C. L. HOFF.

LOOM FOR WEAVING WIRE CLOTH.

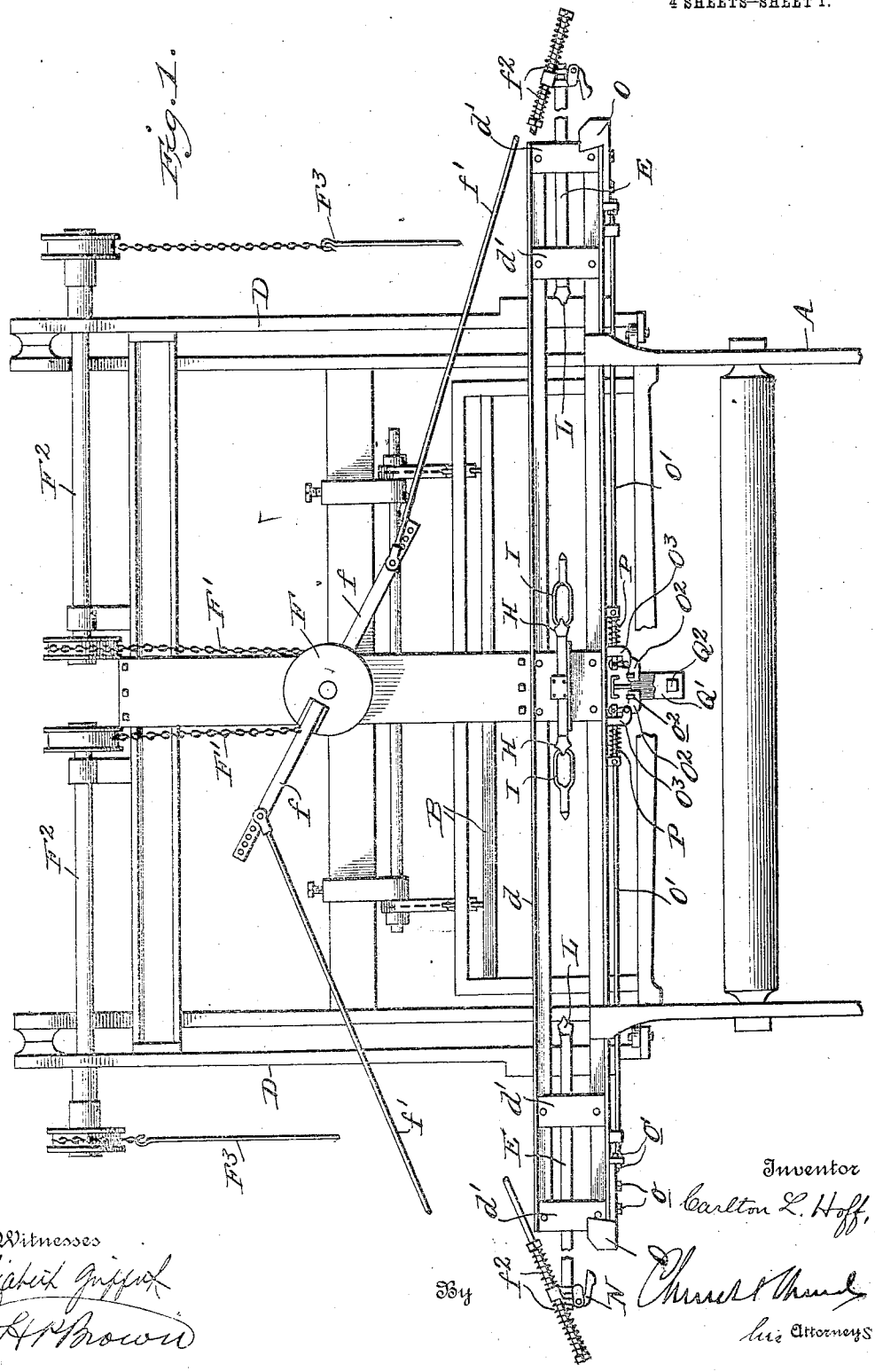
APPLICATION FILED OCT. 4, 1909.

1,056,174.

Patented Mar. 18, 1913.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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4 SHEETS—SHEET 2.

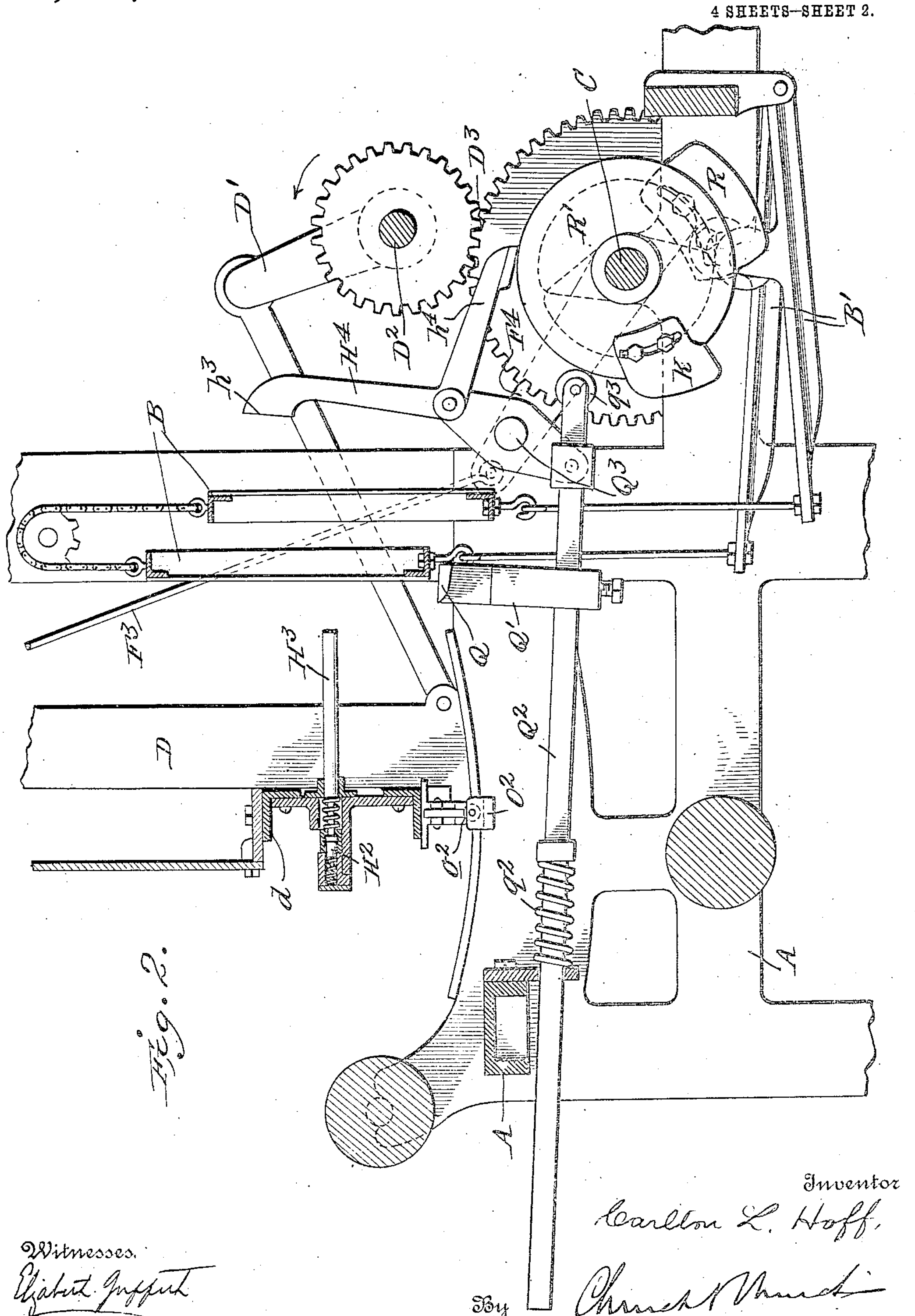

Fig. 2.

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4 SHEETS—SHEET 3.

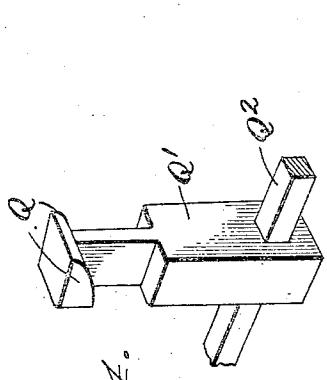

Fig. 4.

Fig. 3.

Fig. 5.

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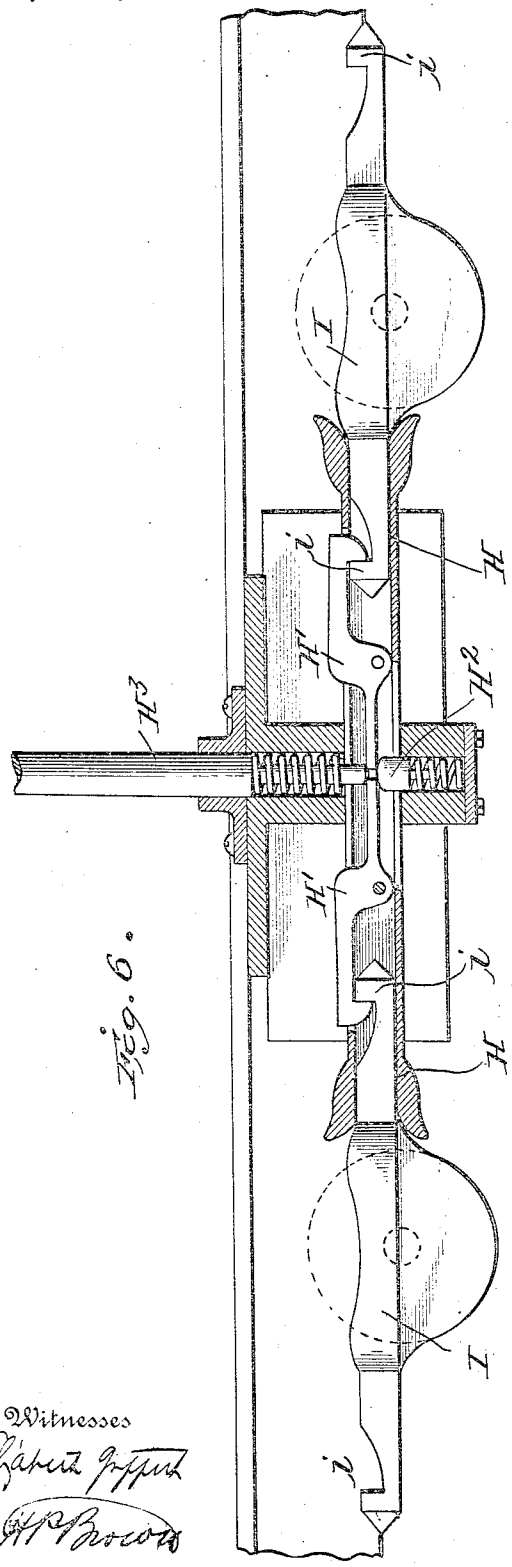
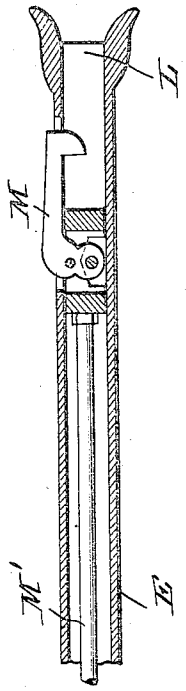


Fig. 6.



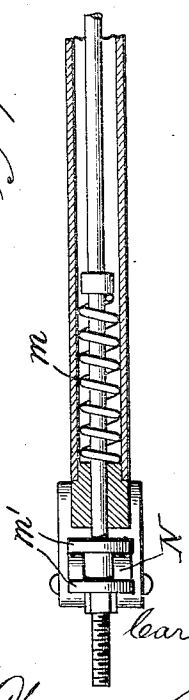


Fig. 7.

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LOOM FOR WEAVING WIRE-CLOTH.

1,056,174. Specification of Letters Patent. Patented Mar. 18, 1913.

Application filed October 4, 1909. Serial No. 520,777.

To all whom it may concern:

Be it known that I, CARLTON L. HOFF, a citizen of the United States, residing at York, county of York, and State of Pennsylvania, have invented certain new and useful Improvements in Looms for Weaving Wire-Cloth; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to looms primarily intended for weaving wire cloth, the objects of the invention being to provide a means whereby a plurality of narrow widths of cloth may be simultaneously woven in a single loom with an expenditure of power and time no greater than heretofore consumed in weaving a single width.

A further object of the invention is to simplify the construction and arrangement of the parts whereby the operation of the machine is improved and the necessity for imparting a variable movement to the shuttle carriers is obviated.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described and pointed out particularly in the appended claims.

In the accompanying drawings—Figure 1 is a front elevation of a wire cloth weaving loom, with portions broken away, and omitted in order to illustrate the present invention more clearly. Fig. 2 is a section in a vertical plane from front to rear through a portion of the machine. Fig. 3 is an elevation of one end of the lathe or lay frame with parts in section and broken away. Fig. 4 is a detail perspective view of the shuttle carrier catch controller. Fig. 5 is an elevation partly in section of the shuttle catch operating cams and parts associated therewith. Fig. 6 is a sectional plan of the central portion of the lathe frame showing the shuttle catches. Fig. 7 is a longitudinal section through one of the shuttle carriers.

Similar letters of reference in the various figures indicate the same parts.

The present invention is illustrated in connection with a type of wire cloth weaving loom which is now in extensive use and well known. For this reason it is deemed unnecessary to illustrate more than those parts of the loom which are directly associated with the mechanism forming the present invention, especially as illustration of additional parts would only tend to confuse the drawings.

In said drawings the reference letter A indicates the frame of an ordinary wire cloth weaving loom, the cloth beam being located on the side of the machine facing the observer in Fig. 1, and at the left hand side of the machine as illustrated in Fig. 2. B indicates the harness comprising the usual pedals and operating mechanism such as the levers B′ adapted to be depressed by cams (dotted lines, Fig. 2) on the shaft C. The lathe or swinging frame is indicated by the letter D and is adapted to be swung or oscillated by the crank arms D′ mounted on a shaft D^2, said shaft D^2 and the shaft C being connected by 2 to 1 gearing D^3. The reeds (not shown) are mounted in the transversely extending portion *d* of the lathe D and at the ends of said transversely extending portion *d* slide ways or bearings *d*′ are provided for shuttle carriers or rods E. These shuttle carriers or rods are reciprocated longitudinally by a central oscillator F connected with the outer ends of the carriers E by crank arms *f* and rods or links *f*′, suitable springs f^2 being interposed in the connections, as is usual in this class of machine. The oscillator F is journaled on the lathe frames so as to swing therewith and its operating or oscillating mechanism comprises flexible connections F′, rock shafts F^2 (Fig. 1), flexible connections and links F^3 and crank arms F^4, shown in dotted lines in Fig. 2 as projecting from the ends of the shaft C. The construction and operation of all these parts being well known no further description is needed.

In the ordinary operation of looms of this character it is found that they can be operated only at a certain moderate speed and the speed of operation, to-wit, the laying of successive weft threads does not differ to a material degree regardless of the width capacity of the loom. As a consequence, it is usual to equip factories with looms of substantially standard width adapted to weave cloth of maximum width, and whenever narrow cloth is to be woven the looms must be operated at a disadvantage. In accordance with the present invention provision is made whereby two widths of narrow cloth may be woven simultaneously each with its own

double selvage edge and, inasmuch as the speed of operation remains the same, the output of the loom is practically doubled.

To accomplish the end desired, the shuttle carriers instead of carrying a single shuttle, are each adapted to manipulate its own individual shuttle, each shuttle being advanced through the shed by its carrier and transferred to a stationary holder at the center, the carrier retreating without the shuttle. When the shed has been shifted the carrier again advances through the shed, picks up its shuttle and carries it back to the starting point. The two carriers move in unison in opposite directions if so desired, thereby balancing the operating mechanism, although it will be understood that in so far as the present invention is concerned this is not essential, nor is it essential that the particular shuttle carrier operating mechanism illustrated and heretofore used be employed, as any suitable means which will give the shuttle carriers a reciprocatory movement in proper time with relation to the decussation of the warp threads may be employed.

By reference particularly to Figs. 1, 2 and 6 it will be seen that the fixed holder for the shuttles is located at the center of the lathe and is provided with oppositely projecting sockets H for the ends of the shuttles. The shuttles I are each provided with hooks i with which pivoted latches H′ in the sockets are adapted to coöperate. The proximate ends of the latches are pressed rearwardly by a spring actuated plunger H^2 and are adapted to be released or moved in the opposite direction by a spring retracted plunger H^3. The plunger H^3 slides in a bearing in the lathe and projects some distance in rear thereof or into a position where, when the lathe is swung rearwardly, it will contact with the upper end h^3 of a bell crank lever H^4 whenever the latter is swung forwardly through the contact of its opposite arm h^4 with an adjustable cam K on the shaft C.

When the bell crank lever H^4 is swung forwardly and the plunger H^3 contacts therewith it operates to release the catches from the shuttles I and the latter are then free to be taken by the shuttle carriers.

Each shuttle carrier (Fig. 7) is provided with a socket L at its forward end and with a pivoted catch M adapted to coöperate with and retain a shuttle in the end of the carrier. The catches M are operated by rods M′ extending longitudinally within the shuttle carriers and at their outer ends provided with springs m normally tending to hold the catches M in their closed or locked positions. The outer ends of the rods are further provided with adjustable stops or nuts m' with each of which one arm of a bell crank N is adapted to engage, said bell crank levers being pivotally mounted on the outer ends of the shuttle carriers, as will be readily understood from an inspection of Fig. 3.

For releasing the shuttles from the shuttle carriers the bell crank levers N are adapted to engage cams O located on the lathe frame but, inasmuch as this release must occur only during each alternate swing of the lathe, provision must be made whereby the cams are movable into and out of operative position. The mechanism for accomplishing this in accordance with the present invention is exceedingly simple, the cams O being slidably mounted on the under-face of the lathe frame by bolts o passing through slots in the inwardly extending bases of the cam. Said cam bases are adjustably connected by lock nuts o' with rods O′ extending toward the center of the lathe frame and at the inner ends pivotally connected with bell crank levers O^2 journaled in brackets O^3 and adapted, when their horizontally projecting arms are depressed to draw the cams inwardly against the tension of springs P and thereby remove said cams from the paths of the bell crank levers N. The horizontally projecting arms of the bell crank levers O^2 are preferably provided with anti-friction rollers o^2 and the latter, as shown in Figs. 1 and 3, are located at substantially the center of the lathe and in position to contact with the under faces of inclines Q whenever the lathe is swung rearwardly and the said inclines are advanced, as will be now described.

The inclines Q, Figs. 2 and 4, are preferably formed by the under faces of a head on a block Q′ adjustably mounted on a sliding rod Q^2. The rod Q^2 slides in bearings held at one end of the rod by the fixed shaft Q^3 and by the frame A at the opposite end. A spring q^2 serves to force the rod inwardly or toward the rear and the rear end of the rod is provided with an anti-friction roller q^3 adapted to coöperate with an adjustable cam R mounted on the shaft C. Conveniently the cams K and R may be adjustably mounted on opposite sides of a disk R′ on said shaft C and said cams are so positioned with relation to each other that the cam K will be in engagement with the arm h^4 of the bell crank lever when the inner end of the rod or slide Q^2 is in engagement with the cam R, with the result that the shuttles are released from the central fixed holder at the same time that they are engaged by the latches in the carriers. The last mentioned latches are released by the cams O only when the bell crank levers O^2 are not moved to draw the cams inwardly.

To retain the catches in the central holders released from the shuttles during the initial forward movement of the lathe the cam K is preferably made with an inclined outer face whereby the upper end of the bell

crank lever H^5 is caused to follow the movement of the lathe for a short distance, thus giving the carriers ample time to withdraw the shuttles from the holders. The cams O are held in inoperative position a sufficient length of time to allow the shuttle carriers to retreat or move outwardly beyond a position where it would be possible for the bell crank levers N to engage said cams, the period during which they are held being determined by the length of the cam R.

By connecting shafts D^2 and C by 2 to 1 gearing, it will be seen that the lathe is caused to make two oscillations during each revolution of the shaft C and the shuttle carriers are reciprocated in and out during each movement of the lathe. During one movement or excursion of the shuttle carrier the bell crank lever H^4 or movable release stop for the shuttle holder catches is out of operative position and the incline Q is also out of its operative position so that the cams O are in position to engage the bell crank levers N to thereby release the shuttles from the carriers. This release occurs at the moment when the said shuttles have automatically engaged the catches in the holder.

From the foregoing, it will be readily understood that during one excursion of the lathe the shuttles are held in the central holders and during the next excurison of the lathe the shuttles are held in the carriers and during each excursion or at such period when the warp threads have been properly decussated the shuttles are transferred from the holder to the carrier or from the carrier to the holder and carried through the shed.

In the particular embodiment of the invention illustrated it will be noted that the shuttle carrier catch release cams O are normally held in position to release the carrier catches, but are moved out of their operative position by the cam R on the drive shaft, but the catches H' of the shuttle holders will normally engage the shuttle and retain the same, unless the release stop or bell crank lever H^4 is advanced to move them out of operative position. Through the mechanism described, the two sets of catches are caused to alternate in action; that is to say, the holder catches release the shuttles when the carrier catches engage the same and the carrier catches release the shuttles when the holder catches engage the same, thereby effecting a positive transfer of the shuttles from one to the other.

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

1. In a loom for weaving wire cloth, the combination with the frame, harness, lathe, oppositely disposed reciprocatory shuttle carriers on the lathe, oppositely arranged shuttle holders on the lathe intermediate the carriers, and shuttle catches in the carriers and holders, respectively, of releasing devices for said catches embodying cams timed to move into operative position during alternate excursions of the lathe, and connections controlled by said cams for controlling the release of the carrier and holder catches alternately.

2. In a loom for weaving wire cloth, the combination with the frame, harness and lathe movable toward and from the harness, of reciprocatory shuttle carriers on the lathe, shuttle holders fixed centrally on the lathe adapted to receive shuttles simultaneously from each carrier, catches for holding the shuttles in the carriers and holders, and means for releasing the carrier catches mounted on the lathe and carried thereby into engagement with coöperating members on the frame, means mounted on the lathe and operated by engagement with a member carried on the frame, at alternate reciprocations, for releasing the holding catches simultaneously.

3. In a loom for weaving wire cloth, the combination with the frame, harness and lathe movable toward and from the harness, of a reciprocatory shuttle carrier on the lathe, a shuttle catch on the inner end of the carrier and releasing mechanism for said catch, embodying a bell crank lever at the outer end of the carrier, a connection between said lever and catch, a cam block slidably mounted on the under side of the lathe frame in the path of the bell crank lever, means for operating said cam block comprising an adjustable rod, a bell crank lever centrally located on the lathe, of an incline carried on a rod, a cam on the main drive coöperating therewith to depress the bell crank lever at alternate movements of the lathe frame.

4. In a loom for weaving wire cloth, the combination with the frame, harness and lathe movable to and from the harness, of a reciprocatory shuttle carrier on the lathe, a shuttle catch on the inner end of the carrier and releasing mechanism for said catch embodying a bell crank lever on the outer end of the carrier, a connection between the lever and catch, a cam block slidably mounted on the under side of the lathe frame in the path of the lever, an adjustable connection between said cam block, and a bell crank lever centrally located on the lathe frame and pivoted thereto, an operating member comprising an incline mounted on a rod and carried into and out of the path of the last mentioned lever by coöperation with the driving mechanism.

5. In a loom for weaving wire cloth, the combination with the frame, harness and lathe movable toward and from the harness, of a reciprocatory shuttle carrier on the lathe, a catch therefor, a shuttle holder

mounted in fixed position on the lathe embodying oppositely arranged shuttle catches, movable means normally in position to release the catch on the carrier when the carrier is at the inner end of its excursion, means operated by the movement of the lathe for releasing the catches on the holders simultaneously, when the carrier is at the inner end if its excursion, whereby the shuttle may be transferred from the holder to the carrier and vice versa.

6. In a loom for weaving wire cloth, the combination with the frame, harness and lathe movable toward and from the harness, of oppositely disposed reciprocatory shuttle carriers on the lathe, oppositely arranged shuttle holders on the lathe intermediate the carriers, provided with spring pressed catches to engage simultaneously shuttles from each carrier, spring-pressed shuttle catches in the carriers, releasing means for said catches and a single means for releasing both holder catches when the lathe is swung rearwardly whereby the shuttles will be transferred from the holders to the carriers.

7. In a loom for weaving wire cloth, the combination with the frame, harness and lathe movable toward and from the harness, of oppositely disposed reciprocatory shuttle carriers on the lathe provided with spring-pressed catches, oppositely arranged shuttle holders centrally fixed on the lathe, of spring pressed catches therein, a push bar for releasing the catchers in the holders simultaneously, a movable stop with which said bar contacts when the lathe is moved rearwardly, means for moving the stop into and out of operative position during alternate movements of the lathe, and means for releasing the catches in the carriers when the stop is out of operative position.

8. In a loom for weaving wire cloth, the combination with the frame, harness lathe, oppositely disposed shuttle carriers on the lathe, oppositely arranged shuttle holders centrally fixed on the lathe, comprising a casing, spring pressed catches therein, a push rod coöperating with said catches, whereby the catches are released at the same moment, by the movement of the lathe and action of the push rod.

9. In a loom, the combination of a support, a pair of shuttles; a pair of bars for moving said shuttles into and out of said support; means for operating said bars; a pair or rocking clamps mounted in said support and arranged to engage said shuttles when the latter are in place therein; means for operating said clamps; a pair of rocking clamps associated with said bars for engagement with said shuttles; and means for operating the second named clamps.

10. In a loom the combination of a support, a pair of shuttles, mechanism for moving said shuttles into and out of the support, a pair of rocking clamps mounted in said support and arranged to engage said shuttles when the latter are in place therein, and mechanism for simultaneously rocking both clamps into position to release both shuttles from the support and automatic means for returning the clamps to position to receive both shuttles simultaneously.

11. In a loom, the combination of a support, a pair of shuttles, mechanism for moving said shuttles into and out of the support, a pair of clamps mounted in said support, each clamp being provided at one end with a finger adapted to engage one of the adjacent shuttles when the latter is in place in said support and at the other end with an arm, a push rod engaging said arms for rocking the clamps and means for actuating said push rod.

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