No. 719,666.

PATENTED FEB. 3, 1903.

E. HERZIG.

NEEDLE LOOM.

APPLICATION FILED OCT. 3, 1901.

NO MODEL.

4 SHEETS—SHEET 1.

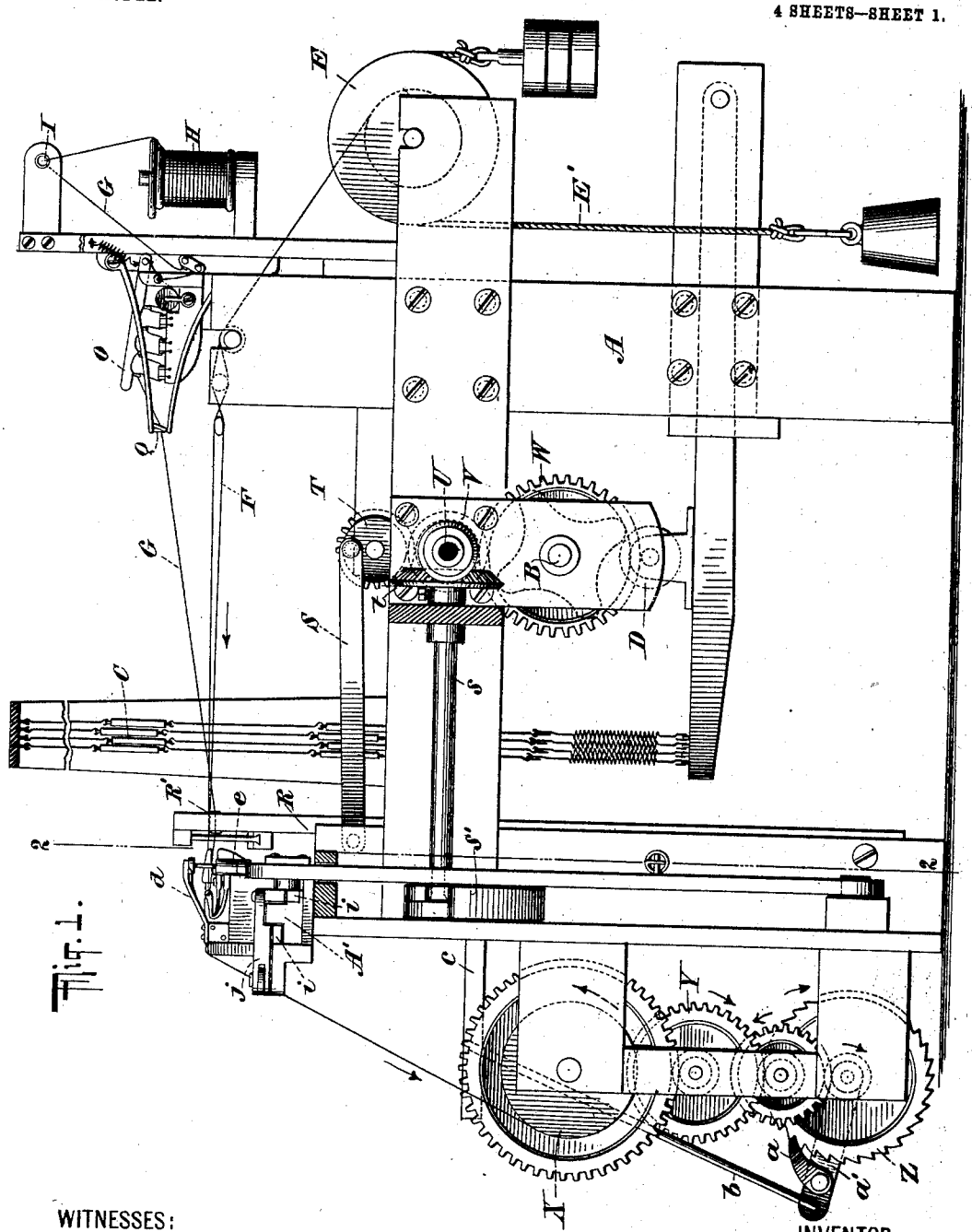


Fig. 1.

WITNESSES:

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ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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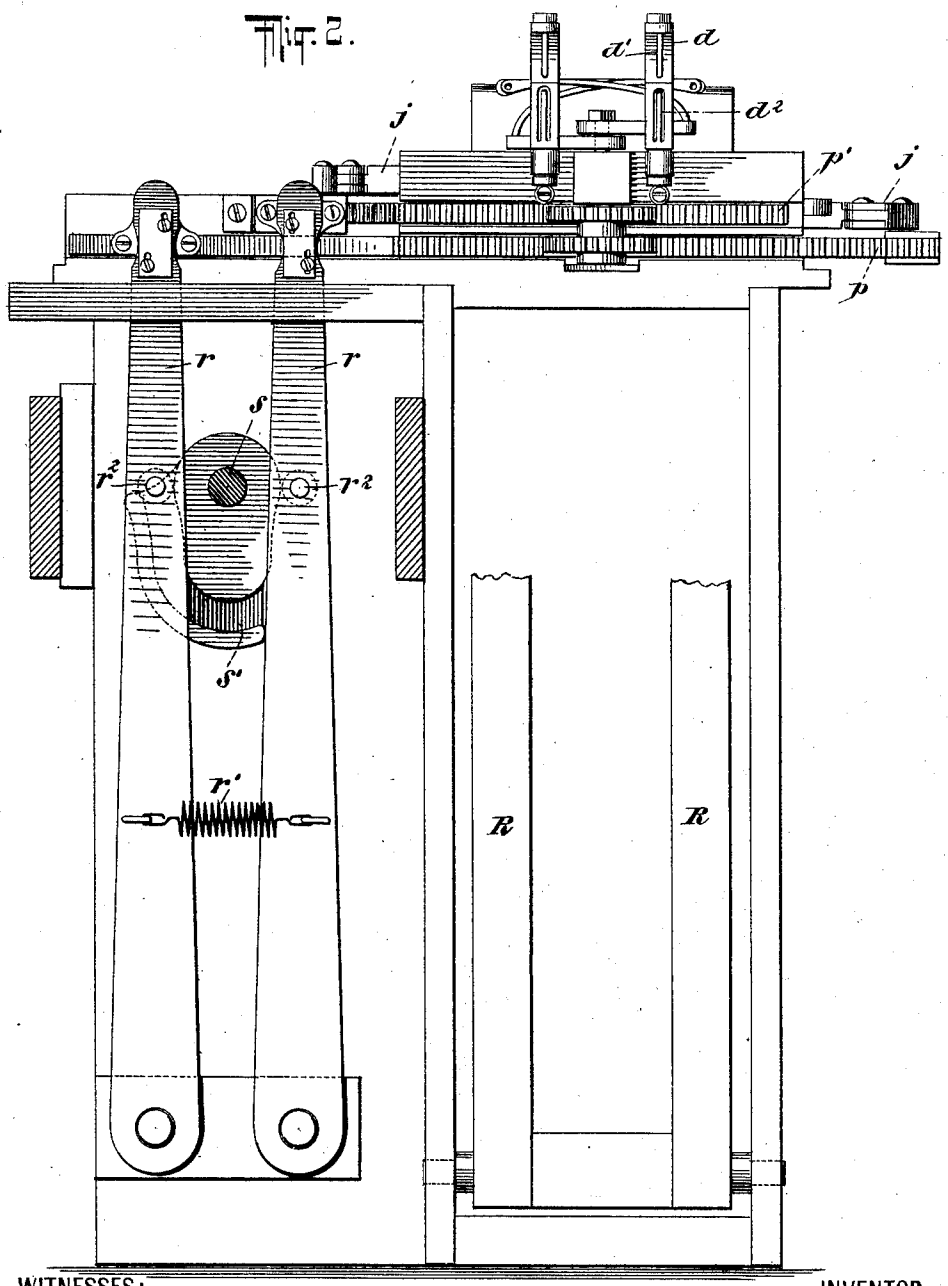
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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 5.

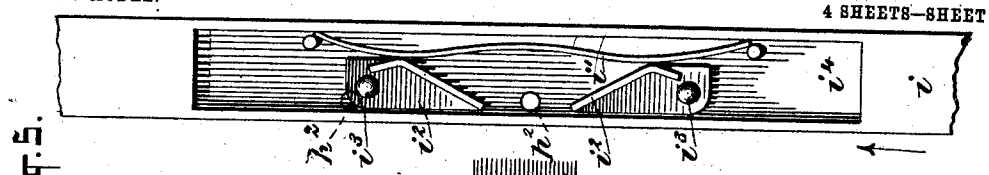


Fig. 4.

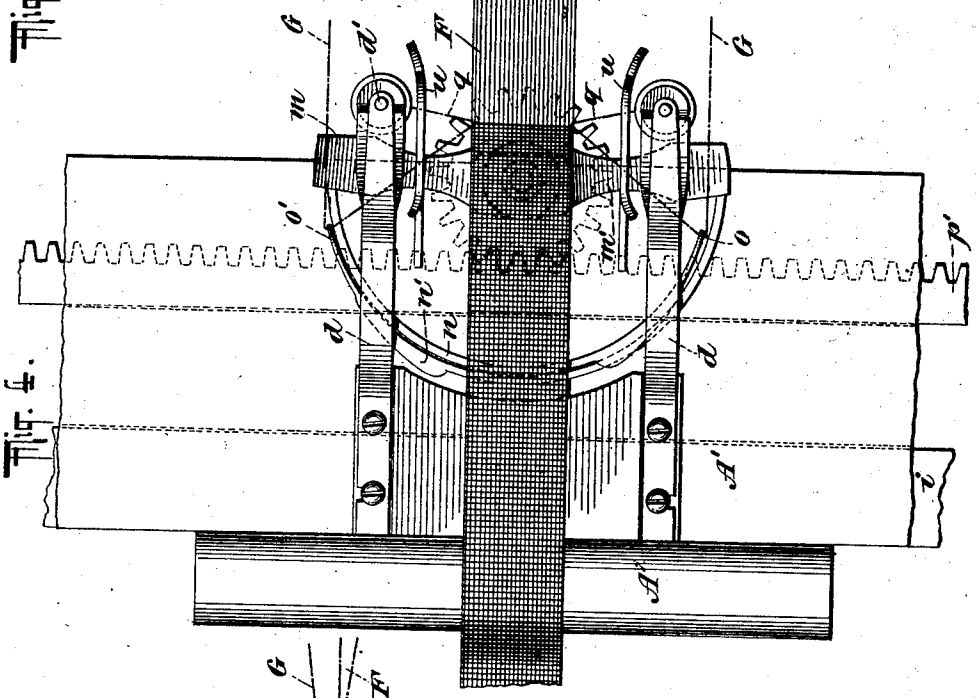
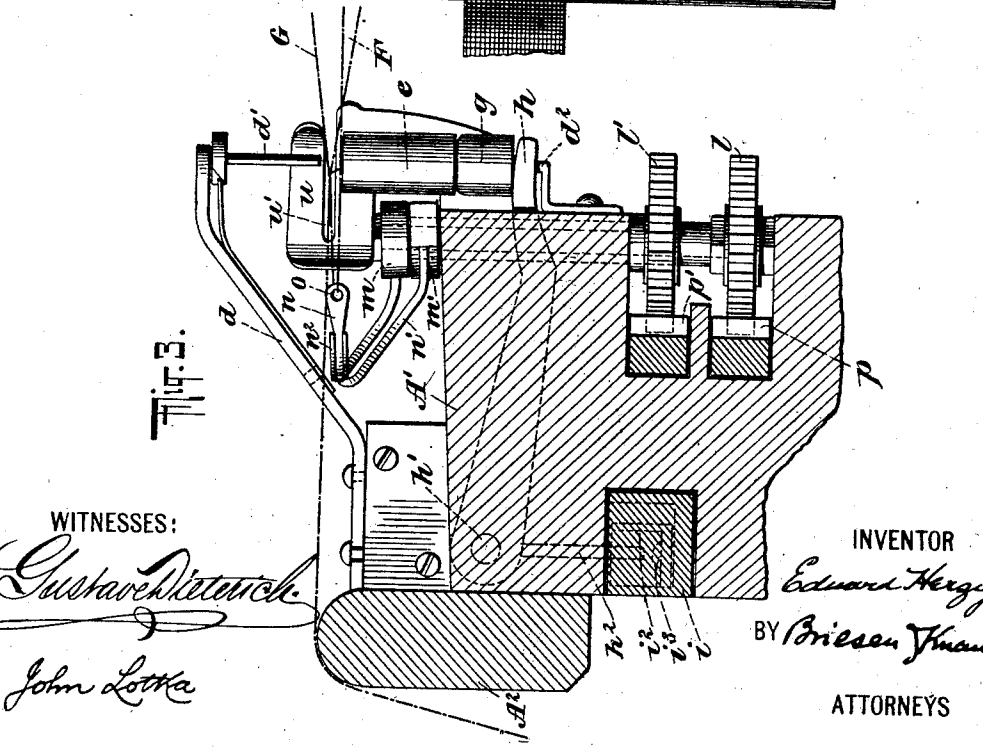


Fig. 3.



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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 6.

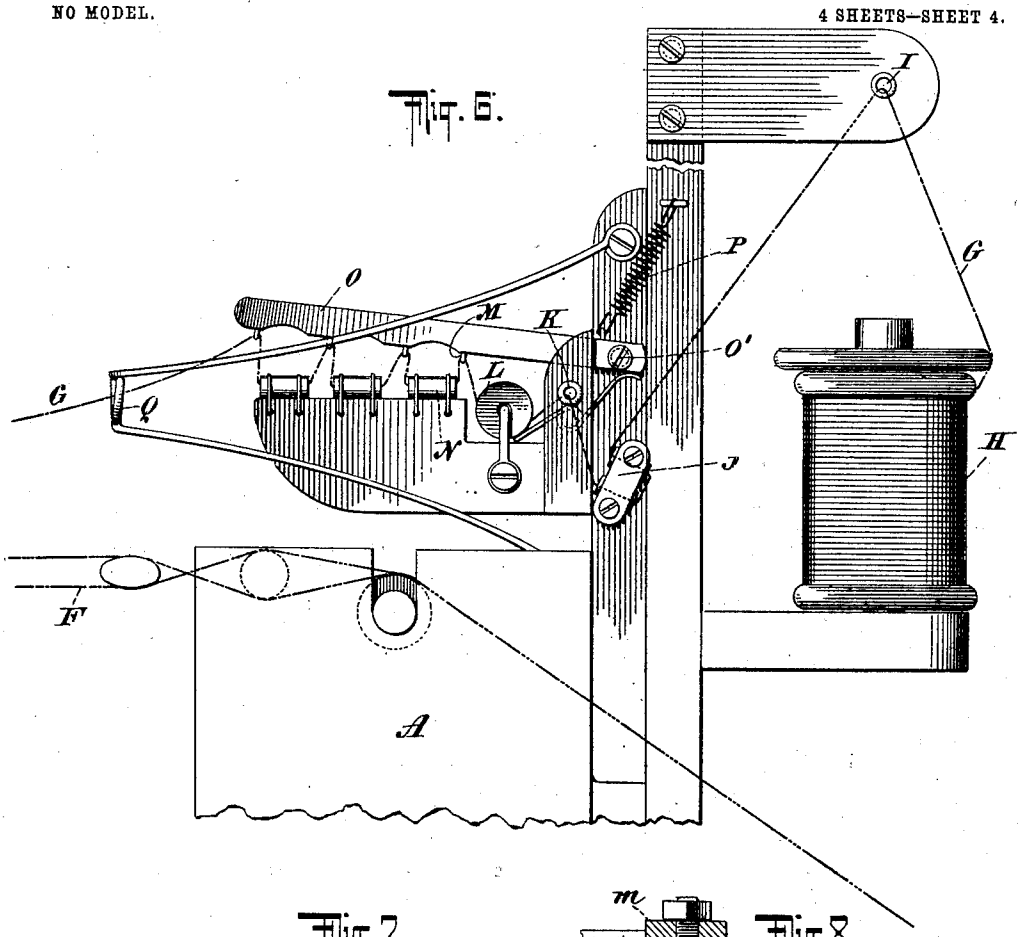


Fig. 7.

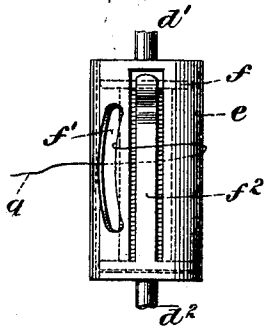
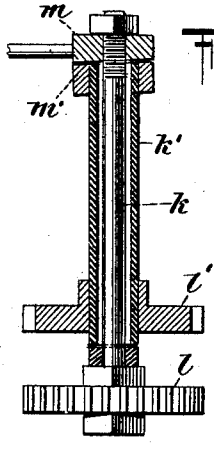


Fig. 8.



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UNITED STATES PATENT OFFICE.

EDUARD HERZIG, OF UNION HILL, NEW JERSEY.

NEEDLE-LOOM.

SPECIFICATION forming part of Letters Patent No. 719,666, dated February 3, 1903.

Application filed October 3, 1901. Serial No. 77,350. (No model.)

To all whom it may concern:

Be it known that I, EDUARD HERZIG, a citizen of the United States, residing at Union Hill, Hudson county, New Jersey, have invented certain new and useful Improvements in Needle-Looms, of which the following is a specification.

My invention relates to looms, particularly to such as are intended for weaving narrow fabrics, such as ribbons, and has for its object to provide a simple and efficient construction for rapidly producing the fabric and for securing a close and even mesh.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved loom with parts in section. Fig. 2 is a sectional elevation thereof on the line 2 2 of Fig. 1. Fig. 3 is an enlarged longitudinal section of that part of the machine at which the weft is inserted. Fig. 4 is a plan of the same parts. Fig. 5 is a detail plan of a slide for operating the weft-spools. Fig. 6 is an elevation showing the tension mechanism for the weft-threads on an enlarged scale. Fig. 7 is a detail of the selvage-spools, and Fig. 8 is a sectional elevation of the weft-carrier shafts and the parts connected therewith.

The machine comprises a frame A, having a main shaft B, from which the heddles C are operated by means of any approved mechanism, such as indicated at D.

E is the drum from which the warp F is supplied, said drum being provided with a cord E′ and weights or any other tension mechanism.

G indicates the weft-threads, one on each side of the machine, and each of said weft-threads passes from a supply-spool H through an eye I, a double eye J, another eye K, and in contact with a roller L. From there the thread G passes alternately through eyes M and tubular guides N, the latter being stationary, while the eyes M are secured upon a bar O, pivoted at O′ and drawn upward by a spring P. From the outermost eye M the thread G passes through a guide Q and then through guides R′, carried by the lay R, which may be arranged and operated in the usual manner by means of a bar S, having a crank-pin connection with a gear-wheel T, driven from the counter-shaft U and from the main shaft B by means of gearing V W. The finished fabric passes over a guide portion A^2 of the frame to a roll X, which is periodically rotated by means of gearing Y, and a ratchet-wheel Z, driven by means of a pawl a, which is mounted on an arm a'. This arm receives a periodical oscillating movement through the medium of a rod b and a bar c, operated in any suitable manner. Adjacent to the guide A^2 is located the weft-inserting portion of the machine, which is there provided with a support A′, from which extend brackets d in a direction parallel with that of the warp F and at each side of the same. These brackets are provided at their free ends with downwardly-projected pins d', which aline with similar pins d^2, arranged on the part A′ of the frame, the adjacent ends of the pins d' d^2 being spaced, as shown best in Figs. 2 and 3. On these pins d' d^2 are adapted to slide the selvage-spool holders e, the construction of which is shown in detail in Fig. 7. These holders are provided with bottoms, on which rest the spools f, with curved slots f', through which the thread from the spools f passes out, and with elastic tongues f^2. Below each spool-holder e is mounted to slide on the pin d^2 a lifter g, adapted to be operated by an arm h, fulcrumed at h' and provided with a downwardly-projected pin h^2. This pin is adapted to be moved forward and backward, so as to swing the arm h up and down by means of a slide i, to which a reciprocating motion is imparted through the medium of rods j, connected in any suitable manner with a moving part of the machine. Each of the slides i is of the specific construction shown in Figs. 3 and 5 and is provided with a recess i^4, within which is located a guide i', preferably in the nature of a spring, and with guides i^2, pivoted at i^3, said guides being arranged obliquely with reference to the guide i'. It will be understood that assuming the pin h^2 to be in the central position shown in Fig. 5 and the slide to move in the direction indicated by the arrow in said figure the pin h^2 will come in contact with the inclined guide i^2 and will thus be brought into the angle formed by the two guides i' i^2,

and finally the guide i yielding the pin h^2 will be forced past the guide i^2. This movement of the pin h^2 will correspond to an upward movement of the lifter g and the spool-holder e. As soon, however, as the pin h^2 is clear of the guide i^2 the weight of the spool and of the lifter, together with that of the arm h, will cause the pin h^2 to move back to its original position, as indicated in dotted lines in Fig. 5. Then when the slide i moves in the direction opposite to the arrow, the pin h^2 upon coming in contact with the guide i^2 will swing the latter on its pivot i^3, and thus pass into the central space between the two guides i^2, to then impinge against the inclined face of the other guide i^2, when the operation will be repeated in substantially the same manner. Adjacent to the selvage-spool holders e and at a point located centrally with respect to the warps F is located a shaft k, perpendicular to the plane of the warps—that is, vertical—said shaft carrying at its upper end the hub m of a weft-carrier n, which is formed at its end with an eye o and adjacent thereto with cheeks n^2. At its lower end the shaft k has a gear-wheel l. On the shaft k is loosely mounted a tubular shaft k', carrying a gear-wheel l' and the hub m' of another weft-carrier n'. The two weft-carriers are substantially alike, except that they extend in opposite directions. They rise gradually from the hubs m m' along what may be practically termed a "spiral" line, it being understood that the eyes o o' are at the highest portion of each weft-carrier, while the hubs m m' are at the lowest portion of such carriers. The gear-wheels l l' are in mesh with racks p p', to which a reciprocating motion is given by means of levers r, drawn toward each other by means of a spring r'. The said levers are moved from each other by means of a cam s' acting on studs or rollers r^2 and secured to a shaft s, which is driven from the counter-shaft U by means of bevel-gearing t. Between the two spool-holders e are arranged stationary guides u, each of which is provided with a slot u' at about the same level as the space intervening between the adjacent ends of the pins d' d^2.

The arrangement of the weft-threads G is as follows: They pass forward from the spools H through the tension device previously described and through the guide R' of the lay to the eyes o o', then inward to the fabric, it being understood that one weft-thread is wound off the spool H while the other weft-thread winds off the spool H on the other side. The selvage-threads q, which wind off the spools f, extend inward to the outermost warps F and are interwoven with the wefts G, the two weft-carriers swinging through the shed alternately and the spools f being each lowered at the time the corresponding eye o or o' is in its outermost position. By the rising and falling of the spools f the selvage-thread on each side is interwoven with the weft, thus forming a secure edge for the fabric. The fabric is thus extremely strong and durable.

In detail the process of weaving is as follows: The weft G, shown at the bottom in Fig. 4, has reached the position represented by a swinging movement of the weft-carrier n, and while this movement took place the corresponding selvage-spool carrier was in its upper position, so that the weft-thread passed under the selvage-thread q. After the weft-thread passed through the shed (downward in Fig. 4) the corresponding selvage-spool carrier e dropped into the position shown best in Fig. 3, so that the part of the selvage-thread adjacent to the spool-carrier came to be below the portion of the weft which extends through the shed, as also clearly appears in Fig. 3. Thus when the weft-carrier n swings forward, or to the right from the position shown in Fig. 4, it carries the weft over the selvage-thread instead of under the same, as before, and the result is an interweaving or interlocking of the weft with the selvage thread. At the same time one selvage-spool carrier e is lowered the other is raised. When, therefore, the weft-carrier n, after passing through the shed, lays the weft G in the slot u' of the guide u, shown at the top in Fig. 4, said weft passes under the selvage-thread q at the top of Fig. 4. Then the spool carrying this selvage-thread is lowered and the weft-carrier n returns to its original position, whereby the weft is interlocked with the selvage-thread at the top of Fig. 4. After the weft-carrier n has thus returned to its original position the shed is changed and the weft-carrier n' is operated in a corresponding manner to carry the other weft-thread through the shed first in one direction and then back, this weft being interlocked with the two selvage-threads in the same manner as described with reference to the movement of the weft-carrier n. By the use of the guides u, located between the selvage-thread carriers and the warp or web, I preserve that portion of the selvage-thread which is adjacent to the warp in a horizontal position, and, moreover, I prevent the weft from being dragged down by the weight of the selvage-thread and its carrier.

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

1. In a loom the combination of means for holding the warp, and for forming the shed, with weft-carriers movable transversely through the shed, a selvage-thread carrier movable at an angle to the plane of the warp laterally of the web, and a guide for the selvage-thread and for the weft, which guide is located between the selvage-thread carrier and the warp.

2. In a loom the combination of means for holding the warp and for forming the shed, with guides located at each side of the warp and substantially parallel therewith, vertically-movable selvage-thread carriers located

exteriorly of said guides and adjacent thereto, and means for inserting the weft.

3. In a loom the combination with warp-holding and shed-forming means, of a guide located adjacent to the warp at the side thereof, means for inserting the weft, and a selvage-thread carrier located adjacent to the guide upon the outside thereof and movable at an angle to the plane of the warp.

4. In a loom, the combination of means for holding the warp and for forming the shed, with weft-carriers pivoted centrally of the warp, selvage-thread carriers movable at an angle to the plane of the warp, and guides for the weft and selvage threads, said guides being located between the selvage-thread carriers and the warp.

5. In a loom, the combination of means for holding the warp and for forming the shed, with movable weft-carriers arranged to insert the weft, spaced alining-guides located at each side of the warp, selvage-thread carriers, and means for operating said carriers.

6. The combination in a loom of means for holding the warp and for forming the shed, with weft-carriers for inserting the weft, stationary spaced guide-pins located at each side of the warp, selvage-thread carriers mounted to slide on said guide-pins, means for operating said carriers, and guides located between the selvage-thread carriers and the warp and provided with slots alining with the spaces between the said guide-pins.

7. In a loom, the combination with means for holding the warp and for forming the shed, of weft-carriers for inserting the weft, selvage-thread carriers movable at an angle to the plane of the warp, operating-levers for moving the selvage-thread carriers, and slides for guiding said operating-levers, each slide carrying a guide on one side and pivoted guides on the other side, which pivoted guides are provided with inclined faces to engage a portion of the said levers.

8. In a loom, the combination with means for holding the warp and for forming the shed, of weft-carriers for inserting the weft, selvage-thread carriers movable at an angle to the plane of the warp, operating-levers for moving the selvage-thread carriers, and slides for guiding said operating-levers, each slide having a recess, an elastic guide set therein at one side, and pivoted guides set therein at the other side and each provided with an inclined face.

EDUARD HERZIG.

Witnesses:
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THOS. H. WALKER.