C. H. Knowlton.

Drop Box Loom.

No. 81,792. Patented Sept. 1, 1868.

Fig: 1.

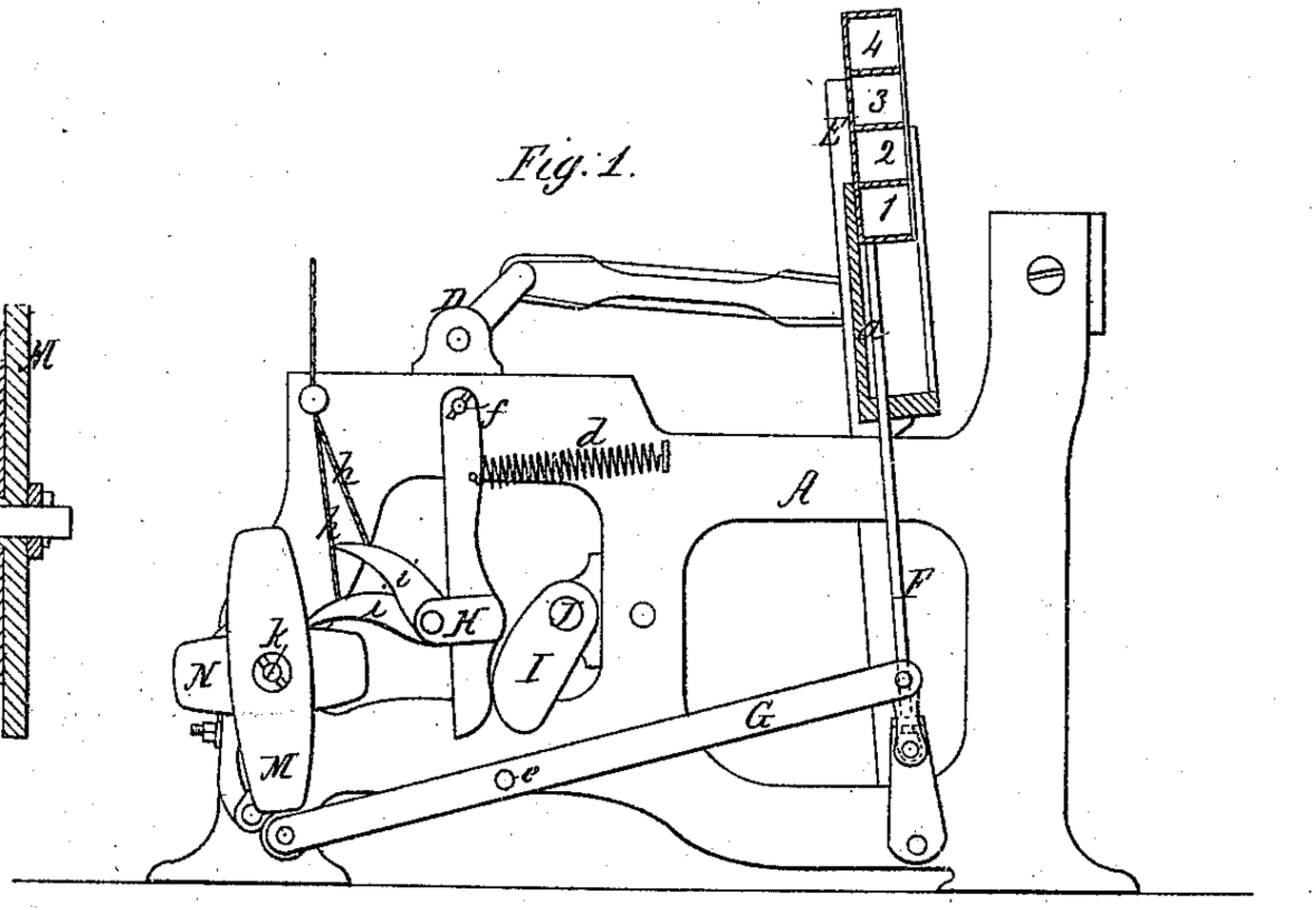
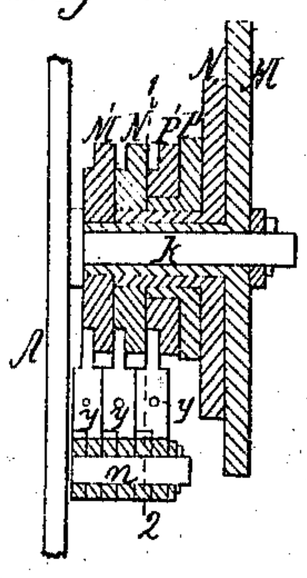


Fig: 3.



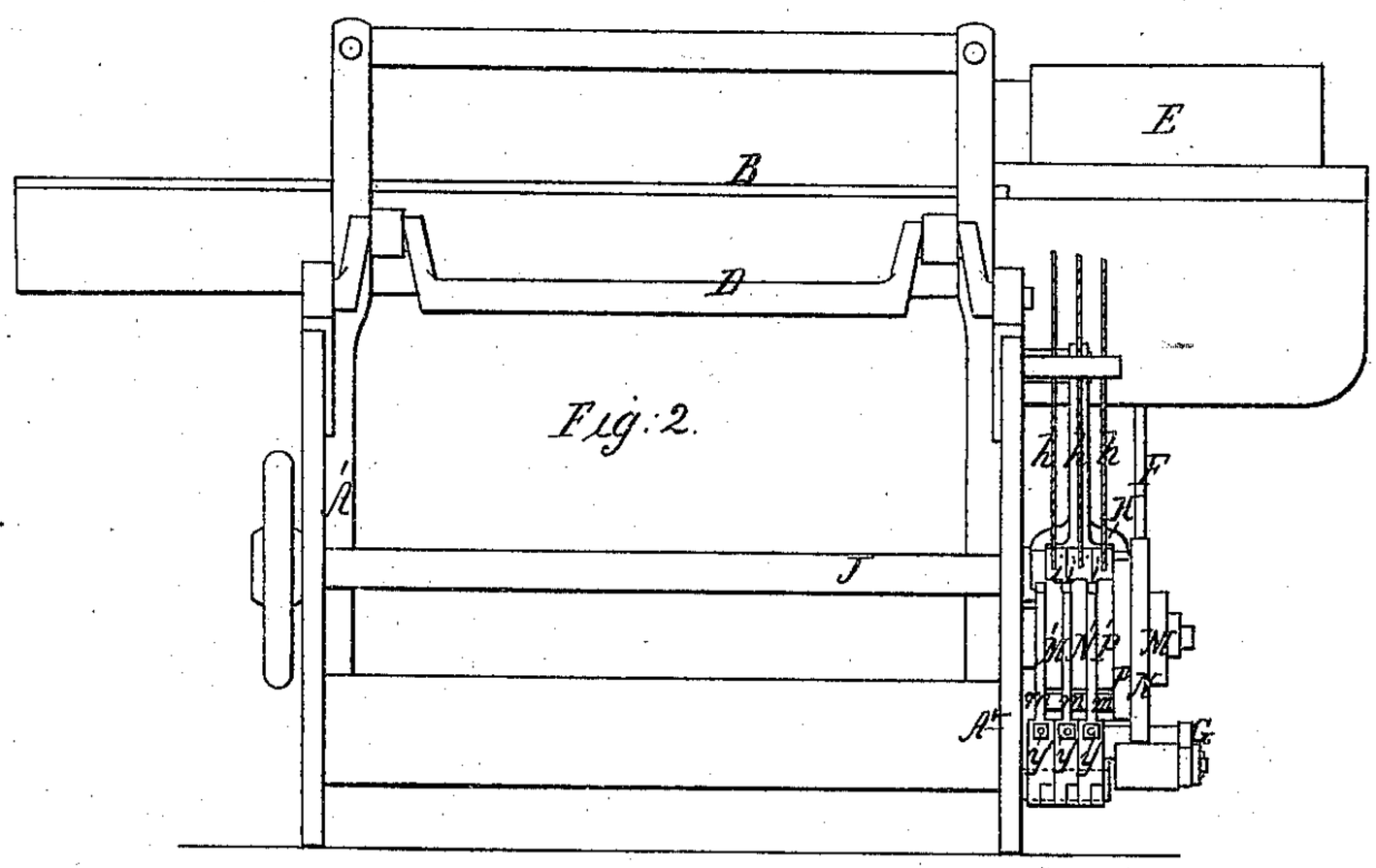
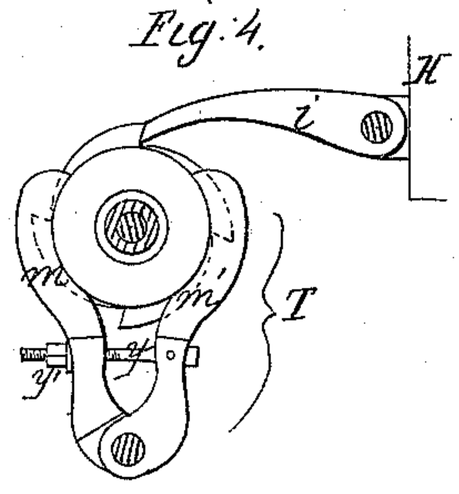


Fig: 2.

Fig: 4.



Witnesses;

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UNITED STATES PATENT OFFICE.

CHARLES H. KNOWLTON, OF CAMDEN, NEW JERSEY, ASSIGNOR TO FUR BUSH & GAGE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CAMS FOR OPERATING SHUTTLE-BOXES.

Specification forming part of Letters Patent No. **81,792**, dated September 1, 1868.

To all whom it may concern:

Be it known that I, CHARLES H. KNOWLTON, of Camden, Camden county, New Jersey, have invented an Improvement in Drop-Box Looms; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of certain mechanism, fully described hereinafter, for operating and effecting changes in the movements of drop-boxes of looms.

In order to enable others skilled in the art to make and apply my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a side view of a loom with my improvement, the drop-box being in section; Fig. 2, a rear view; Fig. 3, a section of the cams for operating the drop-box; and Fig. 4, a section on the line 1 2, Fig. 3.

Similar letters refer to similar parts throughout the several views.

A and A′ are the opposite side frames of the loom, and are connected together in the usual manner. B is the lathe, connected to the frame and operated by the crank-shaft D, as in ordinary looms, and at each end of the lathe is a receptacle, *a*, for the reception of the drop-box E, which, in the present instance, has four compartments.

The rod F of the drop-box is connected in the usual manner to the lever G, hung to a pin, *e*, on the frame, the end of the short arm of this lever being provided with a roller, on which the cams, referred to hereinafter, operate.

An arm, H, is hung to a pin, *f*, on the frame A, and this arm is actuated by a cam, I, on the shaft J, a spring, *d*, tending to move the arm in one direction and the cam in the contrary direction. To the arm H are loosely hung three pawls, *iii*, to each of which is attached a cord, *h*, these cords being controlled by the usual pattern-chain or by jacquard apparatus, which it has not been deemed necessary to illustrate in the drawing.

A stationary pin, *k*, secured to the frame A of the loom, carries the cams for operating the drop-box. The largest cam, M, has a hub fitted directly to, but so as to turn freely on, the said pin. The next cam, N, has a hub turning on that of the cam M, and a third cam, P, has a hub turning on that of the cam N.

A ratchet-wheel, M′, is secured to the hub of the cam M, a similar ratchet-wheel, N′, to the hub of the cam N, and a similar wheel, P′, to the hub of the cam P, and to each of these ratchet-wheels is adapted one of the pawls *i* of the vibrating arm H. Each of the ratchet-wheels has a shoulder, embraced by the jaws *m* and *m′* of the friction-clamp T, the three clamps being connected to a pin, *n*, on the frame. The jaws *m* and *m′* of each clamp are connected together by a bolt, *y*, attached to one jaw, and a nut, *y′*, bearing on the inside of the other jaw, so that, on tightening the nuts, the shoulders of the ratchet-wheels may be griped with more or less force by the clamps. These nuts are so adjusted that sufficient friction is imparted to the ratchet-wheels to prevent them from moving too freely, but not too much friction to prevent the wheels from being operated by the pawls, without the demand for undue exertion from the operating-cam I.

Owing to each of the ratchet-wheels having an independent friction-clamp, a movement imparted to any one of the wheels will be imparted to that cam only to which that wheel is secured, and this movement will have no tendency to disturb the other wheels.

As seen in Fig. 1, the drop-box has been elevated, so that its lowest compartment, 1, coincides with the bed of the lathe, and one of the pawls *i* is lowered so as to act on the ratchet-wheel M′ of the largest cam, M, while the other pawls are out of gear with the ratchet-wheels, which, together with their cams, are held by the friction-clamps.

While the cam M is being operated by the pawl of the cam H, and the cam N is stationary, and in the position shown in Fig. 1, the drop-box will be so actuated that there will be a constant change in its position, the shuttle of the lowest compartment, 1, and that of the highest compartment, 4, being alternately acted on, for the cam M will depress the short arm of the lever, so as to raise the box to its full height, and then permit the box to fall to its lowest point by its own weight, the fall being limited by the roller on the short arm of the lever coming in contact with the hubs only of

the cams; but if the second cam, N, be stationary in a position at right angles to that shown in Fig. 1, while the cam M continues in operation, the upward movement of the short arm of the lever G will be so much more limited and the drop-box so operated that the shuttle of the first compartment and that of the second compartment will be acted on alternately. In like manner, by the simple adjustment of the pawls *i*, the three cams M, N, and P can be caused to make as many different changes in the movement of the drop-box as the number of the compartments will admit of.

Drop-boxes with more or less than four compartments may be used in combination with the above-described appliances, providing the number of ratchet-wheels, pawls, and cams be proportioned accordingly.

It will be understood that the above-described devices for operating the cams may be applied to both sides of the loom.

I claim as my invention and desire to secure by Letters Patent—

1. In a drop-box loom, the within-described system of ratchet-wheels and cams, adapted to each other, carried by one spindle, and arranged to be operated and to operate substantially as and for the purpose herein set forth.

2. The friction-clamps T, in combination with the cams which operate the drop-boxes of looms.

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

CHARLES H. KNOWLTON.

Witnesses:

JOHN WHITE,

W. J. R. DELANY.