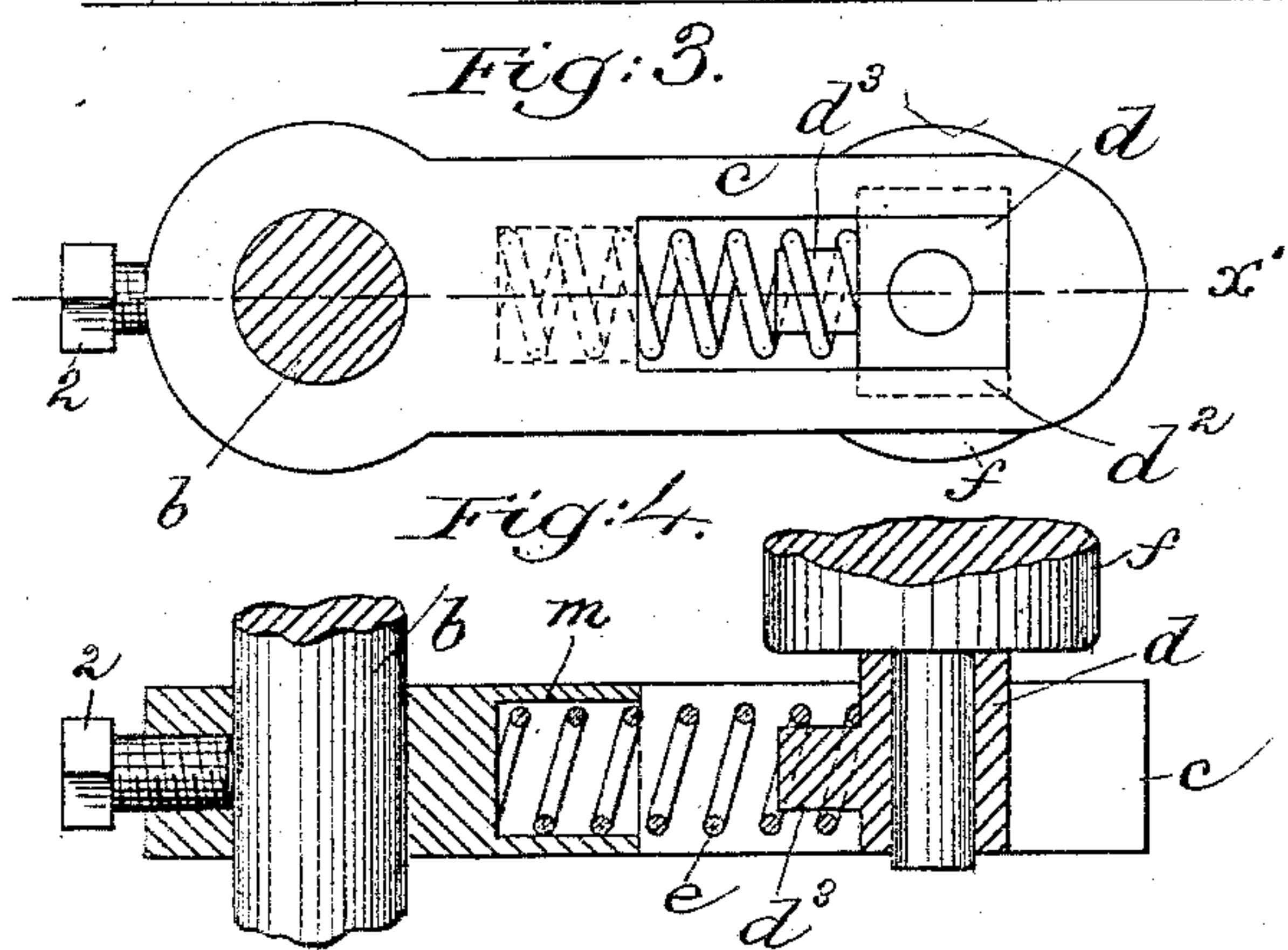
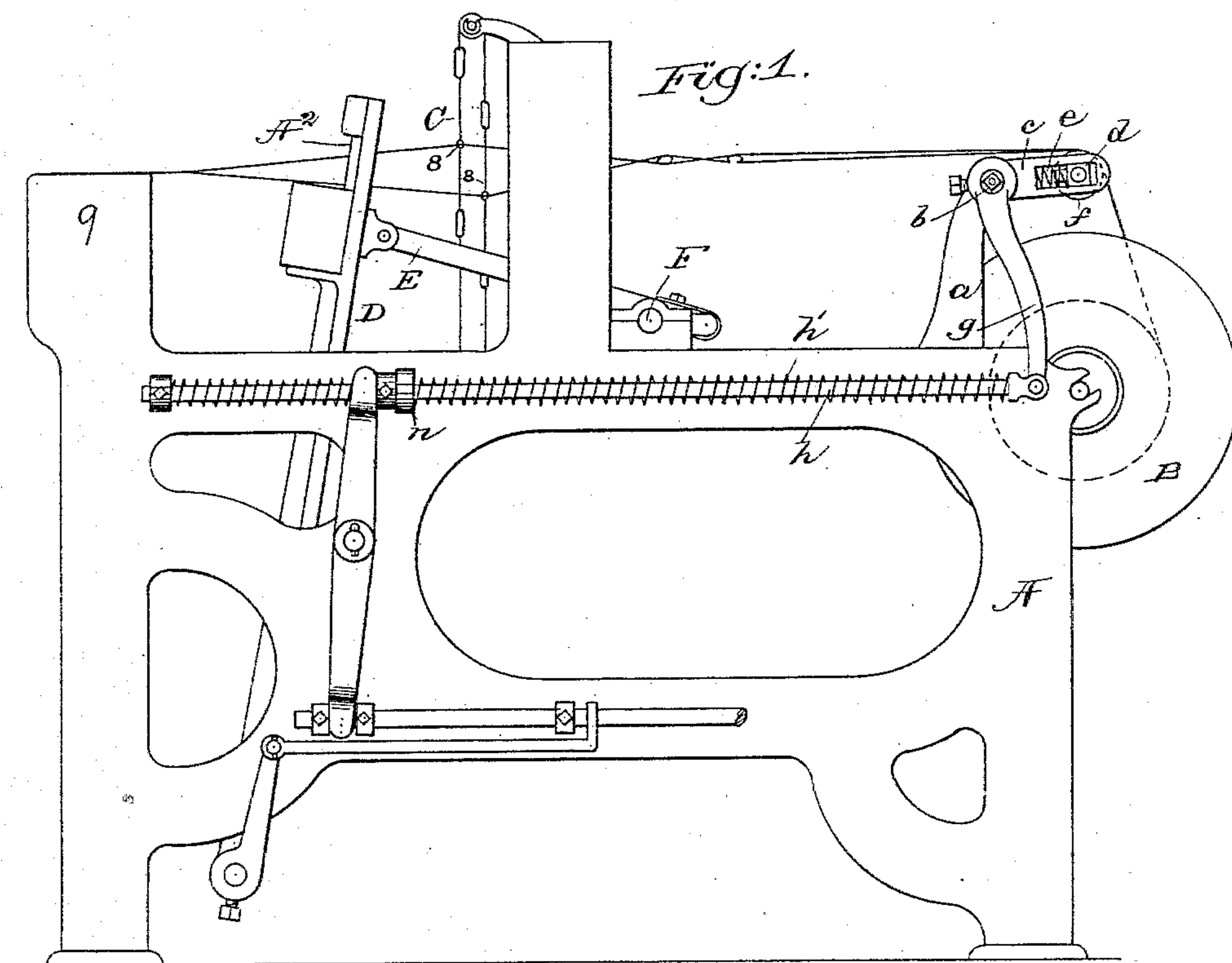


(No Model.)

D. DURKIN.  
WHIP ROLL FOR LOOMS.

No. 381,617.

Patented Apr. 24, 1888.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## WHIP-ROLL FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 381,617, dated April 24, 1888.

Application filed August 31, 1887. Serial No. 248,373. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL DURKIN, of Northbridge, county of Worcester, and State of Massachusetts, have invented an Improvement in Whip-Rolls for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In accordance with this invention the yarn to be woven into cloth as it passes from the yarn-beam to the heddles is carried over a bearing-roll, the journals of which are supported in yielding boxes so located that the said roll, under strain applied to the warp in weaving, is free to be moved substantially horizontally toward and from the breast-beam and fell of the cloth.

In looms for weaving cotton cloth, to which my invention is chiefly applicable, the take-up usually continues to operate even after the weft in the shuttle runs out and until the loom is stopped, and under such circumstances, to avoid the formation of thin stripes in the fabric, it is customary to turn the take-up roll or mechanism backward by hand for about the number of lost picks; but if the mechanism so operated by hand be turned back for a distance less than to compensate for the lost picks a thin stripe will appear in the cloth, and if turned back for a distance greater than necessary the cloth when the weaving is again commenced will show a thick stripe. These evils, apparent in most cotton cloth, are obviated by the employment of the yielding bearing-roll herein shown, which is free to move horizontally to a limited extent, under the action of a spring, toward the breast-beam or toward the fell of the cloth. So, also, if for any reason the shuttle should be caught in the shed as the lay is being moved forward, the extra strain exerted upon those warp-threads immediately above and below the shuttle will be sufficient to cause the movement of the bearing-roll toward the breast-beam or the fell of the cloth, thereby preventing the warp from being broken, the yielding bearing-roll thereafter taking back the said warp-threads or taking up the slack therein as soon as the shuttle is removed. As the lay beats the filling into the cloth, the blow of the reed on the filling pulls the bearing-roll somewhat forward against the

spring supporting it, such operation being repeated at every pick. The springs supporting the bearing-roll are of such length and stiffness as to permit the said roll, in case a shuttle is caught in the shed when the lay beats up, to move far enough toward the harnesses to prevent what is called a "smash" in the warps, or to prevent the warps being broken.

Figure 1, in side elevation, shows a sufficient portion of an ordinary loom to enable my invention to be understood. Fig. 2 is a partial top view of Fig. 1; Fig. 3, a partial section in the line *x*, Fig. 2, showing one of the arms for supporting the yielding roll; Fig. 4, a section in the line *x'*, Fig. 3, parts being in elevation. Fig. 5 is a modification showing the box for the bearing-roll as adapted to slide in a rigid or stationary guiding-arm.

The loom-frame A, the yarn-beam B, harnesses C, having heddles 8, lay D, links E, crank-shaft F, and reed A<sup>2</sup> are and may be of any usual shape and construction.

Upon the frame A are erected two uprights, *a*, which receive a shaft, *b*, having attached to it by suitable screws, 2, two arms or bearings, *c*, which, as herein shown, are slotted to receive the journal-boxes for the journals of the bearing-roll *f*, said boxes resting upon spiral springs *e*. Each of these boxes *d*, fitted to slide in a slot which guides it as the bearing-roll is moved toward the breast-beam by the strain of the warp upon it, has a foot, *d'*, which enters one of the said springs *e*, the said feet forming a connection to prevent the disengagement of the boxes from the springs, or their movement laterally out from their guiding-slots in the arms or guides *c*, the lower ends of each of the said springs being so held in the said arms as to prevent them from being moved out laterally from the slots of the arms or guides *c*, the said connection being herein shown by means of a socket in the arm or guide *c*, which leaves a wall, *m*, (see Fig. 4,) to surround the said spring.

The foot on the box and the socket referred to to receive the spring are effectual in preventing lateral movement of the said spring out from the slot in the arm *c*.

The shaft *b* may have attached to it at one end an arm, *g*, which may be connected to a link, *h*, extended through a guide, *n*, the link



having a spring,  $h'$ , upon it, which normally acts to keep the bearing-roll  $f$  elevated, as shown in Fig. 1, the said rod actuating any usual let-off mechanism.

5 The warp-yarns are all led from the yarn-beam  $B$  up over the yielding bearing-roll  $f$ , thence into and through the heddle-eyes of harnesses of usual construction, and thence the said warp yarns are passed, as usual, through  
10 the dents of the reed over the breast-beam  $9$ , and to a cloth-receiving or take-up roller. (Not shown.) The slots in the arm  $c$  form substantially horizontal guides for the boxes  $d$  in their movement under the strain of the  
15 warp on the roller  $f$ .

When the shed is being made for weaving, the warps are subjected to their maximum strain, and the roll  $f$  is somewhat depressed, and at such time, if necessity demands, the  
20 boxes holding the journals of the yielding bearing-roller  $f$  are free to be moved in a substantially horizontal direction in the slots in the arms  $c$ , and toward the breast-beam and fell of the cloth, thus giving up, as it were, a  
25 portion of the warp-threads, the closing of the shed, however, relieving the strain of the warp-threads upon the yielding bearing-roller  $f$  and permitting it to be moved by its springs away from the breast-beam or fell of the cloth,  
30 thus taking up the extra slack in the warp. The rod  $h$ , when the bearing-roll is made to vibrate by reason of the strain upon it, may, in practice, actuate a let-off, as in United States Patent No. 289,420.

35 The boxes  $d$  will preferably have a flanged edge at  $d^2$ , (see dotted lines, Fig. 3,) the flanges preventing the lateral movement of the boxes outwardly from the arms  $c$ .

In Fig. 1 the boxes  $d$  are shown as depressed  
40 somewhat into the slots in the guide-arms  $c$ , as they will be when the strain of the warp on the yielding bearing-roll is about at the minimum, as when the shed is open and loom working properly.

45 Prior to my invention I am aware that a roller over which warp yarns are extended has been supported upon a spring.

It is absolutely essential to the practical operation of the mechanism herein described that  
50 the warp-threads be extended between the usual warp-beam and heddles over a roller which is

free to rotate as strain is put upon the warp, which tends to take it from the usual warp-beam, for were a non-rotating bar employed instead of the roll the friction and strain upon  
55 the warp-threads would be so great as to be destructive to the operation of the parts for the production of the results accomplished by my invention.

In Fig. 5 I have shown a modification where-  
60 in the boxes are free to slide in slotted guides formed in the uprights  $a$ .

I claim—

1. The breast-beam, and warp-beam, and bearing-roll  $f$ , and boxes to support its jour-  
65 nals or ends, and guides for the boxes, combined with springs co-operating with the said boxes to permit the bearing-roll to be moved bodily in a substantially horizontal plane to-  
70 ward and from the breast-beam and the fell of the cloth, and with the rod or shaft  $b$ , arm  $g$ , and means to act upon the said arm to vibrate the said rod or shaft and bearing-roll, to operate all substantially as and for the purpose set  
75 forth.

2. The bearing-roll  $f$ , the boxes  $d$ , having feet  $d^3$ , and the springs  $e$ , to engage the said feet, combined with the socketed and slotted arms or guides in which the said boxes are free  
80 to slide, the said boxes receiving in them the journals of the bearing-roll  $f$ , the springs and feet preventing the escape of the boxes from the slots of the arms or guides, substantially as described.

3. The bearing-roll  $f$ , the boxes  $d$ , having feet  $d^3$ , and the springs  $e$ , to engage the said feet, combined with the socketed and slotted arms or guides in which the said boxes are free  
85 to slide, and with the shaft  $b$ , carrying the said arms or guides, the said boxes receiving in them the journals of the bearing-roll  $f$ , the springs and feet preventing the escape of the boxes from the slots of the arms or guides,  
90 substantially as described.

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

DANIEL DURKIN.

Witnesses:

E. D. BANCROFT,  
C. E. LONGFELLOW.