M. L. STONE.

AUTOMATIC WEFT REPLENISHING MECHANISM FOR LOOMS.

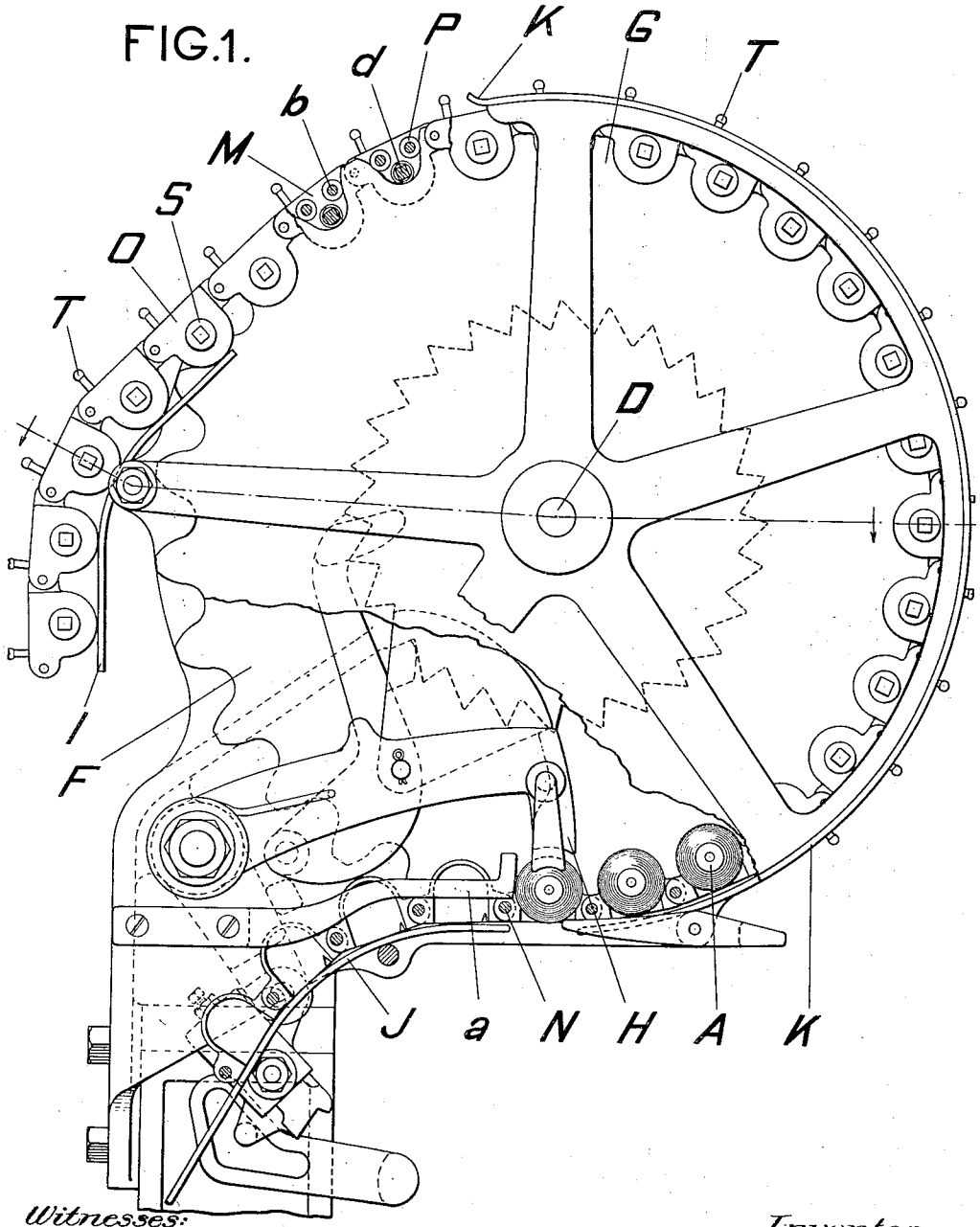
APPLICATION FILED DEC. 11, 1907.

940,286.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.

FIG. 1.



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Inventor:
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3 SHEETS—SHEET 2.

FIG. 2.

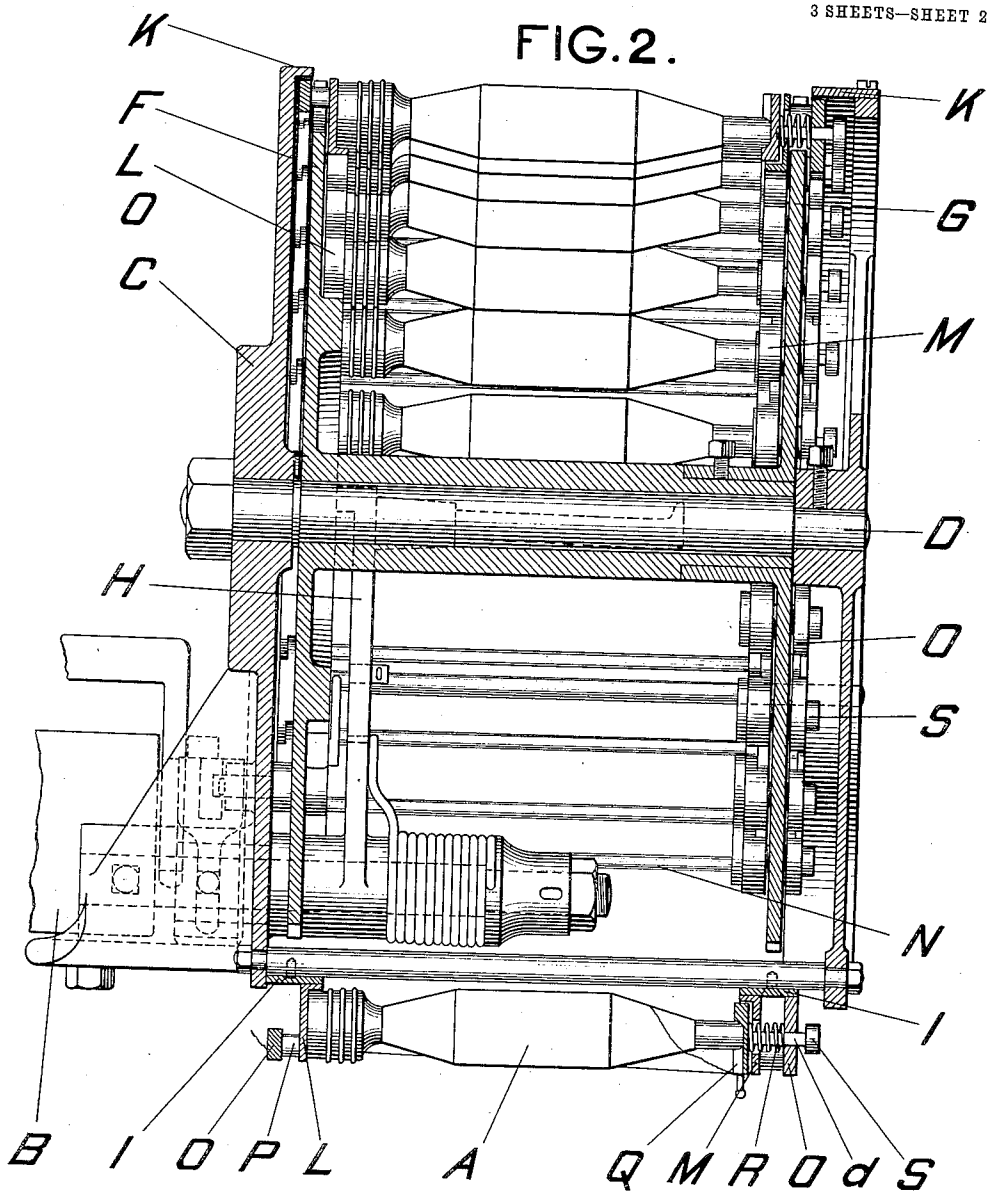

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FIG. 3.

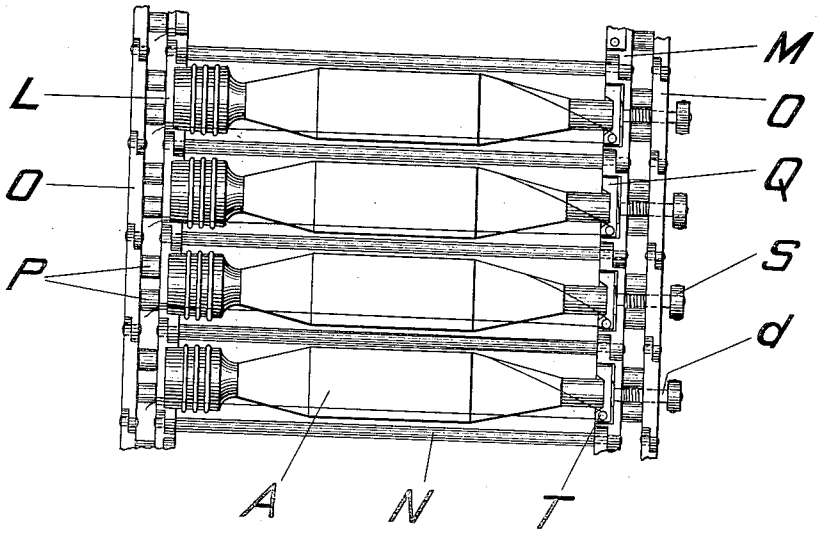


FIG. 4.

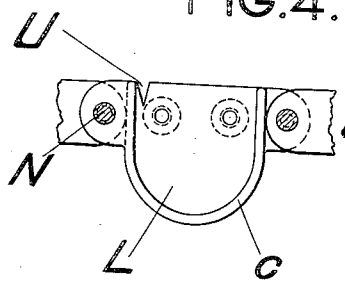


FIG. 5.

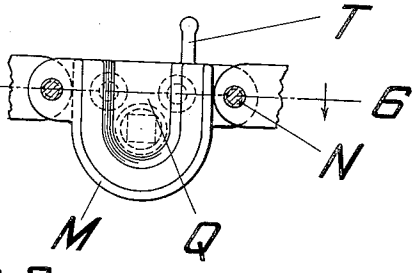
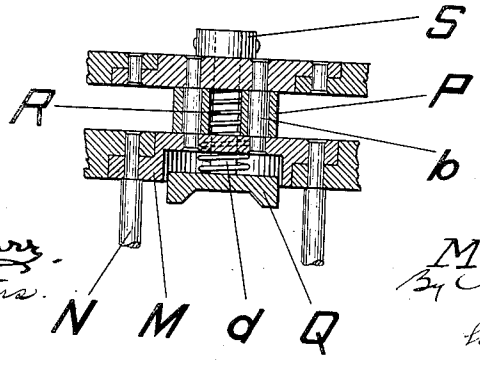


FIG. 6.



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his attorney

UNITED STATES PATENT OFFICE.

MELVIN L. STONE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

AUTOMATIC WEFT-REPLENISHING MECHANISM FOR LOOMS.

940,286. Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed December 11, 1907. Serial No. 406,121.

To all whom it may concern:

Be it known that I, MELVIN L. STONE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Automatic Weft-Replenishing Mechanism for Looms, of which the following is a specification.

The object of this invention is to increase the number of spare weft-carriers used in automatic weft-replenishing looms and to enable said weft-carriers to be assembled in large number away from the weave room, thereby enabling the spare weft-carriers to be put in position on the loom at remote intervals and without any attention on the part of the weaver. To this end, the weft-carriers are put in place on a detachable flexible chain of indefinite length provided with means for holding weft-carriers and for the attachment of the ends of the weft threads. This chain-carrier can be supplied with the weft-carriers outside of the weave room and, if desired, can be rolled into small compass. The loom is provided with appropriate means to coöperate with and feed said chain-carrier step by step as required, so as to present the weft-carrier successively into transferring position in the loom.

The present improvements are illustrated in the accompanying drawings, wherein—

Figure 1, is a side view of so much of a loom as is necessary for the understanding of the present invention, the improved weft-replenishing devices being illustrated in position. Fig. 2, is a horizontal section of the parts shown in Fig. 1. Fig. 3, is a plan view of a portion of the chain-carrier showing some weft-carriers in place. Fig. 4, is a side view of one of the holders of the chain-carrier which holds a weft-carrier butt. Fig. 5, is a similar view of a support and retainer for a weft-carrier tip. Fig. 6, is a detail section in the plane indicated by the line 6—6 in Fig. 5.

As shown in Fig. 3, the weft-carriers are put in place and held by a chain-carrier of indefinite length, and which preferably is made long enough to hold sufficient weft-carriers to supply the loom for an entire day, thus making it feasible to replenish the loom when the mill is not running. The details of the chain-carrier will not be described until after it has been made plain how such chain-carrier supplied with weft-carriers is used on the loom.

The chain-carrier is used in connection with a rotary magazine and transferrer resembling those set forth in United States Letters Patent of Stimpson, No. 664,790, December 25, 1900, and No. 718,587, January 13, 1903. At one end of the breast-beam B, of the loom is a fixed bracket C, carrying a horizontal stud D, on which turns a rotary magazine comprising a hub, and two separated sprocket wheels F, and G, the peripheries of which are suitably toothed, as shown in Fig. 1, to engage the chain-carrier. As shown in Fig. 2, these sprocket wheels are a sufficient distance apart to receive between them the lengths of the weft-carriers. Whenever a weft-carrier is transferred into weaving position in the loom, the sprocket wheels F, and G, are fed forward one step automatically in the manner in which the rotary magazine of said Stimpson patents is fed. The lowermost weft-carrier (see Fig. 1) is in transferring position, being maintained there, in a well-known manner, by a fixed stop *a*. In this position said lowermost weft-carrier is directly above the chamber (open top and bottom) of an automatically threading shuttle when the lay is at or near front center, as in said Stimpson patents; and it is also immediately below the usual transferrer H. This transferrer, as in the said Stimpson patents, is automatically moved whenever the condition of the running weft demands. Thereupon, the transferrer ejects the lowermost weft-carrier from the magazine into weaving position in the loom, driving out the spent weft-carrier, and on the restoring movement of the transferrer, the rotary magazine is fed forward one step to bring the next weft-carrier into transferring position, all as well known. In the present case, however, the rotary magazine is simply a feeder for the detachable chain-carrier.

The chain-carrier is guided into position upon the sprocket wheels of the magazine by means of the fixed guides I (see Figs. 1 and 2), and is directed away from the magazine when depleted of weft-carriers by the fixed guides J, shown in Fig. 1. Fixed guards K (see Figs. 1, and 2), maintain the chain-carrier in coöperation with the sprocket wheels of the rotary magazine.

The chain-carrier consists of holders L,

and supports M, pivot rods N, links O, and rollers P, and in addition has special features relating to means for retaining the weft-carriers in place and for holding on to the ends of the weft threads. The holders L, and supports M, are pivotally connected with the rods N, there being as many of the holders L, and supports M, as there are weft-carriers; and the rods N, space the holders and support a sufficient distance apart to receive the lengths of the weft-carriers. In addition, there are the outer rows of links O, pivoted to each other in line with the rods N; and between the said links and the holders and supports are distance studs *b* (Fig. 6), which secure said links to said holders and supports, and which also serve as bearings for the anti-friction rollers P, which coöperate with the sprocket-wheels. The sprocket teeth pass between the rollers P, and also between the outer links O, and the inner holders L, and supports M. This construction gives a flexible chain construction to coöperate with the sprocket-wheels, and at the same time fixes the holders L, and supports M, with respect to each other so as to enable them to retain the weft-carriers.

The holder L, is for the butt of a weft-carrier. It has an inwardly projecting flange *c*, to partially embrace the butt of the weft-carrier. The flange, however, does not extend all around, but leaves the holder open on one side, this being the bottom when the corresponding weft-carrier is in transferring position.

The support M, is for the tip of a corresponding weft-carrier. This tip support, however, does not come into immediate contact with the tip of the weft-carrier, but it serves as a support for a presser plate or retainer Q. This retainer, as is best shown in Fig. 2, is mounted on a stem *d*, which extends through and is guided by apertures in the support M, and in the corresponding link O. A coiled spring R, interposed between the retainer and adjacent link O, and surrounding stem *d*, forces the retainer Q, against the tip end of the weft-carrier with sufficient force to maintain the weft-carrier in place, said weft-carrier being thereby forcibly pressed at its butt against the face of the holder L. Each weft-carrier is thus grasped and yieldingly held at its two ends. The spring-pressed retainer Q, is grooved as illustrated in Figs. 2, and 5, so as to permit the escape of the tip when the weft-carrier is forced downwardly by the transferrer. The spring R, is not strong enough to resist the force of the transferrer. When the chain-carrier is empty, fresh weft-carriers are supplied by pulling outwardly each retainer Q, against the tension of its spring R, by means of a knob S, on the stem *d*.

Each retainer Q, has an outwardly projecting stud T, constituting a guide around which the thread of the corresponding weft-carrier is passed, as indicated in Fig. 3. The thread might be wound about this stud and be thus held in place. Preferably, however, the end of the thread is simply passed around this guide and its free end is held in a notch or anchorage U, (see Fig. 4), in the butt holder L, so that the guide and anchorage are separated from each other. Accordingly, when a weft-carrier is transferred into weaving position in the loom, the thread is freed from the guide T, but is still held by the anchorage U. This furnishes slack thread so that the liability is diminished of breaking the thread when the weft-carrier is transferred into weaving position and makes its first traverse through the shed. The anchorage U, it will be noted, is nearer the middle of the loom and to the adjacent selvage than is the guide T.

The chain-carrier is supplied with weft-carriers and the threads are secured at any convenient place. This may be done by boys in any place and at any desired time. A chain-carrier supplied with the weft-carriers can then be taken to the loom at any suitable time, as before the mill starts in the morning, or after it closes in the evening. The chain-carrier is brought into coöperative position with the rotary magazine which can be turned by hand until the leading weft-carrier is in transferring position. The chain-carrier is fed step by step, as replenishing demands, until all of its weft-carriers have been used, or until it is replaced by a fresh one. In case all of the weft-carriers are used, the empty chain-carrier drops by gravity from the bottom guides K, away from the loom. A suitable receptacle may receive the empty chain and also the depleted weft-carriers.

I claim—

1. An automatic weft-replenishing loom having, in combination, a rotary magazine having separated sprocket wheels, a transferrer, means for feeding the magazine one step whenever the transferrer acts, and a detachable flexible chain-carrier of indefinite length coöperating with said rotary magazine, said chain-carrier having means for grasping and yieldingly holding at butts and tips respectively a large number of weft-carriers, and having also a guide and a separated anchorage for the thread of each weft-carrier.

2. An automatic weft-replenishing loom having, in combination, a rotary magazine having separated sprocket wheels, a transferrer, means for feeding the magazine one step whenever the transferrer acts, and a detachable flexible carrier of indefinite length coöperating with said rotary magazine, said flexible carrier having means for holding a large number of weft-carriers, and having

also an anchorage for the thread of each weft-carrier.

3. An automatic weft-replenishing loom having, in combination, a rotary magazine having separated sprocket wheels, a transferrer, means for feeding the magazine one step whenever the transferrer acts, and a detachable flexible-carrier of indefinite length coöperating with said rotary magazine, said flexible carrier having means for holding a large number of weft-carriers.

4. An automatic weft-replenishing loom having, in combination, a rotary feeder, a transferrer, means for moving said feeder one step at each action of the transferrer, and a detachable flexible-carrier of indefinite length coöperating with said rotary feeder, said flexible-carrier having means for holding a large number of weft-carriers.

5. An automatic weft-replenishing loom having, in combination, a feeder, a transferrer, means for moving said feeder one step at each action of the transferrer, and a detachable flexible-carrier of indefinite length coöperating with said feeder, said flexible-carrier having means for holding a large number of weft-carriers.

6. An automatic weft-replenishing loom having, in combination, a transferrer, a detachable flexible-carrier of indefinite length having means for holding a large number of weft-carriers, and having also an anchorage for the thread of each weft-carrier, and means for feeding said flexible-carrier at each action of the transferrer.

7. An automatic weft-replenishing loom having, in combination, a transferrer, a detachable flexible-carrier of indefinite length having means for holding a large number of weft-carriers, and means for feeding said chain-carrier at each action of the transferrer.

8. A flexible-carrier of indefinite length for an automatic weft-replenishing loom having means for holding a large number of weft-carriers, and having also a guide and a separated anchorage for the thread of each weft-carrier.

9. A detachable flexible-carrier of indefinite length for an automatic weft-replenishing loom having means for grasping and yieldingly holding at butts and tips respectively a large number of weft-carriers.

10. A detachable flexible-carrier of indefinite length for an automatic weft-replenishing loom having means for holding a large number of weft-carriers, and having also an anchorage for the thread of each weft-carrier.

11. A detachable flexible-carrier of indefinite length for an automatic weft-replenishing loom having means for holding a large number of weft-carriers.

12. A detachable flexible-carrier for an automatic weft-replenishing loom having means for holding a multiplicity of weft-carriers, both when attached to and detached from the loom, and said carrier when loaded with weft-carriers being attachable to the loom.

13. An automatic weft-replenishing loom having, in combination, a transferrer, a detachable flexible-carrier having means for holding a multiplicity of weft-carriers, both when attached to and detached from the loom, and having also an anchorage for the threads of the weft-carriers, said carrier when loaded with weft-carriers being attachable to the loom, and means for feeding said flexible-carrier relatively to said transferrer.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

MELVIN L. STONE.

Witnesses:
WM. T. MOLLOY,
CHARLES STICKNEY.