

**No. 666,385.**

**Patented Jan. 22, 1901.**

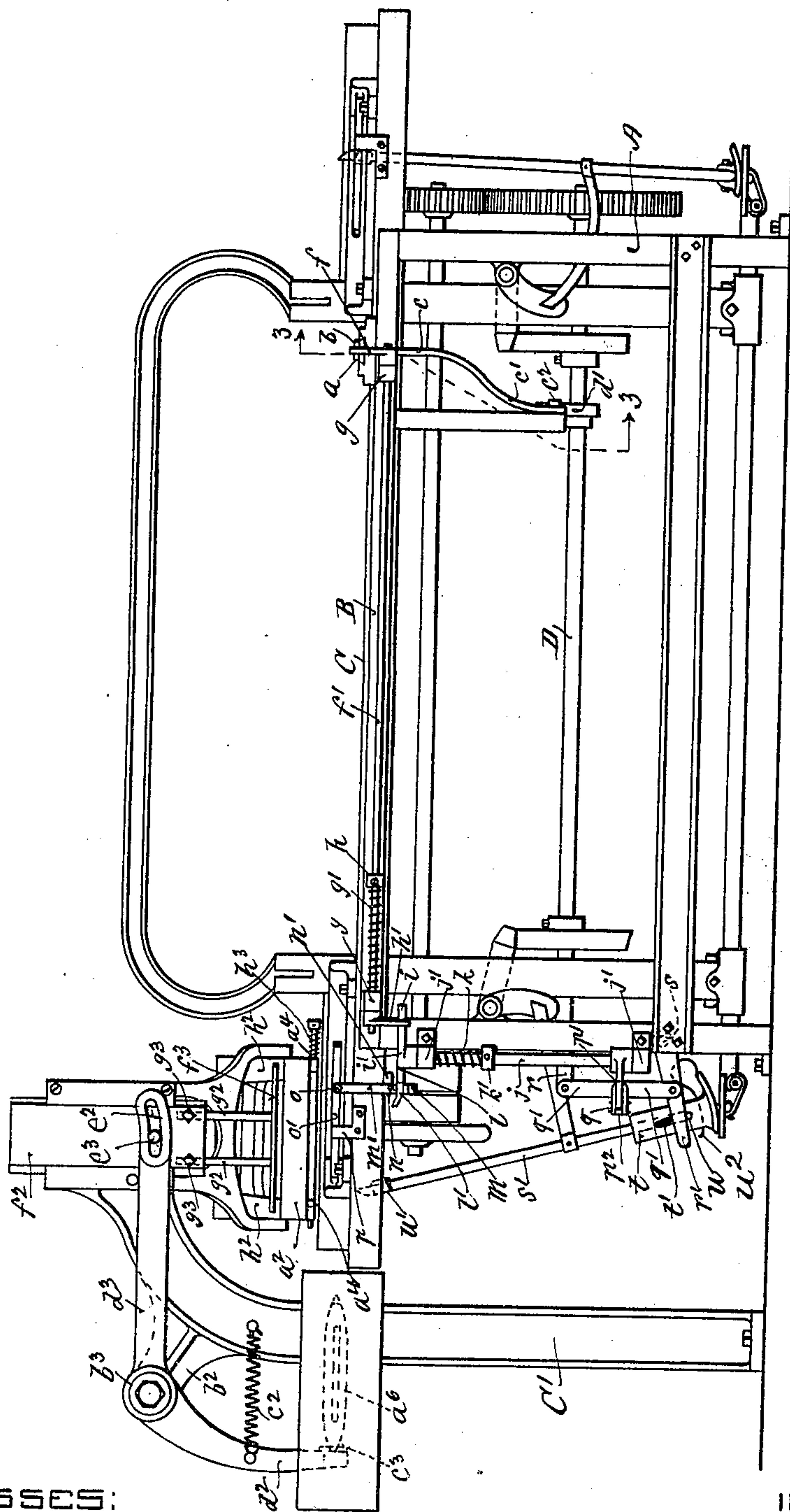
**J. KEITH.**

**WEFT REPLENISHING MECHANISM FOR LOOMS.**

(Application filed Feb. 16, 1899.)

(No Model.)

**2 Sheets—Sheet 1.**



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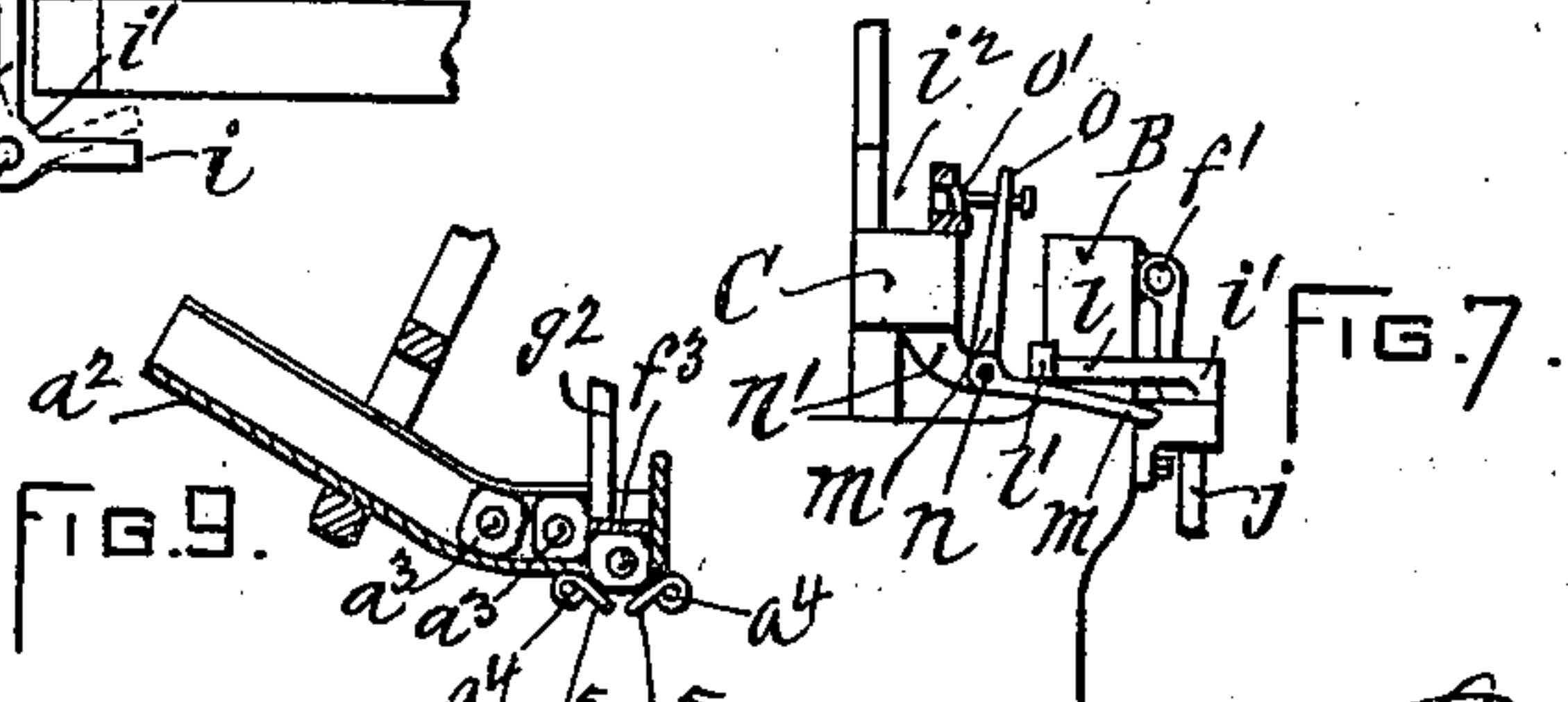
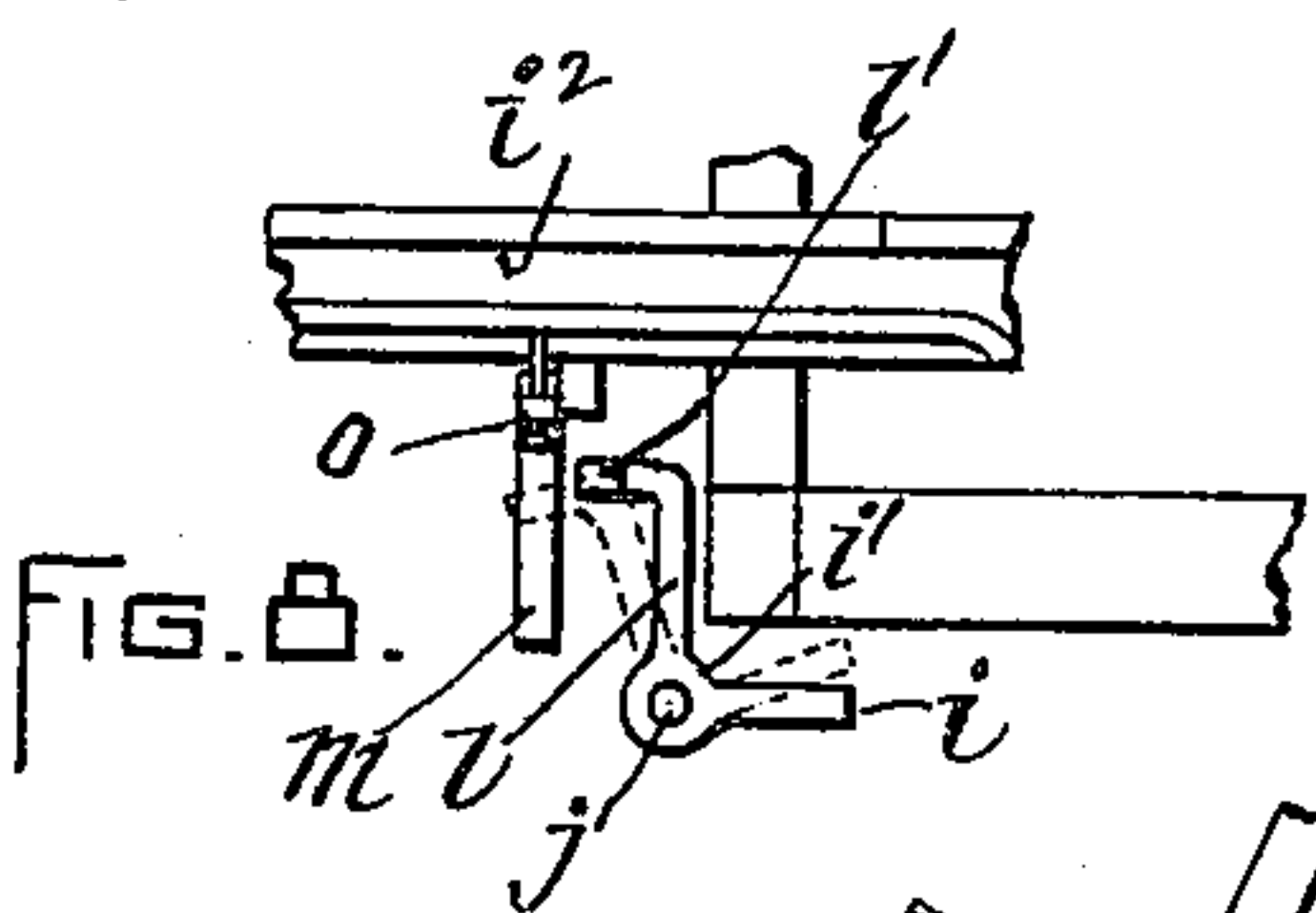
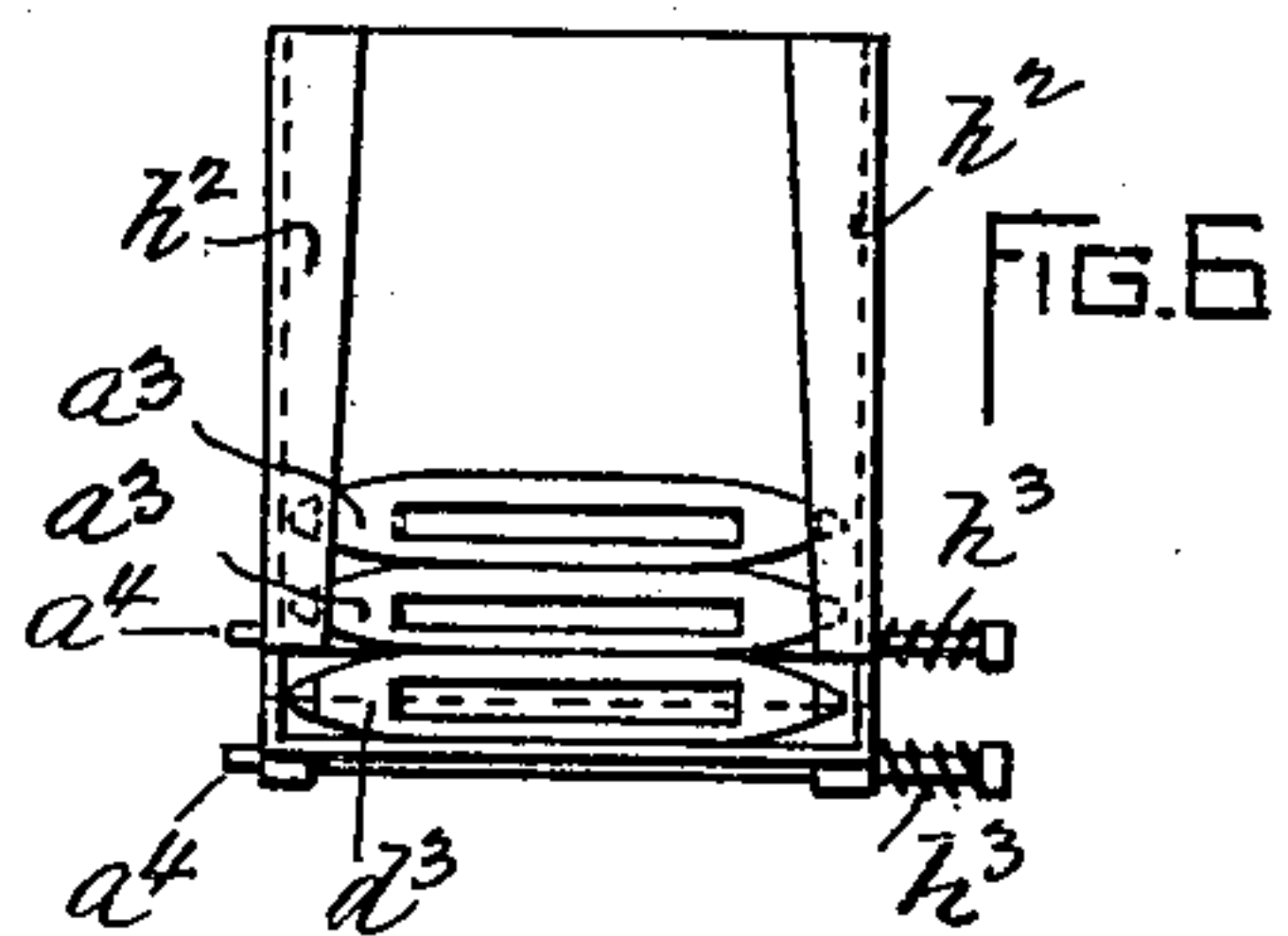
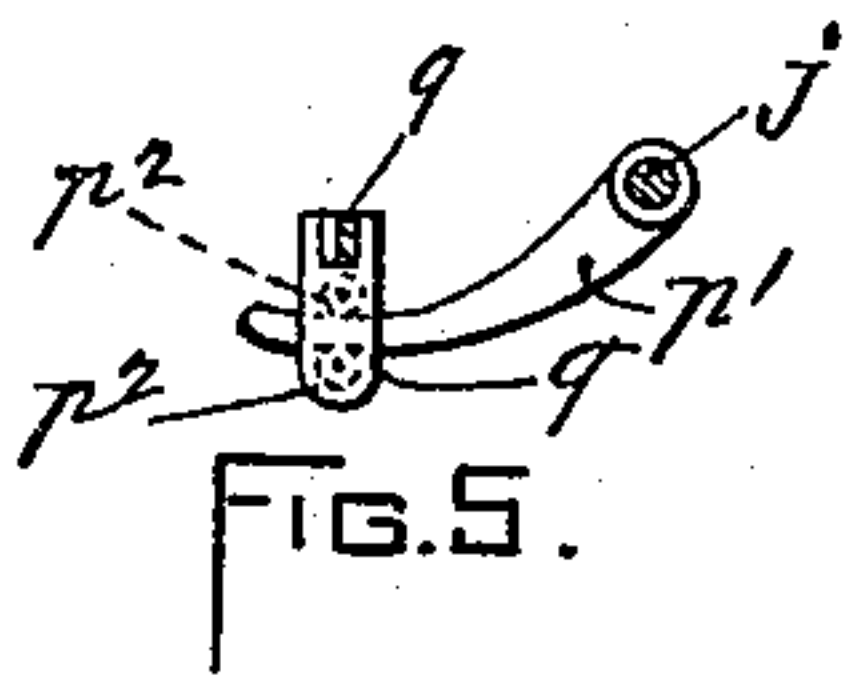
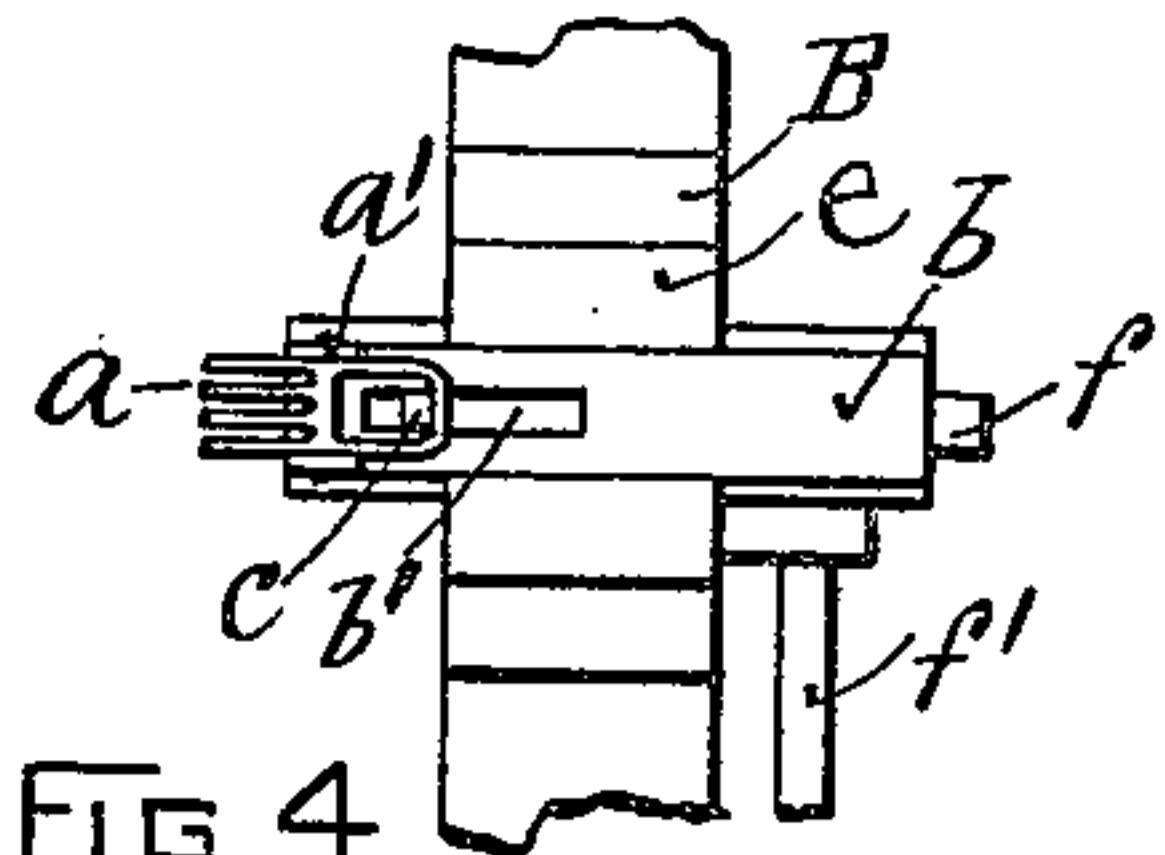
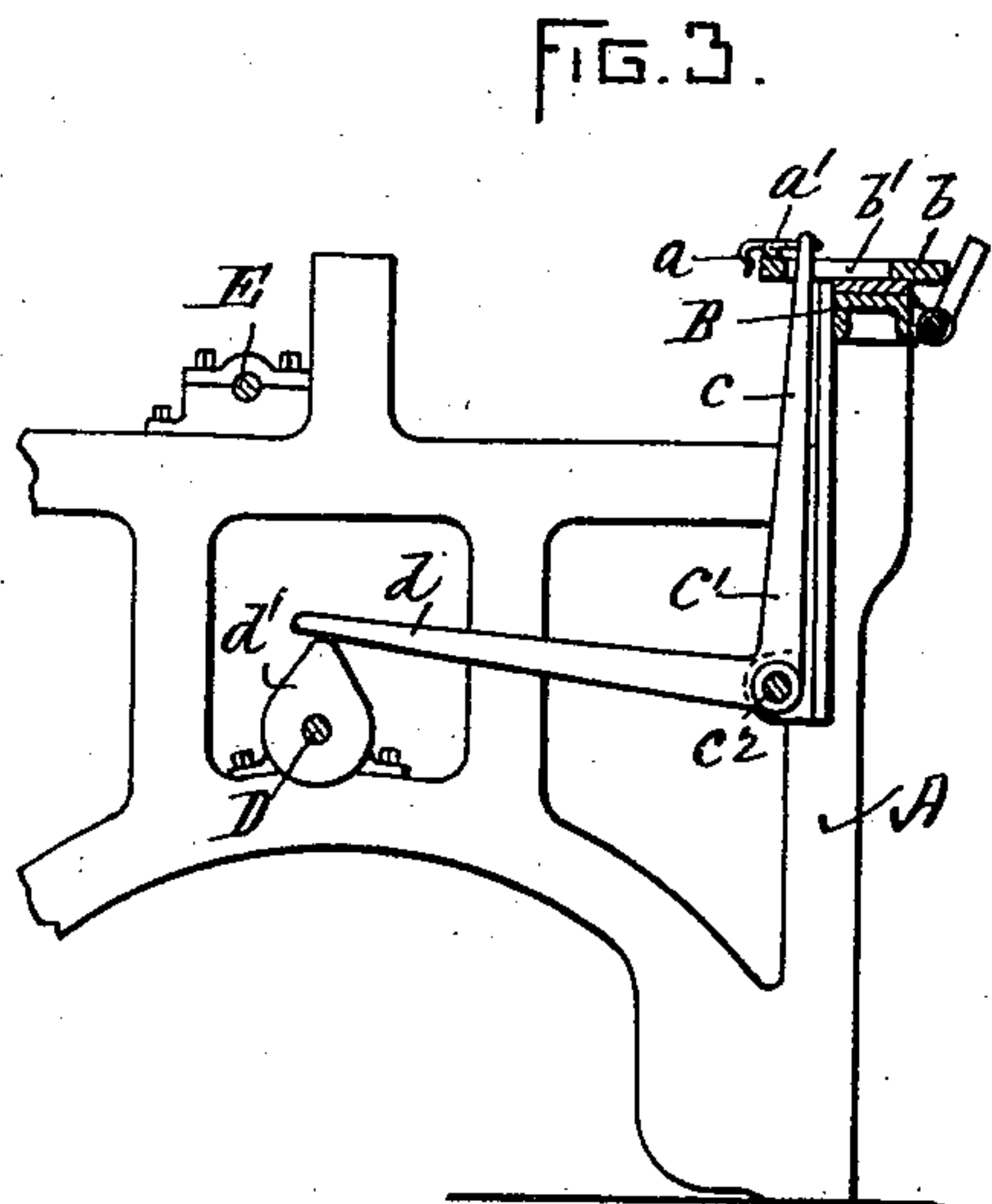
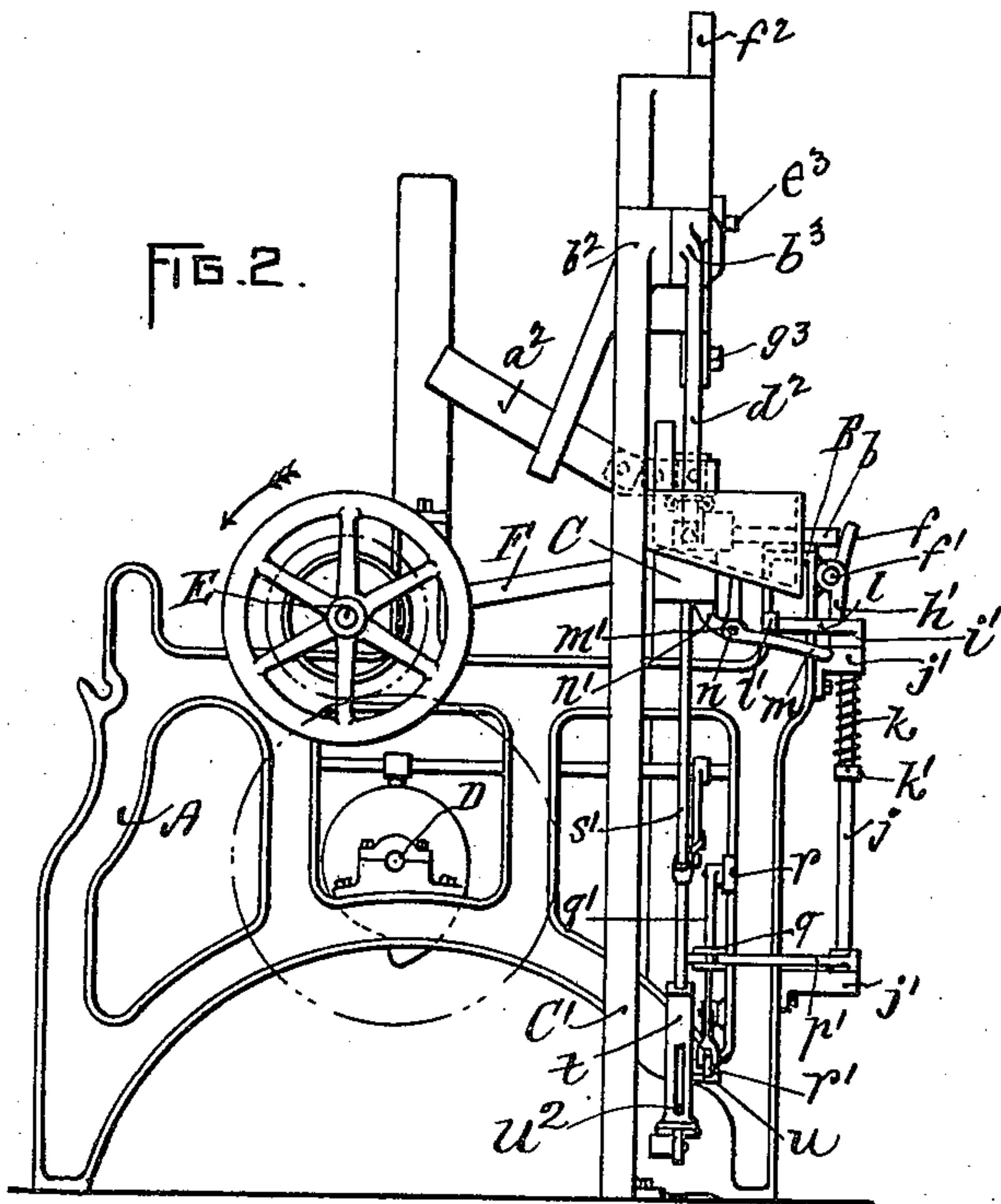
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WEFT REPLENISHING MECHANISM FOR LOOMS.

(Application filed Feb. 16, 1899.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## WEFT-REPLENISHING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 666,385, dated January 22, 1901.

Application filed February 16, 1899. Serial No. 705,698. (No model.)

*To all whom it may concern:*

Be it known that I, JEREMIAH KEITH, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Improvement in Weft-Replenishing Mechanism for Looms, of which the following is a specification.

The object of my invention is to provide efficient means for discharging the shuttle from the shuttle-race upon the breaking or failure of the filling-thread and the insertion of a fresh shuttle in its stead; and my invention consists in employing the momentum of the discharged shuttle for forcing the fresh shuttle into the shuttle-box.

It also consists in means for removing the picker out of the path of the shuttle upon the breaking or failure of the filling-thread and in special details of construction, as hereinafter set forth.

In the accompanying drawings, Figure 1 represents a front elevation of a loom provided with my improvement. Fig. 2 represents an end view of the same. Fig. 3 represents an enlarged detail section taken in the line 3 3 of Fig. 1. Fig. 4 represents an enlarged detail top view showing the connection of the weft-fork with the breast-beam. Fig. 5 represents a top view of the swinging arm which serves to cause the depression of the picker-staff and picker. Fig. 6 represents a top view of the bed of the hopper. Fig. 7 represents a detail view showing the mechanism for opening the shuttle-binder. Fig. 8 represents a top view of the horizontal lever by means of which the shuttle-binder is opened, and Fig. 9 represents an axial section of the bed of the hopper.

In the drawings, A represents the frame of the loom; B, the breast-beam; C, the lay; D, the cam-shaft; E, the crank-shaft, and F the pitman, which connects the crank with the lay. The weft-fork *a* is pivoted at the point *a'* to the slide *b*, which is provided with a slot *b'*, adapted to receive the upright arm *c* of the bell-crank lever *c'*, the said lever being pivoted at the stud *c<sup>2</sup>* and having its arm *d* in engagement with the cam *d'* upon the shaft D. The slide *b* is held in the block *e*, secured to the upper side of the breast-beam B, and at its outer end *e'* engages with the arm *f*, secured to the end of rock-shaft *f'*, which is

supported at the front side of the breast-beam B in the bearings *g g*, and upon the rock-shaft *f'* is placed the torsion-spring *g'*, secured at one end to the bearing *g* and at the other to the adjustable collar *h*, the torsion of the said spring serving to carry the arm *f* inwardly, and to the opposite end of the rock-shaft *f'* is secured the arm *h'*, which engages with the arm *i* of the lever *i'*, the said lever being secured to the upper end of the upright rock-shaft *j*; which is held in the bearing-brackets *j' j'*, attached to the loom-frame, and upon the rock-shaft *j* is placed the torsion-spring *k*, which is secured at one end to the bearing-bracket *j'* and at the other end to the adjustable collar *k'*, the said spring serving to carry the arm *l* of the lever *i'* inward, the said arm being carried outward against the resilience of the spring by means of the outward movement of the slide *b*. The arm *l* is provided at its end with the turned portion *l'*, which upon the outward movement of the arm *l* will be brought in the proper line for engagement with the upper side of the downwardly-turned curved arm *m* of the bell-crank lever *m'*, which is pivoted at the point *n* to the bracket *n'*, attached to the lay-beam, and connected at its upper end with the shuttle-binder *o'*, located at the forward side of the shuttle-box, so that upon the engagement of the arm *m* of the bell-crank lever *m'* with the arm *l'*, as indicated by dotted lines in Fig. 8, the shuttle-binder will be drawn outward against the resilience of the shuttle-binder spring *p* to allow the ready entrance of a fresh shuttle into the shuttle-box upon the discharge of the shuttle therefrom, the arm *l'* of the lever *i'* passing over the arm *m* of the bell-crank lever *m'* and opening the shuttle-binder at the forward beat of the lay. To the lower end of the upright rock-shaft *j* is secured the curved arm *p'*, (shown in Fig. 5,) which passes between the anti-friction-rollers *p<sup>2</sup>* of the joint-piece *q* of the toggle-levers *q' q'*, one of which levers is jointed to the bracket *r*, attached to the loom-frame, and the other to the arm *r'*, which is pivoted to the frame at the point *s*. The picker-staff *s'* is held to slide in the socket-piece *t*, provided at one side with the slot *t'*, the said picker-staff being provided with the stud *u*, which projects through the



slot  $l'$  and engages with the under side of the arm  $r'$ , and by means of the downward movement of the arm  $r'$  the picker  $u'$ , which serves to throw the shuttle, may be drawn downward out of the shuttle-box to allow the escape of the shuttle by the unobstructed continuation of its flight through the end of the shuttle-box, the upward movement of the picker-staff being effected by means of the bent spring  $u^2$ , upon which the lower end of the picker-staff rests.

The inclined hopper  $a^2$ , in which the shuttles  $a^3$   $a^3$   $a^3$  are held preparatory to being fed to the shuttle-box, is supported by the standard  $C'$ , which may be either secured to the floor at the end of the loom, as shown in Fig. 1, or attached to the frame  $A$ . To the projecting arm  $b^2$  of the standard  $C'$  is pivoted the bell-crank lever  $b^3$ , which is actuated in one direction by means of the spring  $c^2$  and in the opposite direction by means of the engagement of the flying shuttle with the buffer  $c^3$  at the lower end of the arm  $d^2$ , and the outer end of the arm  $d^3$  is provided with the slot  $e^2$ , which incloses the stud  $e^3$ , projecting from the face of the slide  $f^2$ . The shuttle-forcer  $f^3$  is attached to the slide  $f^2$  by means of the rods  $g^2$   $g^2$ , which are held in proper adjustment by means of the set-screws  $g^3$ .

The opposite ends of the hopper  $a^2$  are provided with the side guides  $h^2$   $h^2$ , which serve to retain the deposited shuttles in position endwise. At the lower end of the hopper  $a^2$  are arranged the rock-shafts  $a^4$   $a^4$ , provided with the inwardly-directed wings  $a^5$   $a^5$ , which serve to support the lower shuttle  $a^3$  of the series until the said shuttle is forced into the shuttle-box  $i^2$  by the downward action of the forcer  $f^3$ . The wings  $a^5$   $a^5$  are caused to support the shuttle by means of the torsion-springs  $h^3$   $h^3$ , arranged upon the outward projection of the shafts  $a^4$   $a^4$ , and the shuttle is forced downward between the wings  $a^5$   $a^5$  upon the downward movement of the shuttle-forcer  $f^3$ , caused by the impact of the flying shuttle  $a^6$  upon the buffer  $c^3$  of the lever  $b^3$ .

I claim as my invention—

1. In a loom, the combination of the lay, the weft-fork, and means for actuating the shuttle through the shed, with means connected with the weft-fork for withdrawing the shut-

tle-actuating means, and allowing the shuttle to pass directly through the shuttle-box without deflection.

2. In a loom, the combination of the lay and the picker-staff with the weft-fork and means arranged between the picker-staff and weft-fork for moving the picker-staff out of the path of the flying shuttle, substantially as described.

3. In a loom, the combination of the lay, and the hopper for holding the shuttles, of means for causing the impact of the discharged flying shuttle, to force a shuttle from the hopper into the shuttle-box, substantially as described.

4. In a loom, the combination of the lay, the shuttle-box, the shuttle-binder, and means for actuating the shuttle through the shed, with means connected with the weft-fork, for withdrawing the shuttle-actuating means to allow the discharge of the shuttle from the shuttle-box and for opening the shuttle-binder at the forward movement of the lay, substantially as described.

5. In a loom, the combination of the lay, a shuttle-box thereon, and the shuttle-binder, a hopper, and devices operated by the flying shuttle for transferring a shuttle from the hopper into the said shuttle-box, at the forward movement of the lay, with devices to open the shuttle-binder prior to the passage of the flying shuttle through the shuttle-box, and to close the binder upon the subsequently-inserted shuttle, substantially as described.

6. In a loom, the combination of the lay, the picker-staff, and means for operating the same, with a hopper held independently of the lay, a forcer and the shuttle actuated by the picker-staff to cause the transfer of another shuttle from the hopper to the shuttle-box, substantially as described.

7. A shuttle-feeding apparatus, consisting of a hopper, a forcer, and an actuating-lever provided with a bunter adapted to receive the impact of the flying shuttle, substantially as described.

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Witnesses:

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