

No. 665,624.

Patented Jan. 8, 1901.

H. W. WYMAN.
STOP MOTION FOR LOOMS.

(Application filed June 13, 1900.)

(No Model.)

3 Sheets—Sheet 1.

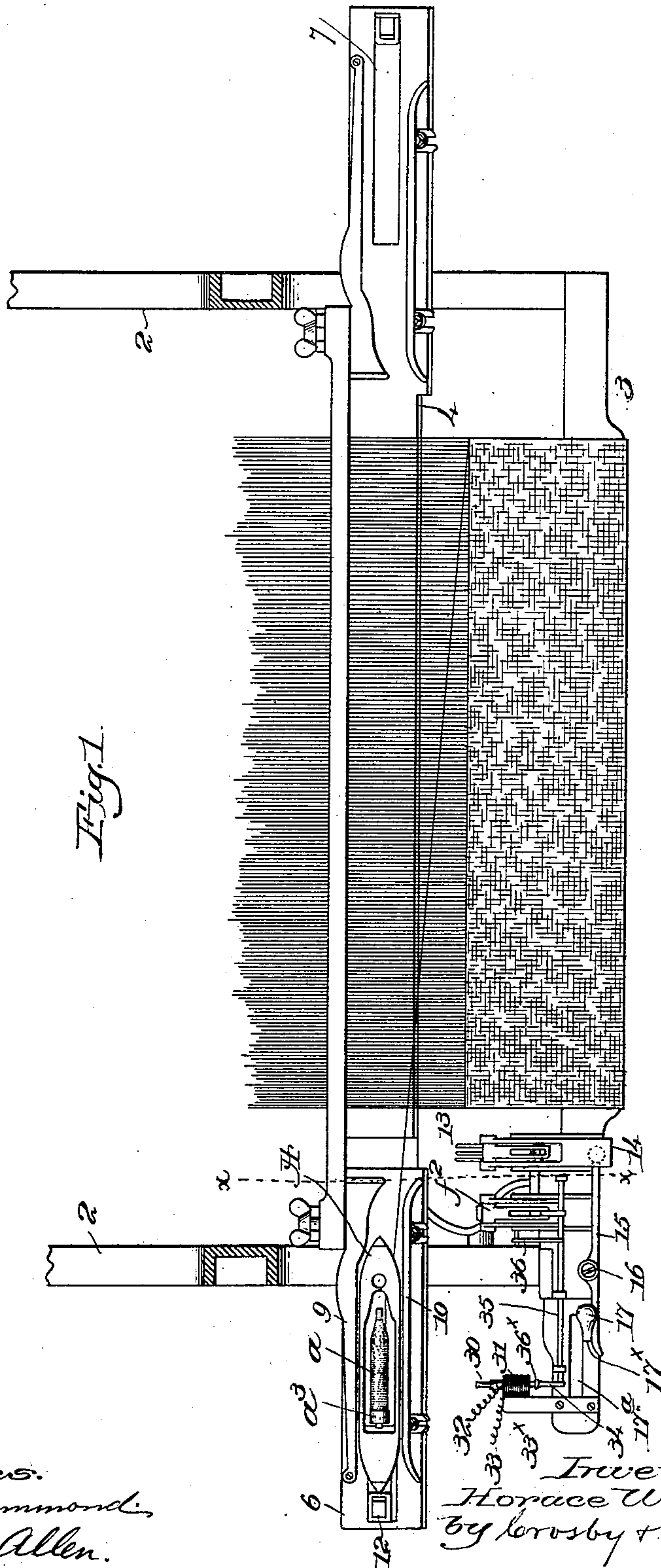


Fig. 1.

Witnesses.
Thomas Drummond,
Edward H. Allen.

Inventor.
Horace W. Wyman,
by Crosby & Gregory
Attys.

No. 665,624.

Patented Jan. 8, 1901.

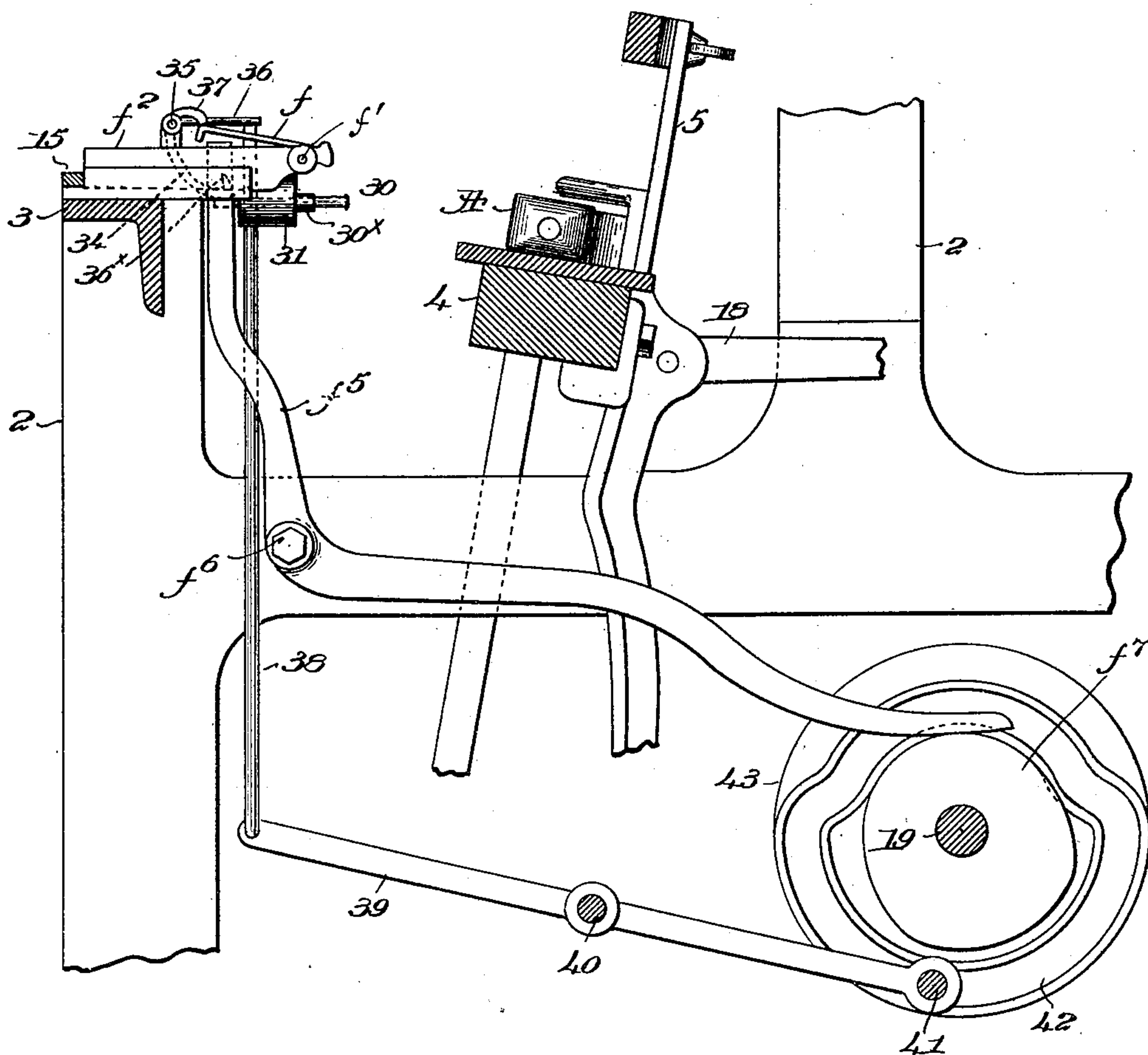
H. W. WYMAN.
STOP MOTION FOR LOOMS.

(Application filed June 13, 1900.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.



Witnesses.
Thomas J. Drummond,
Edward F. Allen.

Inventor.
Horace W. Wyman,
by Crosby & Gregory
attys.

No. 665,624.

Patented Jan. 8, 1901.

H. W. WYMAN.
STOP MOTION FOR LOOMS.

(Application filed June 13, 1900.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 3.

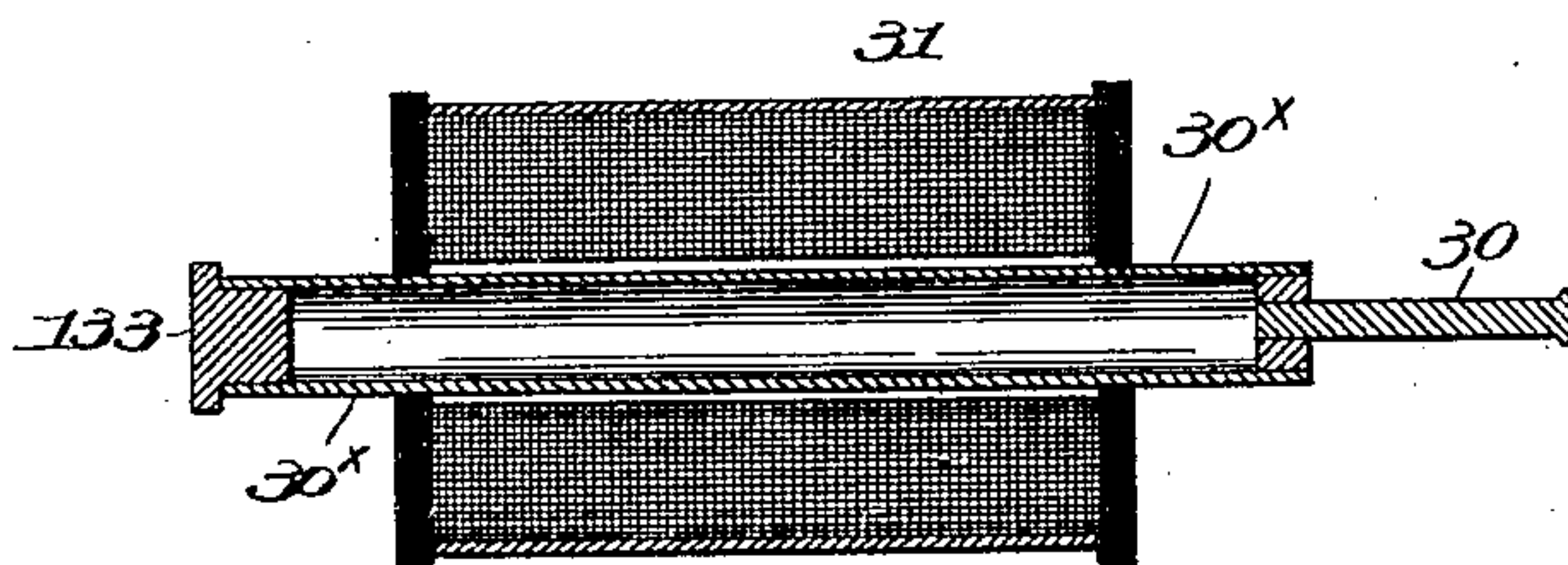


Fig. 4.

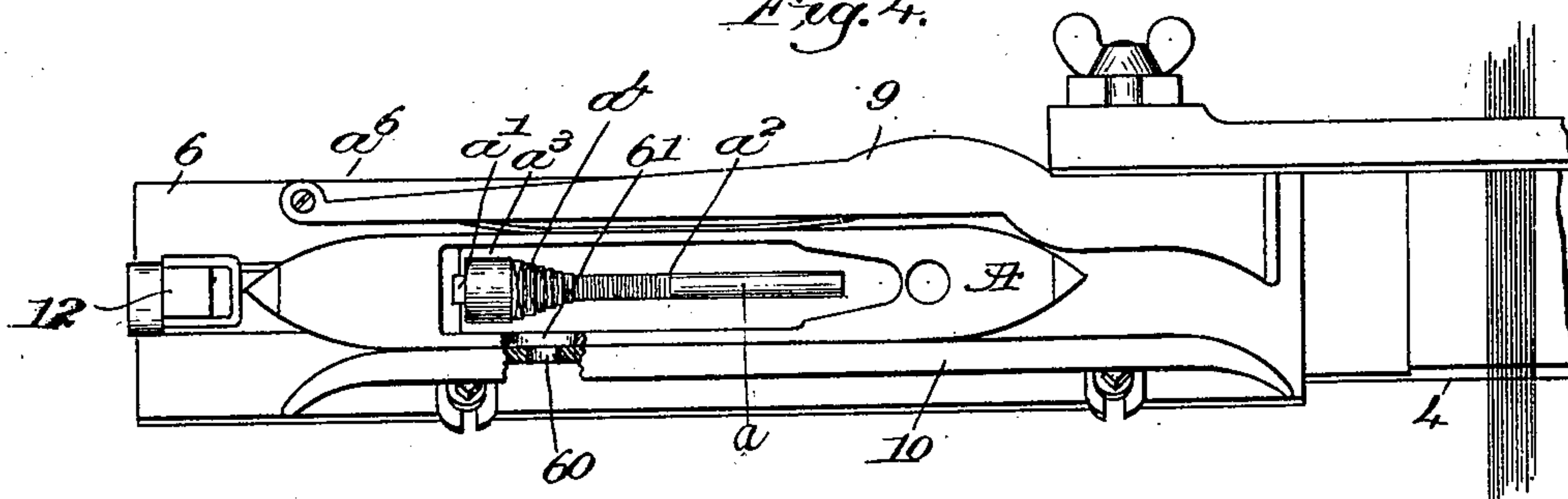


Fig. 6.

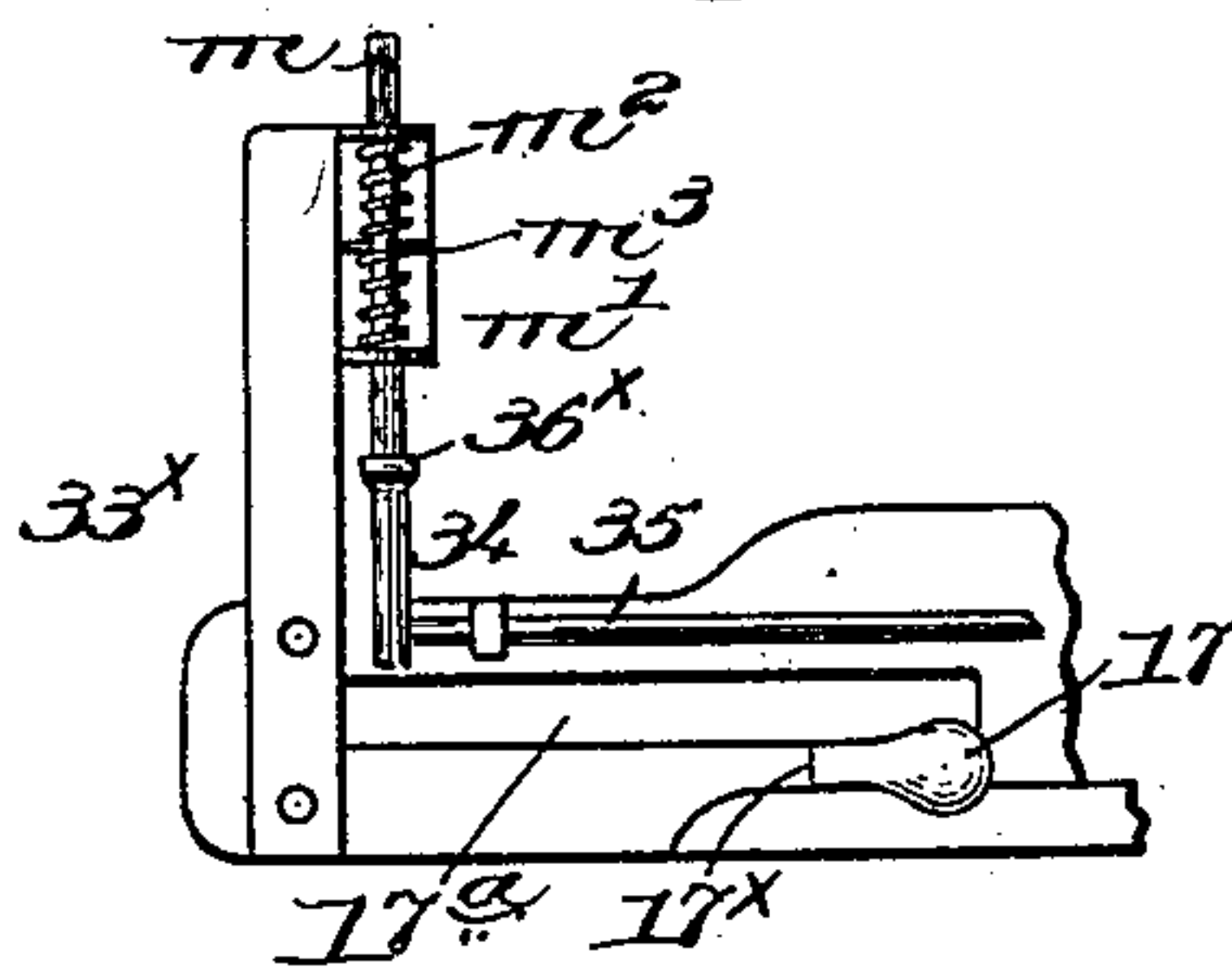


Fig. 5.



Witnesses.

Thomas J. Drummond.
Edward G. Allen.

Inventor.
Horace W. Wyman,
by Crosby & Gregory
attys.

UNITED STATES PATENT OFFICE.

HORACE W. WYMAN, OF WORCESTER, MASSACHUSETTS.

STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 665,624, dated January 8, 1901.

Application filed June 13, 1900. Serial No. 20,124. (No model.)

To all whom it may concern:

Be it known that I, HORACE W. WYMAN, a citizen of the United States, residing at Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

To enable perfect cloth to be woven, all filling must reach fully from selvage to selvage, and consequently to weave perfect cloth it is necessary to stop the loom before the filling on the filling-carrier has become fully exhausted. At the present time looms are in use containing filling-carriers provided with a metallic surface with which coöperates a feeler to detect the substantial or near exhaustion of filling from the carrier, and the movement of the feeler operates suitable means to supply fresh filling. In another application, Serial No. 9,658, filed by me on March 22, 1900, I have shown a filling-carrier provided with magnetic material and a coating magnetized feeler, the feeler being moved by the filling-carrier when the filling has been exhausted to the predetermined point, thus putting the filling-carrier in its abnormal position and effecting a change of filling.

My present invention has for its object to apply the feeler mechanism represented in said application as a means to stop the loom whenever the filling has been substantially or nearly exhausted, my invention being applicable to ordinary cotton looms wherein the insertion of filling is controlled by the hand of the operator.

Figure 1 in plan view represents a sufficient portion of a loom to enable my invention to be understood. Fig. 2 is a section in the line x , Fig. 1, with the addition of a portion of the usual cross-shaft and cams operative in stopping the loom before the filling is fully exhausted, said cam and the levers operated by it being omitted from Fig. 1. Fig. 3 is an enlarged detail of one form of feeler with a surrounding coil, thus making of the feeler a solenoid. Fig. 4 is an enlarged detail of one end of the lay and a shuttle therein having a filling-carrier constructed in accordance with my invention, the plate against which

the front side of the shuttle works and the wall of the shuttle being broken away to show openings therein. Fig. 5 is an enlarged detail showing the base or head of the filling-carrier, and Fig. 6 shows a modified form of feeler.

Referring to the drawings, the loom-frame 2, the breast-beam 3, the lay 4, having a reed 5 and shuttle-boxes 6 and 7, one at each end of the lay, the binders 9, the front walls 10 of the shuttle-boxes, the picker-stick 12, having the usual picker for throwing the shuttle, the filling-fork 13, carried by the filling-fork slide 14, the lever 15, pivoted at 16 and moved by the said slide whenever the weft breaks to thus effect the release of the shipper-handle 17 and let it in its movement effect in any usual manner the stopping of the loom, the lay-connecting rods 18, (shown partially only in Fig. 2,) the cam-shaft 19, driven in practice from a gear on the usual crank or lay shaft (not shown) through a suitable gear (not shown) connected with the cam-shaft so that said cam-shaft is rotated once to two rotations of the crank-shaft, the shuttle A, the slide-bar f^2 , with the exceptions to be hereinafter specifically described, the overbalanced lever f , pivoted thereon at f' and having a heavier end next the lay, so that the downturned end of the lever f is maintained normally in its elevated position, as shown in Fig. 2, due to the weight of said heavier end, and the lever f^5 , pivoted at f^6 and operated once for each pick by the cam f^7 on the cam-shaft 19, are and may be all as common in the loom described in my said application.

Herein the shuttle A is represented of the kind ordinarily used in cotton-looms, and the filling-carrier is represented as a bobbin a , sustained by a spindle a' , held in any suitable or usual manner in the shuttle. The bobbin herein represented is, however, peculiar in that it is provided (see Fig. 5) between its barrel a^2 and its head a^3 with a magnetic surface a^4 of a considerable length in the direction of the bobbin, said surface covering substantially the conical part of the bobbin upon which the base of the cop or filling is wound. As herein shown, the base is stepped or provided with a series of annular projections varying in diameter, and the magnetic surface applied to the conical part of the bobbin

is also stepped, so that the filling is wound on the cone-shaped magnetic surface. Although the magnetic surface may be of the same diameter throughout and operate equally well, yet I prefer the cone or tapered shape, as herein shown. These steps in the magnetic surface perform an important office, as they prevent the filling from slipping away from the magnetic surface during the operation of weaving, and thereby expose the magnetic surface to the feeler before the near exhaustion of the filling; and thereby stop the loom before the proper time. This magnetic surface may be applied to the bobbin by sliding it upon the bobbin and then by pressure shrinking the metal to fit the conical portion of the bobbin whatever its outline—that is, whether stepped or not—and the end a^5 of the magnetic surface is spun or worked into a suitable groove, it may be, in the bobbin. The extension of this magnetic surface in the direction of the length of the bobbin is of material advantage, for the reason that at times the shuttle coming into the shuttle-box rebounds and occupies different positions when a feeler, to be described, enters the hole 60 in the wall 10 and the hole 61 in the shuttle-body; but by lengthening the hole 61, as represented in Fig. 4, and providing the bobbin with the extended surface a^4 , so located as to be covered with thread, the feeler may contact with the magnetic surface whenever the latter is sufficiently exposed to warrant the stopping of the loom, and consequently it is not necessary to provide the loom with any shuttle-positioning part, as would be the case if the hole 61 was but slightly larger than the diameter of the feeler and the magnetic surface on the bobbin were but substantially of the length of the diameter of the feeler.

In Figs. 1 and 3, 30 represents the feeler, it, as shown, consisting of a magnetized bar carried by a cylindrical body 30^x , provided with a head 133, the said body being surrounded by a wire coil 31, wound in any usual way and in communication with a suitable battery or other source of electrical supply, the coil and body of the feeler acting as a solenoid, which, it will be understood, causes the body of the feeler to occupy a normal position in the coil; but the body may slide in the coil into an abnormal position, the electricity in the coil immediately restoring the body to its normal position. The coil 31 is sustained (see Fig. 1) on a suitable stand 33^x , and viewing said figure the ends of the wires of the coil are represented by 32 and 33. The shipper-handle 17 when the loom is running is held in a notch 17^x at one end of the slot 17^a , in which the shipper-handle works. This shipper-handle in practice may be connected operatively with any usual or suitable mechanism for insuring the starting or stopping of the loom, the loom running so long as the shipper-handle is in engagement with the stop 17^x , as represented in Fig. 1. I have not herein shown any means made operative

by the release of the shipper-handle to stop the loom; but the means may be that commonly in use—as, for instance, in United States Patent No. 593,070, dated November 2, 1897—or as commonly found in any usual loom.

The breast-beam or a suitable continuation thereof has suitable bearings or stand, in which is mounted a rock-shaft 35, having at one end a downturned arm 34, the shape of which is best shown in Fig. 2, said arm having, it may be, at its lower end an upwardly-extended lip. (Shown in Fig. 2.) The rock-shaft 35 near its opposite end has a projection 37. The lower end of the arm 34 rests normally upon the head 133 of the feeler, and each time the lay moves forward the feeler 30 receives over it the wall 10 of the shuttle-box and at every other forward beat of the lay the shuttle is present in the box, and at such beats the shuttle itself is carried sufficiently far forward to enable the feeler 30 to meet the filling on the filling-carrier, which pushes the feeler toward the breast-beam; but such movement does not remove the feeler from under the arm 34, and when the lay is moved backwardly the feeler is restored to its normal position. The feeler, it will be understood from the foregoing description, behaves as a magnet and coacts with the magnetic surface on the bobbin, and whenever the feeler meets the magnetic surface of the bobbin or whenever the feeler comes sufficiently close to said magnetic surface as to enable the feeler to be moved by the force of attraction with the lay and the shuttle on their back stroke the feeler will be put into its abnormal position, it being drawn away from the breast-beam for a distance sufficient to retire from the arm 34, letting the rock-shaft 35 turn, due to the fact that said arm is no longer supported, causing the arm or projection 37 to meet the lever f and depress it sufficiently far to put the depending end of said lever in the range of movement of the lever f^5 , which done, the lever f^5 in engagement with the lever f moves the slide f^2 to the left, viewing Fig. 2, causing the ends of said slide to meet the lever 15 and move it in a direction to effect the release of the shipper-lever, which constitutes the active part, as I have said, of any usual or suitable stop-motion device. For the best results I prefer to use the coil, and whenever the feeler is put into its abnormal position—that is, whenever it is drawn with the lay on its back stroke far enough to retire from contact with the arm 34—the loom will be immediately stopped.

I have illustrated the feeler as a magnet and the metal of the bobbin as magnetic; but my invention would not be departed from if the metallic surface of the bobbin were magnetized and the feeler was made as a magnetic body, and, in fact, I can stop the loom by a feeler composed of a magnetized bar m , as represented in the modification, Fig. 6, the feeler being maintained in its normal position

by means of a suitable spring or springs m^2 , said bar being sustained in a suitable guide m' , attached to the stand 33^x, the withdrawal of the feeler from the stand and the spring being prevented by a suitable stud or pin m^3 , which is represented as extended through the magnetized bar m .

In practice the binders will be acted upon in usual manner by fingers controlled by suitable springs.

The rock-shaft 35 has an extension or arm 36, which is acted upon by the rod 38, connected with the lever 39, moved by the cam 42 immediately after the lever f^5 has engaged the lever f and moved the slide f^2 backwardly, the rising of the rod 38 turning the rock-shaft 35 to put the lever 34 above the line of movement of the feeler, so that the feeler may immediately come again into its normal position.

My invention is applicable for use in connection with cops, as well as with bobbins, and it will be understood that many cops are or may be wound on metallic cop-tubes, they extending somewhat into the base or large end of the thread mass, and when the large end of the cop is sufficiently exhausted to substantially or partially uncover the tube, so that the feeler and the tube may be mutually attracted, the feeler will be moved into its abnormal position.

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

1. In a loom, a filling-carrier and a feeler yieldingly sustained in normal position, one presenting a magnetic and the other a magnetized body, and stop mechanism operated by said feeler when in its abnormal position due to the coaction of said feeler with said filling-carrier.

2. In a loom, a lay, a shuttle having a weft-carrier presenting a magnetic surface between its barrel and head, and having in its front side wall an opening, a shuttle-wall having an opening, a feeler composed of a magnetized body, stop-motion devices, means between said feeler and said stop-motion devices, said means being held in inoperative

position while the feeler is in its normal position, the movement of the feeler into its abnormal position, due to the substantial exhaustion of the filling on the bobbin, effecting the movement of the stop-motion device to stop the loom.

3. In a loom, a lay, a shuttle having a weft-carrier provided with a magnetic surface between its head and body, and having in its front side wall an opening, a shuttle-wall having an opening, and a feeler composed of a magnetized body, stop-motion devices, and means between said feeler and said stop-motion devices made operative to stop the loom by the withdrawal of filling from the magnetic surface of the filling-carrier to a predetermined point.

4. In a loom, a shuttle, a filling-carrier provided with a magnetic body provided with steps to retain the filling upon its surface, a magnetic feeler adapted to contact with said carrier as the filling is withdrawn to expose the magnetic body of the carrier, and stop devices to stop the loom upon the movement of said feeler into its normal condition.

5. In a loom, a shuttle, a filling-carrier provided with a magnetic body having steps of different diameter, said steps serving to retain the filling against longitudinal displacement, combined with stop-motion devices, and a magnetized feeler coacting with the magnetic body of said carrier before the near exhaustion of the filling from said carrier to move said feeler into its abnormal position and stop the loom.

6. A bobbin having a barrel and a head, and a magnetic covering surrounding a tapered portion of the body between its barrel and head.

7. A bobbin having at its exterior a stepped surface covered with magnetic material.

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

HORACE W. WYMAN.

Witnesses:

GEO. W. GREGORY,
MARGARET A. DUNN.