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PATENTED JAN. 29, 1907.

L. MILLER.

WEFT REPLENISHING MECHANISM FOR LOOMS.

APPLICATION FILED SEPT. 20, 1904.

3 SHEETS—SHEET 1.

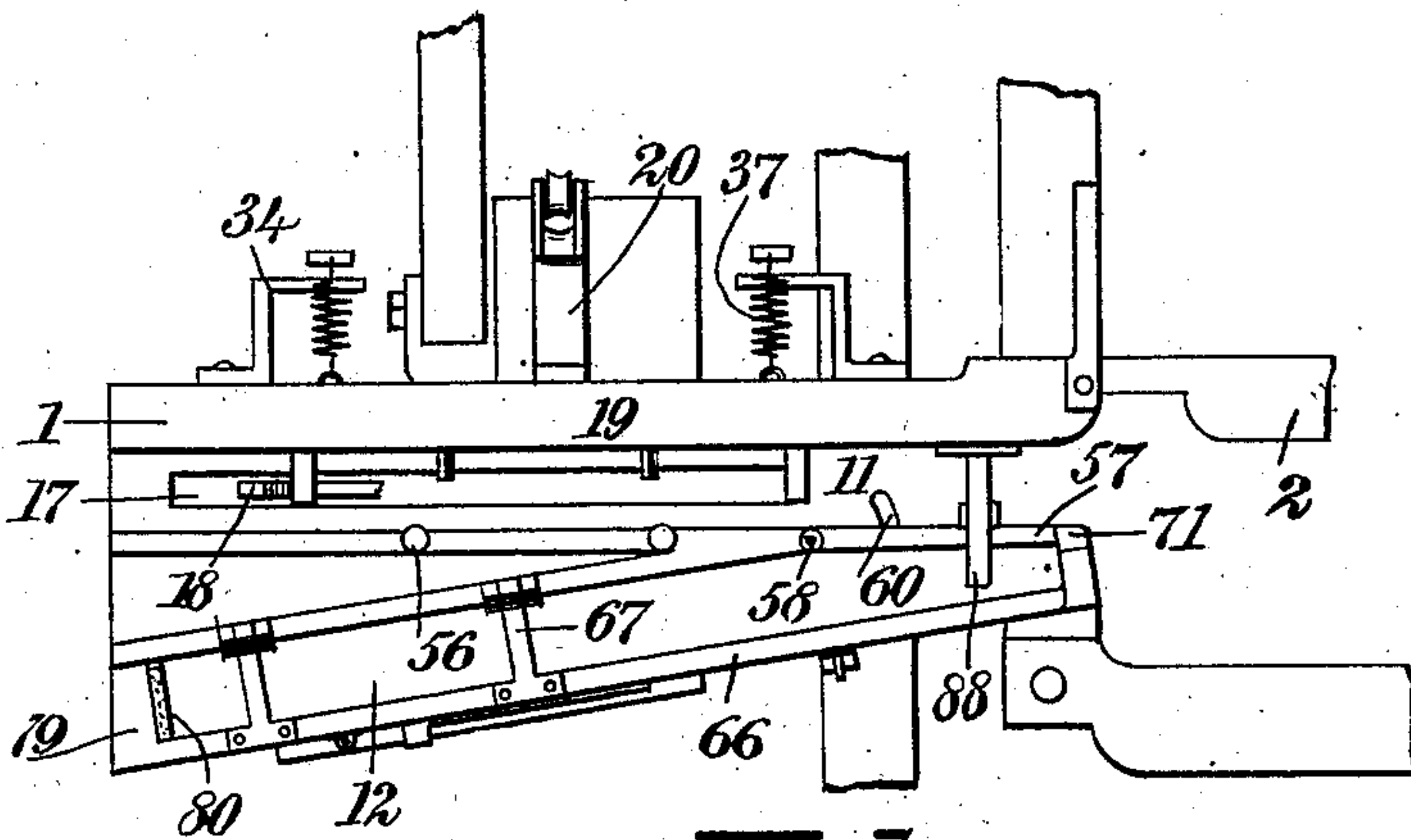
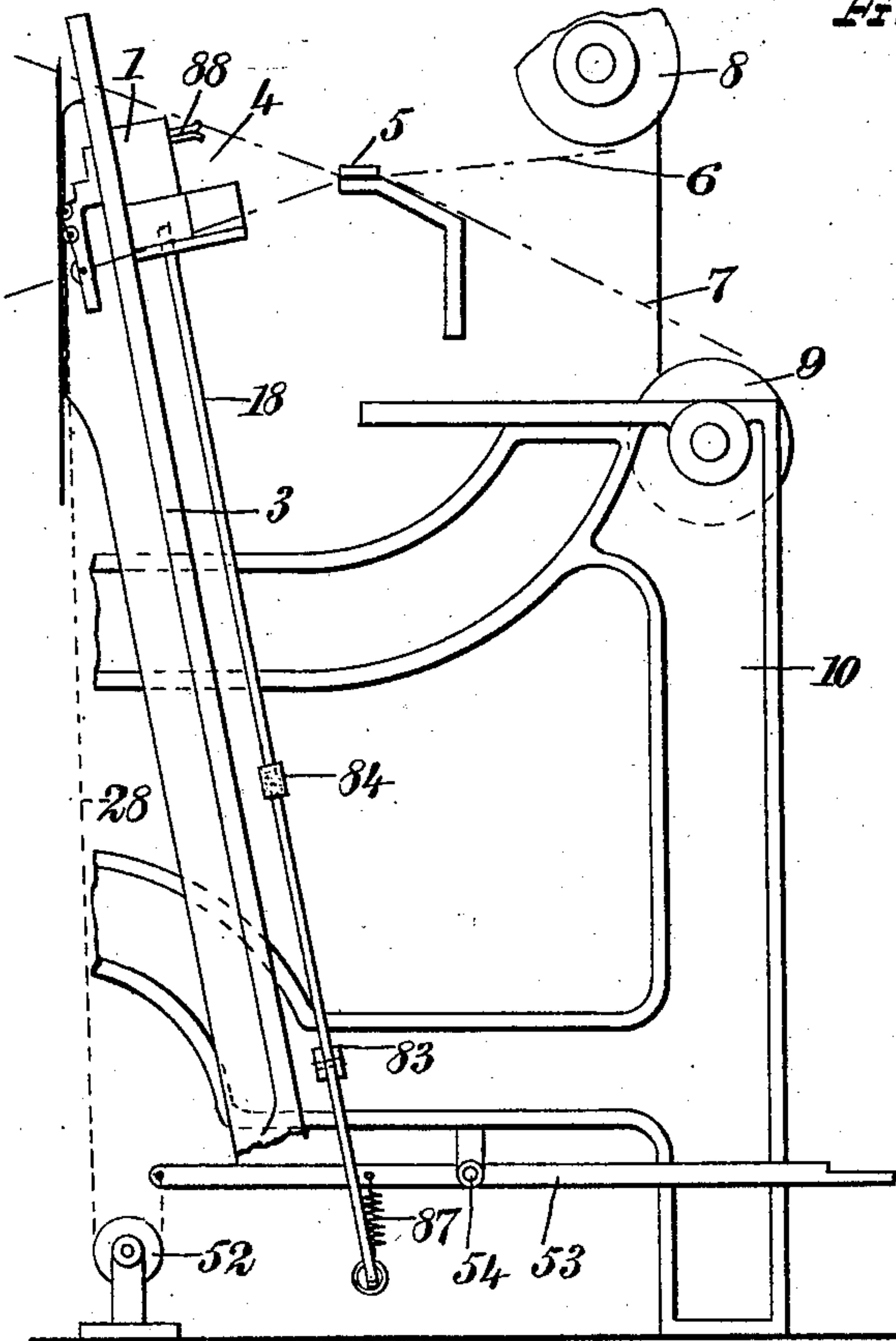
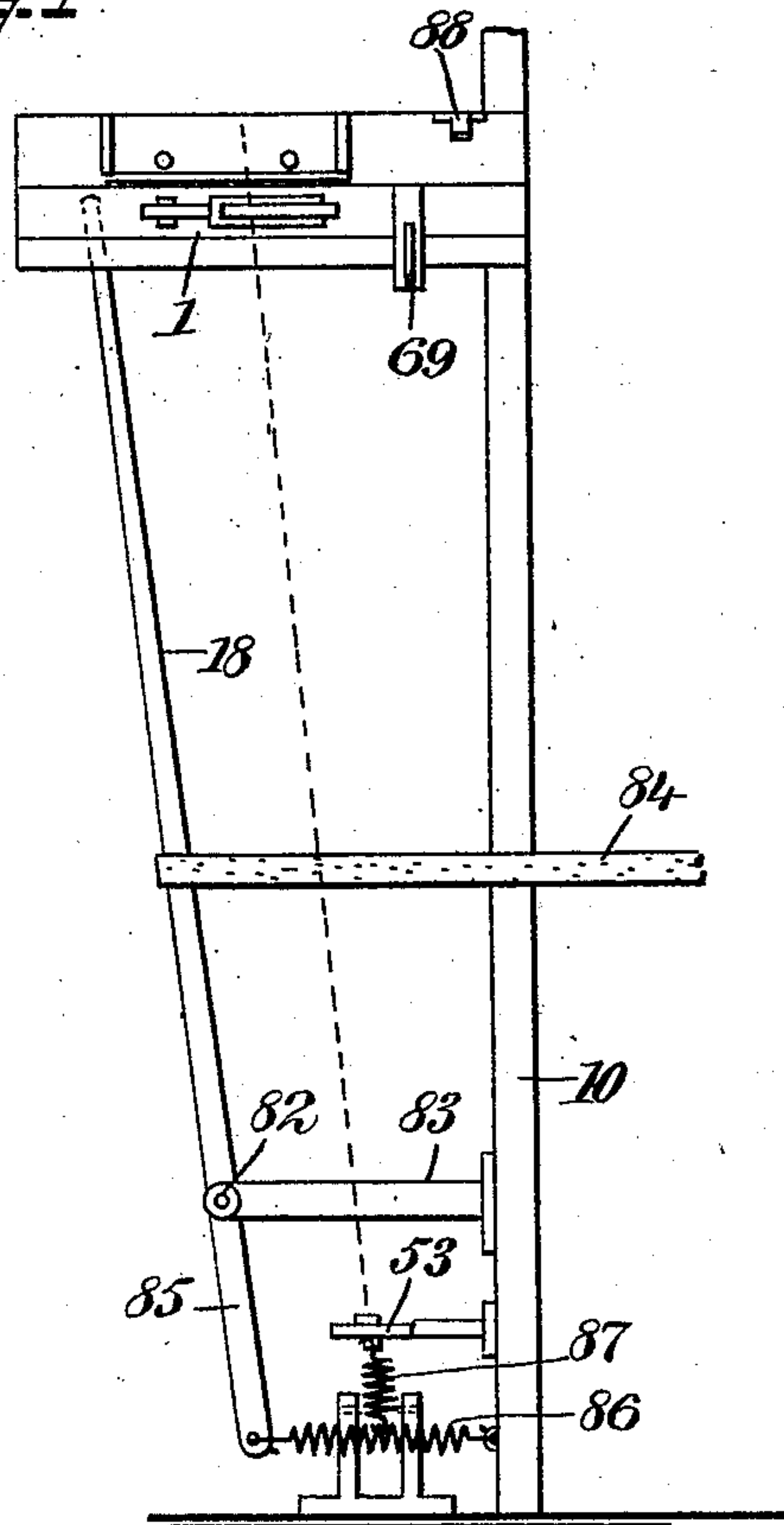


Fig. 1



WITNESSES:

John Beipton Fig. 2
A. L. Ammen



INVENTOR

Fig. 3 *Lester Miller*
BY *Wm. M. Miller*
ATTORNEYS

No. 842,683.

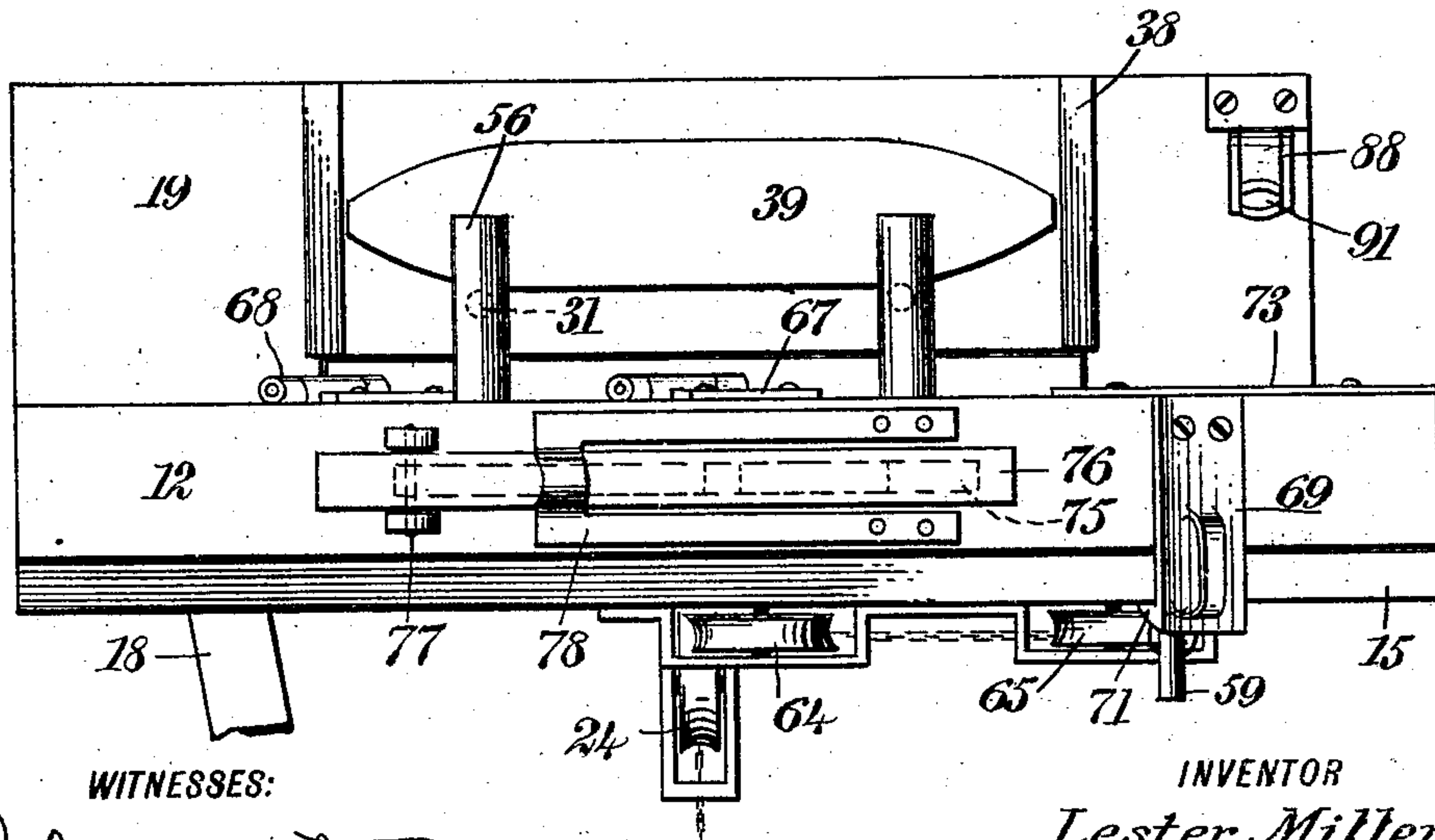
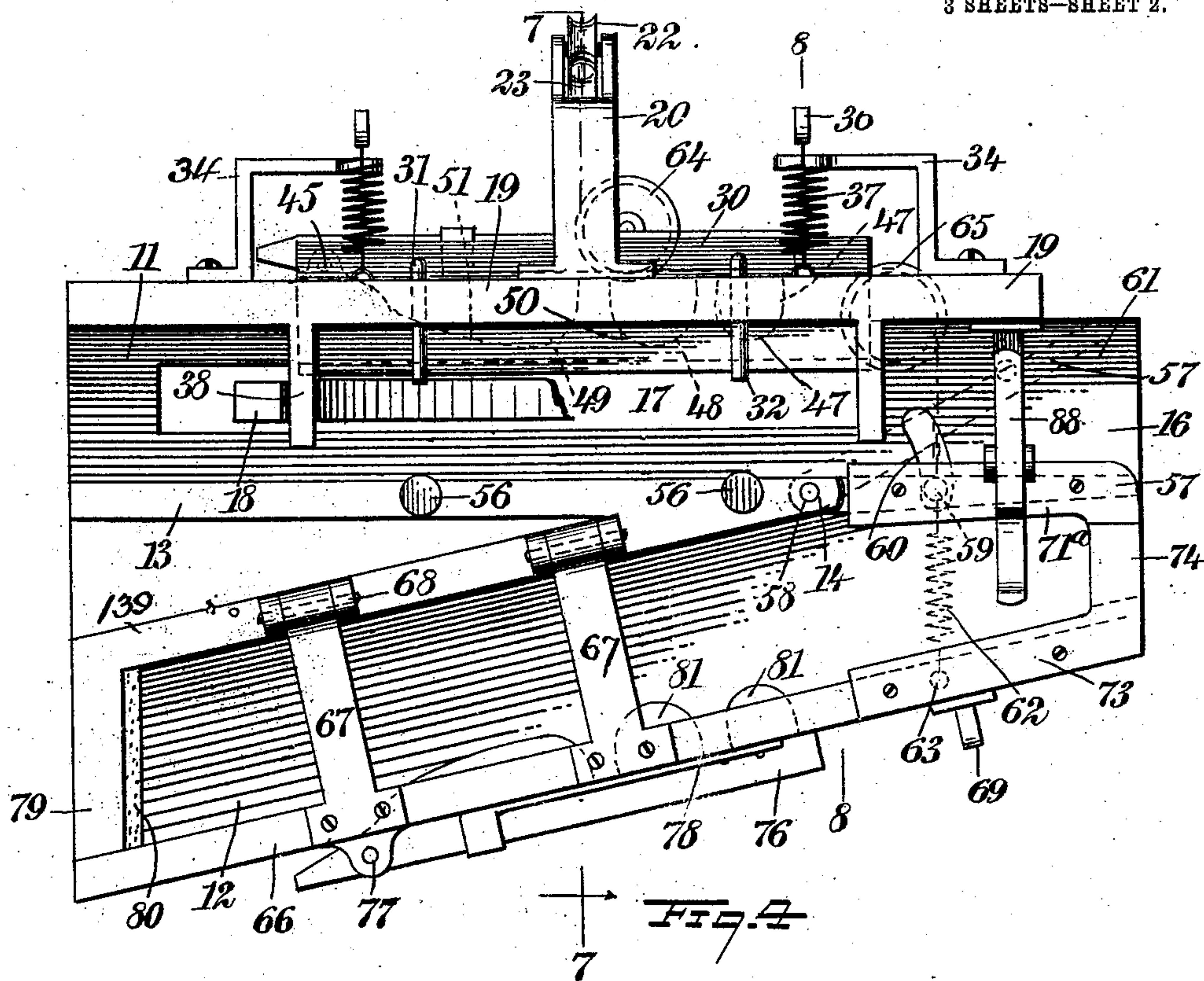
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3 SHEETS—SHEET 2.



WITNESSES:

John A. Supton
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FIG. 5

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UNITED STATES PATENT OFFICE.

LESTER MILLER, OF YONKERS, NEW YORK.

WEFT-REPLENISHING MECHANISM FOR LOOMS.

No. 842,683.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed September 20, 1904. Serial No. 225,213.

To all whom it may concern:

Be it known that I, LESTER MILLER, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented a new and Improved Weft-Replenishing Mechanism for Looms, of which the following is a full, clear, and exact description.

The invention relates to weft-replenishing mechanism, such as used in looms. While the invention is intended to be used especially in connection with carpet-loom, it should have a wide general usefulness in connection with looms of all kinds.

In weaving operations the contents of the shuttles soon become exhausted, and frequently it is necessary to stop the operation of the loom in order to substitute another shuttle.

The object of this invention is to provide an arrangement whereby another shuttle may be substituted for the one in use without necessitating the suspension of the weaving operation.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

Reference is to be had to the accompanying drawings, which form part of this specification, in which drawings like characters of reference indicate like parts in the several views, and in which—

Figure 1 is a plan of a shuttle-box constructed according to my invention, representing a portion of the batten in connection with the same. Fig. 2 is a side elevation showing a portion of a carpet-loom, certain parts being broken away, as will appear. Fig. 3 is an end elevation showing certain parts represented in Fig. 2. Fig. 4 is a plan of a shuttle-box constructed according to my invention and upon an enlarged scale. Fig. 5 is a side elevation of the box shown in Fig. 4. Fig. 6 is also a side elevation of the box shown in Fig. 4, but representing the side opposite to that shown in Fig. 5. Fig. 7 is a vertical transverse section taken substantially upon the line 7 7 of Fig. 4, and Fig. 8 is also a vertical section taken substantially on the line 8 8 of Fig. 4.

Referring more particularly to the parts, 1 represents the shuttle-box, which is attached in the usual manner at the extremities of a batten 2. As shown most clearly in Fig. 2, the shuttle-box and the frame 3, to which it

is attached, are disposed adjacent to the shed 4, which is formed beyond the fell 5, from which the fabrics 6 and 7 pass to the cloth-beams 8 and 9. The beams are suitably mounted upon the frame 10 of the loom.

Referring especially to Fig. 4 and the figures following same, the shuttle-box comprises a main box 11 and an auxiliary box 12. The auxiliary box 12 is disposed in an inclined position with respect to the main box, and the walls 13 13^a between the boxes unite, as shown, at the point 14. As indicated most clearly in Figs. 7 and 8, the floors 15 of the two boxes are at the same level, and a forward portion 16 of these floors may be said to be common to the two boxes. In the floor of the main box 11 a longitudinally-disposed opening 17 is formed, through which the upper extremity of a picker-staff 18 projects in the usual manner.

The wall 19 of the main box 11, which is remote from the auxiliary box 12, projects to a considerable distance above the upper edges of the other walls of the box, as indicated most clearly in Figs. 5, 7, and 8. To the upper portion of this wall 19 a bracket 20 is attached, the body whereof extends downwardly, as shown most clearly in Fig. 7. In the body 21 of the said bracket three pulleys 22, 23, and 24 are rotatably mounted, and over these pulleys run branches 25, 26, and 27 of a main chain 28. In the wall 19, and preferably on substantially the level of the other walls of the box, a longitudinally-disposed opening 29 is formed, and in this opening lies a shelf 30, the inner edge whereof normally projects into the space above the lower portion of the main box 11. This shelf constitutes a guard for retaining a shuttle lying in the bottom of the main box. Its functions and operation will appear more fully hereinafter. From the upper face of this shelf or guard 30 fingers 31 extend vertically, and these have laterally-turned extensions 32, which pass through openings 33 formed in the wall 19 of the box, and these extensions 32 project horizontally across the space above the box 11, as shown most clearly in Fig. 7. The shelf or guard is constrained inwardly. For this purpose a pair of oppositely-disposed brackets 34 are attached to the outer face of the wall 19, and these brackets constitute guides for stems 35, which are rigidly attached to the outer edge of the shelf, as indicated most clearly in Fig. 8. These stems carry cross-heads 36, to the arms of which springs

37 attach, the said springs being attached to the outer face of the wall 19, as shown. To the inner face of the wall 19 above the guard or shelf 30 laterally-projecting wings 38 are attached, which extend across the space above the main box 11, as shown. The space between these wings is sufficient to receive a shuttle 39, laid longitudinally upon extension 32 of the fingers 31, as indicated most clearly in Fig. 5.

Below the opening 29 in the wall 19 of the box there is provided a similar opening 40, which is, however, of less extent. Through this opening 40 a brake or shuttle-check 41 normally projects into the interior of the box, as indicated most clearly in Fig. 7. This shuttle-check is constrained inwardly by means of a bifurcated spring 42, which attaches to the outer face of the wall 19 at 43 and is provided with a yoke 44, which presses against the rear edge of the shuttle-check, as shown. The rear extremity of the shuttle-check 41 is preferably pivoted, as at 45, between ears 46, attached to the rear face of the wall. The portion which projects through the opening is preferably formed into shoes 47, 48, and 49, presenting rounded noses 50, increasing in size toward the rear portion of the box. The rearmost shoe 49 preferably presents an inclined edge 51, disposed toward the rear of the box.

Referring again to the chain 28, it will appear from an inspection of Fig. 2 that this chain runs vertically downward and passes around the under side of a pulley 52, near which it attaches to a lever or treadle 53, which is fulcrumed at 54 to the lower portion of the frame 10. The branches 25 and 26 of the chain, which have already been referred to, attach by means of eyes 55 to the rear edges of the shelf 30 and the shuttle-check 41. From this arrangement it should appear that if the shuttle is placed in the position shown in Fig. 5, resting upon extensions 32 of the fingers 31, the treadle 53 may be operated so as to draw upon the chains 25 and 26. In this manner the horizontal extensions 32 of the fingers 31 will be substantially withdrawn from the space beneath the shuttle, allowing the same to descend by gravity, so as to rest upon the bottom 15 of the main box 11. In Fig. 7 the shuttle 39 is represented in dotted outlines as resting upon the extensions 32 and also in dotted outlines resting upon the bottom of the box. In order to guide the shuttle in its descent to prevent its miscarriage, a pair of upwardly-projecting guards 56 are provided, which project upwardly from the upper edge of the front wall 13 of the main box at points opposite to the extensions 32, as indicated.

At substantially the point 14 referred to above where the adjacent side walls of the box meet a gate 57 is pivoted upon a vertical pin 58. The lower edge of this gate is

provided with a stud 59, which extends downwardly therefrom and projects through a circumferentially-disposed slot 60, which is formed upon the axis of the pin 58 as a center. The gate 57 normally lies in the position in which it is represented in Fig. 4, its free extremity lying substantially in alignment with the aforesaid front wall 13 of the main box; but from the arrangement described it may assume the inclined position in which it is represented in dotted lines in this figure. When occupying this latter position, the gate constitutes a closure for the mouth 61 of the main box 11 and presents itself in an inclined position in such a manner that if struck by a shuttle moving toward the main box it would operate to deflect this shuttle into the auxiliary box. The gate 57 is maintained in its normal position by means of a spring 62, attaching to a fixed stud 63 and to the aforesaid stud 59. The branch chain 27 aforesaid affords means for throwing this gate across the mouth of the main box at the same time that the guard-shelf 30 and brake 41 are withdrawn. For this purpose the guide-pulleys 64 and 65 are provided on the inner side of the main box over which the branch chain 27 passes, so as to enable the same to attach to the stud 59, leading in a direction therefrom which is opposed to the direction of the pull of the spring 62.

The outer wall 66 of the auxiliary box 12 is attached to horizontal bars 67, which are hinged at 68 to the opposite wall 13^a of the auxiliary box. From this arrangement when it is desired to remove a shuttle which has been received in the auxiliary box the outer wall 66 may be moved upwardly to rotate about the hinges 68 as an axis. In order to maintain the wall 66 in its normal position, a resilient handle 69 is attached at 70 to the outer wall thereof, said handle having a nib or catch 71, which lies against the lower face of the bottom of the box, as indicated most clearly in Fig. 8.

Anticipating that when the returning shuttle impinges upon the inclined deflecting-gate 70 there may be a tendency for this shuttle to fly upwardly, I provide the upper edge of the gate with a guard-strip 71^a, which strip is formed into a lateral extension 72, which projects in the direction of the auxiliary box. I also provide at the upper edge of the outer wall 66 of the auxiliary box a similar guard-strip 73, and this strip is provided with a lateral extension 74, which extends in the direction of the main box 11 and overlies the aforesaid extension 72.

As indicated, the edges of the bodies of the strips 71^a and 73 preferably overlap the edges of the parts to which they attach, increasing their efficiency as guards. By reason of the presence of the extensions 72 and 74 it follows that even though the gate is

thrown to the extreme inclined position across the mouth of the main box said extensions will substantially overlap and will guide the shuttle downwardly, which might strike against the same.

In the outer wall 66 of the auxiliary box a longitudinally-disposed opening 75 is formed, and through this opening projects a shuttle-check 76, which is substantially similar in construction to the aforesaid shuttle-check 41. This shuttle-check is hinged toward the rear upon a pin 77 and is constrained inwardly by a spring 78, which is substantially similar in construction to the spring 42 described in connection with the shuttle-check 41. At the end wall 79 and against the forward face thereof I provide a buffer 80, of rubber or similar material, adapted to act as a cushion in arresting the flight of the discharged shuttle. It should be understood, however, that the velocity of the movement of the shuttle would have already been substantially reduced by striking the shoes 81 of the shuttle-check 76. In the descent of the shuttle 39 at the rear portion of the box 11 there is some danger that the rear extremity of the shuttle may descend upon the extremity of the picker-staff in such a way as to render the operation of the picker-staff for the next pick ineffective. In order to prevent such a contingency, the picker-staff is controlled from the treadle in a manner which will now be described. Referring particularly to Figs. 2 and 3, the picker-staff has its fulcrum at 82 upon a bracket 83, attached to the frame 10 of the machine. A horizontal strap 84 attaches to the picker-staff above the fulcrum 82, and this strap is actuated from some moving part of the loom in the usual manner. The picker-staff has an extension 85 beyond the fulcrum 82 thereof, and to this extension attaches a spring 86, which returns the picker-staff toward a rear position. The treadle 53 passes transversely above this spring 86, and the forward portion of the treadle is connected, by means of a spring 87, with the body of the spring 86, from which arrangement it follows that when the treadle is depressed the body of the spring 86 will be displaced laterally in such a manner as to increase its tensile effect upon the extension 85 of the picker-staff. In this way the upper portion of the picker-staff is moved rearward, so as to carry its extremity out of the path of the rear extremity of the shuttle. To the inner face of the wall 19, preferably near the mouth of the main box 11, there is attached a clamp 88. This clamp comprises an extension 89, pivoted at 90, and between the body of the clamp and the extension 89 a jaw 91 is formed, adapted to receive a thread when passed into the same. This jaw is held closed by means of a suitable spring 92, which operates upon the rear portion of the extension 89, so as to

maintain the jaw in a closed position, as will be readily understood.

In the operation of the loom having a shuttle-box constructed according to my invention it should be understood that the shuttle would pass to and fro between the main boxes. When the weaving operation is progressing in this manner, the operation of the main box will be the same as that of an ordinary shuttle-box. In order to exchange the nearly-exhausted shuttle for another one having a fresh supply of woof, a new shuttle will have been previously placed in the position illustrated in Fig. 5 and resting upon the extensions 32 of the fingers 31. A thread leading from the shuttle having been caught in the clamp 88 at a suitable moment, the treadle 53 would be depressed. This act would withdraw the extensions 32 from under the shuttle 39 and allow the same to descend into the bottom of the main box. This operation is effected through the medium of the branch chains 25 and 26 in a manner fully described above. A depression of the treadle would also operate to actuate the branch chain 27 in such a manner as to pull the gate 57 in an inclined position across the mouth of the main box. A returning shuttle striking upon the inclined gate would be deflected thereby into the auxiliary box. Upon releasing the treadle 53 the spring 62 turns the gate 57 to its normal position, and when the next pick occurs the new shuttle would fly from the main box and begin its work.

The shuttle-check 41, which constitutes an attachment of the main box, operates to reduce the velocity of the incoming shuttle in the same manner as the shuttle-check 76 used in connection with the auxiliary box.

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

1. In a loom, in combination, a shuttle-box, a guard-shelf projecting through the wall thereof, extensions moving therewith and constituting supports for a shuttle, springs constraining said shelf inwardly, and means for withdrawing said shelf and said extensions.

2. In a loom, in combination, a shuttle-box, a gate adapted to deflect an incoming shuttle, laterally-projecting wings carried by the wall of said shuttle-box and adapted to receive a shuttle therebetween, a movable member projecting through the wall of said shuttle-box and constituting means for supporting a shuttle lying between said wings, a treadle, and mechanism connecting said treadle with said gate and said movable member.

3. In a loom, in combination, a main shuttle-box, an auxiliary shuttle-box disposed in a position inclined thereto, a gate pivotally mounted at the entrance to said boxes, the floor of said main box beneath

said gate having a slot therein, said gate having a projection extending below said slot, a spring attached to the said projection and normally maintaining said gate to open said main shuttle-box, means for passing a substitute shuttle to said main shuttle-box, and means for actuating the said gate and opposing said spring.

4. In a loom, in combination, a main shuttle-box, an auxiliary shuttle-box disposed in a position inclined thereto, a gate pivoted at the entrance to said boxes and adapted to deflect an incoming shuttle into said auxiliary box, a guard-shelf projecting through the wall of said main box and adapted to retain a shuttle when lying within said main box, springs constraining said shelf inwardly, a shuttle-check projecting through the wall of said main box, a spring constraining said shuttle-check inwardly, chains attached to said shelf and to said shuttle-check, a chain attaching to said gate, means for guiding said chains and a treadle for operating the same.

5. In a loom, in combination, a main shuttle-box, an auxiliary shuttle-box disposed in a position inclined thereto, a movable gate mounted at the mouth of said main box and adapted to deflect an incoming shuttle into said auxiliary box, and a laterally-projecting guard-strip carried by said gate and projecting above to the path of an incoming shuttle.

6. In a loom, in combination, a main shuttle-box, an auxiliary shuttle-box disposed in a position inclined thereto, a pivoted gate disposed between said boxes and adapted to deflect an incoming shuttle into said auxiliary box, a guard-strip carried by said gate and having a lateral extension projecting in the direction of said auxiliary box, and a guard-strip carried by said auxiliary box and having an extension projecting in the direction of said main box.

7. In a loom, in combination, a main shuttle-box, an auxiliary shuttle-box, a gate therebetween adapted to deflect an incoming shuttle into said auxiliary box, said auxiliary box having a hinged side to facilitate the removal of said shuttle, and a spring-pressed shuttle-check projecting through said hinged side and tending to arrest the flight of the incoming shuttle.

8. In a loom, in combination, a loom, a lever, means actuated by said lever for passing a substitute shuttle into said shuttle-box, a picker-staff projecting into said shuttle-box, and a connection between said lever and said picker-staff for withdrawing said picker-staff rearwardly.

9. In a loom, in combination, a shuttle-box, a lever, means actuated by said lever for passing the substitute shuttle into said shuttle-box, a picker-staff projecting into said shuttle-box, a spring constraining said picker-staff toward an extreme rear position, and a connection between said lever and said spring adapted to displace said spring laterally.

10. In a loom, in combination, a shuttle-box, a treadle, means actuated by said treadle for passing a substitute shuttle to said shuttle-box, a picker-staff projecting into said shuttle-box, a spring constraining said picker-staff toward a rear position, and a spring connecting the body of said first spring with said treadle whereby the depression of said treadle displaces said first spring laterally.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LESTER MILLER.

Witnesses:

THOMAS LANE.

OTTO F. FREY.