

No. 687,128.

Patented Nov. 19, 1901.

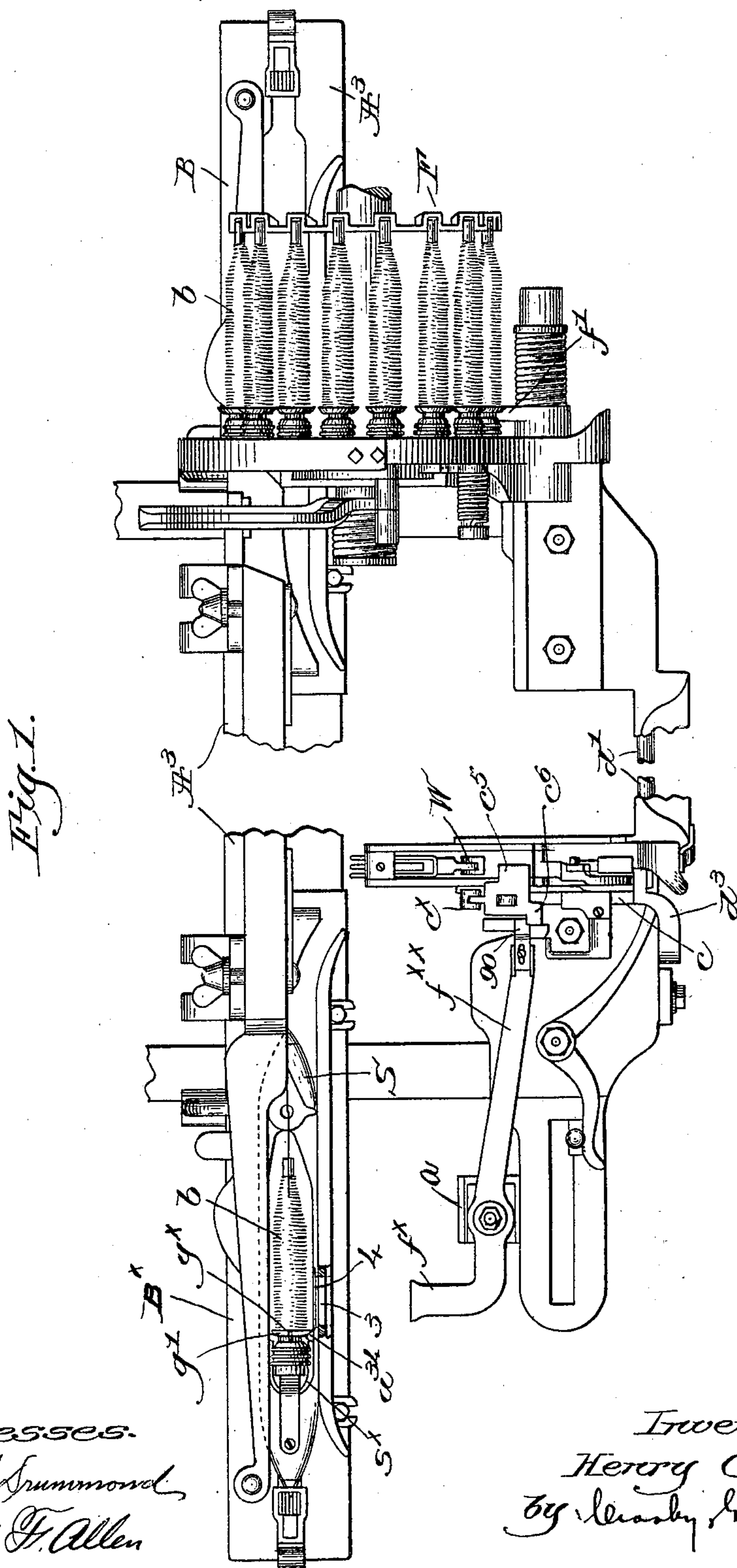
H. CÔTÉ.

FILLING REPLENISHING LOOM AND FILLING CARRIER THEREFOR.

(Application filed July 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
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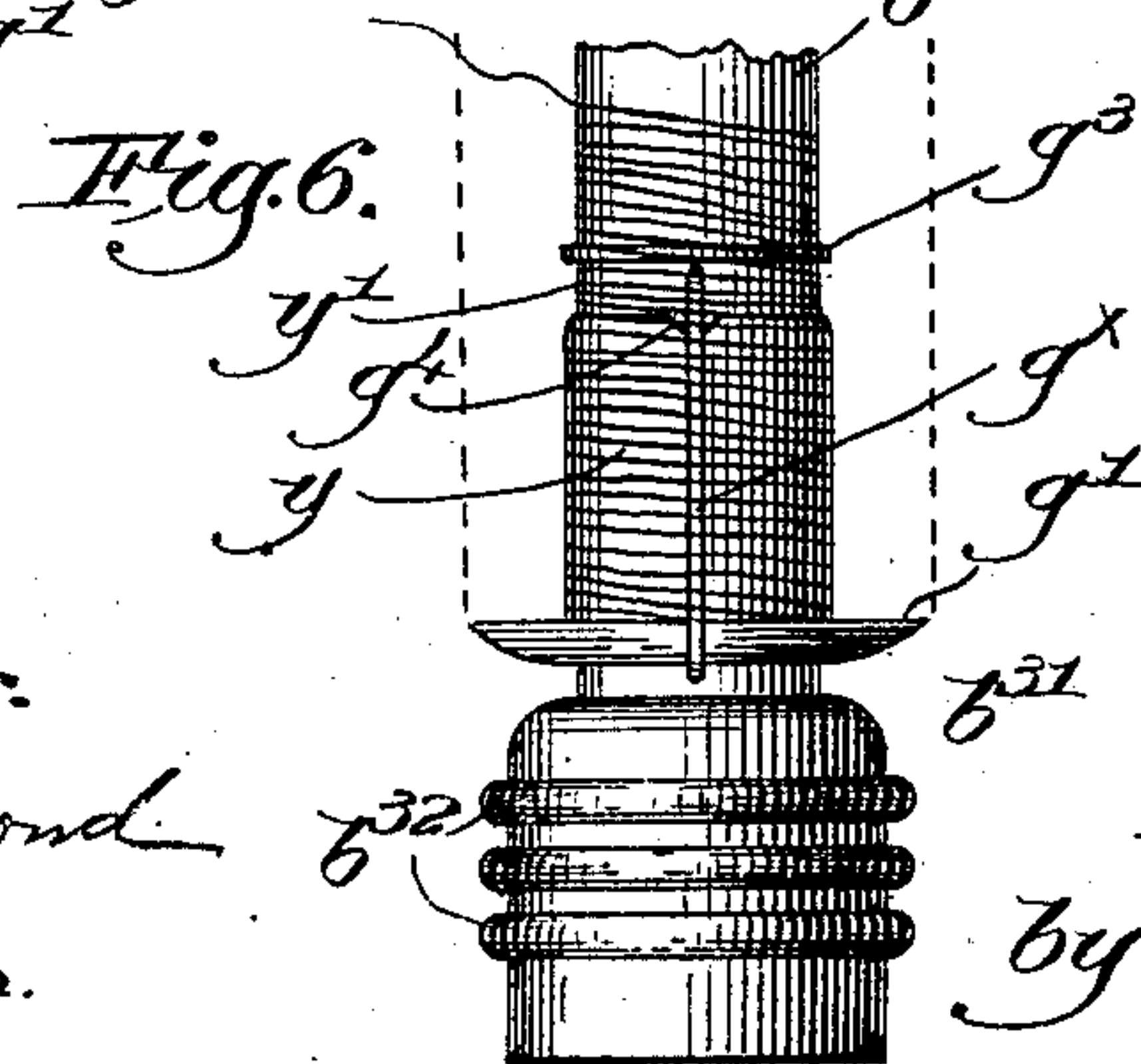
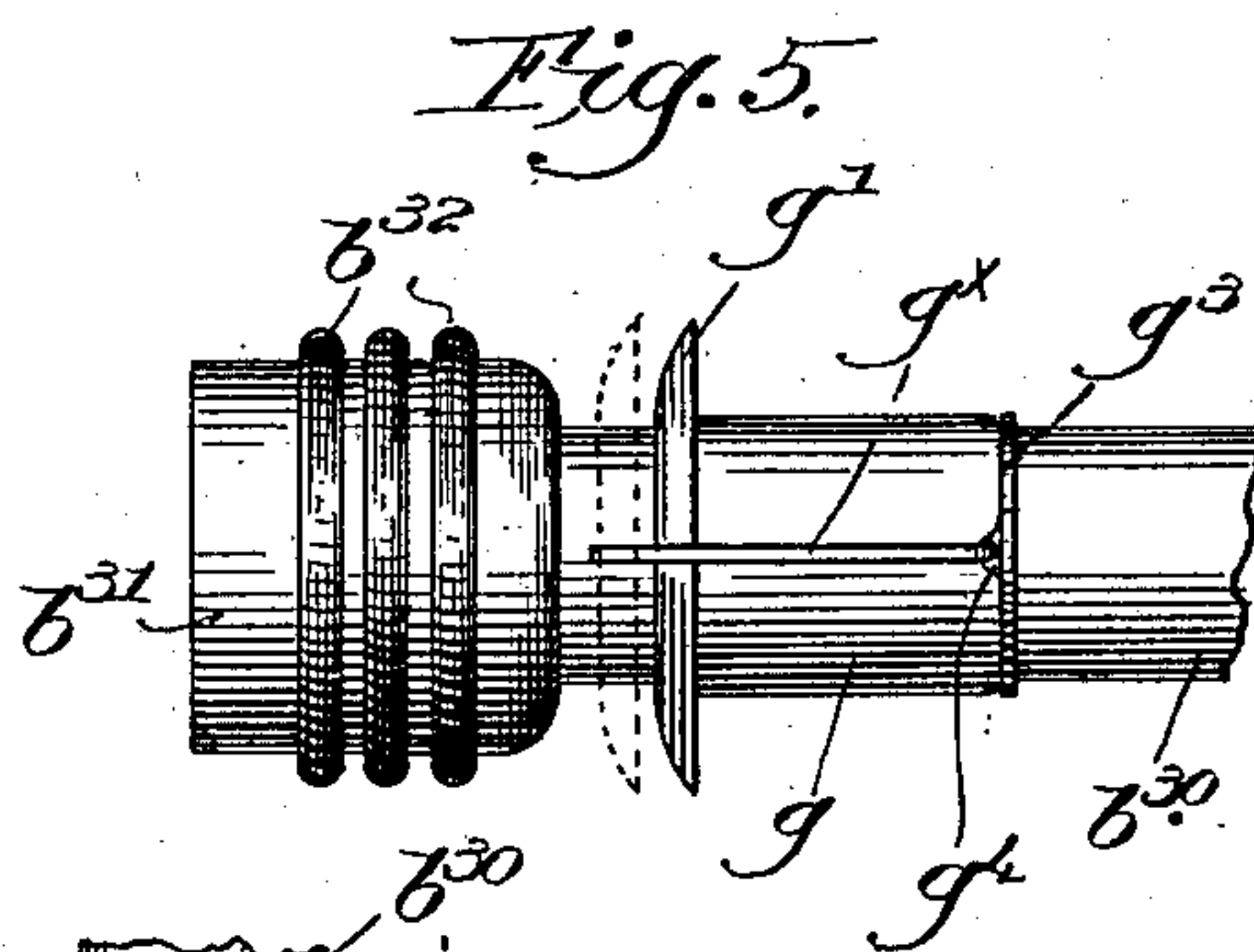
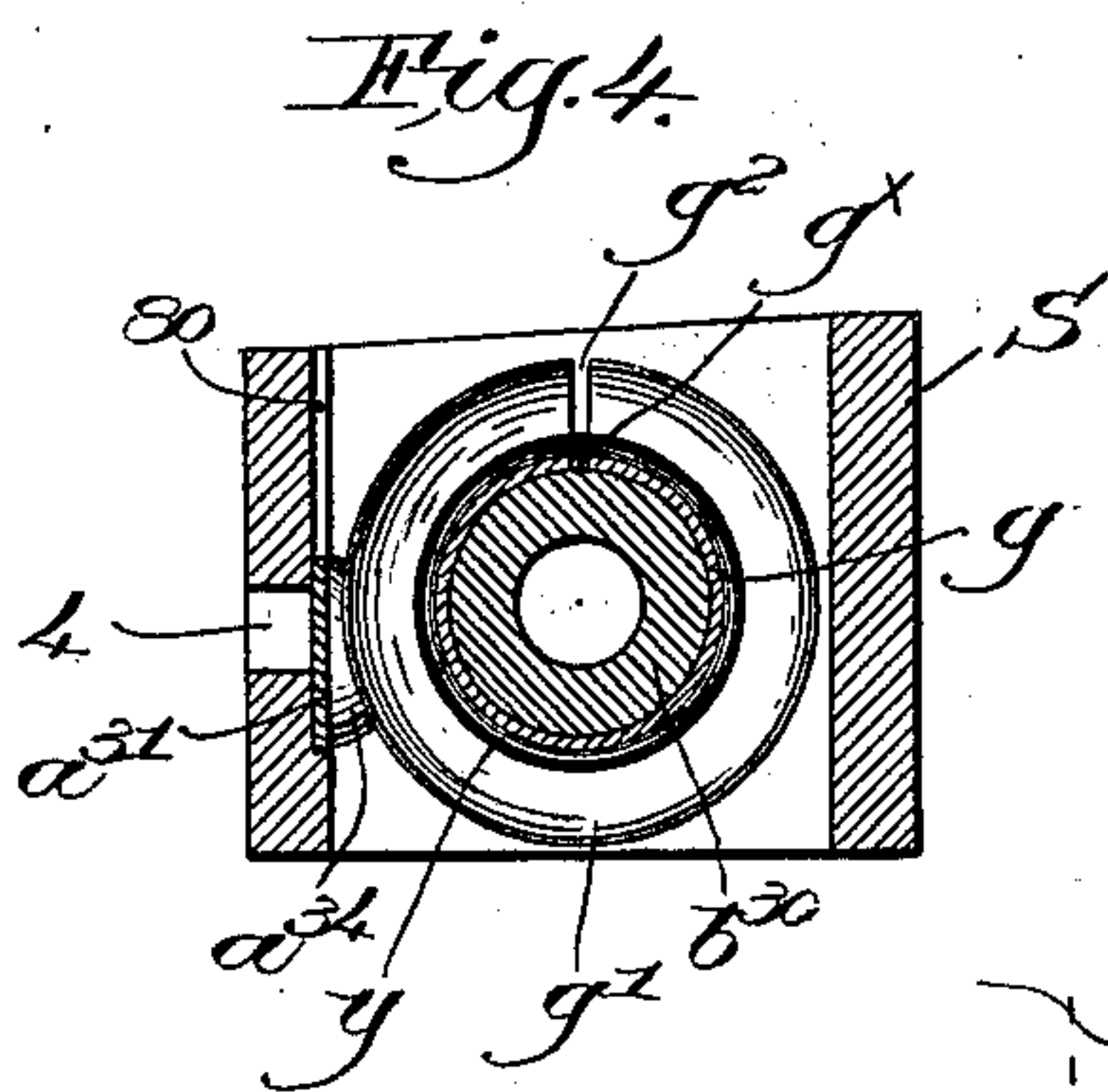
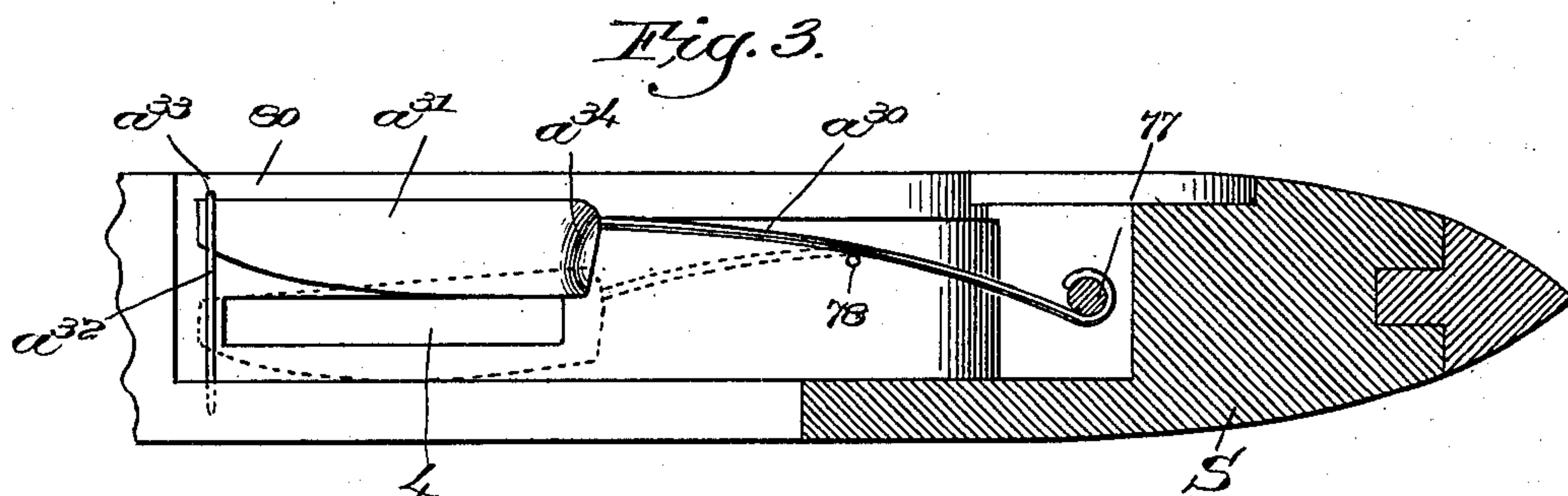
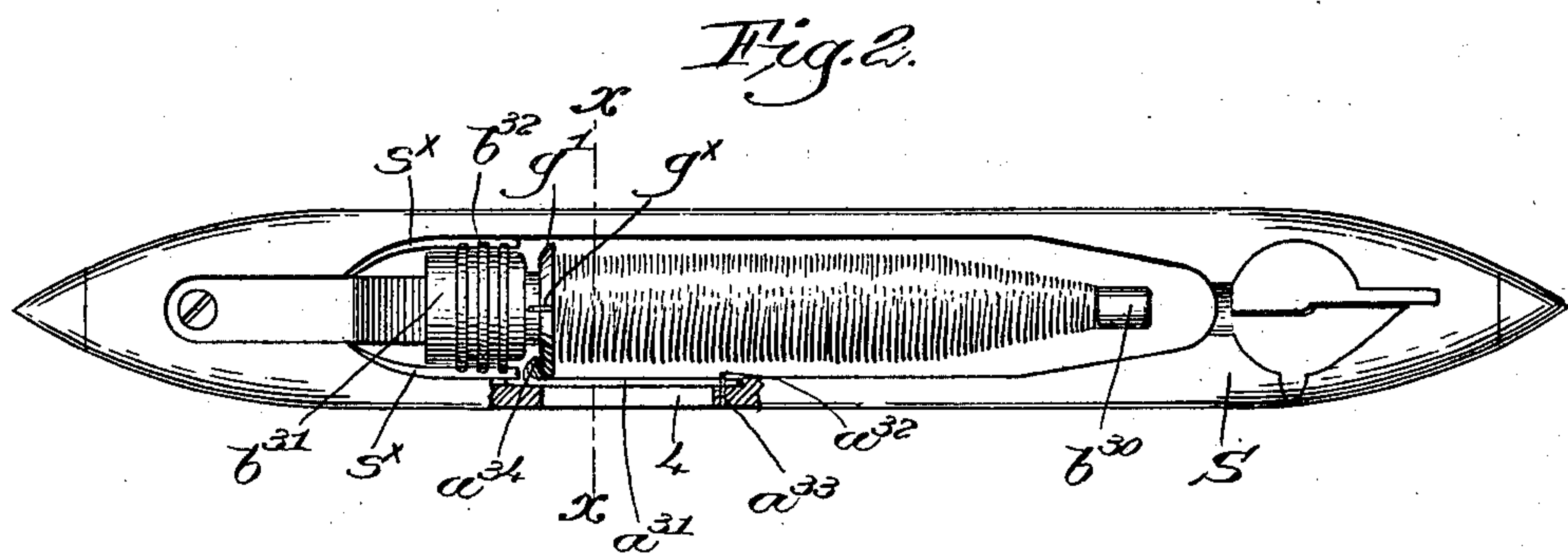
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(Application filed July 12, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY CÔTÉ, OF WOONSOCKET, RHODE ISLAND, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

FILLING-REPLENISHING LOOM AND FILLING-CARRIER THEREFOR.

SPECIFICATION forming part of Letters Patent No. 687,128, dated November 19, 1901.

Application filed July 12, 1901. Serial No. 67,953. (No model.)

To all whom it may concern:

Be it known that I, HENRY CÔTÉ, a citizen of the United States, and a resident of Woonsocket, county of Providence, State of Rhode Island, have invented an Improvement in Automatic Filling-Replenishing Looms and Filling-Carriers Therefor, 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 automatic looms of the type wherein the time of operation of the filling-replenishing mechanism is governed by the quantity of filling remaining in the shuttle, the weaving off of the filling to the desired extent being indicated by suitable means, and therethrough at the appropriate time a change of filling is effected. Such indicating means usually include a feeler, as is the case in my present invention; but the effective action of such feeler is herein determined in a novel manner by the movement of a governing device on the filling-carrier, such device being operatively moved by the filling when the predetermined degree of exhaustion thereof is attained. By my invention the residue of filling on the filling-carrier at the time of replenishment can be reduced to a very small amount indeed, so that the percentage of waste is greatly minimized.

Various other novel features of my invention will be hereinafter described in full, and particularly pointed out in the following claims.

I have herein chosen to illustrate my invention in connection with a loom wherein the feeler is moved at each alternate beat of the lay until the filling has been exhausted to the desired point, whereupon the requisite movement of the feeler is not effected, and through suitable controlling means the filling-replenishing mechanism is then actuated.

Figure 1 is a top or plan view, centrally broken out, of a sufficient portion of a loom to be understood, with one embodiment of my invention applied thereto. Fig. 2 is a plan view, enlarged and partly broken out, of the shuttle with a filling-carrier therein, with the different members in the condition which pertains until the predetermined ex-

haustion of the filling. Fig. 3 is a still larger detail of a portion of the shuttle looking at the interior of one side wall, showing the feeler-actuator in the position assumed when a change of filling is to be effected or when the shuttle is empty, the holding-jaws for the filling-carrier being omitted. Fig. 4 is an enlarged cross-section on the line $x x$, Fig. 2, through the shuttle, filling-carrier, and feeler-actuator. Fig. 5 is a detail of the base or head end of the filling-carrier, showing the governing device thereon in full lines in position to release the feeler-actuator; and Fig. 6 is a similar view showing the preliminary winding of the filling on the governing device with a part of the subsequent winding, which holds the said device in operative position.

In the top or plan view, Fig. 1 the filling-feeder F for the filling-carriers b , the transferrer f' , and the controlling rock-shafts d' , adapted to be rocked to effect a change of filling, are and may be substantially as in United States Patent No. 662,320, dated November 20, 1900.

The stand a , upon which is fulcrumed the L-shaped feeler-arm f^x , extended at its inner end at f^{xx} , the shuttle-box B^x at the left-hand end of the lay A^3 and having an aperture 3 in its front wall, through which the extremity of the feeler f^x passes as the lay beats up, the weft-hammer W , the slide-bar c , having fulcrumed upon it a latch-carrier c^3 , the latch c^x , and the foot c^6 to rest upon the plate 90 at the extremity of the feeler-arm f^{xx} , and the upturned arm d^3 , fast on the controlling-shaft d' to rock the latter when the slide-bar c is moved outwardly, are also all as in the said patent, the latch c^x being normally in the path of a part of the weft-hammer, to thereby move the slide-bar c outward unless the plate 90 is withdrawn from the foot c^6 .

The feeler f^x will be intermittingly engaged and moved until the filling is exhausted to a predetermined extent, each of such feeler movements withdrawing the plate 90 from beneath the foot c^6 to permit the latch c^x to move into inoperative position out of the path of the weft-hammer, as in said patent.

In the patented structure the feeler enters the aperture 3 in the front wall of the shut-

tle-box and also an aperture 4 in the side wall of the self-threading shuttle S to directly engage the filling; but herein a feeler-actuator is mounted on the shuttle, and by a suitable governing device, to be hereinafter described, the actuator is maintained in position to intermittently engage and move the feeler until the filling has been exhausted to a predetermined extent, and at such time the governing device will be positively moved by or through the filling into inoperative position, and the actuator will then assume automatically such a position that it will fail to cooperate with the feeler, and the actuation of the filling-replenishing mechanism is then effected by or through such failure of these parts to cooperate.

In the present embodiment of my invention the shuttle S, which may be an automatically-self-threading shuttle of any usual construction and provided with holding-jaws s^x , Fig. 2, for the head of the filling-carrier, is provided in one of its side walls with an aperture 4, which will register with the aperture 3 in the front wall of the shuttle-box B^x when the shuttle is properly boxed therein, as shown in Fig. 1, and on the inner face of the slotted side wall of the shuttle (best shown by reference to Figs. 2, 3, and 4) I have mounted the feeler-actuator, shown as a thin metallic plate or blade a^{31} , preferably long enough to practically close the aperture 4 when said actuator is in its operative dotted-line position, Fig. 3, a spring-arm a^{30} , secured at one end to the actuator, being shown in Fig. 3 as hooked around the screw 77, which maintains the holding-jaws s^x in place in the shuttle-body, the said arm passing over a lug or projection 78, driven into the adjacent side wall of the shuttle.

The feeler-actuator a^{31} can move down from full to dotted line position when the spring a^{30} is bent, and the vertical movement of the actuator is controlled or limited by a loop-like guide or stop a^{32} , which at its lower end is driven into the bottom of a recess 80, made in the inner face of the side wall, said guide being bent over at its top, as at a^{33} . (See Figs. 2 and 3.) This guide is located at or near the free end of the actuator, and the latter at its end nearest the resilient support a^{30} is provided with an inwardly-projecting cam lump or surface a^{34} , which is engaged by the governing device to be described, when a fresh filling-carrier is inserted into the shuttle to automatically move the actuator into dotted-line position, Fig. 3, and also shown in full lines in the cross-sectional view, Fig. 4, to close the aperture 4 in the side wall of the shuttle, and when said actuator is in such position it will be obvious that the entrance of the feeler f^x into the interior of the shuttle is prevented.

Referring now to Figs. 2, 4, 5, and 6, the filling-carrier, which is of a construction in general well known in the art, comprises, essentially, an elongated barrel b^{30} , an enlarged

head or base portion b^{31} , provided with the usual annular rings or enlargements b^{32} , to be engaged by the holding-jaws, the filling-carrier as a whole being designated by the reference-letter b in Fig. 1. A governing device for the feeler-actuator is mounted on the filling-carrier, and comprises, as herein shown, an elongated tubular sleeve-like body g , having at its end nearer the base of the filling-carrier an enlarged annular head or governor g' , which is best shown in Fig. 4 as radially slotted at g^2 to receive a loop-like limiting-stop g^x , which is conveniently made of a piece of wire extended longitudinally of the filling-carrier and bent at its ends and driven into the barrel, its rear end being bent inward between the base of the filling-carrier and the head or governor g' and its forward end passing into the barrel adjacent a stop, shown as a ring or collar g^3 , rigidly secured to the barrel, the front end of the tubular body g of the governing device being notched, as at g^4 , Figs. 5 and 6, to receive the bent-in end of the wire g^x .

In Fig. 5 the two limits of movement of the governing device are shown in dotted lines, said device being readily movable longitudinally on the filling-carrier, but being restrained from rotation thereon by the wire g^x and having its movement toward the tip of the filling-carrier limited by the stop g^3 .

When the yarn is to be wound upon the filling-carrier, the latter is placed upon the upright spindle in well-known manner, and at such time the weight of the governing device will cause it to drop toward the base of the filling-carrier into dotted-line position, Fig. 5, or full-line position, Fig. 6, and referring now more particularly to the latter figure the yarn is wound initially upon the body g , as at y , Fig. 6, forming what I have termed a "preliminary winding," and then the yarn is wound about the barrel of the filling-carrier between the stop g^3 and the adjacent end of the tubular body g , as at y' , this latter winding constituting the beginning of what I have termed the "service-winding"—that is to say, the main wound mass of filling which is to be laid by the shuttle in the shed. The preliminary winding y will contain sufficient filling to extend at least once across the lay, and it will be noticed by reference to Fig. 2 and also to Fig. 1 that the service-winding of the yarn is traversed upon the filling-carrier between the head g' of the governing device and the tip of the filling-carrier in usual manner, the outline of such service-winding being partially indicated by dotted lines in Fig. 6. The portion of yarn laid upon the barrel at y' between the stop g^3 and the adjacent end of the governing device will prevent any longitudinal movement of the latter toward the tip of the filling-carrier, and the full filling-carrier (shown in Figs. 1 and 2) will have the governor g' held firmly in position near the base of the filling-carrier, so that when the latter is inserted in the

shuttle in well-known manner by the automatic filling-replenishing mechanism said governor will engage the cam-surface a^{34} of the actuator and will depress the latter into the dotted-line position, Fig. 3, and full-line position, Fig. 4, in the latter figure the governor being shown as in operative engagement with the actuator and holding it in its operative position.

It will be remembered that so long as the actuator and the feeler f^x cooperate on alternate forward beats of the lay the latch c^x will be moved out of the path of the weft-hammer, and no actuation of the filling-replenishing mechanism will be effected. It is also to be remembered that in this apparatus a fresh supply of filling is to be inserted in the shuttle prior to the complete exhaustion of the filling-in play, and I will now describe the manner in which the exhaustion of filling to a predetermined extent operates to effect, through the governing device on the filling-carrier, the operation of the filling-replenishing mechanism.

As the shuttle lays the filling the latter is woven off from the filling-carrier gradually down to the winding y' , and when the latter has been woven off it will be manifest that there will be nothing to prevent longitudinal movement of the governing device toward the tip of the filling-carrier into inoperative position. As soon as the yarn begins to draw off from the preliminary winding y the yarn tension will act to positively pull the governing device forward into full-line position, Fig. 5, thereby drawing the head g' away from engagement with the cam-surface a^{34} , and as soon as the feeler-actuator is thus released the resiliency of its supporting-arm a^{30} will cause it to rise into full-line inoperative position, Fig. 3, thus uncovering the aperture 4 in the shuttle-wall, and when the shuttle enters the box B^x the feeler f^x will enter the aperture 3 in the front wall of said shuttle-box and will also pass freely through the aperture 4 into the interior of the shuttle-body, and hence the feeler will not be moved, so that the plate 90 will not be withdrawn from beneath the foot c^6 . The latch-carrier c^6 accordingly will not be rocked on its fulcrum. The latch c^x will remain in the path of and be engaged by the weft-hammer W , and the slide-bar c will be moved outwardly against the arm d^3 , to thereby in well-known manner effect the operation of the filling-replenishing mechanism when the shuttle reaches the right-hand shuttle-box, and a new supply of filling will be inserted in the shuttle.

As is common in looms of this character, the incoming or fresh supply of filling ejects the spent filling-carrier, which passes freely through the bottom of the shuttle and out through the usual slot in the bottom of the shuttle-box, the governor or head g' of the governing device being small enough to readily pass through the shuttle from top to bottom. The pull of the yarn which posi-

tively moves the governing device forward or toward the tip of the filling-carrier is assisted rather than hindered by the action of the cam-surface a^{34} on the head g' of such governing device, as it will be manifest that the resiliency of the supporting-arm a^{30} when the actuator is depressed into operative position always has a tendency to lift the actuator and to push the device forward on the filling-carrier, so that there is practically no tendency whatever to break the yarn at this point by increasing the strain upon it.

By making the preliminary winding y sufficient to extend at least across the lay it will be manifest that there will be enough filling left in the shuttle to be laid, as the shuttle is thrown from the detecting or feeling box B^x at the left side of the loom toward the opposite right-hand box in the present instance, which is adjacent the filling-replenishing mechanism, such box being indicated at B , Fig. 1.

It will be manifest from the foregoing description that the residue of yarn on the filling-carrier when the latter is ejected from the shuttle by the incoming fresh or full filling-carrier is reduced to a minimum, as practically the entire body of yarn will be used up before the change is effected.

As a matter of fact, of course enough additional yarn should preferably be included in the preliminary winding to afford a factor of safety, giving a little more yarn in each preliminary winding than is sufficient to extend once across the lay.

I am aware that heretofore a filling-carrier has been provided with a longitudinally-movable governing device held in one position by the filling until the latter has been exhausted to a predetermined extent, the said governing device thereafter being moved, by or through the shock due to stoppage of the shuttle in the shuttle-box, into position to cooperate with and move a feeler; but it will be manifest that such operation and arrangement are entirely different from that herein shown and claimed, as in the present instance the governing device is not only moved positively into abnormal position upon exhaustion of the filling to a predetermined extent, but said governing device does not at any time cooperate directly with the feeler. It merely fulfils the function of a governing device or controller for the feeler-actuator.

My invention is not restricted to the precise construction and arrangement herein shown and described of one practical embodiment of my invention, for so far as I am aware it is broadly new to control a feeler-actuator by or through the movement of a governing device on the filling-carrier, the movement of such device being effected by or through the yarn when exhausted to a predetermined extent.

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

1. In a loom, a shuttle, a filling-carrier

therein having a governor maintained operative by the filling until exhausted to a predetermined extent, the filling upon subsequent weaving off acting upon and moving
 5 said governor into inoperative position, an actuator mounted on the shuttle and normally maintained by the governor operative to intermittently engage and move the feeler, filling-replenishing mechanism, and control-
 10 ling means therefor, including a feeler, failure of the latter to cooperate with the actuator, due to its release by the governor when the latter becomes inoperative, effecting the actuation of the filling-replenishing mechanism.

15 2. In a loom provided with automatic filling-replenishing mechanism, means, including a feeler, to control it, a shuttle, and a filling-carrier therein provided with means to effect an intermitting movement of the feeler
 20 until the filling is exhausted to a predetermined extent, the filling, upon such exhaustion, positively moving the means governed thereby into inoperative position, to prevent movement of the feeler and through the latter
 25 effecting the actuation of the filling-replenishing mechanism.

3. In a loom provided with automatic filling-replenishing mechanism, means, including a feeler, to control it, a shuttle, a filling-
 30 carrier therein, and means to effect an intermitting movement of the feeler until the filling is exhausted to a predetermined extent, such means including a member longitudinally movable on the filling-carrier, a preliminary
 35 winding of the filling being wound upon a part of said member, subsequent winding holding the latter in operative position, weaving off of the preliminary winding acting to effect positive longitudinal movement of said
 40 member and operating to thereby prevent movement of the feeler, to thereby effect the actuation of the filling-replenishing mechanism.

4. In a loom provided with automatic filling-replenishing mechanism, means, including a feeler, to control it, a shuttle, a filling-
 45 carrier therein, and means to effect an intermitting movement of the feeler until the filling is exhausted to a predetermined extent, such means including a collar longitudinally
 50 movable on the filling-carrier and having an annular enlargement, a preliminary winding of the filling sufficient to extend across the lay being wound upon the collar, subsequent
 55 winding holding the latter in operative position, exhaustion of the filling to the preliminary winding then acting by the pull of the filling to positively move the collar into inoperative position, to prevent movement of the
 60 feeler and therethrough effect the actuation of the filling-replenishing mechanism.

5. In a loom provided with automatic filling-replenishing mechanism, a feeler, a shuttle, a filling-carrier therein having a longitudinally-movable governor maintained operative by the filling, and an actuator on the
 65 shuttle held by the operatively-positioned

governor in the path of and to intermittently move the feeler, exhaustion of the filling to a predetermined extent moving the governor
 70 to release the actuator and prevent cooperation thereof with the feeler, to thereby effect through the latter the actuation of the filling-replenishing mechanism.

6. In a loom provided with automatic filling-replenishing mechanism, a feeler, a shuttle, a filling-carrier therein having a longitudinally-movable, annular governor upon a part of which a preliminary winding of the filling is wound, the main filling mass holding the governor operative, and an actuator mounted on the shuttle and moved by the governor into operative position upon insertion of the filling-carrier in the shuttle to intermittently engage and move the feeler,
 75 withdrawal of the filling to the preliminary winding moving the governor to release the actuator, failure of the feeler to cooperate with the latter acting through said feeler to effect the operation of the replenishing mechanism.
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7. In a loom provided with automatic filling-replenishing mechanism, a feeler, a shuttle, a filling-carrier therein having a longitudinally-movable governor maintained operative
 95 by the filling, until exhausted to a predetermined extent, and a yielding-mounted actuator on the shuttle, having a part thereof in the path of the governor when a filling-carrier is inserted in the shuttle, to move the
 100 actuator into position to intermittently engage and move the feeler until the predetermined exhaustion of the filling, movement of the governor at such time releasing the actuator and permitting it to return to inoperative position, out of the path of the feeler, failure of the latter to be moved effecting the actuation of the replenishing mechanism.
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8. In a loom provided with automatic filling-replenishing mechanism, a feeler, a shuttle having an aperture in its side wall to receive the feeler, a yielding-mounted actuator on the shuttle, to open or close the aperture, a filling-carrier, and a longitudinally-movable governor thereon to engage the actuator and close the aperture, to effect intermitting movement of the feeler by engagement with the actuator, the governor being retained in operative position by the filling until exhausted to a predetermined extent,
 110 subsequent movement of the governor relatively to the filling-carrier releasing the actuator and thereby opening the aperture, to permit entrance of the feeler and actuation of the replenishing mechanism.
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9. In a loom provided with automatic filling-replenishing mechanism, a feeler, a shuttle, a feeler-actuator mounted thereon, adapted when operative to intermittently engage and move the feeler, a filling-carrier sustained
 130 in the shuttle, and means movably mounted on the filling-carrier to operatively position the actuator and so retain it until said means is rendered inactive, the filling when weaving

off after predetermined exhaustion thereof positively moving said means, subsequent failure of the feeler to coöperate with the actuator operating by or through the former to effect the actuation of the replenishing mechanism.

10. In a loom provided with automatic filling-replenishing mechanism, a feeler, a shuttle, a spring-supported actuator thereon, a filling-carrier adapted to be sustained in the shuttle, and longitudinally-slidable means on the filling-carrier to depress the actuator into the path of and to intermittingly move the feeler, said means being moved by the filling, when exhausted to a predetermined extent, to release the actuator and prevent coöperation thereof with the feeler, to thereby effect the actuation of the replenishing means.

11. In a loom provided with automatic filling-replenishing mechanism, means to control the time of operation thereof, a shuttle, and a filling-carrier therein having a governing device movable thereon for said controlling means, the said device being held from movement by the filling until exhausted to a predetermined extent, the filling, upon subsequent drawing off of the same from the filling-carrier positively moving the governing device into position to effect, through the controlling means the actuation of the filling-replenishing mechanism.

12. In a loom provided with automatic filling-replenishing mechanism, means to control the time of operation thereof, a shuttle, a filling-carrier therein, and a governing device for said controlling means, bodily movable longitudinally upon the filling-carrier, a preliminary winding of the filling sufficient to extend at least once across the lay being wound upon a portion of said device, the latter being held from movement by the service-winding of the filling until the latter is exhausted to said preliminary winding, weaving off of the said winding acting to positively move the governing device into position to effect, through the controlling means, the actuation of the replenishing mechanism.

13. In a loom, a shuttle, a filling-carrier therein having a longitudinally-movable governing device, the filling being wound initially upon the latter and thereafter to retain it from movement until exhaustion of the filling to a predetermined extent, filling-replenishing mechanism, and controlling means therefor, the governing device when released being moved by filling tension into position to effect, through the controlling means, the actuation of the replenishing mechanism.

14. A filling-carrier for looms, having a longitudinally-movable governing device thereon provided with an enlarged annular head, said device supporting a preliminary winding of the filling and being held from movement by the service-winding.

15. A filling-carrier for looms, having a collar longitudinally movable thereon and provided at its end nearer the base of the filling-carrier with an annular, enlarged head, and means to limit longitudinal movement of said device.

16. A filling-carrier for looms, having a collar longitudinally movable thereon and provided at its end nearer the base of the filling-carrier with an annular, enlarged head, and means to prevent rotation of said device and to also limit its longitudinal movement.

17. A filling-carrier for looms, having upon its barrel a longitudinally-movable annular governor provided with an elongated tubular body surrounding the barrel and extended toward the tip thereof, a preliminary winding of the filling being laid upon the body and subsequent filling-winding keeping the governor in position near the base of the filling-carrier.

18. A shuttle for feeler-looms, having a feeler-actuator mounted thereon, a filling-carrier adapted to be inserted in the shuttle, and a device longitudinally movable on said filling-carrier and held in position by the filling until exhausted to a predetermined extent, to move the actuator into operative position when the filling-carrier is inserted in the shuttle, the pull of the filling when weaving off after predetermined exhaustion acting upon said device to move it into inoperative position.

19. A shuttle for feeler-looms, a spring-supported feeler-actuator mounted thereon, a filling-carrier, and a governor thereon held by the main mass of filling in position to engage and move the actuator into active position when the filling-carrier is inserted in the shuttle, the filling when weaving off after exhaustion to a predetermined extent acting upon and positively moving the governor to release the actuator.

20. A shuttle for feeler-looms, having an aperture in one of its side walls, a feeler-actuator movably mounted on the shuttle, means to move the actuator to open said aperture, a filling-carrier adapted to be inserted in the shuttle, and means on said filling-carrier to move the actuator to close the aperture, the filling on the filling-carrier maintaining such means in engagement with the actuator until exhaustion of the filling to a predetermined extent, the filling when subsequently weaving off acting upon said means and rendering the same inoperative relative to the actuator.

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

HENRY CÔTÉ.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST W. WOOD.