No. 871,447. PATENTED NOV. 19, 1907.

F. P. ROGERS.

WEFT REPLENISHING MECHANISM FOR LOOMS.

APPLICATION FILED OCT. 25, 1906.

2 SHEETS—SHEET 1.

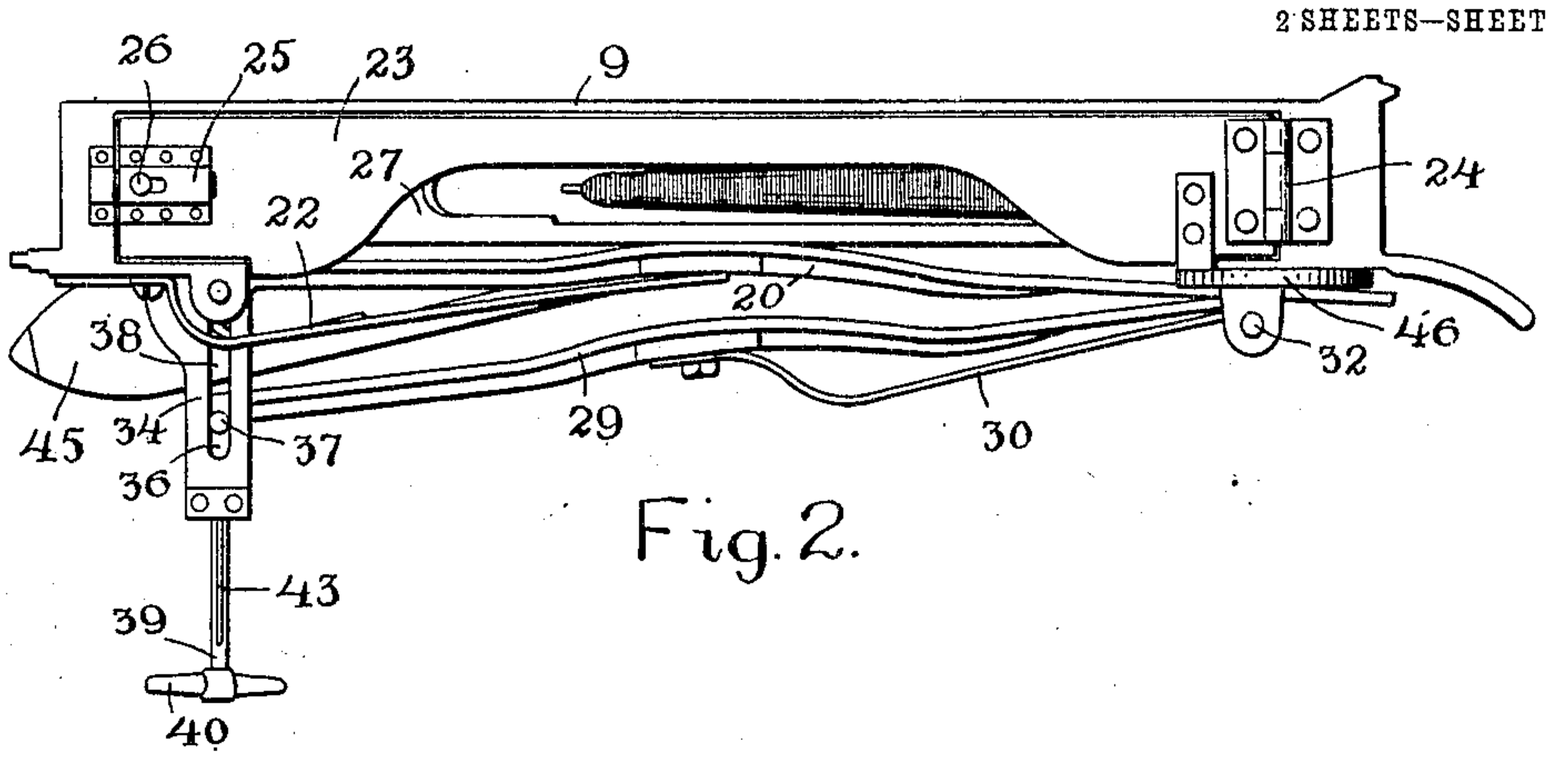


Fig. 2.

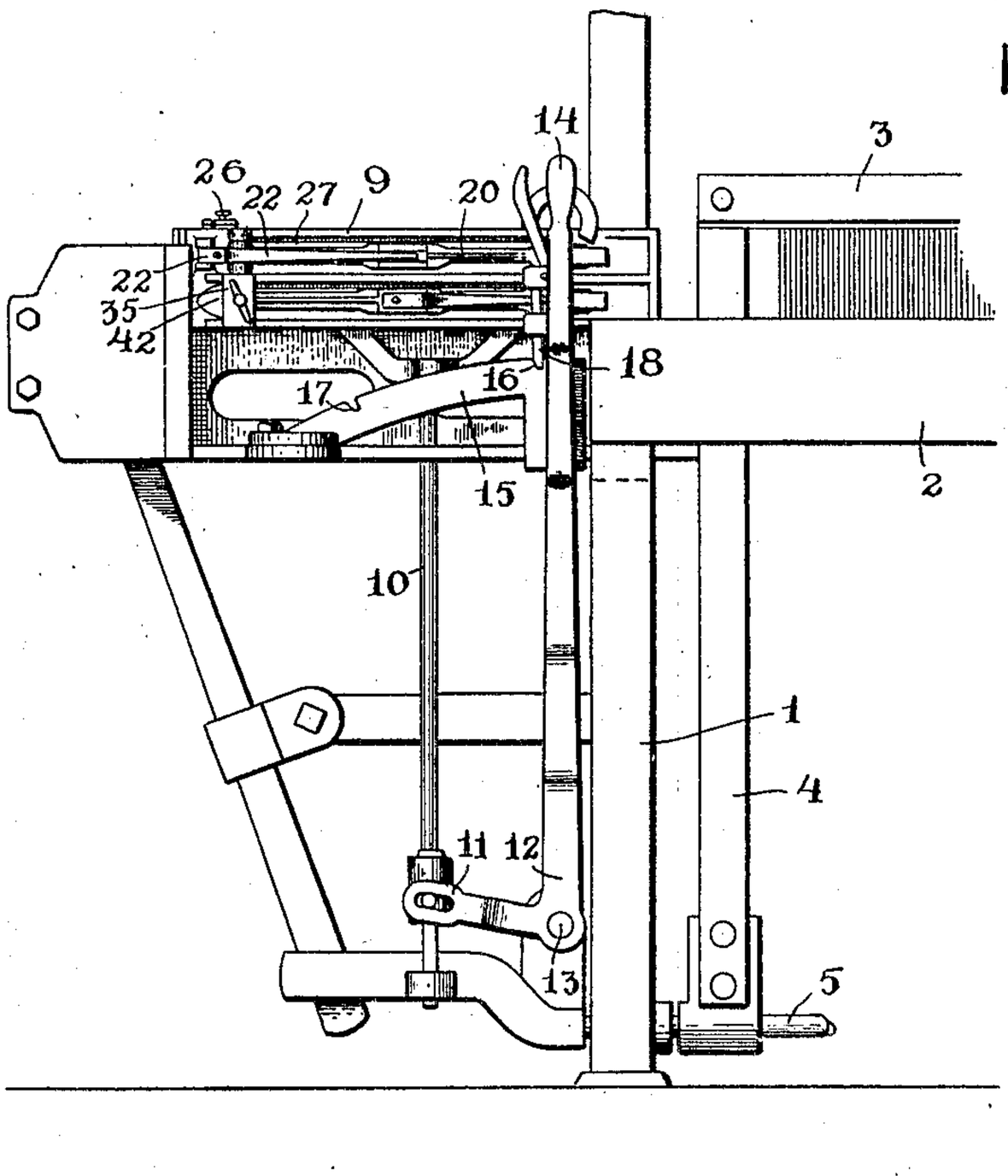


Fig. 1.

Witnesses

Roy D. Tolman.

Penelope Comberbach.

Inventor

Frank P. Rogers.

By Rufus B. Fowler

Attorney

No. 871,447. PATENTED NOV. 19, 1907.

F. P. ROGERS.

WEFT REPLENISHING MECHANISM FOR LOOMS.

APPLICATION FILED OCT. 25, 1906.

2 SHEETS—SHEET 2.

Fig. 3.

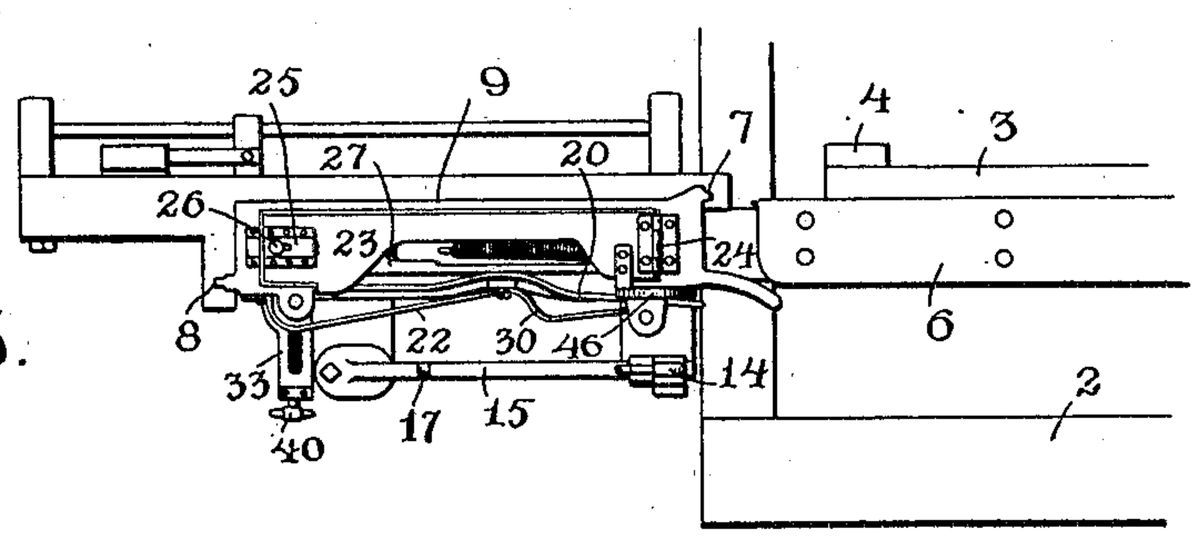


Fig. 4

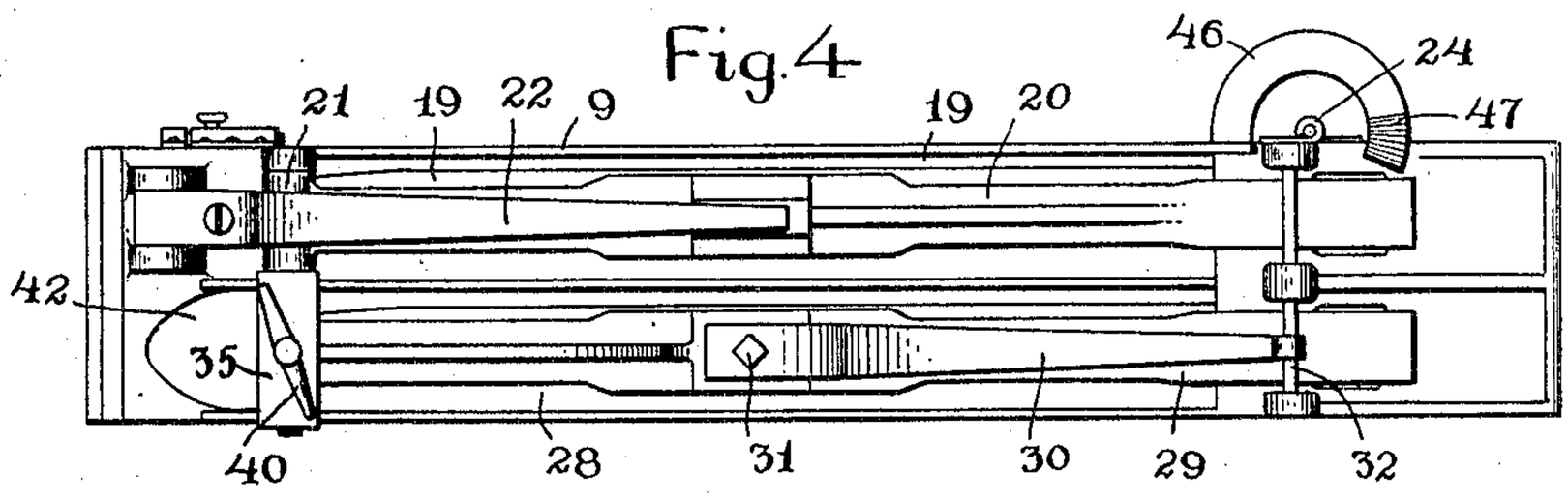


Fig. 5.

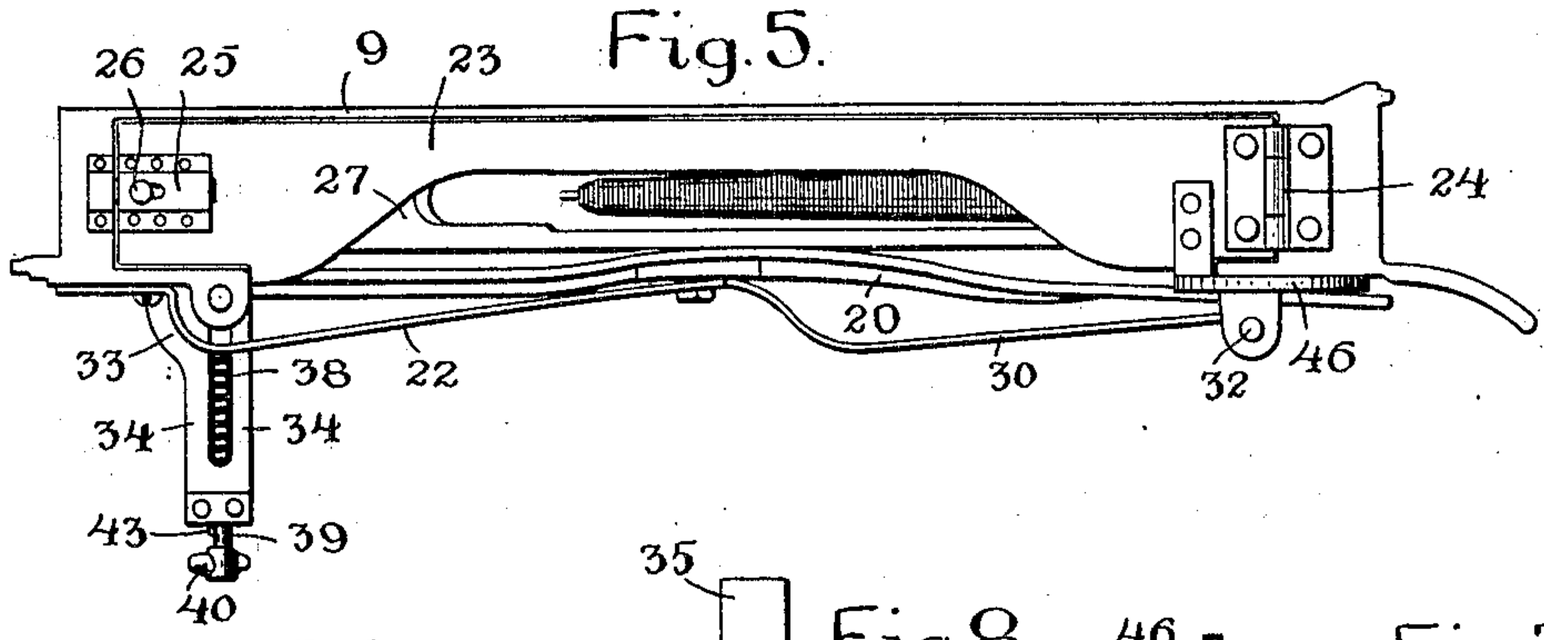


Fig. 8.

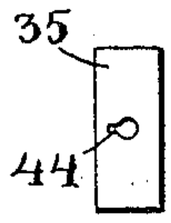


Fig. 7.

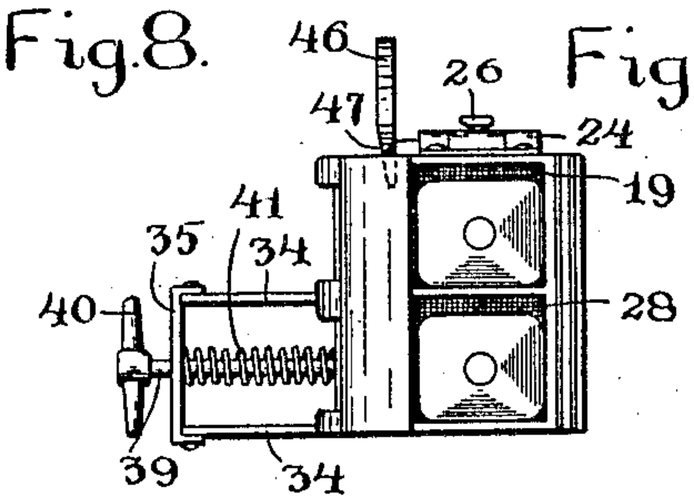
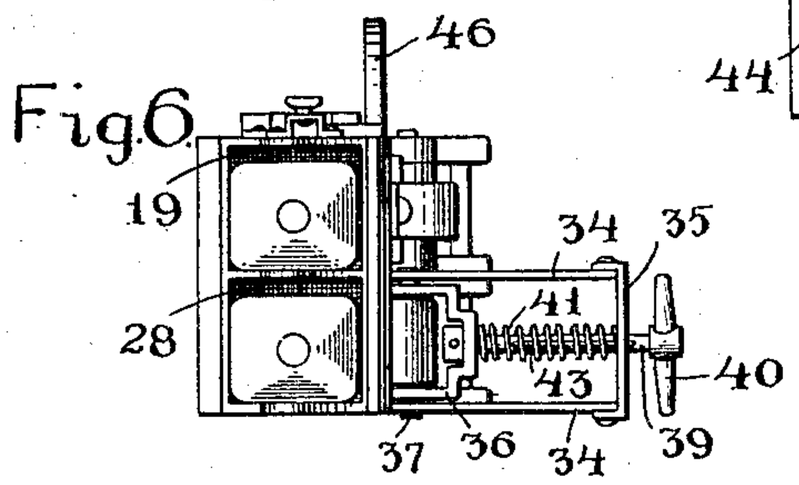


Fig. 6.



Witnesses

Roy D. Tolman.

Penelope Comberbach.

Inventor

Frank P. Rogers.

By Rufus B. Fowler

Attorney

UNITED STATES PATENT OFFICE.

FRANK P. ROGERS, OF WORCESTER, MASSACHUSETTS.

WEFT-REPLENISHING MECHANISM FOR LOOMS.

No. 871,447. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed October 25, 1906. Serial No. 340,500.

To all whom it may concern:

Be it known that I, FRANK P. ROGERS, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in a Weft-Replenishing Mechanism for Looms, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a front elevation of one end of a loom, those parts being shown in detail which are directly concerned with my present invention. Fig. 2 is a top view on a larger scale of the shuttle box detached from a loom, and showing a shuttle partially withdrawn from the lower cell of the box. Fig. 3 is a top view of that end of the loom shown in Fig. 1. Figs. 4 and 5 are front and top views respectively of the shuttle box detached from the loom. Fig. 6 is a detached and end view of the shuttle box showing the end farthest from the loom side. Fig. 7 is a detached end view of the shuttle box showing the end nearest the loom side, and Fig. 8 shows a detail of construction.

Similar reference letters and figures refer to similar parts in the different views.

It is the object of my present invention to provide a simple and efficient means for replenishing the weft by the operator during the continued operation of the loom, without the use of complicated mechanism or the employment of separate receptacles for holding the spare or spent shuttles other than the box employed in the operation of weaving.

I am aware that it is not new to provide means for replenishing the shuttle with weft prior to the total exhaustion of the weft from the shuttle without stopping the loom, but in devices for this purpose a receptacle for a shuttle is provided independent of and in addition to the cells of a movable shuttle box which are operative during the process of weaving, and requiring more or less complicated mechanism to transfer the shuttle to and from the operative shuttle boxes.

In accomplishing the object of my invention I employ a movable shuttle box at one end of the loom having at least two cells, but more may be used if required, all of which are provided with adequate shuttle binders, and are operative during the process of weaving, and I provide means for the removal of a spent shuttle through the top of the upper cell, and for the insertion of a spare shuttle into the lower cell, with means, manually controlled at will, for bringing either of the cells of the movable shuttle box into alinement with the raceway of the lay. Aside from the construction of the movable shuttle box and means for moving it, my improvements necessitate no change in the construction and operation of the other parts of the loom, which may be of any known type.

In the accompanying drawings I have represented only such portions of the loom as are necessary to illustrate the nature and mode of operation of my present improvement. The movable shuttle box which embodies the principal features of my improvement may be used at either end of the loom and the opposite end of the loom may be provided with a plain shuttle box, if a single shuttle is to be used, or with a movable shuttle box having a multiplicity of cells in case more than one shuttle is to be used. In the accompanying drawings I have represented a movable shuttle box embodying my improvement as applied to the left hand end of the loom in Figs. 1 and 3, while in the remaining figures of the drawings I have shown the shuttle box on a larger scale and detached from the loom for the purpose of better illustrating the construction of the shuttle box by which shuttles are inserted and removed.

Referring to the accompanying drawings 1 denotes a portion of a loom side, 2 the breast beam, 3 the hand rail, 4 one of the lay swords pivoted on a rock shaft 5 and supporting the lay beam having a raceway 6 for the running shuttle. Supported at one end of the lay are ways 7 and 8 for a movable shuttle box 9, carried upon a box rod 10 which may be provided with any known means for raising and lowering the shuttle box in its ways. In the present instance the box rod 10 is supported by the slotted end 11 of a bell crank lever 12, pivoted at 13. The bell crank lever 12 is provided with a handle 14 in convenient position to be seized by the operator. Mounted upon the framework of the lay is a plate 15 curved concentrically with the pivot 13, and provided with notches 16 and 17 adapted to be engaged by a latch pin 18, of any suitable form of construction and carried by the bell crank 12 by which the latter is locked in position at each end of its throw, the notches 16 and 17 being arranged to lock the bell crank in position with either

the upper or lower cell of the shuttle box in alinement with the raceway of the lay.

The shuttle box 9, in the present instance, is provided with two cells, that number only being necessary when a single shuttle is to be used. The upper cell 19 is provided with the usual shuttle binder 20, pivoted at 21 and provided with the ordinary binder spring 22. The upper cell is provided with a cover 23 hinged at one end at 24 to the body of the shuttle, and provided at its opposite end with a latch 25, provided with a knob 26 by which the latch may be released and the cover raised by the operator to allow a shuttle 27 to be removed from the top of the cell. The lower cell 28 of the shuttle box is provided with a shuttle binder 29 having a spring 30 rigidly attached at 31 to the center of the binder and acting against a pin 32 carried by the shuttle box. The front of the shuttle box opposite the lower cell 28 is provided with a forwardly projecting bracket 33, consisting of the two slotted arms 34, 34, united at their outer ends by a cap piece 35. One end of the binder 29 is pivoted in a movable frame 36, with the pivotal pin 37 of the binder extending into the slots 38 of the arms 34. Swiveled in the frame 36 is a spindle 39 having a handle 40 and inclosed by a spiral spring 41 interposed between the cap piece 35 and the frame 36, in order to hold the pivoted end of the binder 29 in position against the frame of the shuttle box. The shuttle box is provided with an opening 42 adjacent to the pivoted end of the binder 29 to allow for the insertion of a shuttle endwise when the pivoted end of the binder 29 is drawn away from the shuttle box in the position shown in Fig. 2, which is accomplished by means of the handle 40 and spindle 39 which slides in the cap piece 35. As the pivoted end of the binder is drawn forward the spiral spring 41 is compressed, and the tension of the spring when the handle 40 is released, serves to restore the binder to its normal position. The spindle 39 is provided on one side with a spline 43 and by drawing the spline entirely through the opening 44 in the cap piece 35 the spindle 39 may be turned a partial revolution in order to lock the spindle against the tension of the spring 41 and permanently hold the binder away from the shuttle box during the insertion of a shuttle, which is entered endwise behind the binder 29 in the position shown by the shuttle 45, Fig. 2.

The cover 23 of the upper cell 19 is provided near its pivoted end with a cam plate 46 curved concentrically with the pivot of the hinge 24, and having its free end slightly beveled at 47 to form a cam surface which enters behind the free end of the upper shuttle binder 20, as the cover 23 is raised, and serves to force the end of the shuttle binder outward against the tension of the spring 22 and relieve the shuttle held in the upper cell from the pressure of the binder, and facilitating the removal of the shuttle.

The operation of my improved weft replenishing device is as follows:—During the operation of weaving with a full shuttle, the movable shuttle box 9 is lowered to bring the upper cell 19 in alinement with the raceway of the lay. The pivoted end of the lower shuttle binder 29 is withdrawn from the front of the box by pulling the handle 40 into the position shown in Fig. 2. The handle 40 and its connected spindle 39 is then rotated slightly to bring the spline 43 out of alinement with the opening 44, causing the end of the spline to abut against the cap piece 35 and hold the shuttle binder from being retracted by the tension of the spiral spring 41. The withdrawal of the pivoted end of the binder provides sufficient space with the opening 42 for the insertion of a filled shuttle endwise, as shown in Fig. 2. The spring 41 is then released by turning the spindle 39 to bring the spline 43 again in alinement with the opening 44 in the cap piece 35, causing the pivoted end of the binder to be carried into and held in its normal position, as shown in Fig. 5. The process of weaving is then allowed to continue until the bobbin of the running shuttle is nearly exhausted and has been thrown into cell 19 of the shuttle box. Before the next pick the shuttle box is raised to bring the lower cell 28 into alinement with the raceway of the lay, when the shuttle contained therein becomes the running shuttle and the partially exhausted shuttle held in the cell 19 of the shuttle box is removed through the top of the box by lifting the cover 23. The box may then be lowered at the convenience of the weaver bringing the upper cell 19 again into alinement with the raceway of the lay and rendering the lower cell 28 inoperative for the insertion of another shuttle.

I claim,

1. In a loom, a lay, a movable shuttle box having a multiplicity of operative cells, in different horizontal planes, an opening in the top of the uppermost of said cells provided with a removable cover, for the removal of a shuttle from said upper most cell, an opening in one of the lower cells for the insertion of a shuttle, and means for moving said shuttle box.

2. In a loom, a lay, a vertically reciprocating shuttle box having a multiplicity of operative cells, means for reciprocating said shuttle box, an opening in the top of said shuttle box for the removal of a shuttle from the uppermost cell, and a removable cover for said opening.

3. In a loom, a lay, a shuttle box having a multiplicity of operative cells, in different horizontal planes, the uppermost of said cells provided with an opening in its top for the

removal of an exhausted shuttle, one of the lower of said cells provided with an opening for the insertion of a full shuttle, and means for rendering said upper and lower cells inoperative during said removal and insertion.

4. In a loom, a lay, a movable shuttle box having two cells one above the other, the upper of said cells provided with an opening in its top for the removal of a shuttle, a shuttle binder for said upper cell, means for moving said shuttle binder out of contact with the shuttle in said upper cell, and means for bringing either of said cells into alinement with the raceway of the lay at will.

5. In a loom, a lay, a movable shuttle box having two cells one above the other, means for bringing either of said cells into alinement with the raceway of the lay at will, a shuttle binder for the uppermost cell, a hinged cover for the top of the uppermost cell, and means carried by the cover for relieving the pressure of the shuttle binder simultaneously with the raising of the cover.

6. In a loom, a lay, a movable shuttle box having two cells one above the other, means for bringing either of said cells into alinement with the raceway of the lay at will, a pivoted shuttle binder for the lower cell, and means for moving the pivoted end of said shuttle binder away from the shuttle box, thereby forming an opening for the insertion of a shuttle.

7. In a loom, a lay, a movable shuttle box having two cells one above the other, means for bringing either of said cells into alinement with the raceway of the lay, a hinged cover for the top of the uppermost cell, and means for holding said cover normally in position.

8. In a loom, a lay, a movable shuttle box having two cells one above another, means for bringing either of said cells into alinement with the raceway of the lay, a hinged cover for the uppermost of said cells, a shuttle binder for the uppermost cell, and an arm carried by said cover to contact with said shuttle binder as the cover is raised and to relieve the pressure of the binder.

9. In a loom, a lay, a movable shuttle box having two cells one above the other, means for bringing either of said cells into alinement with the raceway of the lay, a pivoted shuttle binder for the lowermost cell, means for withdrawing the pivoted end of the binder away from the shuttle box, and means for locking the binder in its withdrawn position.

10. In a loom, a lay, a movable shuttle box having two cells one above the other, means for moving either of said cells into alinement with the raceway of the lay, a shuttle binder for the lowermost cell, means for withdrawing one end of said binder away from the shuttle box, means for holding the binder in its withdrawn position to allow a shuttle to be inserted, and a spring for restoring the binder to its normal position.

11. In a loom, a lay, a movable shuttle box having two cells one above the other, means for moving either of said cells into alinement with the raceway of the lay, a shuttle binder for each of said cells, means for relieving the pressure of each of said binders at will, an opening in the top of the uppermost cell for withdrawing a shuttle, and means for closing said opening to render the cell operative during weaving.

12. In a loom, a lay, a movable shuttle box comprising two operative cells one above the other, the upper cell provided with an opening in its top for the removal of a shuttle and the lower cell provided with an opening in its front for the insertion of a shuttle, and means for bringing either of said cells into alinement with the raceway of the lay at will.

FRANK P. ROGERS.

Witnesses:
RUFUS B. FOWLER,
PENELOPE COMBERBACH.