

No. 812,970.

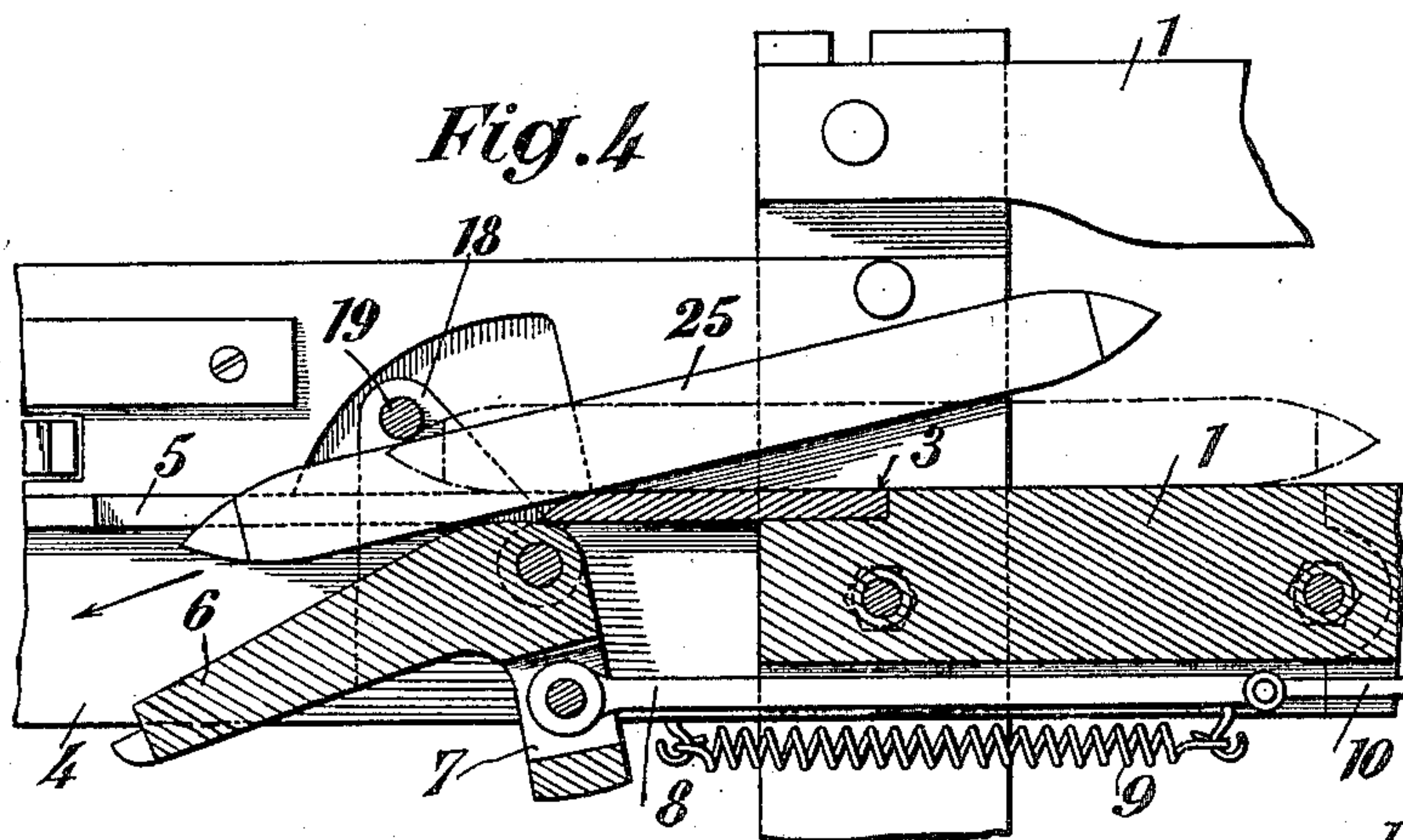
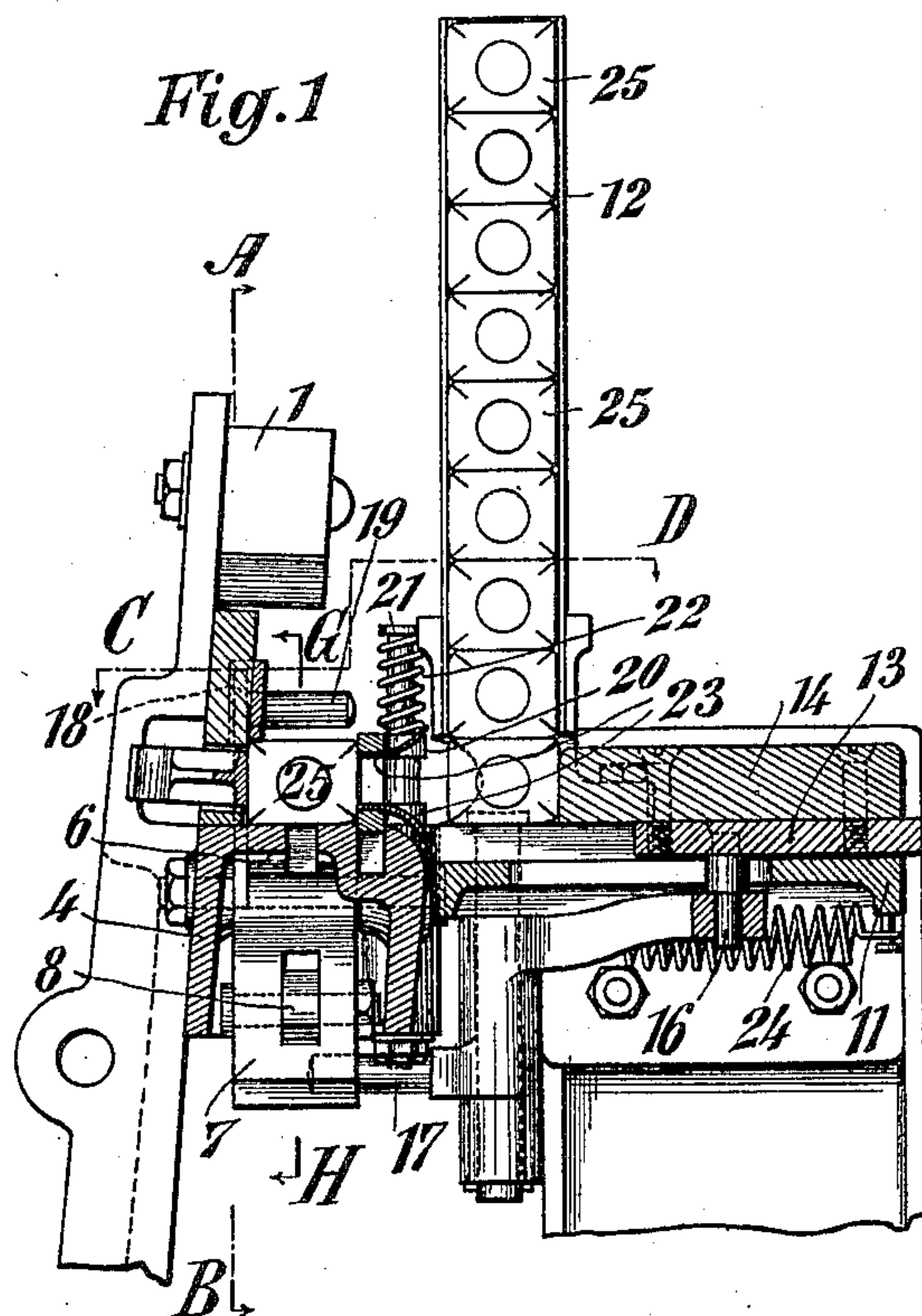
PATENTED FEB. 20, 1906.

H. ZWICKY.

WEFT REPLENISHING MECHANISM FOR LOOMS.

APPLICATION FILED DEC. 2, 1904.

3 SHEETS—SHEET 1.



Witnesses:

Harry L. Amer.

C. M. Pommer

Inventor:

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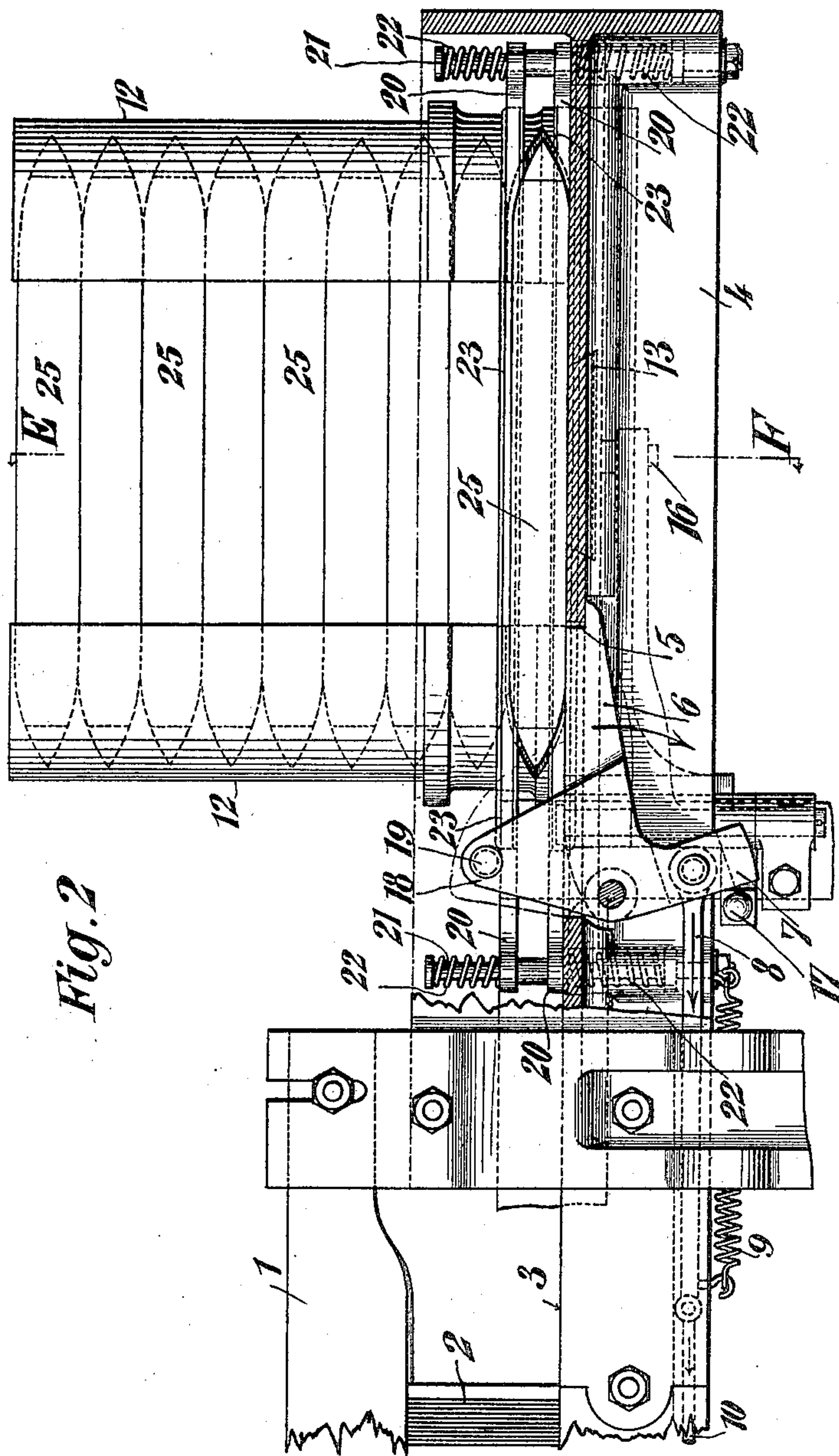


Fig. 2

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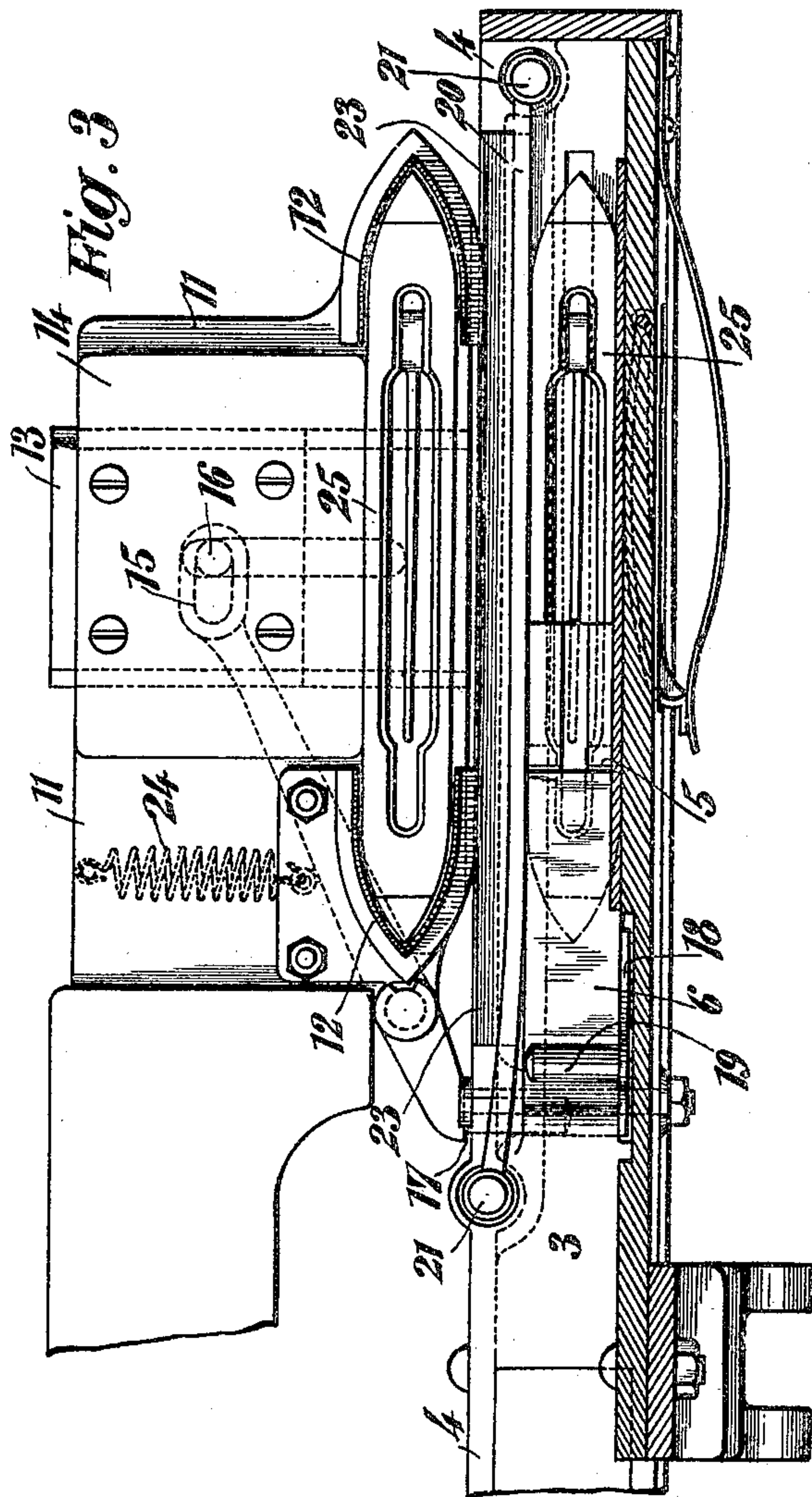
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APPLICATION FILED DEC. 2, 1904.

3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

HEINRICH ZWICKY, OF SCHINDELLEGI, SWITZERLAND.

## WEFT-REPLENISHING MECHANISM FOR LOOMS.

No. 812,970.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed December 2, 1904. Serial No. 235,177.

*To all whom it may concern:*

Be it known that I, HEINRICH ZWICKY, a citizen of the Republic of Switzerland, residing at Schindellegi, canton of Schwyz, Switzerland, have invented new and useful Improvements in Weft-Replenishing Mechanisms for Looms, of which the following is a specification.

This invention relates to a shuttle-changing mechanism of the kind in which an opening intended for carrying off the empty shuttles is uncovered in the shuttle-race by the thread-break-indicating mechanism and the fresh shuttles are introduced into the race from a fixed shuttle-receiving mechanism.

As compared with the arrangements of the above-mentioned kind hitherto employed the present invention is characterized by the extreme simplicity of the device, which enables a sure action to be obtained and allows of the application of the apparatus to any existing loom without substantial alteration thereof.

In contrast to the devices of the above-mentioned kind hitherto employed this improved mechanism has only few movable main parts which only execute very small movements. In addition to the mechanism for closing the shuttle exit or aperture in the shuttle-race there is in addition to these main parts only a slide or pusher for pushing a fresh shuttle onto the race from the shuttle-magazine and an intermediate member for displacing the pusher. The intermediate member is set in motion by the lay by the intermediary of the shuttle-exit gate, the latter, when it uncovers the shuttle exit or aperture in the shuttle-race and the lay is moved against the shuttle-magazine, encountering the intermediate member, whereby the latter and with it the pusher are displaced. Thus the movement of the lay itself is utilized for operating the pushing of a fresh shuttle into the shuttle-race.

In practice the shuttle-exit gate has preferably the form of an elbow-lever, one arm of which closes said shuttle-exit in the race, while the other arm is connected with the rod of the shuttle-thread-break-indicating mechanism. A feeler in the form of a pin is mounted on a projection of this elbow-lever or gate, which feeler as soon as said gate uncovers the shuttle exit or aperture in the shuttle-race is placed in the way of the working shuttle, and thus diverts the same to the aperture.

The intermediate member for displacing or

adjusting the slide has preferably the form of a lever which, on the one hand, is connected with the pusher and, on the other hand, lies in the way of one arm of the aperture-closing mechanism when the latter uncovers the opening in the shuttle-race.

Preferably the shuttle-race is closed against the shuttle-magazine by a pair of superimposed bars adapted to spring apart, which are provided with lips diverging against the shuttle-magazine, so that by the pressure of a full shuttle against these lips the bars are separated in order to allow the passage of the shuttle.

A form of construction of the invention is shown as an example in the drawings accompanying this specification, in which—

Figure 1 is a vertical section on the line E F of Fig. 2; Fig. 2, a vertical section on the line A B of Fig. 1, and Fig. 3 a horizontal section on the line C D of Fig. 1, while Fig. 4 shows the object of the invention in a second working position, in vertical section, on the line G H of Fig. 1.

1 shows a portion of the lay, which comprises a reed 2 and a shuttle-race 3. The part of the shuttle-race 3 projecting beyond the reed is formed of a bar 4, which has an opening 5 lying in the race, which opening is closed by a closing device or gate. This gate has the form of an elbow-lever mounted on the bar 4, which engages by means of an arm 6 in the opening 5 in order to close it. To the arm 7 of this lever is linked a rod 8, which is under the action of a spiral spring 9, one end of which is mounted on the lay and the other on the bar itself. To this rod a draw-bar 10 is also linked, which is connected with an ordinary thread-break mechanism, which is not shown, so that when the shuttle-thread breaks or a spool is exhausted the elbow-lever is operated. A horizontal plate 11 is arranged near the end formed by the bar 4 of the shuttle-race and fixed on the loom-frame, on which plate a shuttle-magazine, formed of two vertical guide-bars 12, is placed. 13 indicates a carriage guided in this plate, which carriage supports a pusher 14. A double-armed horizontally-pivoted lever for operating the carriage is provided under the plate 11 and on the same, one arm of which lever has a slotted guide 15, Fig. 3, in which a pin 16, mounted on the carriage, engages. The other arm of this lever carries a pin 17, projecting horizontally. The elbow-lever or trap comprising the arms 6 and 7 has near



the race an upwardly-projecting piece 18, which carries a diverter or guide in the form of a pin 19, projecting horizontally from the projecting piece 18 and directed at right angles to the race. Two movable horizontal bars 20, serving as guides for the shuttle, are located near the shuttle-magazine and beside the race on the bar 4, through which bars 20 vertical pins 21, fixed in the bar 4, are passed. These bars are under the pressure of spiral springs 22, which are wound on the pins 21 and have the tendency to move the bars toward each other. On the side facing the magazine the bars have lips or inclines 23, widening toward the magazine. 24 is a spring which holds in the position shown in Fig. 3 the double-armed lever, mounted under and on the plate 11 and when said lever is operated again returns it into the position shown. 25 represents the shuttles.

The mode of working of the shuttle-changing mechanism, hereinbefore described, is as follows: On the breakage of a shuttle-thread the draw-bar 10 is moved by the thread-break mechanism mentioned, which is not shown in the drawings, in the direction indicated by the arrow in Fig. 2, thus by means of the rod 8 bringing the shuttle-exit gate 6 7 into the position shown in Fig. 4. The shuttle exit or aperture 5 is thus exposed, and the diverter or guide 19 moved into the shuttle-race, so as to come into the path of the shuttle, thus diverting or guiding the shuttle, as shown in Fig. 4, to the opening 5 and causing the same to pass out of the race through this said opening or exit. In the said movement of the shuttle-exit its arm 7 comes into such a position that when the lay swings forward the said arm encounters the pins 17, and thereby turns the double-armed lever, mounted on the under side of the plate 11, which lever thereby pushes the carriage forward, causing the pusher 14 to push the lowermost shuttle in the magazine into the race. In order to allow of this, the bars 20 must be moved apart, so that the shuttle pushed forward by the pusher 14 can pass between these bars. This separating of the bars 20 is performed by the shuttles while they are being pushed forward by bearing against the inclined faces of the lips 23, and thereby moving the bars apart. The springs 9 serve for returning the closing mechanism into its initial position, or rather into the position shown in Fig. 2.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

60 1. In a loom, the combination with the lay and shuttle-race, the latter provided with a shuttle-exit and a stationary magazine to and from which the lay is adapted to move; of a gate normally closing the aforesaid exit, 65 a shuttle-guide operated by the gate and

means operating automatically, when the weft-thread is absent, to open the gate, to move the shuttle-guide into the path of a shuttle on the race and guide it into the exit in said race, and means controlled by the movement of the lay to the shuttle-magazine to feed a fresh shuttle to the race. 70

2. In a loom, the combination with the lay and shuttle-race and a shuttle-magazine stationary relatively to the lay, the latter having motion to and from said magazine and said race provided with shuttle-exit and a gate normally closing said exit; of means controlled by the thread-break indicator of the loom to open said gate when the weft-thread is absent, means operated by the gate to direct the shuttle into the aforesaid exit and means operated by the movement of the lay to the magazine to feed a fresh shuttle therefrom onto the race. 85

3. In a loom, the combination with the lay and shuttle-race and a magazine stationary relatively to the lay, which latter has motion to and from the magazine, and said race provided with a shuttle-exit; of a gate normally closing said exit, a shuttle-guide operated by the gate, an arm on the latter, means connected to said arm and adapted to be operated by the thread-break indicator of the loom to open the gate and move the shuttle-guide into the path of the shuttle to guide it to the shuttle-exit, and mechanism adapted to feed a shuttle from the magazine to the race and actuated by the aforesaid gate-arm when the lay moves to the magazine. 100

4. In a loom, the combination with the lay and shuttle-race and a shuttle-magazine stationary relatively to the lay, the latter having motion to and from the magazine and said shuttle-race provided with a shuttle-exit; of a bell-crank lever, one arm of which serves as a gate for the shuttle-exit and normally closes the same, a shuttle-guide adapted to be moved by the gate into the path of a shuttle in the race and guide it into its exit, means adapted to be operated by the thread-break indicator of the loom and acting on the other arm of the bell-crank lever to tilt the same to open the gate and move the shuttle-guide into the path of a shuttle in the race, and means operated by the movement of the lay to the magazine to feed a fresh shuttle therefrom to the race. 115

5. In a loom, the combination with the lay and shuttle-race and a shuttle-magazine stationary relatively to the lay, said race provided with a shuttle-exit, a gate normally closing the shuttle-exit, and a shuttle-guide carried by the gate and held normally out of the path of the shuttle; of means operating automatically, when the weft-thread is absent to open the gate and thereby move the shuttle-guide into the path of the shuttle in the race and guide it to its exit, and means operated by the movement of the lay to the 130



magazine to feed a fresh shuttle therefrom to the race.

6. In a loom, the combination with the lay and shuttle-race provided with a shuttle-exit, 5 a shuttle-magazine stationary relatively to the lay, a shuttle-ejector adapted to eject one shuttle at a time from the magazine, and a spring-retracted actuating-lever for said ejector, provided at its free end with a pin; 10 of a gate normally closing the shuttle-exit and having a depending arm adapted to be moved in line with the aforesaid pin on the ejector-lever, a shuttle-guide operated by the gate and means to automatically open said gate 15 when the shuttle-thread is absent and thereby move the shuttle-guide into the path of a shuttle in the race and guide it to its exit, and simultaneously move the depending arm on the gate in line with the ejector-lever pin, 20 whereby when the lay moves to the magazine said arm actuates the lever to eject a shuttle from the magazine onto the race.

7. In a loom, the combination with the lay

and shuttle-race, the latter provided with a shuttle-exit, a shuttle-magazine stationary 25 relatively to the lay and having a shuttle-outlet in line with the race, and two yielding bars between the race and magazine having flaring lips facing the said shuttle-outlet; of a gate normally closing the shuttle-exit in the 30 race, means to guide a shuttle to said exit when the gate is opened, means to automatically open the gate when the weft-thread is absent and guide the shuttle in the race to its exit, and means operated by the movement 35 of the lay to the magazine to forcibly move a shuttle therefrom between and through the aforesaid yielding bars onto the race.

In testimony whereof I have signed my name to this specification in the presence of 40 two subscribing witnesses.

HEINRICH ZWICKY.

Witnesses:

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MORITZ VEITH.