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H. K. MARTIN.

PILE WIRE MOTION FOR LOOMS.

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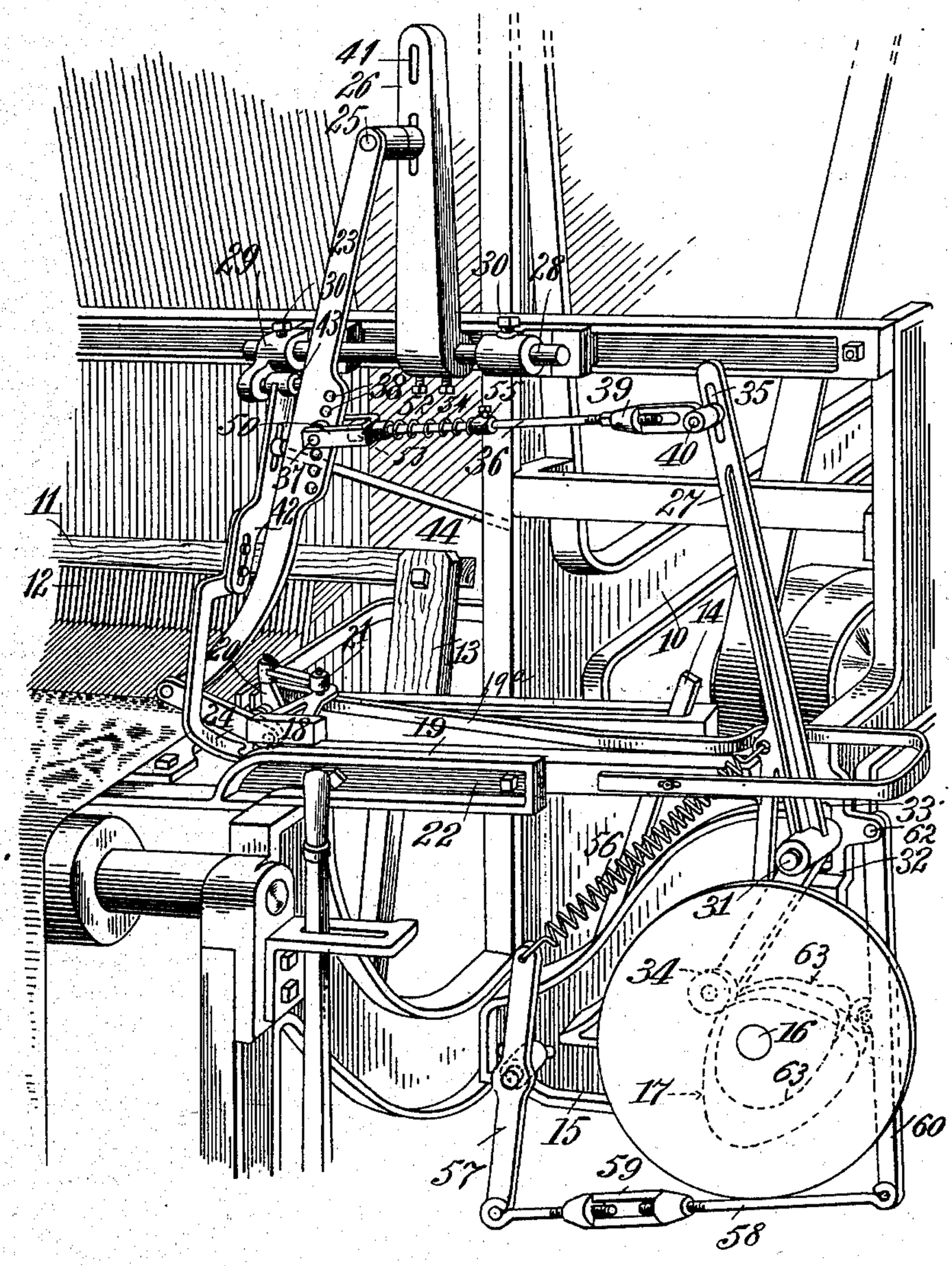
NO MODEL.



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UNITED STATES PATENT OFFICE.

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PILE-WIRE MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 749,443, dated January 12, 1904.

Application filed September 22, 1903. Serial No. 174,185. (No model.)

To all whom it may concern:

Be it known that I, HENRY K. MARTIN, a citizen of the United States of America, and a resident of Chicopee, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Pile-Wire Motions for Looms, of which the following is a full, clear, and exact description.

This invention relates to looms, and more especially to that class thereof which are known in the art as "pile-fabric" looms, in which a series of wires are used over which the loops of the warp are formed during the process of weaving, so as to produce what is generally known as "Brussels" carpet. At the same time it should be stated that my invention is equally applicable to a loom in which wires having knives are used for cutting the loops, thus producing the so-called "Wilton" carpet.

My invention has for one of its objects the provision of means whereby the extent of the movement of the carriage or "horse," as it is sometimes termed, for extracting and inserting the wires may be varied, so as to accommodate the loom to any width of goods desired.

My invention has, furthermore, for its object the provision of means whereby the zone of travel of said carriage may be varied, so that wires of any appropriate length may be inserted into the open shed of the warp-threads and positioned to permit the loops to be properly formed in the making of whatever width of goods may be predetermined, the movement of insertion and positioning of the wires in the shed and the extent of this withdrawal movement being precisely sufficient without being excessive, to the end that a maximum speeding of the loom may be done without detriment to the adequacy of action of the wire motion for the result of the greatest possible production of the pile fabric in any given time.

The wire-operating mechanism requiring easy accessibility, my invention comprises, furthermore, as one of its features an organization of the various coöperating parts of the mechanism, which is disposed above the lay and wire-carriage and in such a manner that any adjustment required by different kinds of work may be easily and readily made, and also any changes or substitutions of any of the operating parts, as well as their working, may be easily made by the operator.

Further improvements forming the subject-matter of this invention may be found in the particular construction of some of the coöperating elements, as will be hereinafter described, and particularly pointed out in the claims.

The accompanying drawing represents a perspective view of such a portion of a loom where my improvement has been applied to the machine, the general operation of which as a whole and as pertains to the lay-shuttle and picker-sticks being substantially well known and in common use.

In the drawing, 10 denotes the side frame of a loom, 11 the reed-cap of the lay, having the reed 12 and carried by the swords 13, which may be pivotally supported in any suitable manner as is usual in machines of this class.

The picker-sticks 14, one at each side of the loom, for driving the shuttle are of ordinary construction and operated by the ordinary picking mechanism. . (Not shown.)

Journaled in bearings on an extension 15 is a shaft 16, which may be geared to the main driving-shaft of the loom in any suitable manner and which serves as the prime mover or actuator for the wire mechanism, the cam 17 being mounted thereon for imparting proper movement to the wire carriage or horse 18, the proper construction of which is well known and which is mounted for reciprocatory movement upon the slide 19.

The hopper 20 is directly operated from a horse 18, being connected with the horse through the means of the link 21, both parts being movable on the slideways 19 and 19^a, which in the present instance comprises separate tracks more or less nearly in parallelism with each other for the horse and the hopper, and which slideways are preferably made a unitary structure comprising a length of spring-strip metal having a return-bend, the rearwardly-disposed portion 19^a thereof being capable of yielding horizontally and transversely of its length, secured to the frame extension 22, as clearly shown.

The means for reciprocating the horse across the loom comprises a lever 23, connected at its

lower end through a link 24 with the hopper 20 and pivotally supported, as at 25, on a bracket 26, which is normally stationary and in which the fulcrum 25 may be slightly adjusted vertically as required. The lever 23 receives an oscillatory movement from a rock-arm 27, which is under the direct control of the cam 17, above referred to, and in order to permit the lever 23 to be properly positioned relatively to the carriage and to the movement thereof the bracket 26 is in the present instance mounted for adjustment on a shaft or spindle 28, supported in brackets 29, which are secured to the frame and which are provided with set-screws 30 for holding shaft 28, and therefore the bracket 26, stationary in adjusted position.

Referring now to the rock-arm 27, it will been that the latter is pivotally supported on a stud 31 in a bracket 32, which is slotted, as shown at 33, so as to permit the stud 31 to be shifted relatively to the rotation axis of the cam 17, and thus vary the rocking movement of said arm and also the timing of its movement simultaneously relative to the uniform movement of the cam 17, inasmuch as the cam-roll 34 will be caused to change its position relative to the contour of the cam whenever the stud 31 is shifted in a vertical direction.

Means are provided whereby the oscillatory movement of the lever 23 may be modified as required, the arm 27 having a slot 35 to receive one end of a link 36, the other end of which may be furthermore adapted to or pivotally held on a bolt 37, adapted to any one of a series of holes 38 provided therefor in the lever 23, so that after the distances of the link 36 from the pivots 31 and 35, respectively, have once been properly regulated the oscillatory movement of the lever 23, and consequently the sliding movement of the horse and hopper 20, will be and remain the same.

In addition to the means for accomplishing the adjustment for various requirements as to the length of travel of the carriage 18 means are provided whereby the zone of said travel may be varied without in any way influencing the amount of said travel, so that if narrow goods are woven the wires which in this case may or may not be suitable for wider goods will be inserted into the open shed of the warp only to the requisite amount, and hence the link 36 is made adjustable, as indicated at 39, so as to shorten or lengthen the distance between the stud 40 on the lever 27 and the stud 37 on the lever 23.

In order to adapt the wire mechanism for different widths of goods, which necessitates different movements of the slide 18, the bracket 26 is preferably slotted at its upper end, as shown at 41, so that a long lever may be substituted for the lever 23, thus obviating the greater rise and fall of the lower end of this lever if it should travel through a greater arc than required in the present instance.

Coöperating with the carriage 18 is the carrier 42, pivoted at 43 on one of the brackets 29, above referred to, and operated by a link 44, controlled by the usual carrier mechanism, this carrier serving the well-known purpose of shifting in the arrangements shown the left-hand end of the rightwardly-withdrawn and forwardly-disposed wire rearwardly for reinsertion between the warps.

In the operation of the machine the connection 26 between the cam-operated lever 27 and the lever 23, which is linked to the horse and through it imparts the movements to the hopper, is to all intents and purposes the same as if such connections were constructed as an integrally-formed link; but for the special purpose of enabling the operator to impart a slight degree of swinging movement to the lever 23 and to the therewith-connected horse and hopper when the loom is stopped, and without having to move the actuating-lever 27 the link 36 is made with the extremity 50, which connects with the lever 23, as a separate part, having a tubular end hub 52 telescopically engaged over the end of the link-rod proper, 36, next to its head or enlargement 53, the spring 54 applied between the shoulder 55 and the tubular hub 52 keeping the two members of the link distended. Thus if the operator desires to move the hopper a short distance, so as to reach by hand and draw out one of the wires nearest the reed of the lay from within the warps, he may conveniently do so by merely grasping the lever 23 and forcing it to the rightward, the part 50 sliding endwise to the right on the main rod of the link and against the spring, the latter reacting, of course, to restore the link to its distended position when the force is released.

It is understood that the horse and hopper are constructed and operated as very common and well known in pile-fabric looms, the hopper having arrangements for grasping the extremity of each pile-wire that is relatively foremost in the made fabric—that is to say, the one which is farthest forward from the reed of the lay—and after such wire has been transferred to and inserted within the warps at the place the nearer to the reed the wire grippers or jaws provided in the hopper, as well known, are automatically opened, releasing the pile-wire last carried thereby, and hence it will be readily understood that in the slight swinging movement which the lever 23 may have imparted thereto when the loom is stopped will be effective to carry the hopper free and clear from the adjacent pile-wire, so that the same may be readily drawn out by hand when occasion therefor demands. Inasmuch as the cam 17 operating against the actuating-lever 27 is against the tension of the spiral spring 56, which causes the retraction

of the actuating-lever as the cam recedes in one portion of its every rotation, and to avoid undue stretching of such spring, whereby its life becomes greatly shortened, the said spring 56, one end of which is connected to the actuating-lever 27, has its opposite end connected to an intermediately-pivoted lever 57, which is through link 58, having, preferably, the turnbuckle 59 therein, connected to the lever 60, pivoted to the frame at 62 and in coöperative relation to a second cam 63 on the same shaft 16 as the cam 17, so that every time the cam 17 imparts the rocking movement to the actuating-lever 27, tending to stretch the spring 56, the other cam 63 permits the levers 60 and 57 to have a swinging movement, so that the lower end of the spring has a substantial degree of movement following the lever 27 and relieving the spring, which is understood as always under sufficient tension to have the proper retracting effect on the actuating-lever.

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

1. In a pile-wire motion, the combination of a wire-carriage, a lever arranged to reciprocate the carriage, a bracket on which the lever is adjustably fulcrumed, to permit its adjustment to and from the wire-carriage, means for adjusting the bracket in a direction substantially parallel with the path of movement of the wire-carriage, a rock-arm, a link connecting the rock-arm and lever, and having an adjustable connection with the lever, a cam arranged to engage the rock-arm, and means for adjusting the fulcrum of the rock-arm with relation to the axis of the cam.

2. In a loom of the character described, the combination with the horse, the slideways therefor, and the hopper, coöperating with the horse as usual, of the lever 23 connected to the horse, the cam-actuated lever 27 and the link connecting said lever 27 and the lever 23, formed in two sections, one of which has the head 53 and shoulder 55, and the other having a tubular portion fitted about and movable endwise along the first section, and a spring interposed between the shoulder and said section 50, substantially as and for the purposes set forth.

3. In a loom of the character described, the combination with the actuating-lever 27, for operating the horse and hopper and the cam 17 coöperating therewith, of another cam 63 rotatable in unison with the cam 17, a lever 60 operated by the cam 63, a lever 57 intermediately pivoted having one end thereof linked to said lever 60, and a spiral spring in tension between the other end of said lever 57, and said actuating-lever 27, substantially as and for the purposes set forth.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

HENRY K. MARTIN.

Witnesses:
WM. S. BELLOWS,
A. V. LEAHY.