

No. 725,194.

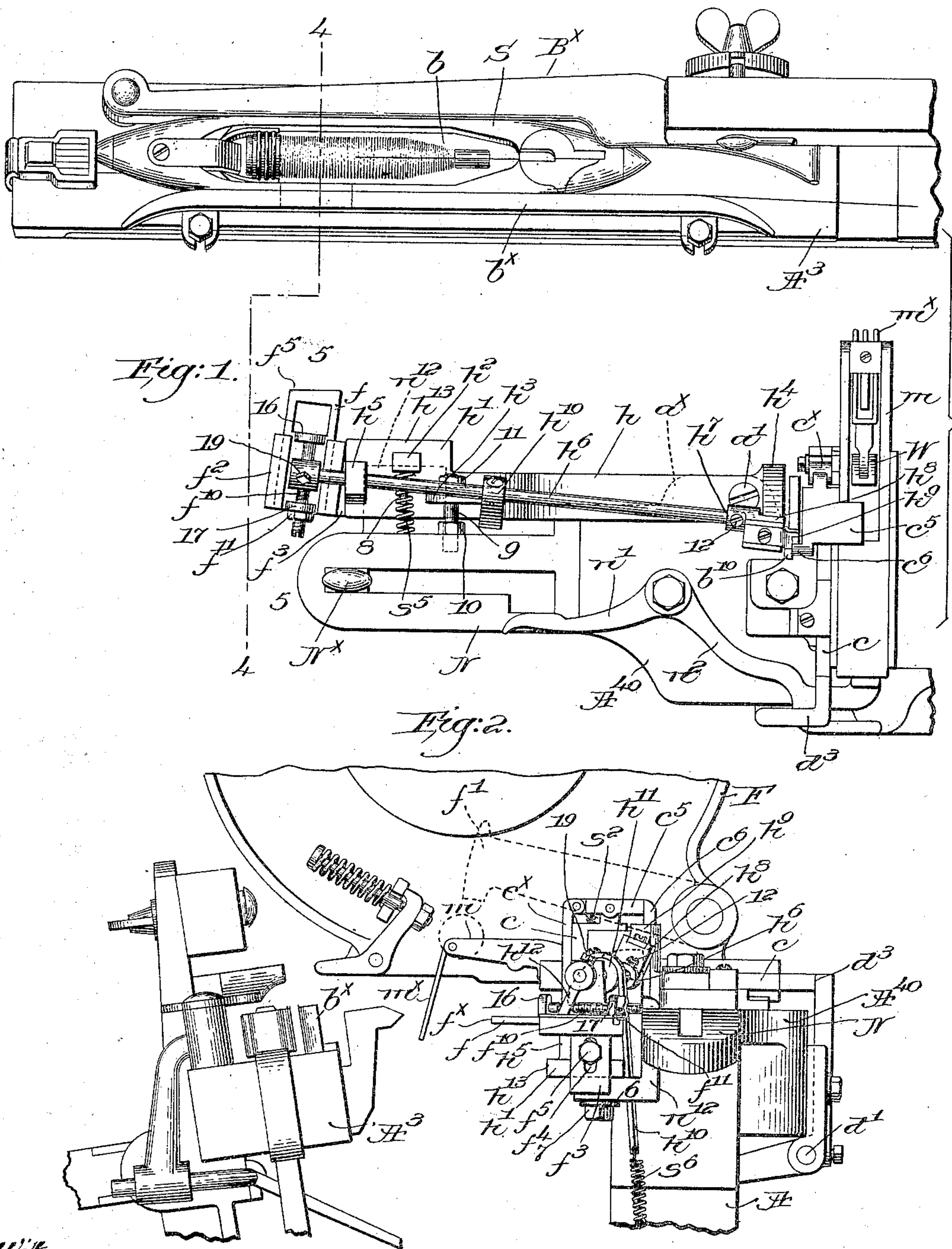
PATENTED APR. 14, 1903.

L. A. AUMANN.  
AUTOMATIC FILLING REPLENISHING LOOM.

APPLICATION FILED OCT. 31, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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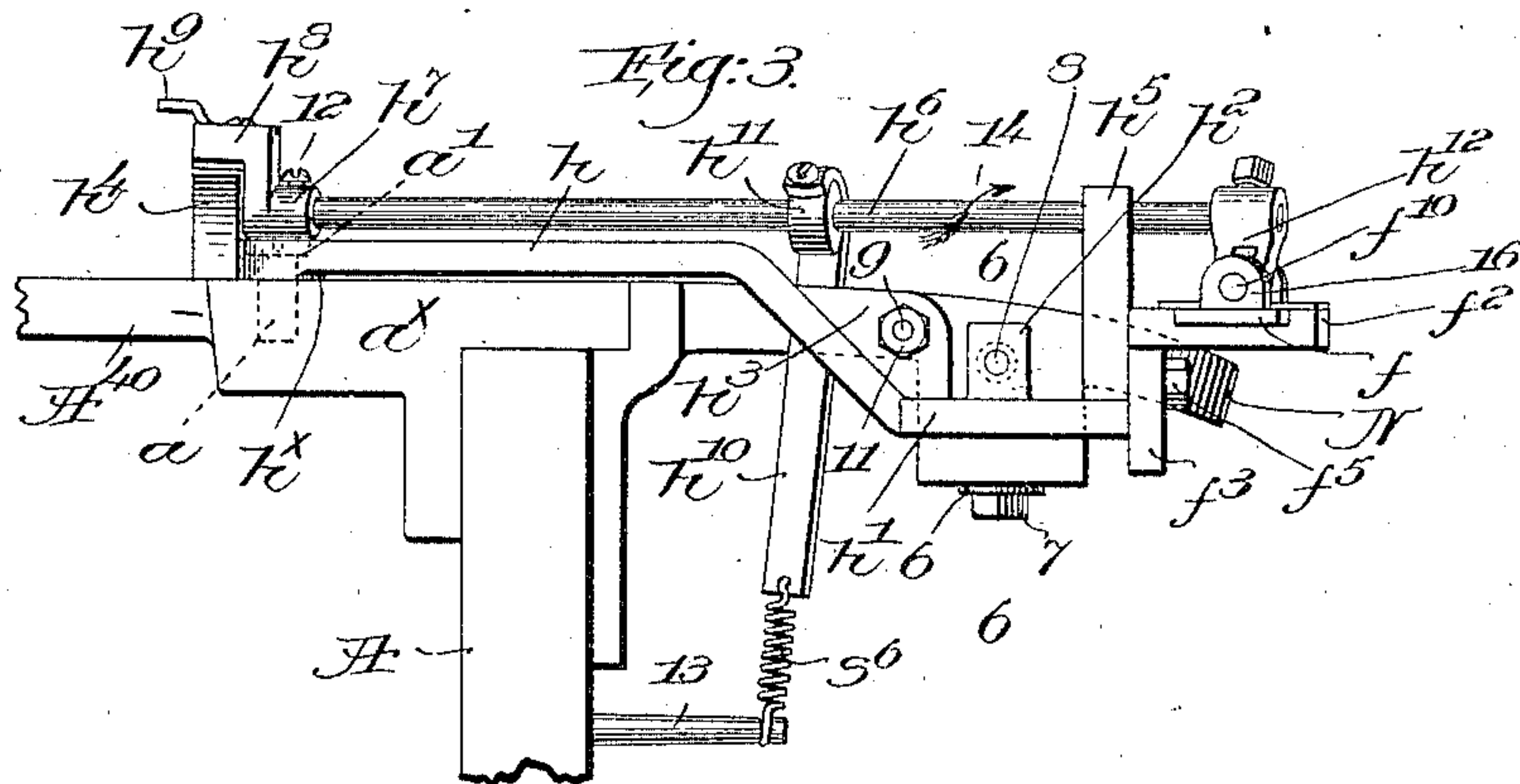


Fig. 4.

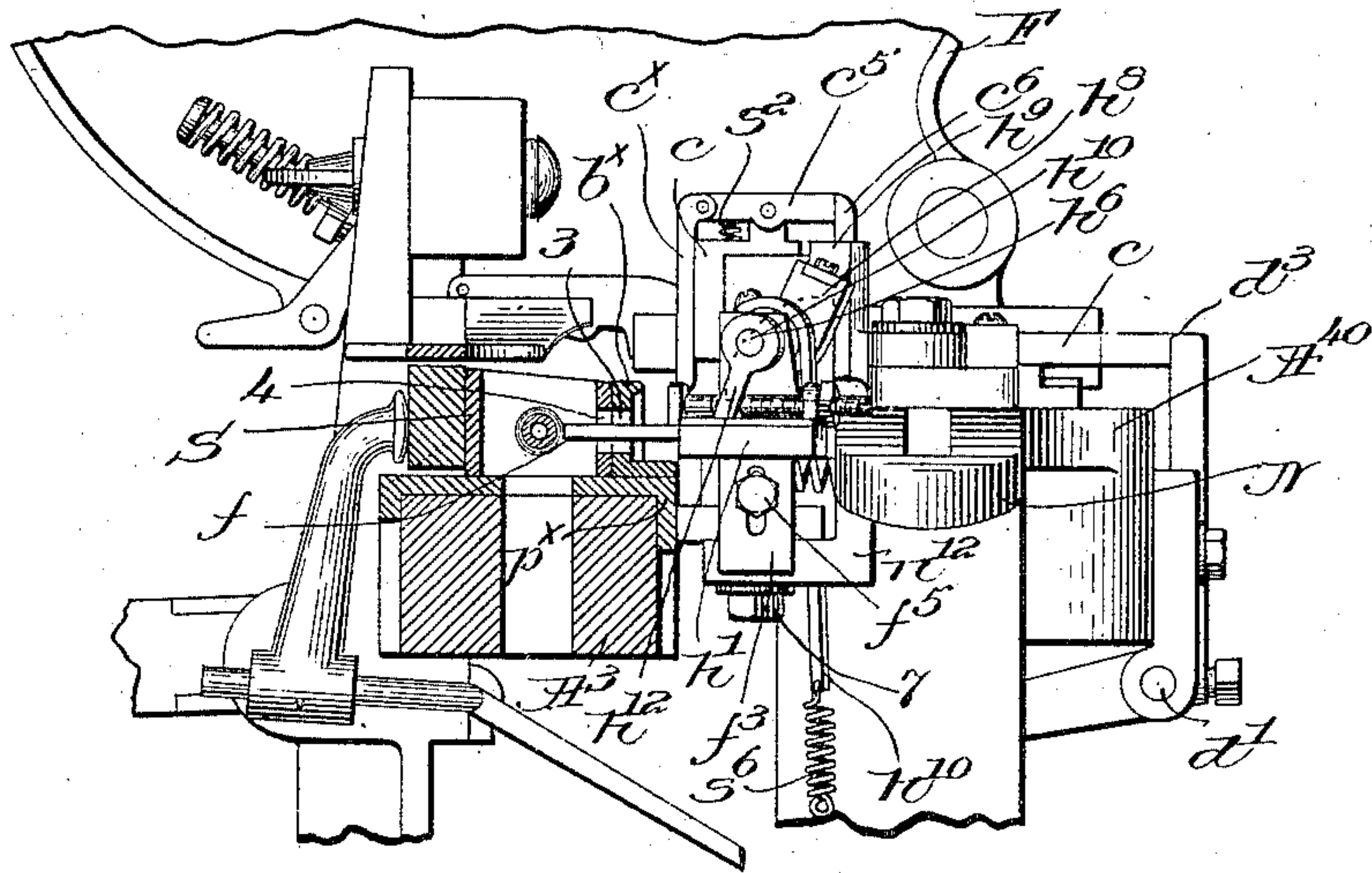


Fig. 5.

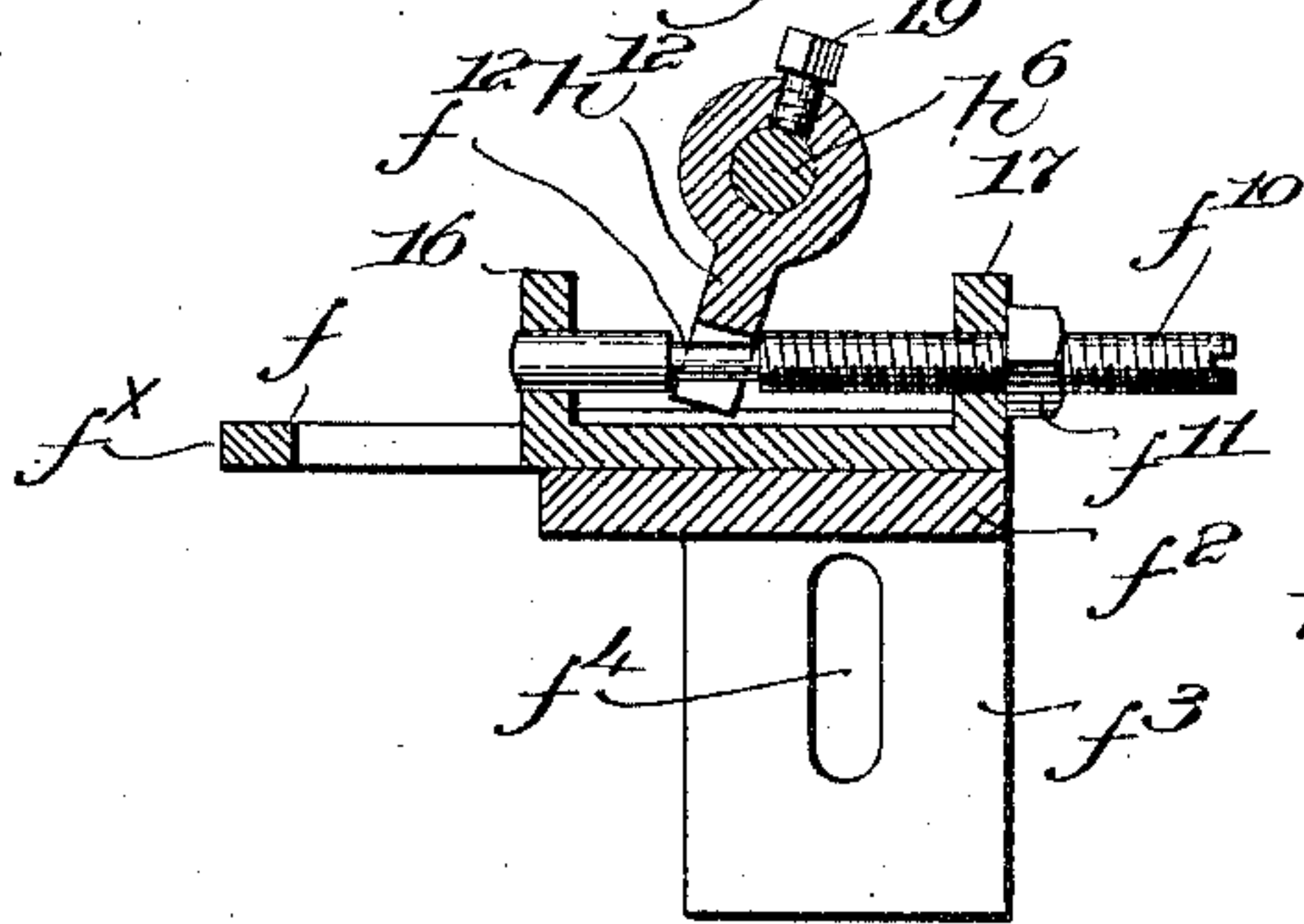
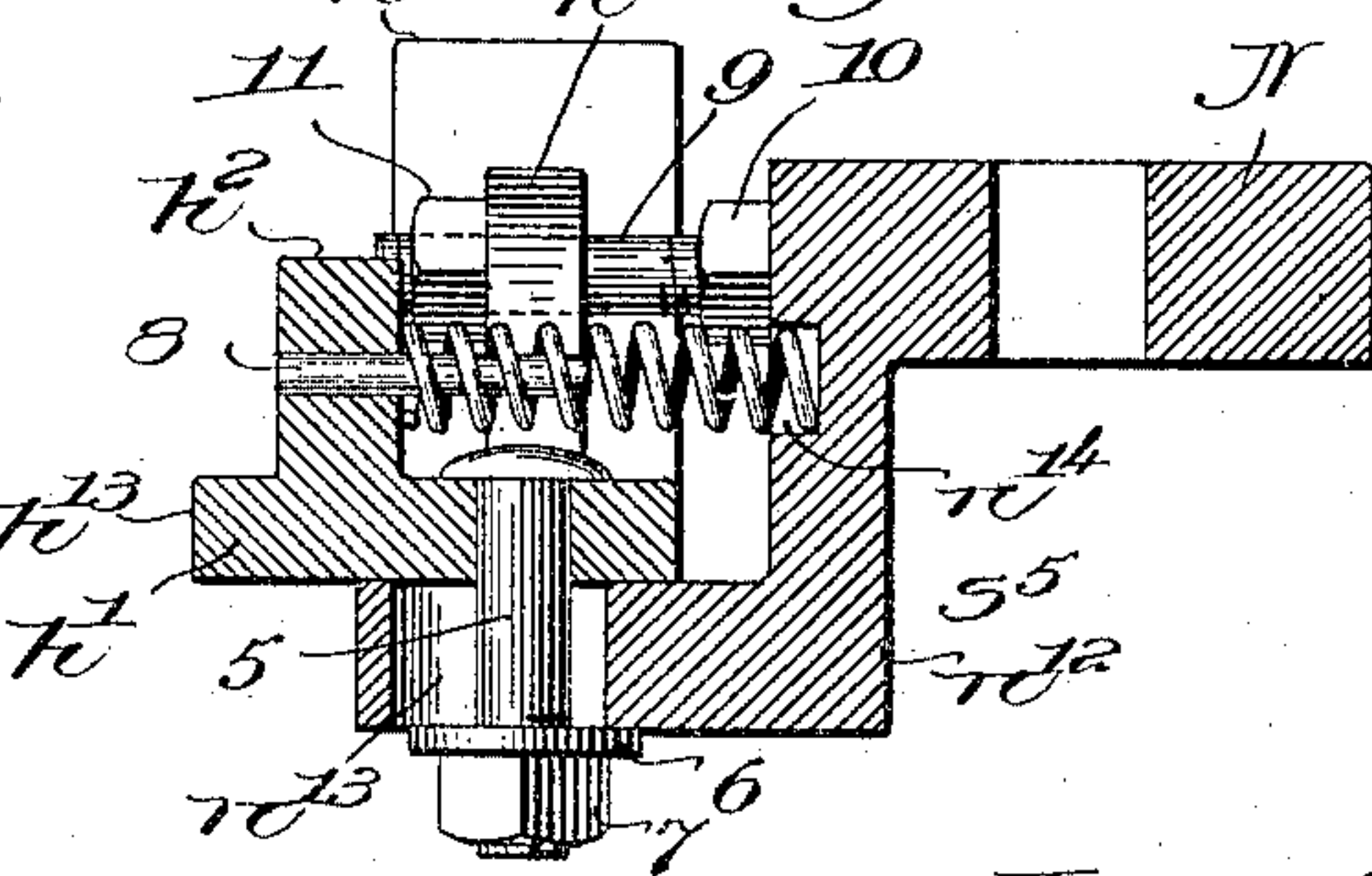


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC FILLING-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 725,194, dated April 14, 1903.

Application filed October 31, 1902. Serial No. 129,550. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS A. AUMANN, a citizen of the United States, and a resident of Chicopee, county of Hampden, State of Massachusetts, have invented an Improvement in Automatic Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to looms of the type wherein upon a substantial or predetermined exhaustion of the filling in the shuttle means for controlling the operation of the loom will be actuated to cause or bring about automatically replenishment of the running or working filling or a stoppage of the loom, as the case may be, looms of such type being technically known as "feeler-looms," inasmuch as the operation of the loom is controlled by or through the agency of a feeler, which intermittently feels the filling in the shuttle and indicates the substantial exhaustion thereof.

Filling-replenishing may be effected either by the substitution of a full shuttle for the running and nearly-empty shuttle or by the introduction of a fresh supply of filling into the running shuttle when its previous supply is exhausted to the desired extent. My present invention, however, is not restricted to either form of replenishing mechanism; but for convenience I have herein shown it in connection with the latter form.

The feeler in a feeler-loom intermittently engages and is moved or vibrated by the filling in the shuttle, and the extent of such movement is at its maximum when the full supply of filling is present, the diminution of the latter as it is woven off causing a gradual decrease in the filling-induced movement of the feeler until the minimum is reached, whereupon through suitable instrumentalities filling replenishment or stoppage of the loom is effected in a manner well known to those skilled in the art. This minimum may be only a very slight movement, or it may be no movement at all, according to circumstances, the parts being so adjusted that the minimum is reached when there is substan-

tial exhaustion of the filling in the shuttle, only enough remaining to traverse the lay a few times.

In order to reduce the waste filling to the smallest practicable or possible amount, it will be manifest that the adjustment must be accurate and quite fine, and when once adjusted it should answer for varying speeds of the loom without further attention. To those skilled in the practical use of looms, however, it is well known that there is an appreciable difference in the actual stroke of the lay when the loom is running, because of slight lost motion of the different parts, so that if the lay reaches a certain point on its front center when the loom is running at a given speed at another speed the lay may overrun that point or fail to quite reach it, as the case may be, owing principally to variations in the momentum of the lay and the looseness of connections. It will be manifest, therefore, that if the feeler is so adjusted as to effect a change in the operation of the loom when desired filling exhaustion has been reached a difference in the forward beat of the lay will tend to effect such change too soon, producing undue waste of filling, or it will delay the change in operation beyond the proper time, so that one or more picks may be made with no filling laid, thus defeating the object of the device.

Various means have been devised to overcome improper action of the feeler hereinbefore referred to and with more or less success in practice; but so far as I am aware they have all depended for their operation upon coöperation with the shuttle itself or something carried by or movable with it. This is somewhat objectionable for various practical reasons, although the underlying principle is good, because the filling-carrier in the shuttle always bears a substantially fixed relation to the side wall of the shuttle or to some part upon or moving with it, and by my invention I have provided for properly positioning the feeler for feeling action independently of the shuttle or any part thereof.

My present invention has for its main object the production of means acting independently of the shuttle to neutralize or pre-



vent in a feeler-loom accelerated or retarded action of the feeler, due to irregular or varying movement of the lay from whatever cause it may be due. This and various other novel features of my invention will be hereinafter fully described, and particularly pointed out in the following claims.

Figure 1 is a top or plan view of one end of the lay and breast-beam of a loom of the feeler type with one embodiment of my invention illustrated in connection therewith, a shuttle being shown in the non-replenishing shuttle-box. Fig. 2 is a left-hand side elevation of the parts shown in Fig. 1 and with a portion of the replenishing mechanism indicated, such mechanism herein being located at the right-hand side of the loom. Fig. 3 is an enlarged detail view, in rear elevation, of the feeler, its movable support, and some of the parts controlled by the feeler. Fig. 4 is a transverse section on the irregular line 4 4, Fig. 1, looking toward the right and with the lay on its front center, it being supposed that filling replenishment is just about to be effected. Fig. 5 is an enlarged sectional detail on the line 5 5, Fig. 1; and Fig. 6 is a similar view, also enlarged, on the line 6 6, Fig. 3, looking toward the left.

The breast-beam  $A^{40}$ , lay  $A^3$ , provided with a shuttle-box  $B^x$ , having an aperture 3 in its front wall  $b^x$ , the feeder  $F$ , Figs. 2 and 4, to hold the reserve supply of filling in the form of filling-carriers, the transferrer  $f'$ , and the operating or controlling rock-shaft  $d'$ , the notched holding-plate  $N$  for the shipper  $N^x$ , (the only member of the stopping mechanism shown,) and the automatically self-threading shuttle  $S$ , adapted to contain a supply of filling, such as a filling-carrier  $b$ , and having a hole 4 in its side wall, may be and are all of well-known or usual construction and substantially as in United States Patent No. 648,986, dated May 8, 1900.

A member of the means for controlling the operation of the loom, herein designed more particularly to actuate a filling-replenishing mechanism, is shown as a latch  $c^x$ , pivotally mounted on a latch-carrier  $c^5$ , fulcrumed on a slide  $c$ , located adjacent the guide for the usual slide  $m$ , on which is fulcrumed the filling-fork  $m^x$ , the weft-hammer  $W$ , Fig. 1, acting in usual manner upon failure of filling to move the slide  $m$  outwardly to operate the knock-off lever  $n' n^2$  and release the shipper to stop the loom. A spring  $s^2$  acts to lift the latch from its normal operative position into inoperative position whenever a dog, to be described, is withdrawn by or through filling-induced movement of the feeler from beneath a depending foot  $c^6$  of the latch-carrier, the latch when operative being in the path of a shoulder  $w^x$  on the weft-hammer, the latter constituting an actuator for the slide. When the said shoulder engages the latch, the slide  $c$  is moved outward and rocks an upturned arm  $d^3$ , fast on the rock-shaft  $d'$ , turning the latter and, as herein shown, effecting filling

replenishment, all substantially as in the patent referred to. On its rear edge and just beyond the slide  $c$  the breast-beam has a projection  $a^x$ , in which is fixed an upright headed fulcrum-stud  $a$ , passing through a counterbored hole in a boss  $h^x$ , near one end of a swinging feeler-support, shown as an elongated arm  $h h'$ , the part  $h'$  at the outer end of said arm being downturned below the holding-plate  $N$ , the boss  $h^x$  resting upon the top of the projection  $a^x$ , (see Fig. 3,) the head  $a'$  of the stud entering the counterbore and preventing lifting of the adjacent end of the feeler-support. The foot of an L-shaped bracket  $n^{12}$  on the holding-plate and turned toward the back of the loom projects beneath and supports the said part  $h'$ , a depending bolt 5 on the latter, Fig. 6, extending through an elongated slot  $n^{13}$  in the bracket and having a washer 6 and nut 7 on its lower end permitting the outer end of the feeler-support to swing and slide upon the bracket-foot toward and away from the breast-beam. A lug  $h^2$  on said support carries a pin 8 to guide the outer end of a spring  $s^5$ , interposed between the lug and the bracket  $n^{12}$ , the spring tending to swing the free end of the feeler-support rearward, a notch  $n^{14}$ , Fig. 6, receiving the front end of the spring. A second lug  $h^3$  on the feeler-support has loosely extended through it a headed stud 9, screwed into a hole in the rear edge of the holding-plate and held in adjusted position by a check-nut 10, the head 11 of the stud acting against the rear face of the lug  $h^3$  to limit the spring-induced movement of the feeler-support, and by adjusting the stud it will be manifest that the extended position of the feeler-support may be changed, the purpose of such adjustment being more clearly apparent hereinafter. Two upturned stands  $h^4 h^5$  on and at the opposite ends of the feeler-support provide bearings for a dog-carrier, shown as a substantially horizontal rock-shaft  $h^6$ , having secured upon it near the stand  $h^4$  a collar  $h^7$ , preferably held in an adjustable manner by a set-screw 12. As best shown in Fig. 1, the stand  $h^4$  is quite near the slide  $c$ , and it is convexed at its top to permit an overhanging arm  $h^8$  on the collar to swing over it when the rock-shaft or carrier  $h^6$  rocks, said arm having rigidly secured to it a preferably-hardened steel plate or dog  $h^9$ , the shape thereof being shown in Figs. 1, 2, and 3. This dog extends beneath the foot  $c^6$  of the latch-carrier and tilts the latter against the spring  $s^2$  to thereby hold the latch  $c^x$  in the path of its actuator—viz., the shoulder  $w^x$  of the weft-hammer. At such time the dog abuts against an upright fixed stop  $b^{10}$  on the guide for the slide  $c$  and is yieldingly retained against it by a spring  $s^6$ , fixed at one end to a pin 13 on the loom-frame and at its other end attached to a flexible band or strap  $h^{10}$ , led up to and partly around a sheave  $h^{11}$ , fast on the rock-shaft  $h^6$ , the end of the strap being secured to the sheave. Manifestly the tendency of the



spring is to turn the shaft in the direction of the arrow 14, Fig. 3, and if the shaft be oppositely turned it will be obvious that the dog  $h^9$  will be withdrawn from beneath the foot of the latch-carrier and the spring  $s^2$  will immediately act to lift the latch  $c^x$  into inoperative position.

The feeler is herein shown as a thin flat plate  $f$ , located opposite the aperture 3 in the shuttle-box wall  $b^x$  and mounted to slide longitudinally in a horizontal grooved holder  $f^2$ , having a depending ear  $f^3$ , provided with an elongated slot  $f^4$  to receive a clamping-stud  $f^5$ , screwed into the outer face of the stand  $h^5$  on the feeler-support, adjustment of the feeler vertically being thereby provided in order that the feeler may move in a horizontal path at the proper height with relation to the shuttle.

Referring to Fig. 1, it will be seen that the longitudinal axis of the feeler is inclined to the feeler-support, but at right angles to the rock-shaft  $h^6$ , the outer end of which projects over the feeler and is connected therewith by means to be described. As the feeler itself is thus at a slight angle to the longitudinal axis of the shuttle and the filling-carrier  $b$  therein, the feeling edge  $f^x$  of the feeler is slightly beveled to be in substantial parallelism to the filling-carrier in order to squarely engage the filling, it being understood that on the forward beat of the lay the feeler passes through the aperture 3 in the front box-wall  $b^x$ , and on every alternate pick it also enters the shuttle through the hole or slot 3 in its side wall. Owing to the relative position of the feeler and the foot  $c^6$  of the latch-carrier, the rock-shaft is diagonal to the front of the lay as the rock-shaft is operated by filling-induced movement of the feeler, and because of this latter fact the sliding movement of the feeler is at right angles to said rock-shaft. The feeler has two upturned transverse ears 16 17, which receive a screw  $f^{10}$ , held in adjustment by a check-nut  $f^{11}$ , the screw having an annular groove  $f^{12}$  between the ears, Fig. 5, to receive the forked or bifurcated end of a depending rocker-arm  $h^{12}$ , made fast on the rock-shaft  $h^6$  by a set-screw 19. Adjustment of the rocker-arm and screw  $f^{10}$  determines the position of the edge  $f^x$  of the feeler relatively to the rear edge of the part  $h'$  of the feeler-support when the feeler is fully extended and the dog  $h^9$  against the stop  $b^{10}$ —that is, when the latch is in its operative position.

It will be noticed by reference to Fig. 1 that the part  $h'$  of the feeler-support is wider than the part  $h$  thereof, so that the rear edge  $h^{13}$  is nearer the lay and parallel thereto, and I have herein provided that some part of the lay on its forward beat shall engage such edge and slightly swing the feeler-support on its fulcrum  $a$  when the lay reaches front center. In Fig. 4 the front downturned edge of the race-plate  $p^x$  of the lay is shown as the part of the lay which engages and moves the feeler-

support against its spring  $s^5$ ; but any other suitable part of the lay may be used, if desired.

The feeler-support is adjusted by means of the stud 9, so that the edge  $h^{13}$  will always be engaged by the lay on its forward beat and slightly moved thereby, the adjustment being determined by the minimum distance which the lay traverses on its forward beat. Such adjustment and movement of the feeler-support acts to properly position the feeler for feeling action on each beat of the lay, though feeling action occurs on alternate beats only, as is well understood, for whether the lay moves beyond or not quite so far as its theoretical stopping-point when at front center the feeler will always occupy the same position relative to the longitudinal axis of the shuttle when in the shuttle-box  $B^x$ .

The adjustment effected by the screw  $f^{10}$  determines how much filling shall be left in the shuttle when filling replenishment is effected, the screw being turned in or out until the thickness of the yarn on the barrel of the filling-carrier when filling replenishment is effected shall be such that the feeler will not be moved by engagement therewith sufficiently to withdraw the dog  $h^9$  from beneath the foot  $c^6$ , such a condition of affairs being illustrated in Fig. 4. It will be seen that by turning the screw out there will be more filling left in the shuttle when replenishing or stopping of the loom is effected, while by turning it in the quantity of filling remaining will be smaller, and such adjustment can be effected with great nicety. Now supposing such adjustment to be made it will be obvious that unless some means are provided for counteracting it an irregular or variable movement of the lay will cause the feeler to effect filling replenishment or loom-stoppage too soon if the lay-stroke is short or too late if the lay-stroke be longer than it should be.

By mounting the feeler as herein described, so that it will be properly and uniformly positioned relative to the longitudinal axis of the shuttle by the movement of the lay, the objectionable results due to irregular movement thereof will be completely obviated or counteracted.

My invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be varied or rearranged in different particulars by those skilled in the art without departing from the spirit and scope of my invention.

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

1. In a loom, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support moved independently of the shuttle, to properly position the feeler for its feeling action.

2. In a loom, a lay, a shuttle to contain a



supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support moved by a part of the lay on each pick, to properly position the feeler for its feeling action.

3. In a loom provided with mechanism to effect a change in its operation, a shuttle to contain a supply of filling, means, including a feeler, to cause the actuation of said mechanism, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a movable support on which the feeler is mounted and movable relatively, said feeler-support being moved independently of the shuttle to properly position the feeler for its feeling action.

4. In a loom, a lay, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support moved independently of the shuttle on each forward beat of the lay, to properly position the feeler for its feeling action.

5. In a loom, a lay, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support having a bunter to be engaged and moved by the lay on each forward beat thereof, to properly position the feeler for its feeling action.

6. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain a supply of filling, means to control the time of operation of said mechanism, including a feeler and an actuating instrumentality governed thereby, presence of the filling in the shuttle acting through the feeler to prevent, and substantial exhaustion of such filling acting to cause, the actuating instrumentality to effect the operation of the replenishing mechanism, and a feeler-support moved independently of the shuttle and the filling therein on the forward beat of the lay to uniformly position the feeler for its feeling action upon the filling in the shuttle.

7. In a loom, a lay, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, presence of filling in the shuttle acting through the feeler to prevent the operation of said means, and substantial exhaustion of the filling acting to cause said means to effect a change in the operation of the loom, and means independent of the shuttle to neutralize accelerated or retarded action of the feeler due to variable movement of the lay.

8. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain a supply of filling, means, including a feeler to intermittently engage the filling in the shuttle, to cause the operation of said mech-

anism upon substantial exhaustion of the filling in the shuttle, and a feeler-support upon which the feeler is movably mounted, said feeler-support being moved by the lay upon its forward beat to cause the feeler to be properly positioned for feeling action upon the shuttle-filling irrespective of variation in the lay-stroke.

9. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain a supply of filling, means, including a feeler to intermittently engage and be moved by the filling in the shuttle, to cause the operation of said mechanism when substantial exhaustion of the filling prevents filling-induced movement of the feeler, and a movable support upon which the feeler is mounted and moved relatively thereto by presence of filling in the shuttle, said support being moved independently of the shuttle on the forward beat of the lay to position the feeler properly with relation to the longitudinal axis of the shuttle.

10. In a loom, the lay, a shuttle adapted to contain a supply of filling, filling-replenishing mechanism, means to determine the time of its operation, including a feeler exterior to the shuttle and adapted to intermittently engage the filling therein and prevent actuation of said means until predetermined exhaustion of the filling in the shuttle, and a pivotally-mounted feeler-support moved independently of the shuttle upon the forward beat of the lay, to bodily position the feeler uniformly with relation to the longitudinal axis of the filling-supply in the shuttle.

11. In a loom, the lay, a shuttle adapted to contain a supply of filling, filling-replenishing mechanism, means to determine the time of its operation, including a slidable, spring-controlled feeler to intermittently engage and be moved by the filling in the shuttle until predetermined exhaustion of such filling, and a support upon which the feeler is mounted, said support being engaged and moved by a part of the lay on the forward beat thereof to properly position the feeler for feeling action, failure of the filling on alternate picks to induce feeler movement causing said means to effect the operation of the replenishing mechanism.

12. In a loom, the lay, a shuttle adapted to contain a supply of filling, means to control the operation of the loom, including a slidable, spring-controlled feeler to intermittently engage and be moved by the filling in the shuttle until predetermined exhaustion of such filling, and a yieldingly-mounted support upon which the feeler is sustained, the lay on its forward beat engaging and moving the support to bring the feeler into proper and uniform relation to the longitudinal axis of the shuttle on each feeling pick irrespective of variations in the stroke of the lay.

13. In a loom, means to control its operation, the lay, a shuttle adapted to contain a supply of filling, an actuator for said means,



the latter including a feeler, a latch maintained inoperative by the presence and rendered operative by the substantial exhaustion of filling in the shuttle, acting by or  
 5 through the feeler, the actuator cooperating with the latch when operative to effect a change in the operation of the loom; and a feeler-support moved independently of the shuttle and filling therein on the forward  
 10 beat of the lay, to properly position the feeler for feeling action.

14. In a loom provided with filling-replenishing mechanism, means to control the time of its operation, the lay, a shuttle adapted to  
 15 contain a supply of filling, an actuator for said means, the latter including a yieldingly-movable feeler to intermittently engage the filling in the shuttle, a latch, a dog to maintain it operative, and a rocking carrier there-  
 20 for, operatively connected with the feeler, presence of filling in the shuttle causing the feeler to rock the carrier and through the dog render the latch inoperative, and substantial exhaustion of the filling preventing rocking  
 25 of the carrier, to permit the actuator to engage the latch and effect filling replenishment.

15. In a loom provided with filling-replenishing mechanism, means to control the time of its operation, the lay, a shuttle adapted to  
 30 contain a supply of filling, an actuator for said means, the latter including a spring-controlled feeler, a movable support therefor, a rocking carrier provided with a latch-dog and mounted on said support, and a latch main-  
 35 tained operative by the dog, presence of filling in the shuttle acting through the feeler to rock the carrier and render the latch inoperative, failure of the carrier to rock and render the latch inoperative effecting engage-  
 40 ment of the latter and the actuator, the feeler-support being moved upon the forward beat of the lay to properly position the feeler for feeling action.

16. In a loom provided with filling-replenishing mechanism, a sliding feeler to inter-  
 45 mittingly engage and be moved by the filling in the shuttle as the lay beats up, a latch, a spring-controlled latch-carrier, a rocking spring-controlled shaft having a dog cooperating with the latch-carrier to maintain the latch operative, and an operative connection  
 50 between the shaft and feeler to rock the former by or through filling-induced movement of the latter until substantial exhaustion of the filling, to withdraw the dog and permit  
 55 movement of the latch into inoperative position, combined with an actuator to cooperate with the latch when operative and there-through effect actuation of the replenishing  
 60 mechanism.

17. In a loom provided with filling-replenishing mechanism, the lay, a swinging feeler-support moved by the lay on the forward beat thereof, a spring to oppositely move it, means  
 65 to regulate the spring-induced movement of the feeler-support, a feeler slidably mounted thereon to intermittently engage and be

moved by the filling in the shuttle as the lay beats up, a latch, a dog to maintain it operative, and a rocking spring-controlled carrier  
 70 for the dog, mounted on the feeler-support and operatively connected with the feeler, filling-induced movement of the latter rocking the carrier to withdraw the dog and inter-  
 75 mittingly render the latch inoperative until substantial exhaustion of the filling, combined with an actuator to cooperate with and move the latch when operative, and control-  
 80 ling connections between the latch and the filling-replenishing mechanism, to effect the operation of the latter upon such movement of the latch.

18. In a loom provided with filling-replenishing mechanism, a lay having a shuttle-box provided with an apertured front wall, a shut-  
 85 tle to contain a supply of filling and having an opening in its side to register with the aperture when the shuttle is boxed, a pivotally-mounted feeler-support engaged and moved  
 90 by the lay upon its forward beat, a yieldingly-controlled feeler mounted on the feeler-support, to enter the shuttle intermittently and engage and be moved by the filling therein, the movement of the feeler-support properly  
 95 positioning the feeler for feeling action, a latch operatively connected with the replenishing mechanism, and an actuator to cooperate with the latch when operative, presence of filling in the shuttle acting through the  
 100 feeler to render the latch inoperative, and substantial exhaustion of the filling acting through the feeler to cause the latch to cooperate with the actuator.

19. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain  
 105 a supply of filling, means, including a feeler, to cause the actuation of said mechanism, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support  
 110 moved independently of the shuttle, to properly position the feeler for its feeling action.

20. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain  
 115 a supply of filling, means, including a feeler, to cause the actuation of said mechanism, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support  
 120 moved by a part of the lay on each pick, to properly position the feeler for its feeling action.

21. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain  
 125 a supply of filling, means, including a feeler, to cause the actuation of said mechanism, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a movable support  
 130 on which the feeler is mounted and movable relatively, said feeler-support being moved independently of the shuttle to properly position the feeler for its feeling action.

22. In a loom provided with filling-replen-



ishing mechanism, a lay, a shuttle to contain a supply of filling, means, including a feeler, to cause the actuation of said mechanism, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support moved independently of the shuttle on each forward beat of the lay, to properly position the feeler for its feeling action.

23. In a loom provided with filling-replenishing mechanism, a lay, a shuttle to contain a supply of filling, means, including a feeler, to cause the actuation of said mechanism, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and a feeler-support having a bunter to be engaged and moved by the lay on each forward beat thereof, to properly position the feeler for its feeling action.

24. In a loom, provided with filling-replenishing mechanism, a lay, a shuttle to contain a supply of filling, means, including a feeler, to control the time of operation of said mechanism, presence of filling in the shuttle acting through the feeler to prevent the operation of said means, and substantial exhaustion of the filling acting to cause said means to operate, to effect filling replenishment, and means independent of the shuttle to neutralize accelerated or retarded action of the feeler to cause filling replenishment, due to movement of the lay.

25. In a loom, the lay, a shuttle adapted to contain a supply of filling, filling-replenishing mechanism, means to determine the time of its operation, including a slidable, spring-controlled feeler to intermittently engage and be moved by the filling in the shuttle until predetermined exhaustion of such filling, and a yieldingly-mounted support upon which the feeler is sustained, the lay on its forward beat engaging and moving the support to bring the feeler into proper and uniform relation to the longitudinal axis of the shuttle on each feeling pick irrespective of variations in the stroke of the lay.

26. In a loom, the lay, a shuttle adapted to

contain a supply of filling, filling-replenishing mechanism, means to determine the time of its operation, including a feeler to intermittently engage and be moved by the filling in the shuttle until predetermined exhaustion of such filling, and a yieldingly-mounted support upon which the feeler is sustained, the lay on its forward beat engaging and moving the support to bring the feeler into proper and uniform relation to the longitudinal axis of the shuttle on each feeling pick irrespective of variations in the stroke of the lay.

27. In a loom provided with filling-replenishing mechanism, means to control the time of its operation, the lay, a shuttle adapted to contain a supply of filling, an actuator for said means, the latter including a feeler, a latch maintained inoperative by the presence and rendered operative by the substantial exhaustion of filling in the shuttle, acting by or through the feeler, the actuator cooperating with the latch when operative, to effect filling replenishment, and a feeler-support moved independently of the shuttle and filling therein on the forward beat of the lay, to properly position the feeler for feeling action.

28. In a loom, the lay, a feeler adapted to vibrate in harmony therewith and governed as to the amplitude of its vibrations by the filling in the running shuttle, a member to control or effect the operation of loom-stopping or filling-replenishing mechanism, an actuator for said member, means acting by or through the feeler to prevent such actuation by the presence, and to effect it by the substantial exhaustion, of filling in the shuttle, and means independent of the shuttle to prevent accelerated or retarded action of the feeler due to variable movement of the lay.

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

LOUIS A. AUMANN.

Witnesses:

LUTHER WHITE,

WILLIAM J. FULLER.