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PATENTED FEB. 5, 1907.

J. V. CUNNIFF.

FILLING DETECTING MECHANISM FOR LOOMS.

APPLICATION FILED NOV. 2, 1906.

Fig. 1.

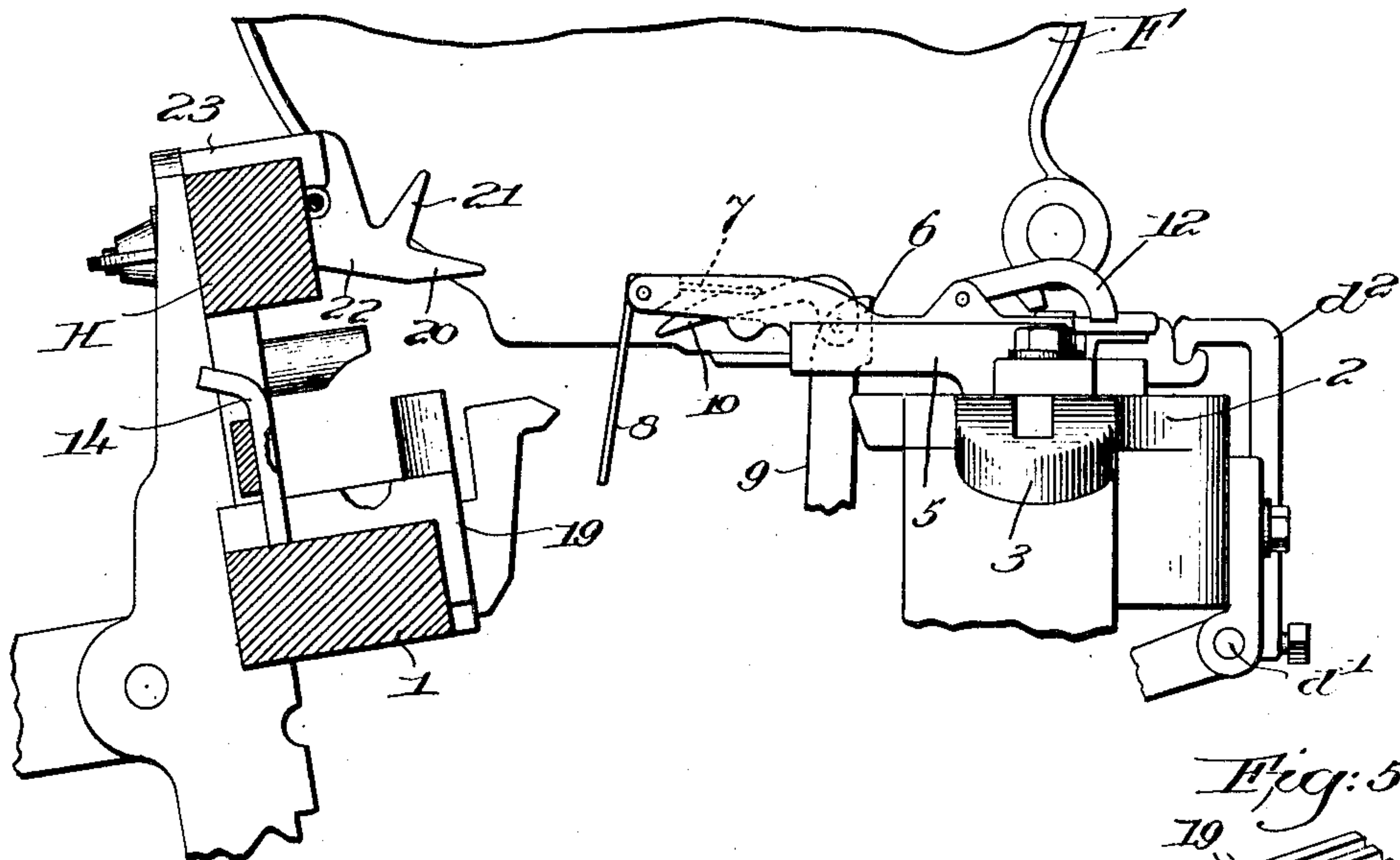


Fig. 2.

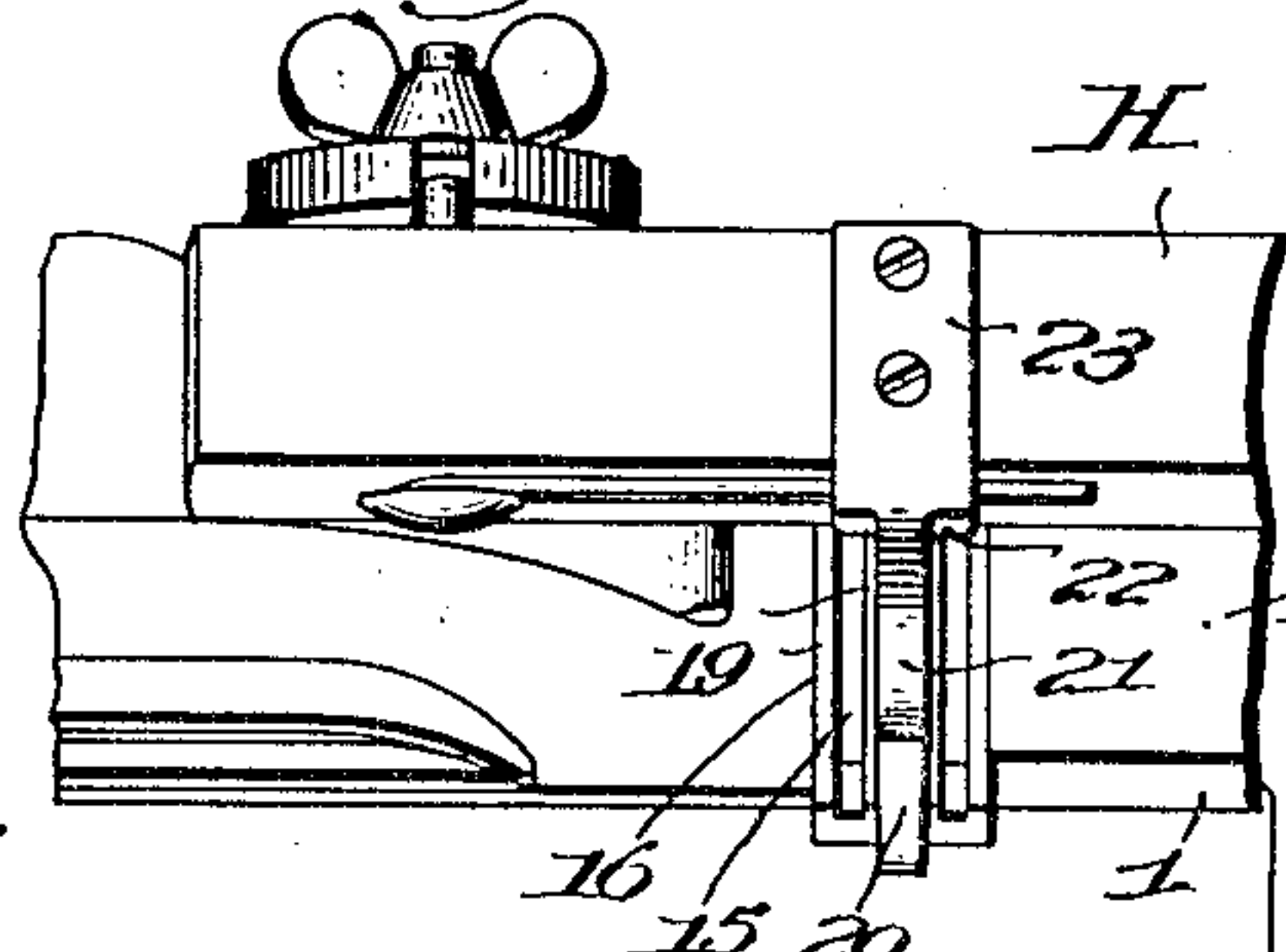


Fig. 3.

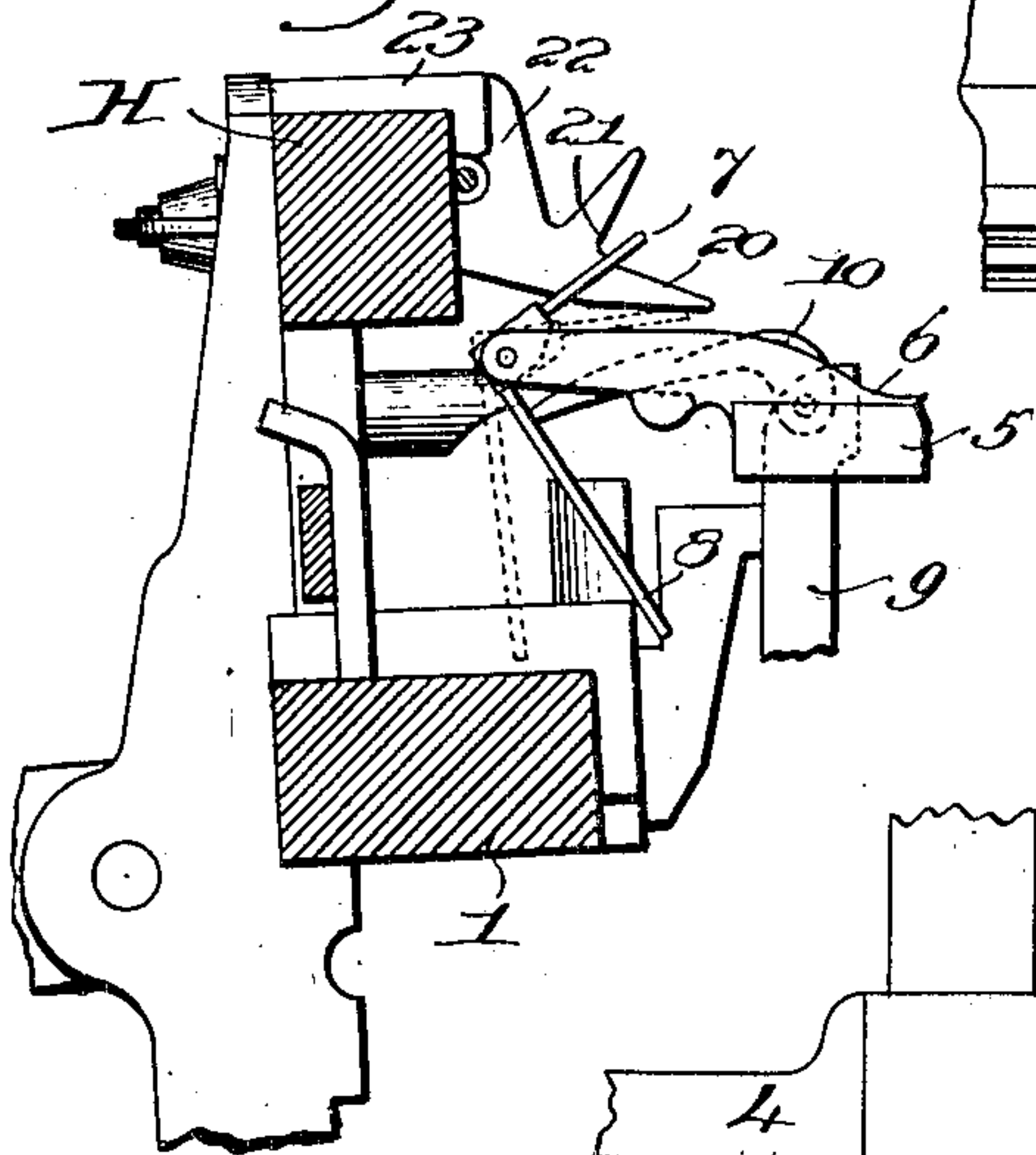


Fig. 5.

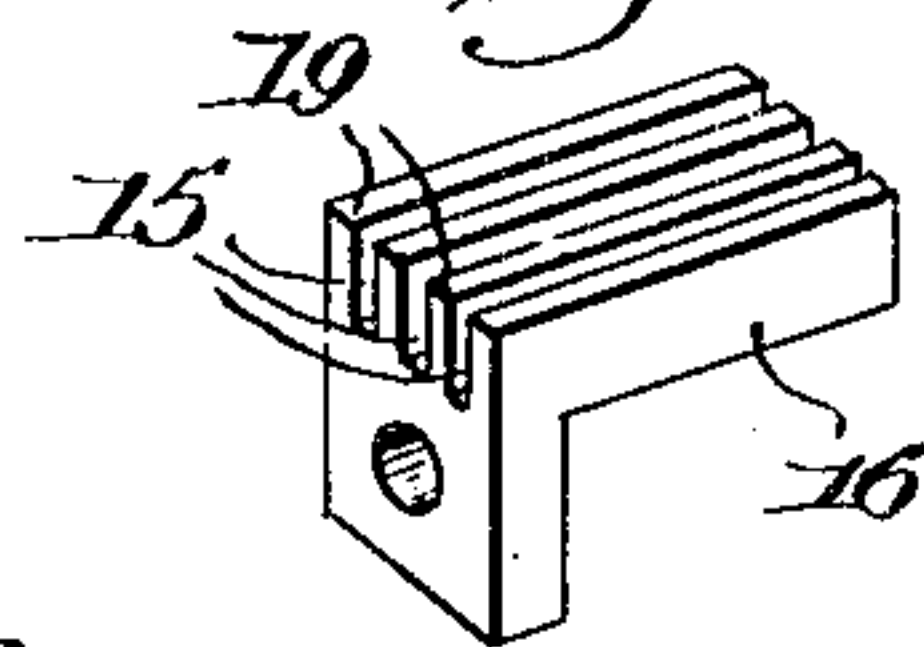
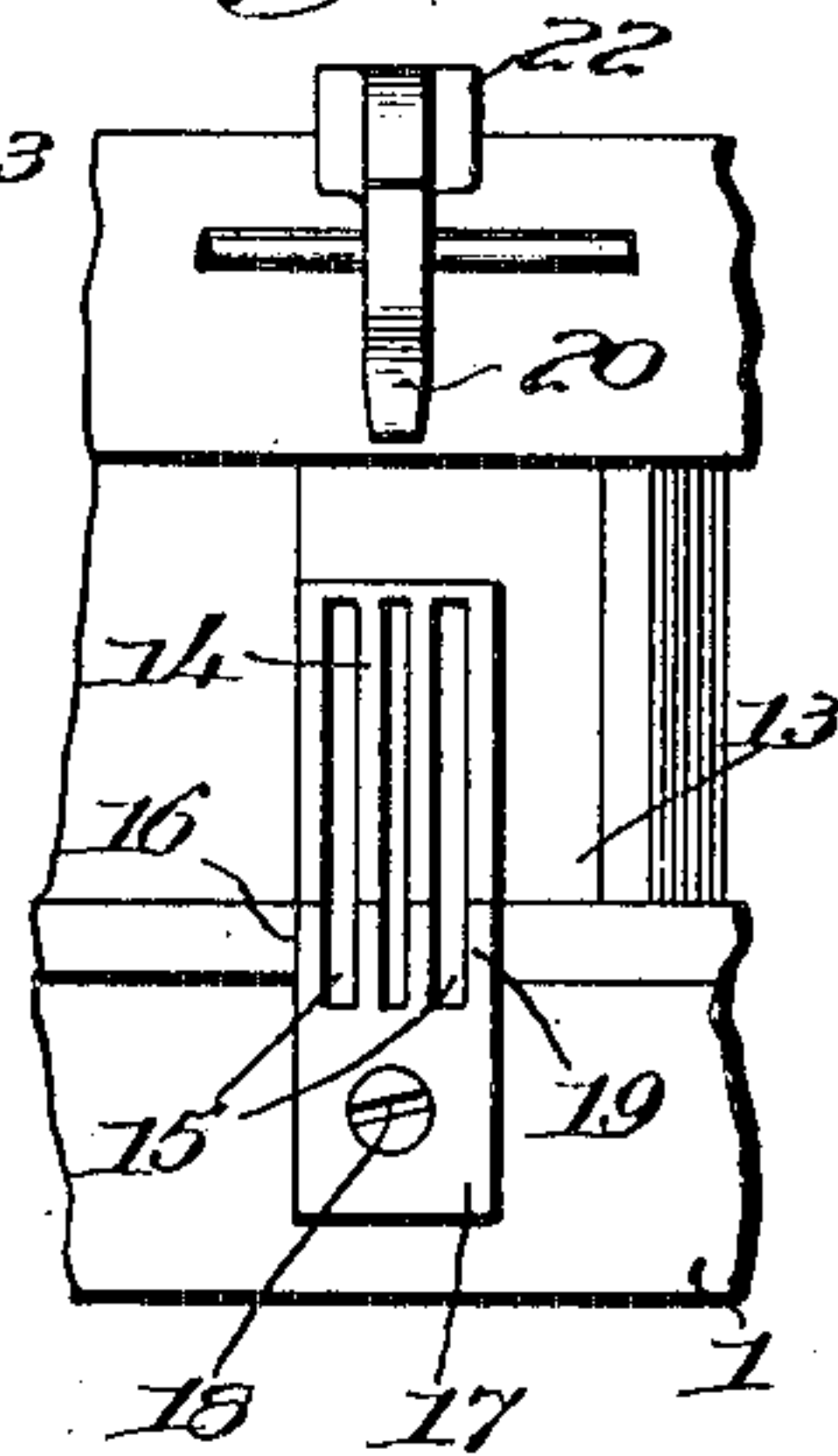


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FILLING-DETECTING MECHANISM FOR LOOMS.

No. 843,196.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed November 2, 1906. Serial No. 341,686.

To all whom it may concern:

Be it known that I, JOHN V. CUNNIFF, a citizen of the United States, and a resident of Fall River, county of Bristol, State of Massachusetts, have invented an Improvement in Filling-Detecting Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates more particularly to the filling-detecting mechanism of a loom for weaving; and it has for its object the production of novel means for effecting automatically a change in the operation of the loom upon the occurrence of a faulty action of the filling-detecting mechanism.

In the ordinary and usually-employed filling-detecting mechanism a filling-detector, such as a filling-fork, is arranged to be engaged and tilted by intact filling on each detecting-pick, failure of the filling, either by breakage or running out thereof, causing no tilting action of the fork, and through well-known mechanism a change in the operation of the loom is immediately effected. Such change may be a replenishment of filling automatically, loom stoppage, or loom stoppage after a predetermined number of successive operations of the replenishing instrumentality, as will be familiar to those skilled in the art.

It will be manifest that tilting of the fork indicates presence of filling under normal conditions; but should the fork-tines become bent or displaced to strike upon some part on or moving with the lay or should the latter change its position, so as to strike the fork, the latter will be tilted whether or not the filling is present. In such case the fork fails to detect filling absence, and the faulty action may continue long enough to make bad cloth, owing to the fact that the loom continues to operate while no filling is laid.

My present invention provides novel means for changing the operation of the loom when such false or improper tilting of the fork occurs, and the various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a left-hand side elevation and

partial transverse section of a sufficient portion of a loom with one embodiment of my invention applied thereto. Fig. 2 is a top plan view of a portion of the mechanism illustrated in Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the fork as tilted improperly and with the novel means embodied in my invention just about to operate. Fig. 4 is a detail in front elevation of a portion of the lay, showing the usual grid and the additional parts whereby improper fork movement effects a change in the operation of the loom. Fig. 5 is a perspective detail to be referred to hereinafter.

Referring to the drawings, the lay 1, breast-beam 2, having at one end a notched holding-plate 3 for the shipper 4, Fig. 2, by or through which power is thrown onto or off the loom, the guide or stand 5, rigidly secured to the breast-beam, the slide 6, longitudinally movable in said stand, the filling detector or fork pivotally mounted on the slide and having a tail 7 and tines 8 to intermittently engage and be tilted by intact filling, and the vibrating actuator or weft-hammer 9, having a hook 10 to engage the fork-tail when the fork detects absence of filling, may be and are all of well-known construction and operate in usual manner. Upon coöperation of the fork-tail 7 and the hook 10 the actuator 9 moves the slide forward, and thereby effects a change in the operation of the loom. Such change in the operation of the loom may be stoppage of the loom, effected by release of the shipper 4 through operative movement of the knock-off arm or lever 11, Fig. 2, or it may be a replenishment of the running filling, or filling replenishment and subsequent stoppage of the loom may be effected.

Herein I have shown my invention applied to an automatic filling-replenishing loom of the Northrop type—such, for instance, as forms the subject-matter of United States Patent No. 529,940, granted to Northrop November 27, 1894.

Referring to Fig. 1, the inner end of the filling feeder or hopper is partly shown at F, and the controlling or operating rock-shaft *d'* to cause the operation of the replenishing mechanism is substantially as in said patent, the rock-shaft having fast upon it an up-

turned arm d^2 to be swung outward by the slide 6 when the latter is moved forward upon detection of filling absence by the fork.

For purposes of illustration I have shown the fork-slide as provided with a latch 12 to engage and operate the knock-off lever 11 when the replenishing mechanism has been operated a predetermined number of times in succession, to thereby effect loom stoppage, substantially as in United States Patent No. 529,943, granted to Northrop November 27, 1894.

So far the mechanism herein illustrated is of well-known construction.

The raceway 13 of the lay is usually provided with a transverse recess opposite the usual grid 14, the tines of the filling-fork sweeping through the recess as the lay beats up to engage the filling when present on the detecting-pick.

If for any reason the fork is tilted by means other than the filling, the function of the fork is not fulfilled, and faulty cloth will be produced so long as the loom continues to run and filling is not laid.

Should the fork-tines become bent, so as to strike any part of the lay, or should the latter shift from its proper path of movement and strike the tines, the fork will be tilted independently of the filling and will cease to properly perform its duty.

In order to prevent the continued normal operation of the loom when the fork is tilted improperly, I have herein provided means to effect automatically a change in the operation of the loom whenever the fork is tilted independently of the filling, and I will now describe one practical embodiment of my invention and the mode of operation thereof.

The lay is provided with a series of channels crossing the raceway, and I conveniently form such channels, as 15, in a metal plate 16, adapted to fit into the usual recess in the lay, a depending ear 17 resting against the front of the lay and being secured thereto by a suitable fastening 18.

The channels 15 are located opposite the tines of the filling-fork and the openings in the grid 14, so that under normal conditions the fork-tines sweep through the channels on the beat up of the lay, the divisions 19, separating said channels, helping to support the filling in front of the grid on the detecting-pick.

If the lay is not moving in its proper path or one or more of the tines of the fork become bent, there will be an engagement between the tines and the front ends of the divisions 19 when the lay has moved forward far enough and the fork will be tilted, elevating the fork-tail 7, as in Fig. 3. This lifting of the tail is effected in time to permit a hook-like finger or prong 20, fast on the lay, to enter the tail,

and as the lay continues to move forward the tail reaches the shoulder 21, and thereupon the lay acts through the fork to pull the slide 6 forward. Such slide movement then effects the actuation of the mechanism, which causes a change in the operation of the loom, just as would have been the case if the fork had detected filling absence.

The hook-like member 20 and elongated shoulder 21 form separated rigid branches of a bracket 22, having an ear 23 rigidly secured to a suitable part of the lay, as the hand-rail H, the shoulder 21 forming a sort of V-shaped notch with the prong 20, (see Figs. 1 and 3,) to securely catch and hold the fork-tail when the latter is moved into position to be entered by the prong.

When the filling is present, supposing the fork and lay to be in proper condition, the tines 8 will not come into engagement with the filling to cause tilting of the fork until after the forward movement of the lay has carried the tip of the prong or finger 20 beyond the free end of the tail. (See dotted lines, Fig. 3.) Such prong is then inoperative so far as the described coöperation with the fork-tail, and the fork is tilted properly by the filling; but the prong 20 serves to limit any undue tilting movement of the fork as it overhangs the tail thereof.

When the fork is tilted by means other than the filling, such tilting must be in time to elevate the tail into position to coöperate with the hook-like device on the lay, and this I effect herein by employing the channeled plate 16, for if either lay or fork-tines are improperly positioned the front ends of the divisions 19 will tilt the fork in time for the desired operation to be accomplished.

I prefer to make the branch or shoulder 21 quite long, as herein shown, in order that it may insure proper coöperation with the fork-tail when necessary.

If the invention herein be applied to a plain loom wherein the detection of filling absence results in loom stoppage, it will be manifest that the change in the operation of the loom due to the operation of the novel means hereinbefore described will be a stoppage of the loom. So, too, it will be manifest that the tilting of the fork independently of the filling will cause the change in the operation of the loom on the same forward beat of the lay whether or not it is a detecting-pick, for when my present invention operates it operates the fork-slide wholly independently of the vibrating actuator or weft-hammer referred to hereinbefore.

Various changes or variations may be made by those skilled in the art without departing from the spirit and scope of my present invention.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a loom, in combination, a lay, a filling-fork adapted to be tilted by intact filling, mechanism to effect a change in the operation of the loom when filling absence is detected by the fork, and means to effect the actuation of said mechanism by or through the lay when the fork is tilted independently of the filling.

2. In a loom, in combination, a lay, a filling-fork adapted to be tilted by intact filling, mechanism to effect a change in the operation of the loom by or through the fork upon detection of filling absence thereby, and means on the lay to cooperate with the fork when tilted independently of the filling and thereby effect the actuation of said mechanism.

3. In a loom, in combination, a lay, a filling-fork having a tail and adapted to be tilted by intact filling, mechanism to effect a change in the operation of the loom by or through the fork upon detection of filling absence thereby, and a member on the lay to cooperate with the fork-tail and effect the actuation of said mechanism when the fork is tilted independently of the filling.

4. In a loom, in combination, a lay, a filling-fork having a tail and adapted to be tilted by intact filling, mechanism to cooperate with the fork-tail and effect a change in the operation of the loom upon detection of filling absence by the fork, and means on the lay to cooperate with the fork-tail when the fork is tilted independently of the filling and thereby effect the actuation of said mechanism.

5. In a loom, in combination, a lay having a grid and provided with a series of transverse channels opposite the grid-openings and beneath the shuttle-path, a filling-fork having tines adapted to normally and intermittently traverse said channels and engage the filling when intact, to cause tilting of the fork, mechanism adapted to effect the operation of a loom-stopping instrumentality or cause a change of filling when the fork detects filling absence, and means to effect such change in the operation of the loom on the forward beat of the lay when the fork is tilted by failure of its tines to traverse the channels in the lay.

6. In a loom, a lay having a grid and a raceway provided with transverse channels opposite the grid, combined with a filling-fork adapted to be tilted by engagement with intact filling and having its tines arranged to traverse the channels when the lay beats up, mechanism to effect a change in the operation of the loom by or through detection of filling absence by the fork, and

means to cause the actuation of said mechanism when the fork is tilted upon failure of its tines to enter the channels in the lay raceway.

7. In a loom, a filling-detector adapted to intermittently engage and be moved by intact filling, and means acting through said detector to effect a change in the operation of the loom when the filling-detector is moved independently of the filling to indicate presence thereof.

8. In a loom, in combination, mechanism, including a filling-detector, to effect a change in the operation of the loom when filling absence is detected by the detector, and means to effect the actuation of said mechanism when the detector indicates presence of filling independently of such filling.

9. In a loom, in combination, a filling-fork adapted to intermittently engage and be tilted by intact filling, mechanism to effect a change in the operation of the loom upon detection of filling absence by the fork, and means to effect the actuation of such mechanism when the fork is tilted independently of the filling.

10. In a loom, in combination, a filling-fork adapted to intermittently engage and be tilted by intact filling, mechanism to effect a change in the operation of the loom by or through the fork upon detection of filling absence thereby, and means to cooperate with the fork when tilted independently of the filling and thereby effect the actuation of said mechanism.

11. In a loom, in combination, a filling-fork adapted to intermittently engage and be tilted by intact filling, mechanism to effect a change in the operation of the loom upon detection of filling absence by the fork, and means to limit tilting movement of the fork when engaged by the filling and also to cooperate with the fork and effect the actuation of said mechanism when the fork is tilted independently of the filling.

12. In a loom, in combination, a lay, a filling-fork having a tail and adapted to intermittently engage and be tilted by intact filling on the forward beat of the lay, mechanism to effect a change in the operation of the loom when filling absence is detected by the fork, said mechanism including a vibrating actuator 9 having a hook 10 to cooperate at such time with the fork-tail, and a member 20 on the lay adapted to enter the fork-tail and effect the actuation of said mechanism independently of the actuator and its hook when the fork is tilted by means other than the filling, the said member 20 extending above the fork-tail and limiting the movement of the fork when tilted by engagement with the filling.

13. In a loom, in combination, a lay, a filling-fork adapted to intermittingly engage and be tilted by intact filling, mechanism to effect a change in the operation of the loom
5 when the fork detects filling absence, means to effect the actuation of said mechanism when the fork is tilted independently of the filling, and a device on the lay to cause such improper tilting, when it does occur, to be
10 effected at an earlier point in the forward

beat of the lay than when the fork is tilted by the filling.

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

JOHN V. CUNNIFF.

Witnesses:

S. W. ASHTON,

ALMA BOURGET.