No. 648,184. Patented Apr. 24, 1900.

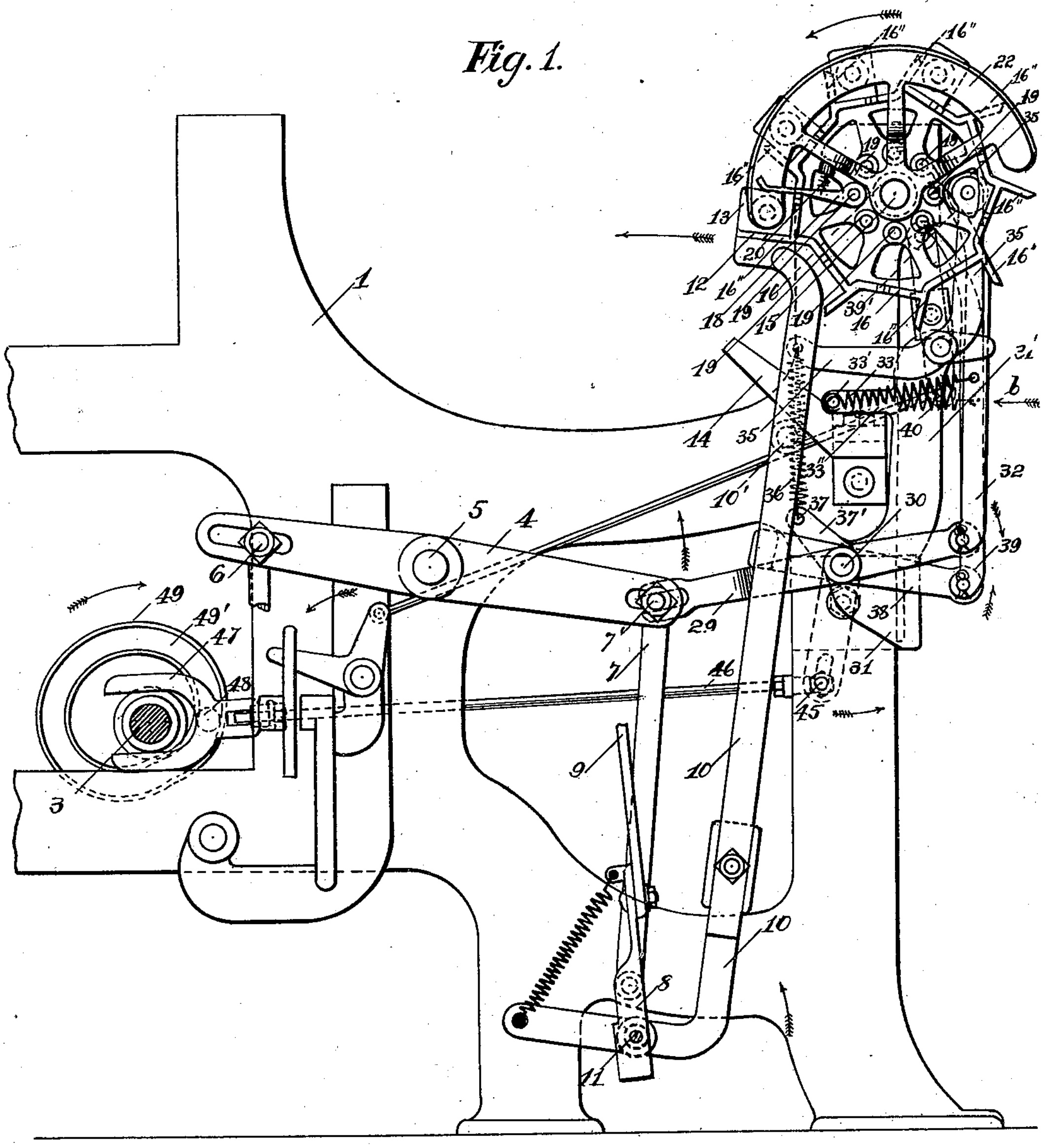
H. WYMAN.

LOOM.

(Application filed May 13, 1899.)

(No Model.) 5 Sheets—Sheet 1.

Fig. 1.



WITNESSES.

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Fig. 2.

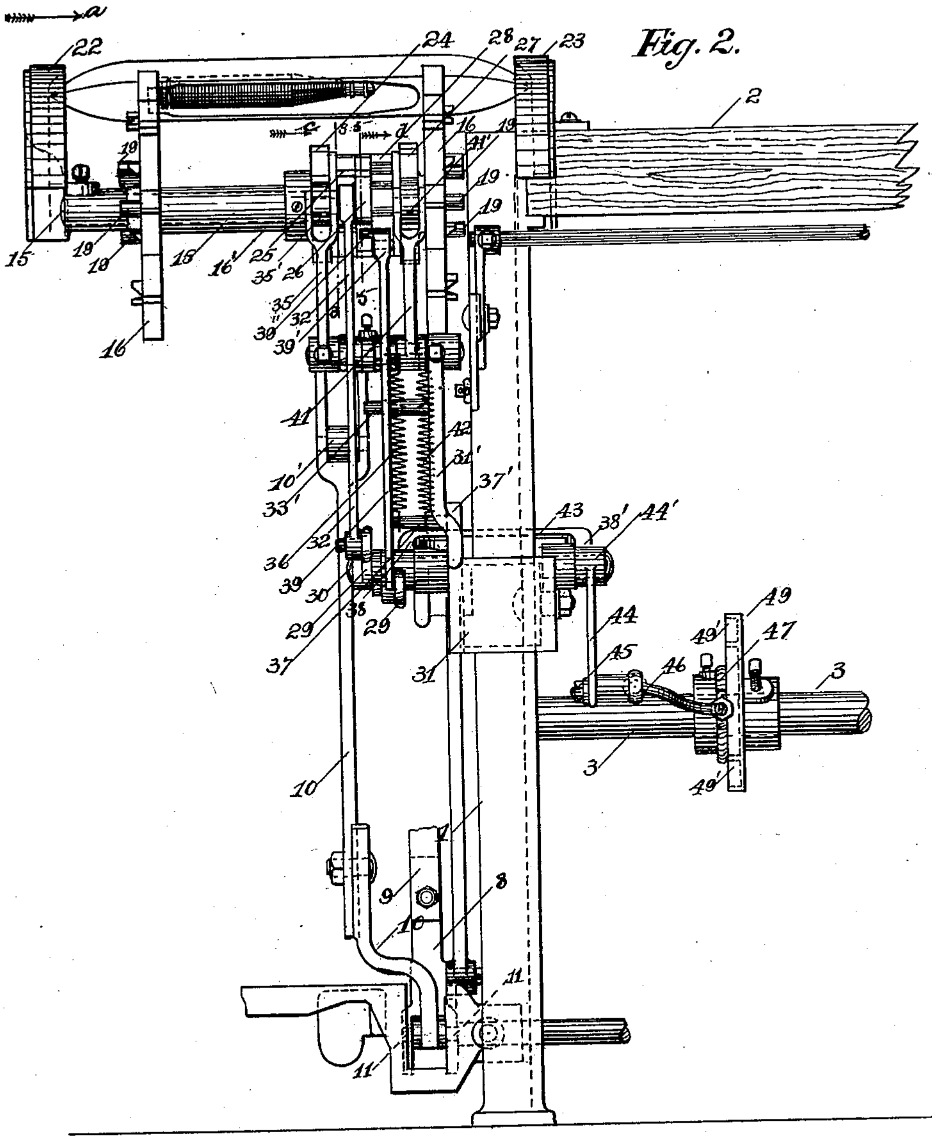

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Fig. 4.

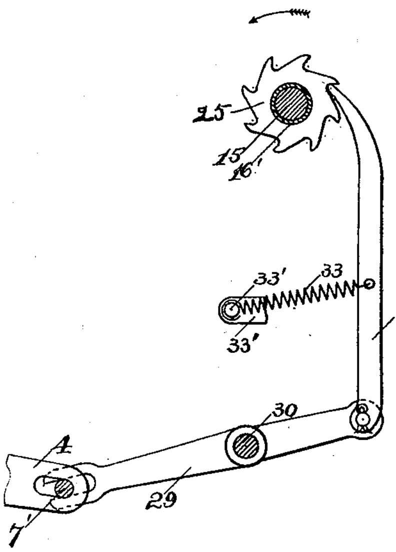
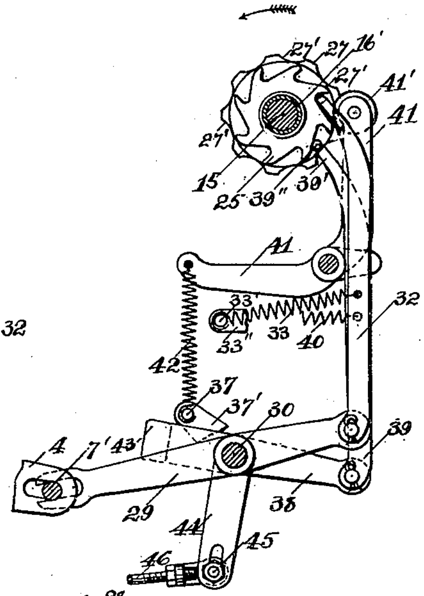


Fig. 3.



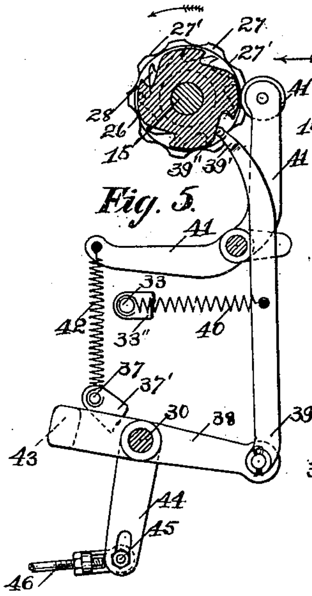


Fig. 5.

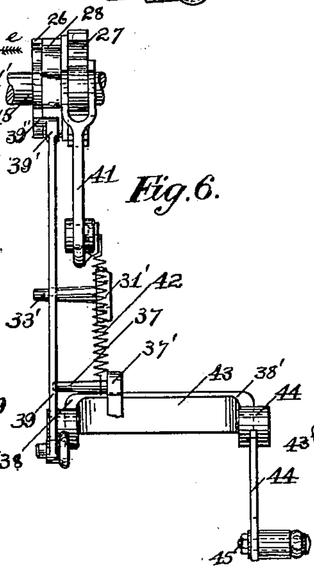


Fig. 6.

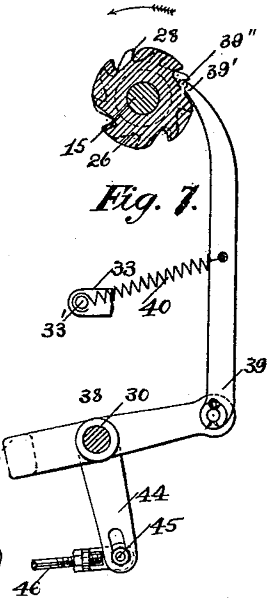


Fig. 7.

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Fig. 9.

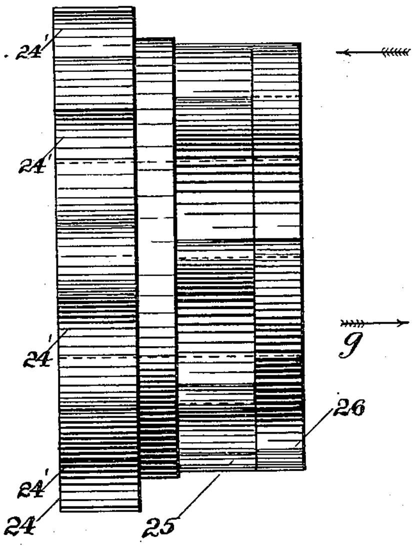


Fig. 8.

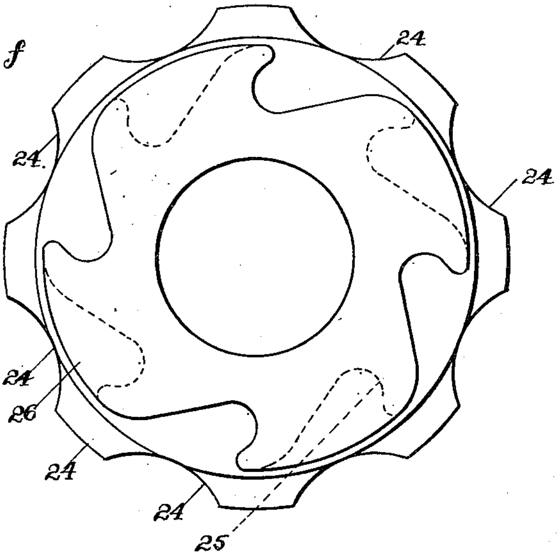


Fig. 11.

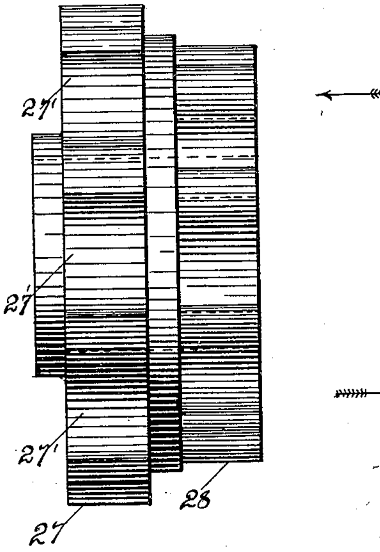
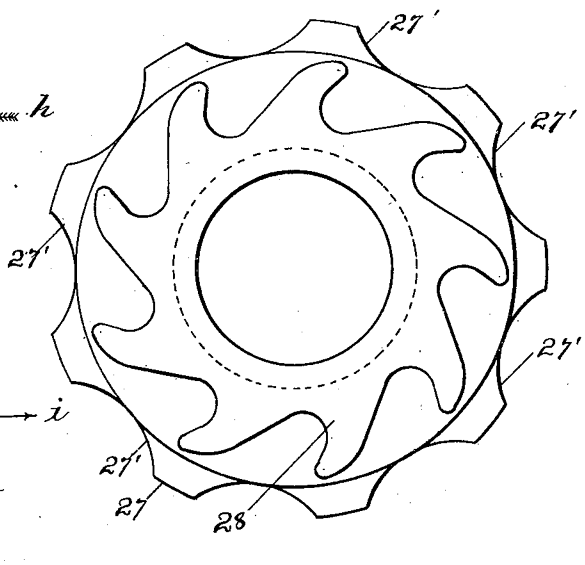


Fig. 10.



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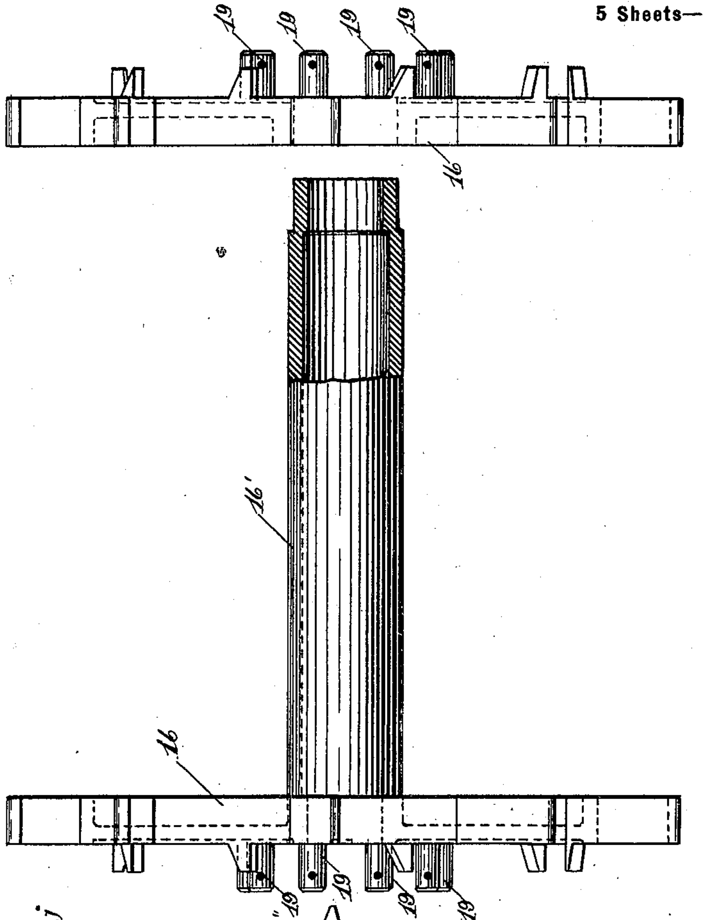

Fig. 12.

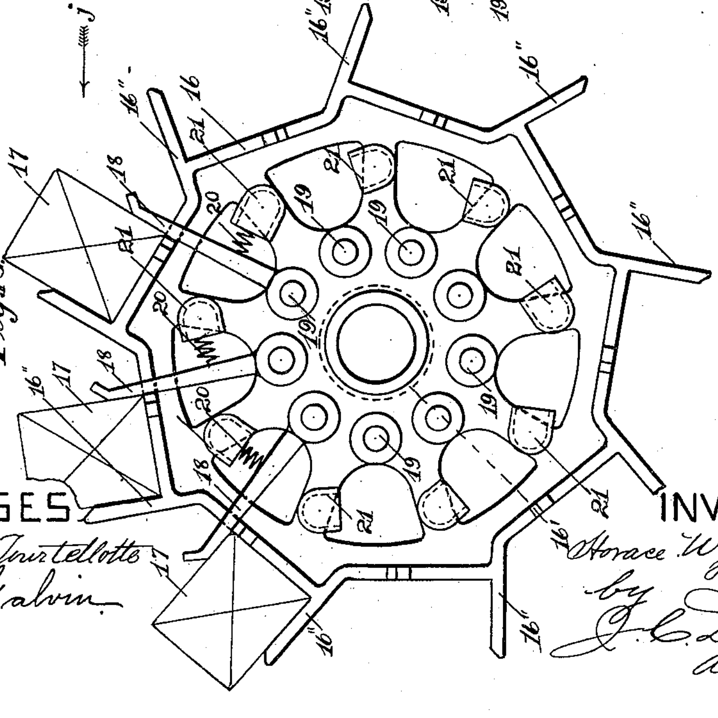

Fig. 13.

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UNITED STATES PATENT OFFICE.

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 648,184, dated April 24, 1900.

Application filed May 13, 1899. Serial No. 716,638. (No model.)

To all whom it may concern:

Be it known that I, HORACE WYMAN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Looms, of which the following is a specification.

My invention relates to looms, and more particularly to improvements in shuttle-changing mechanism for looms of the class shown and described in United States Patent No. 614,369. In the loom shown and described in said patent there is a single spare shuttle carried on what is termed the "shuttle-feeder," and additional shuttles have to be supplied to the shuttle-feeder by the operator after the shuttle-feeder has automatically carried the shuttle thereon into position to be thrown through the shed and returned to its normal position.

The object of my present invention is to provide supplemental mechanism to be combined with the shuttle-feeder mechanism shown and described in said patent, by means of which a number of shuttles, one after the other, may be supplied automatically to the shuttle-feeder, and thus do away with the necessity of the operator supplying fresh shuttles to the shuttle-feeder.

My invention consists in certain novel features of construction of my mechanism for automatically supplying shuttles to the shuttle-feeder, and more particularly in providing a revolving shuttle-carrier reel or device and means for operating the same to automatically place upon the shuttle-feeder a shuttle after the shuttle-feeder has automatically carried the shuttle thereon into position to be thrown through the shed and returned to its normal position.

I have shown in the drawings my improvements applied to and combined with the shuttle-changing mechanism shown and described in said Patent No. 614,369; but I do not limit my invention to this particular shuttle-changing mechanism, as my improvements may be combined with other shuttle-changing mechanisms, if desired. I have shown in the drawings only such parts of the shuttle-changing mechanism of said Patent No. 614,369, with my improvements combined therewith, as will be necessary to enable those skilled in the art to which my invention relates to make and use the same.

Referring to the drawings, Figure 1 is an end view of a portion of a loom looking in the direction of arrow *a*, Fig. 2, showing some of the parts of the shuttle-changing mechanism shown in said Patent No. 614,369 and also showing my improvements combined therewith sufficient to illustrate the operation thereof. Fig. 2 is a front view of the parts shown in Fig. 1 looking in the direction of arrow *b*, same figure. Fig. 3 is a section taken at a point indicated by line 3 3, Fig. 2, looking in the direction of arrow *c*, same figure. Fig. 4 shows the front lever, pawl, and ratchet shown in Fig. 3. Fig. 5 is a section taken at a point indicated by line 5 5, Fig. 2, looking in the direction of arrow *d*, same figure. Fig. 6 is a front view of the parts shown in Fig. 5 looking in the direction of arrow *e*, same figure. Fig. 7 shows the front lever, pawl, and ratchet shown in Fig. 5. Fig. 8 is a side view of the pawl-shield, ratchet, and check-wheel shown in Fig. 9 looking in the direction of arrow *f*, same figure. Fig. 9 is an edge view of the parts shown in Fig. 8 looking in the direction of arrow *g*, same figure. Fig. 10 is a side view of the other ratchet and check-wheel looking in the direction of arrow *h*, Fig. 11. Fig. 11 is an edge view of the parts shown in Fig. 10 looking in the direction of arrow *i*, same figure. Fig. 12 is a front view of the reel which carries the extra shuttles looking in the direction of arrow *j*, Fig. 13. One of the heads or ends is shown detached and one end of the hub in section. Fig. 13 is an end view of the reel shown in Fig. 12, showing three shuttles and holding-fingers.

In the accompanying drawings, 1 is the loom side or frame.

2 is the breast-beam, and 3 is the cam or bottom shaft.

4 is a lever of the shuttle-change mechanism, shown and described in said Patent No. 614,369. Said lever 4 is centrally pivoted at 5 and has the upper end of a rod or link 6 adjustably connected with one slotted end there-

of. The lower end of the link 6 connects with a crank-pin on a disk, (not shown,) through which a rocking motion is communicated to the lever 4, as fully described in said patent. The opposite end of the lever 4 has adjustably attached to the slotted end thereof the upper end of a rod or link 7, the lower end of which is attached to the block 8, to which is attached the lower end of the shuttle-box rod 9 to raise and lower said rod, as fully described in said patent.

The lever or bar 10 of the shuttle-feeder is pivoted on a stud 11 at its lower end and carries at its upper end the plate 12, on which is supported the spare shuttle 13 in the same manner as described in said patent.

The lever or bar 10 is forked or divided at its upper end, as shown in Fig. 2, and carries a roll 10′, which as the lever 10 is lifted with the box-rod 9 by the lever 4 acts against the under inclined side of the finger 14, Fig. 1, and causes the shuttle-feeder plate 12, carrying the spare shuttle 13, to move toward the lay, all as fully described in said patent.

Extending out from the breast-beam end of the loom is a stud 15, on which is loosely mounted the sleeve or hub 16′ of the reel 16, which carries the extra shuttles. The reel 16 has two heads or ends having outwardly-extending fingers 16″, forming recesses to receive the shuttles 17, as shown.

The shuttles 17 are held in the recesses in the heads of the reel 16 in this instance by means of spring-actuated fingers 18, which are pivoted on studs 19, projecting out from each end of the heads of the reel 16. The fingers 18 are actuated by compression spiral springs 20, interposed between the pockets 21 and the fingers 18, as shown in Fig. 13, to cause the free ends of the fingers to bear against the end portion of the shuttles 17 and press them against the stationary fingers 16″ and hold them in place on the reel 16.

Fast on the outer end of the stud 15 is a stationary circular guide 22, and a corresponding guide 23 is secured at the end of the breast-beam. The guides 22 and 23 are grooved on their inner surfaces to receive the points of the shuttle, as shown in Fig. 2, and hold the shuttle in proper position as the reel 16 revolves to supply a new shuttle to the shuttle-feeder plate 12.

On the reel-hub 16′ are, loose, the check-wheel 24, ratchet 25, and pawl-shield 26, which in this instance are made integral, as shown in Figs. 8 and 9. The check-wheel 27 and ratchet 28 are fast on the reel-hub 16′ and in this instance made integral, as shown in Figs. 10 and 11.

I will now describe the mechanism for operating the shuttle-reel 16 to cause the same to revolve at the proper time and automatically deposit or place a shuttle on the shuttle-feeder plate 12.

A lever 29 is centrally pivoted on a shaft 30, mounted in a stand 31, secured to the loom side, and is slotted at one end, and connected with the lever 4 in this instance through the pin 7′ connecting said lever with the rod or link 7. To the opposite end of the lever 29 is pivotally attached the lower end of the pawl 32, the upper end of which is adapted to engage with the ratchet-teeth on the ratchet 25, loose on the hub 16′ of the reel 16. A spring 33, attached to the pawl 32 and to a pin 33′ on an arm 33″ of stand 31, acts to hold the pawl 32 in engagement with the ratchet 25, as shown in Fig. 4. On a stud 34, supported in the upper end of the arm 31′, extending up from the stand 31, is pivotally mounted the angle check-lever 35, carrying a roll 35′ at its upper end, which engages the recesses 24′ in the check-wheel 24, attached to the ratchet 25 to hold the ratchet in position after each partial revolution thereof. The opposite end of the angle check-lever 35 has a spring 36 connected therewith, which is attached to a stud 37 on an arm 37′ of the stand 31 and acts to hold the roll 35′ in engagement with the check-wheel 24. A lever 38 is loosely mounted on the shaft 30, and to its outer end is pivoted the lower end of the pawl 39, the upper end 39′ of which is adapted to engage the ratchet-teeth of the ratchet 28, fast on the reel-hub 16′ to turn said ratchet 28 and the reel 16 when the lug or pin 39″ on the upper end 39′ of the pawl 39 does not ride on the pawl-shield 26, attached to the ratchet 25, and hold said pawl 39 out of engagement with the ratchet 28. A spring 40, attached to the pawl 39 and to the pin 33′ on the arm 33″, acts to hold said pawl in position. On the stud 34 is pivotally mounted the angle check-lever 41, carrying a roll 41′ at its upper end, which engages the recesses 27′ in the check-wheel 27, fast to the ratchet 28. The opposite end of the angle check-lever 41 has a spring 42 connected therewith, which is attached to the pin 37 on the arm 37′. The inner end 38′ of the lever 38 is connected by a bar or yoke 43 (see Figs. 2 and 6) with the hub 44′ of the lever or arm 44, said hub 44′ being loosely mounted on the shaft 30. The free end of the lever 44 is slotted and pivotally attached by a bolt 45 to the outer end of the rod 46. The inner end of the rod 46 is provided with a forked end 47, carrying a pin 48, which travels in a cam-groove 49′ in the cam 49, fast on the bottom shaft 3, as shown in Fig. 1. The revolution of the cam 49 through the roll 48, rod 46, lever 44, bar 43, and lever 38 communicates a regular up-and-down motion to the pawl 39; but the lug or pin 39″ on the upper end 39′ of the pawl 39, riding on the pawl-shield 26, holds the pawl 39 out of engagement with its ratchet 25 and prevents it from turning said ratchet 25 and the reel 16 except at the proper time.

From the above description, in connection with the drawings, the operation of my improvements will be readily understood by those skilled in the art and is briefly as follows: The revolution of the cam or bottom shaft 3 and cam 49 through roll 48, rod 46, lever 44, bar 43, and lever 38 communicates a regular up-and-down motion to the pawl 39, as above stated; but said pawl, by reason of the lug or pin 39'' thereon riding on the pawl-shield 26, forming a part of the ratchet 24, cannot engage and turn its ratchet 25 and the reel 16 until the pawl-shield 26 is moved out of the way of the lug or pin 39''. Whenever the change-shuttle mechanism operates in the manner fully described in said Patent No. 614,369 by reason of the failure of the filling, the lever 4 is moved and through lever 29 the pawl 32 is operated to give one turn to the ratchet-wheel 24. The movement of the ratchet-wheel 24 also moves the pawl-shield 26 and allows the pawl 39 to engage and move its ratchet-wheel 25, fast on the hub 16' of the reel 16, and communicate a partial rotation to the reel 16 and deposit a shuttle on the shuttle-feeder plate 12 immediately after the shuttle-feeder has returned to its normal position from carrying a shuttle into position to be thrown through the shed.

The movements of the several parts of the mechanism are so timed that the shuttle is deposited onto the shuttle-feeder plate 12 at the proper time, and as long as there are any shuttles in the reel 16 a shuttle will be placed on said plate.

The operator will add new shuttles to the reel from time to time as the shuttles therein are used.

It will be understood that the details of construction of my improvements may be varied, if desired, and they may be adapted to be applied to different styles of change-shuttle looms.

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

1. In a loom of the class described, the combination with mechanism for automatically supplying a new shuttle, of supplemental mechanism for automatically supplying additional shuttles to the shuttle-supplying mechanism, comprising a revolving shuttle carrier or reel, and means for operating the same to automatically place a new shuttle in position at the proper time for the shuttle-supply mechanism, substantially as shown and described.

2. In a loom of the class described, the combination with the shuttle-feeder mechanism, of supplemental mechanism for automatically supplying shuttles to the shuttle-feeder, comprising a revolving shuttle carrier or reel, and means for operating the same to automatically place upon the shuttle-feeder a shuttle after the shuttle-feeder has automatically carried the shuttle thereon into position to be thrown through the shed and returned to its normal position, substantially as shown and described.

3. In a loom of the class described, a shuttle-supplying mechanism, comprising a revolving shuttle carrier or reel for supporting and carrying the shuttles in recesses in the heads thereof, means for holding the shuttles in said recesses, and guides to receive the points of the shuttles and hold the shuttles in proper position, in combination with means for revolving the reel, consisting of an actuated pawl to engage a ratchet on the hub of the reel at the proper time to revolve said reel, and mechanism for holding said pawl out of engagement with its ratchet, to prevent its turning the reel except at the proper time, substantially as shown and described.

4. In a loom of the class described, a shuttle-supplying mechanism, comprising a revolving shuttle carrier or reel for supporting and carrying the shuttles in recesses in the heads thereof, means for holding the shuttles in said recesses, and stationary guides to receive the points of the shuttles and hold the shuttles in proper position, in combination with means for revolving the reel, consisting of an actuated pawl to engage a ratchet on the hub of the reel at the proper time to revolve said reel, and mechanism for holding said pawl out of engagement with its ratchet, to prevent its turning the reel except at the proper time, substantially as shown and described.

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Witnesses:
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