

No. 662,441.

Patented Nov. 27, 1900.

O. JANELLE.
FILLING SUPPLY LOOM.

(Application filed Jan. 2, 1900.)

(No Model.)

4 Sheets—Sheet 1.

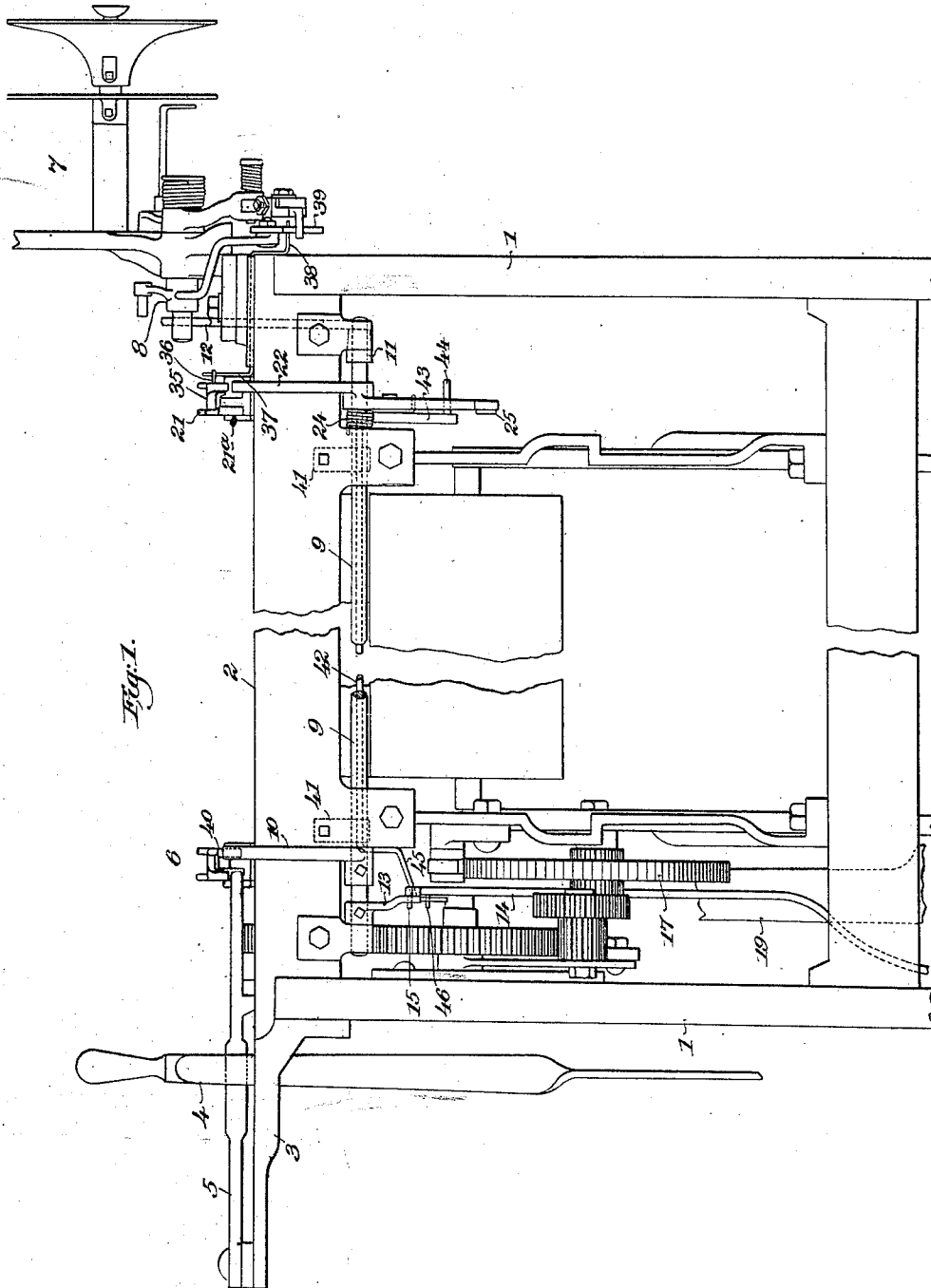


Fig. 1.

Witnesses.

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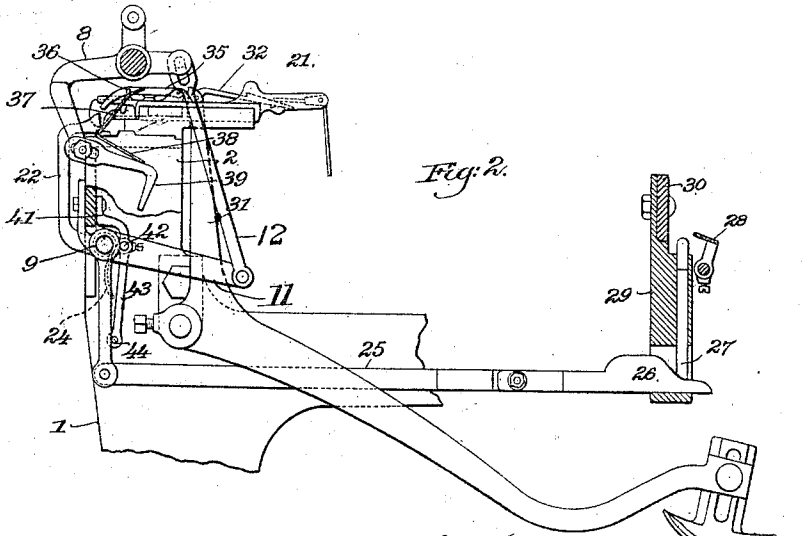


Fig. 2.

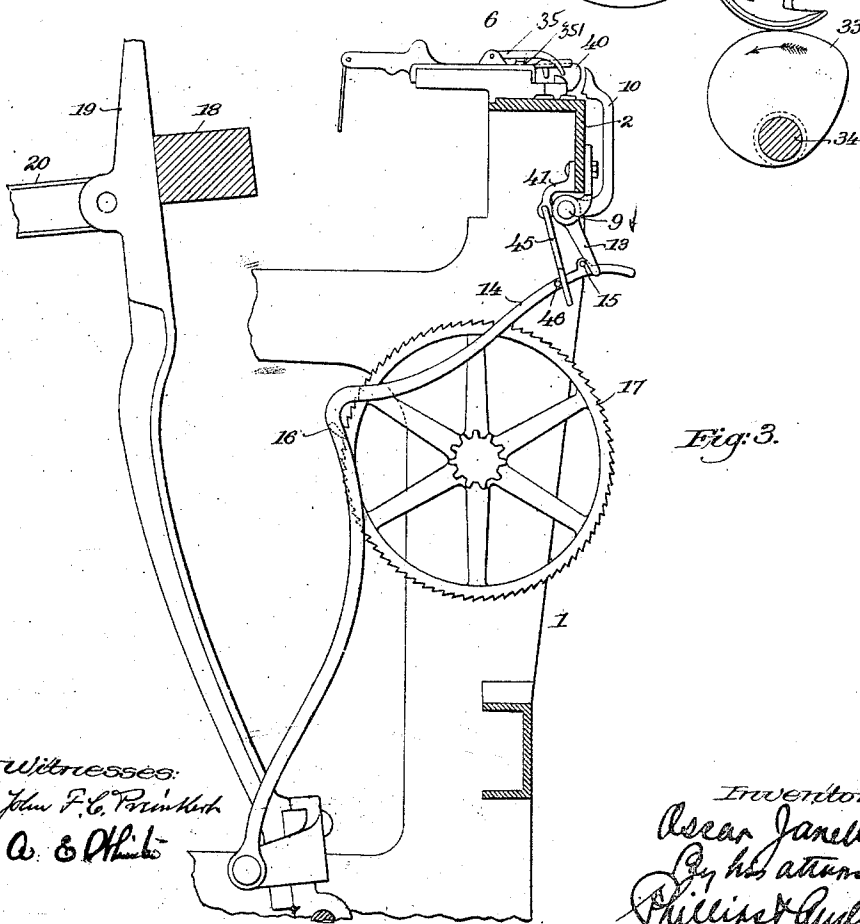


Fig. 3.

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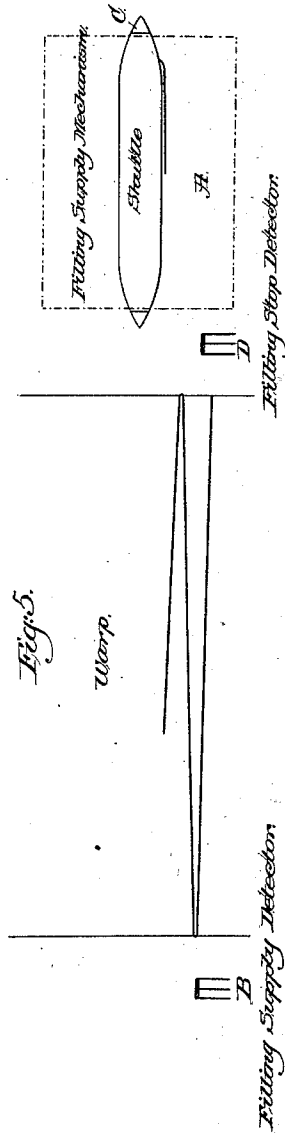
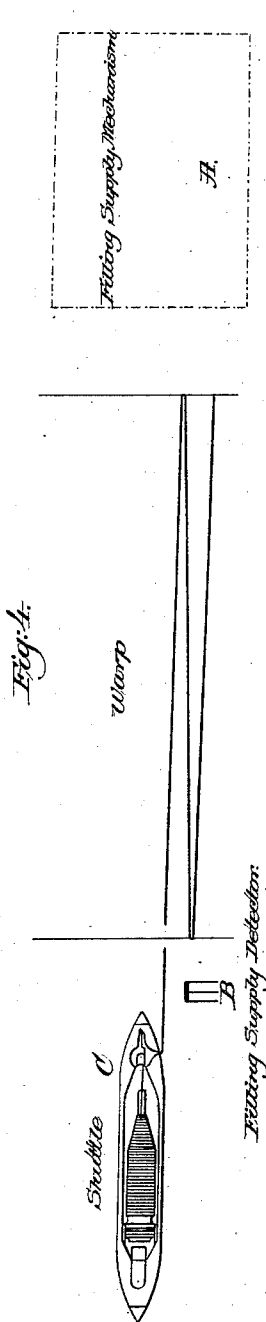
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4 Sheets—Sheet 3.



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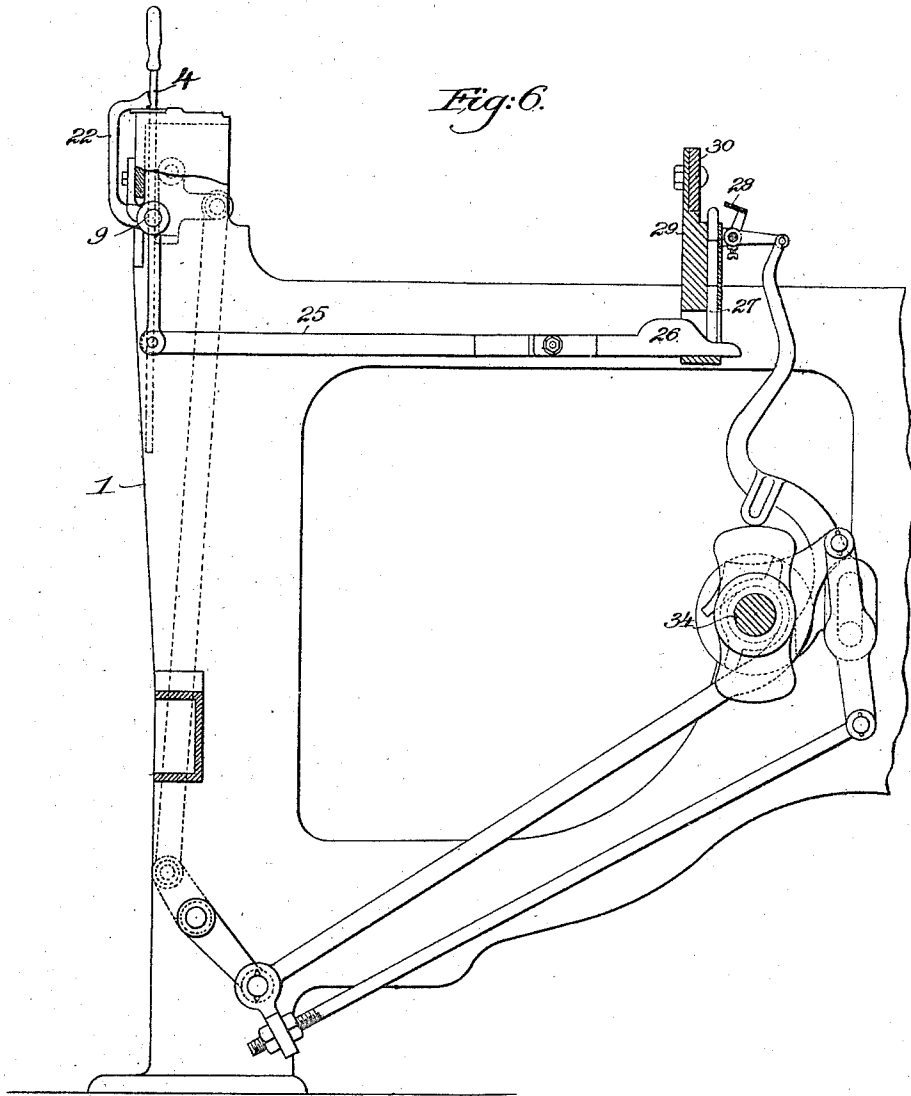
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

OSCAR JANELLE, OF MANCHESTER, NEW HAMPSHIRE, ASSIGNOR TO
STEPHEN N. BOURNE, TRUSTEE, OF SAME PLACE.

FILLING-SUPPLY LOOM.

SPECIFICATION forming part of Letters Patent No. 662,441, dated November 27, 1900.

Application filed January 2, 1900. Serial No. 52. (No model.)

To all whom it may concern.

Be it known that I, OSCAR JANELLE, a citizen of the United States, residing at Manchester, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Automatic Filling-Supply Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in automatic filling-supply looms.

Looms provided with automatic filling-supply mechanism have devices which are intended to operate, when the filling is broken or exhausted, to provide the loom with a new supply of filling while the loom is in motion. This has been accomplished by substituting for the shuttle in the loom another shuttle carrying a new supply of filling, or by providing the shuttle in the loom with a new supply of filling, or, in other words, by changing the shuttle or by changing the bobbin in the shuttle. These looms have a filling-supply detector on one side of the warp which controls the actuating devices of the filling-supply mechanism. The absence of filling causes the detector to set the filling-supply mechanism in motion to renew the shuttle or the bobbin, as the case may be. Provisions are usually made to prevent the taking up of cloth when the filling is absent for a pick or part of a pick and to stop the loom when the filling-supply mechanism fails to provide filling. It sometimes happens that the filling will break at some distance from the shuttle and that the trailing end will be interposed between the filling-detector and the rack on the lay. In this condition the loom continues in operation without laying any filling in the shed until the trailing thread wears through or breaks again, when the filling-supply mechanism is set in motion and weaving is resumed, leaving what is termed a "thin stripe" in the cloth. Of course the presence of a single thin stripe in a piece of cloth makes it a "second." This constitutes so serious an objection in some forms of automatic filling-supply looms that it has been doubted whether they accomplish a useful saving in the ex-

pense of weaving. The thin stripe may also be caused by the clogging of the filling-supply-detector fork.

The object of my invention is to reorganize and improve the automatic filling-supply loom to overcome the objectionable production of thin stripes in weaving.

To the above end the present invention consists, broadly, in the automatic filling-supply loom having provisions for stopping the loom if for any reason the filling-supply detector fails to indicate the absence of filling.

My invention contemplates providing an automatic filling-supply loom with a filling-supply detector on one side of the warp adapted to control the filling-supply mechanism, and a filling-stop detector on the other side of the warp to stop the loom in the absence of filling when the filling-supply detector for any reason fails to operate.

My invention contemplates providing an automatic filling-supply loom with two filling-detector mechanisms, one on each side of the warp, the one having provision to set the filling-supply mechanism in motion and the other having provision to stop the loom, and connecting devices between said detector mechanisms operating to prevent the stop-detector mechanism from stopping the loom when the filling-supply detector operates to set the filling-supply mechanism in motion.

My invention also contemplates certain other features and details of construction hereinafter described, and pointed out in the claims.

It is to be understood that my invention is broad and generic in character and by no means limited to the precise form in which it is illustrated in the accompanying drawings. My invention is adapted to either of the two forms of automatic filling-supply looms above referred to—that is to say, it is adapted to those looms which operate by changing the shuttle as well as those which operate by changing the bobbin in the shuttle.

The specific form of loom which I have illustrated in the accompanying drawings is the well-known Northrop loom, in which the filling-supply mechanism operates by changing the bobbin in the shuttle.

In the drawings and in the following de-

scription I have shown and described the form of the invention which I prefer and which I believe to be the best embodiment thereof.

5 In the Northrop loom the filling-supply mechanism is mounted upon one side of the loom and the filling-supply detector is mounted upon the opposite side of the loom. This loom requires the use of the self-threading shuttle. The thread-eye of the shuttle is located in the end of the shuttle which is nearer the warp when the shuttle is boxed at the opposite side of the loom from the filling-supply mechanism, so therefore a trailing thread extending from the shuttle to the filling-supply detector will prevent the filling-supply mechanism from being set in motion. Of course if the trailing thread were long enough to extend into the shed it would be beaten up by the reed and weaving would be resumed. If the thread should break at the selvage, it will be seen that the next time the shuttle was boxed at the opposite side of the loom to the filling-supply mechanism the trailing thread would extend up to the selvage, and thus be interposed between the filling-supply-detector fork and the rack on the lay, and prevent the detector from setting the filling-supply mechanism in motion. If, on the other hand, the thread should break, not at the selvage but between the filling-supply detector and the shuttle, then of course the filling-supply mechanism would be set in operation, but it is the object of my invention to cure the defect in the operation of the Northrop loom which occurs when the filling breaks at such a point as to operate the filling-supply-detector fork, and thus prevent the making of thin stripes. Now when the shuttle is boxed at the filling-supply side of the loom the position of the thread-eye therein causes the trailing thread to lay alongside of the shuttle, and so the end of the trailing thread does not extend so far toward the warp when the shuttle is at this side of the loom as it does when the shuttle is at the opposite side of the loom. I have availed myself of this fact in the illustrated embodiment of my invention by mounting upon the breast-beam a second filling-detector on the opposite side of the warp from the filling-supply detector. For the sake of convenience I shall throughout this specification refer to this detector as the "stop-detector" and to the other detector as the "filling-supply detector." I also provide suitable connections between the two detector mechanisms, so that when the filling-supply detector is operated to set the filling-supply mechanism in motion the stop-detector mechanism shall be rendered inoperative to perform its function of stopping the loom. It is to be understood that while I prefer the filling-supply detector to have suitable connections for stopping the loom such devices are not indispensable to my invention, as in its broadest aspect such devices may be dis-

70 pensed with without sacrificing its essential virtues. This follows from the fact that the stop-detector will successfully perform the functions of those omitted connections. I have also connected the stop-detector with the take-up mechanism, so that when the loom is stopped the take-up pawl will be disconnected.

75 In the accompanying drawings, illustrating the preferred form of my invention, Figure 1 is a front elevation of a portion of the Northrop loom reorganized and modified in accordance with my invention. Fig. 2 is a side elevation of the loom looking from the filling-supply mechanism side with parts of the loom omitted; and Fig. 3 is a side elevation of the opposite side of the loom, showing the connections between the stop-detector mechanism and the take-up mechanism. Fig. 4 is a diagram showing the relative positions of the shuttle, warp, filling-supply mechanism, and filling-supply detector in the automatic filling-supply loom as it is ordinarily constructed. Fig. 5 is another diagram showing the same as reorganized and modified according to my invention; and Fig. 6 is a side elevation of the loom looking from the filling-supply mechanism side similar to Fig. 2 with parts of the loom omitted, but showing the connections between the warp-feeler and the knock-off lever of the loom.

Referring to Fig. 4, the filling-supply mechanism A is mounted on one side of the loom, and the filling-supply detector B, mounted on the other side of the loom, operates to set the filling-supply mechanism in motion and on the second absence of filling to stop the loom. The shuttle C is shown as boxed in the shuttle-box at the opposite side of the loom from the filling-supply mechanism. The thread is represented as broken at a little distance from the eye of the shuttle. This piece of trailing thread extends from the eye of the shuttle toward the warp, and being interposed between the detector and the rack on the lay it prevents the filling-supply detector from setting the filling-supply mechanism in operation. This diagram clearly illustrates the defect above referred to, which obtains against some forms of prior automatic filling-supply looms. I have overcome this objection in the manner shown in the diagram Fig. 5 and illustrated in Figs. 1, 2, and 3. In the diagram the loom is shown as the same as the loom shown in Fig. 4, with a filling-stop detector D for stopping the loom mounted on the filling-supply mechanism side of the loom. The shuttle C is shown boxed on the same side of the loom, and the trailing thread is therefore laid alongside of the shuttle, as shown, and does not project out toward the warp as it does on the other side of the loom. So it follows that by placing the filling-stop detector D on this side of the loom it will indicate a break in the thread at a distance from the eye of the shuttle. Of course this filling-detector must not operate to stop the

loom on the first absence of filling—that is to say, on the first beat of the lay after the shuttle enters the shuttle-box under the filling-supply mechanism, nor on the beat of the lay immediately after the filling-supply detector has operated to set the filling-supply mechanism in motion, and so I employ here a detector operating to stop the loom on the second absence of filling, and I furthermore provide connections between this filling-stop detector and the filling-supply detector operating to render the stop-detector inoperative when the filling-supply detector operates to set the filling-supply mechanism in motion. So in case of the occurrence of a trailing thread the stop-detector would operate to stop the loom.

Having thus described the general features of my invention in its broader aspects, I now proceed to a description of the specific form shown in the accompanying drawings.

I have shown in the drawings only so much and such parts of the well-known Northrop loom as is necessary for a clear understanding of the cooperation therewith of my improvement.

The frame 1 supports the operative parts of the loom. The breast-beam 2 has the projection 3, which affords a guide for the shipper-lever 4 and a support for the knock-off lever 5. The filling-supply detector 6 is constructed substantially as illustrated and described in patent to Northrop, No. 529,943, and operates in the manner therein described to set the filling-supply mechanism in action and to stop the loom when the filling-supply is exhausted. The filling-supply mechanism 7 is constructed substantially as shown in patent to Northrop, No. 568,455, the lever 8 corresponding to the lever shown separately in Figs. 5 and 6 of said patent, the function of which lever is to permit the filling-supply dog to be raised by its spring into position to be engaged by the bunter on the lay. The detector-shaft 9 is operated by the filling-supply detector, as described in said Patent No. 568,455, through the lever 10, secured thereto. Upon one end of the detector-shaft 9 is secured the lever 11, which carries on its end the slotted link 12, which operates in the usual manner to permit the lever 8 to be moved by the filling-supply dog. (See patent to Northrop, No. 568,455, wherein the lever d^2 and slotted link d^4 correspond to the lever 11 and slotted link 12 herein.) Upon the other end of the detector-shaft 9 is mounted the lever 13, which by engagement with the projection 15 on the pawl-carrier 14 lifts the pawl 16 out of engagement with the ratchet in the manner described in patent to Northrop, No. 610,636. The take-up devices 17 are constructed substantially as described in said patent. The lay 18, the swords 19, the pitmen 20, the let-off, the shedding mechanism, and the warp-stop devices are of any usual or preferred form.

Upon the side of the warp adjacent to the

filling-supply mechanism is mounted the filling-stop detector 21, which is similar to the filling-supply detector 6 and which through suitable mechanism operates to stop the loom in case the filling-supply detector fails to set the filling-supply mechanism in motion. The filling-stop-detector slide is returned to its normal position by a spring 21^a, of which one end is attached to the slide and the other to the slide-support. Loosely mounted on a suitable support, as the detector-shaft 9, is a lever 22, which has its upper end opposite the pawl 35 of the filling-stop detector. A spring 24 tends normally to hold the lever 22 in the position shown in Fig. 2. A rod 25 is secured to the lower end of the lever 22 and it carries upon its rear end the wedge 26, which when it is moved rearwardly is adapted to raise the stop-rod 27 in front of the warp-feeler 28. The stop-rod 27 is slidingly mounted in a guide 29, secured in any suitable manner to the member 30 of the frame of the loom. Thus when the lever 22 is oscillated by the filling-stop detector it operates to lift the stop-rod 27, so that the feeler 28 will engage it and the loom will be stopped thereby in the usual manner. (See Fig. 6, which illustrates the connections between the feeler 28 and the knock-off lever 4 of the Northrop loom and which is substantially the construction illustrated in the patent to Draper, No. 618,378.) It is to be understood that the filling-stop detector may be arranged to connect with any convenient means of stopping the loom and that the arrangement which I have shown and described is a convenient one and the one which I prefer.

The weft-hammer 31, its hook 32, and the cam 33 operate in the same manner as the weft-hammer for the filling-supply detector, the cam 33 of course being mounted upon the cam-shaft 34 at one hundred and eighty degrees of angle to the position occupied by the cam which operates the weft-hammer of the filling-supply detector. From the side of the pawl 35 of the filling-stop detector there projects a pin 36, which is adapted to be engaged by a wire 37, pivotally mounted on the breast-beam and having an end 38, projecting in front of the hook 39 of the lever 8. This wire 37 is clearly shown in Figs. 1 and 2.

The operation of the filling-stop mechanism is as follows: Let it be assumed that the loom is running properly and weaving cloth and that thereupon the bobbin of the shuttle becomes exhausted or the filling breaks, and first let it be assumed that there is no trailing thread and that the filling broke or became exhausted on the motion of the shuttle through the shed away from the filling-supply mechanism. The absence of weft will be indicated by the filling-supply detector, and its weft-hammer will move the slide 40 forwardly, so that its end shall engage the lever 10, thereby oscillating the detector-shaft 9. This oscillation of the detector-shaft will set the filling-supply mechanism in motion, because it

will raise the rear end of the lever 11 and raise the slotted link 12, and thereby permit the lever 8 to be moved by the spring on the dog of the filling-supply mechanism. The shuttle will now be thrown into the shuttle-box under the filling-supply mechanism, and on the next beat of the lay the absence of filling will be indicated by the filling-stop detector 21, and the weft-hammer 31 will push the filling-stop slide rearwardly and remove the wedge 35 from under the pawl 35, thereby permitting its operative end to be dropped low enough to engage the lever 22 on the next reciprocation of the slide. The filling-supply mechanism would at this time operate to provide a new supply of filling, and so on the next forward motion of the weft-hammer the weft-fork would be filled and its hook would fail to engage the weft-fork, the slide would stand still, and the hammer would push the wedge under the pawl 35 and restore it to its normal position. If, however, the filling had broken or become exhausted as the shuttle was passing through the shed in the direction to enter the shuttle-box under the filling-supply mechanism, such mechanism would not at this time operate to put a new bobbin in the shuttle, but the shuttle would be thrown across to the opposite side of the loom, and then the filling-supply detector would operate to set the filling-supply mechanism in motion to insert a new bobbin the next time the shuttle reached the box under the filling-supply mechanism. So, therefore, in this case on the first beat of the lay which would indicate an absence of weft opposite the filling-stop detector 21 the only operation would be the dropping of the pawl 35 into operative position to engage the lever 22. Then the filling-supply mechanism would be set in motion by the filling-supply detector and the oscillation of the lever 8 would actuate the wire 37 to lift the pawl 35, so that on second absence of weft opposite the filling-stop detector the pawl would be lifted by the wire, so that it should not engage the lever 22 on this reciprocation of the slide and the loom would not be stopped. The bent wire 37 constitutes what may properly be called a "stop-preventer," since it operates to prevent the stopping of the loom when the filling-supply mechanism has been set in motion by the filling-supply detector. On the occasion of a trailing thread the filling-supply detector would fail to indicate the break in the filling, but the filling-stop detector would indicate it, and the first reciprocation of the filling-stop-detector slide would operate to drop the pawl 35 in position to engage the lever 22, and the next successive reciprocation of the filling-stop-detector slide would cause the pawl to engage the lever 22 and stop the loom, because the stop-preventer mechanism would be inoperative to lift the pawl 35 by reason of the fact that the filling-supply mechanism had not been set in motion by the filling-supply detector.

The ordinary Northrop loom is provided

with a letting-back mechanism for the take-up—such, for instance, as is shown in the patent to Draper and Northrop, No. 678,838, which lets back the take-up to allow for the absent weft-thread. This loom is also provided with the pawl-lifting lever 13, above described, for lifting the pawl of the take-up mechanism, and I have found it desirable in practice to lift this pawl when the loom is stopped by my filling-stop detector. To this end I have mounted in suitable bearings 41 on the rear of the breast beam the rock-shaft 42, to which is secured at one end the lever 43, having the pin 44 at its end which is engaged by the dependent end of the lever 22, so that when the lever 22 is oscillated it will cause a corresponding oscillation of the rock-shaft 42. From the other end of the rock-shaft there projects the lever 45, which is adapted to engage the pin 46, mounted in the side of the pawl-carrier 14. Thus it will be seen that when the filling-stop detector operates to stop the loom the pawl-carrier 14 will be elevated so as to disengage the pawl 16 from the ratchet 17 of the take-up mechanism, and so the take-up will be stopped just before the stopping of the loom, so that when the loom is started again the fell will occupy its correct position to receive the filling.

Having thus described my invention both in its generic character and in the specific form in which I have embodied it, I claim as new and desire to secure by Letters Patent of the United States—

1. In an automatic filling-supply loom, the combination with filling-supply mechanism, of a filling-supply detector mounted on one side of the warp, connections between the filling-supply mechanism and the filling-supply detector for setting the former in motion, a filling-stop detector mounted on the other side of the warp, means for stopping the loom, and connections between the filling-stop detector and the stopping means, substantially as described.

2. In an automatic filling-supply loom, the combination with filling-supply mechanism, of a filling-supply detector mounted on one side of the warp, connections between the filling-supply mechanism and the filling-supply detector for setting the former in motion, a filling-stop detector mounted on the other side of the warp, means for stopping the loom, connections between the filling-stop detector and the stopping means and connections between the filling-supply detector and the filling-stop detector operative to prevent the latter from stopping the loom when the former operates to set the filling-supply mechanism in motion, substantially as described.

3. In an automatic filling-supply loom, the combination with bobbin-changing mechanism, of a filling-supply detector mounted on the opposite side of the warp from the bobbin-changing mechanism, connections between the bobbin-changing mechanism and the filling-supply detector for setting the former in

motion, a filling-stop detector mounted on the other side of the warp from the filling-supply detector, means for stopping the loom and connections between the filling-stop detector and the stopping means, substantially as described.

4. In an automatic filling-supply loom, the combination with bobbin-changing mechanism, of a shuttle having its eye near one end thereof, a filling-stop detector mounted upon that side of the warp from which the shuttle-eye is most remote when the shuttle is boxed on that side of the loom; means for stopping the loom, connections between the filling-stop detector and the stopping means, a filling-supply detector mounted upon the opposite side of the warp from the filling-stop detector and connections between the bobbin-changing mechanism and the filling-supply detector for setting the former in motion, substantially as described.

5. In an automatic filling-supply loom, the combination with filling-supply mechanism, a filling-supply detector, and operative connections therebetween; of a filling-stop detector, stopping means and operative connections therebetween; and a stop-preventer operated by the filling-supply detector to render the former is operative, substantially as described.

6. In a loom the combination with two filling-detectors mounted one on each side of the warp, said detectors having provisions to stop the loom on the second absence of filling, of connecting mechanism between said filling-detectors to render one of them inoperative on the second absence of filling when the other is operative, substantially as described.

7. In an automatic filling-supply loom, the combination with bobbin-changing mechanism, a filling-supply detector mounted on the opposite side of the warp from the bobbin-changing mechanism, a filling-supply-detector lever, a detector-shaft and connections between the bobbin-changing mechanism and

the detector-shaft; of a stop-detector, mounted on the same side of the warp as the bobbin-changing mechanism, having a pawl, provision for dropping the pawl on the first absence of weft, a filling-stop-detector hammer; means operated by the filling-supply detector for lifting the pawl of the stop-detector during the stroke of the filling-stop-detector hammer next following the second absence of weft; stopping means and connections between the stopping means and the pawl, substantially as described.

8. In an automatic filling-supply loom, the combination with filling-supply mechanism, of a combined filling supply and stop detector mounted on one side of the warp, having provisions for setting the filling-supply mechanism in motion on the first absence of weft and for stopping the loom on the second absence of weft, a filling-stop detector mounted on the other side of the warp, having provision for stopping the loom on the second absence of weft, and connections between the combined filling supply and stop detector and the filling-stop detector for rendering the latter inoperative on the second absence of weft when the former had been operative on the first absence of weft substantially as described.

9. In an automatic filling-supply loom, the combination with filling-supply mechanism, a filling-supply detector, and operative connections therebetween; of a filling-stop detector, stopping means, and operative connections therebetween; take-up mechanism, and connections between the filling-stop detector and the take-up mechanism for stopping the take-up just before the stopping of the loom, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

OSCAR JANELLE.

Witnesses:

SAMUEL J. LORD,
HARRY T. LORD.