A. Nimmo.

Loom.

No. 93,637. Patented Aug. 10, 1869.

Fig. 1

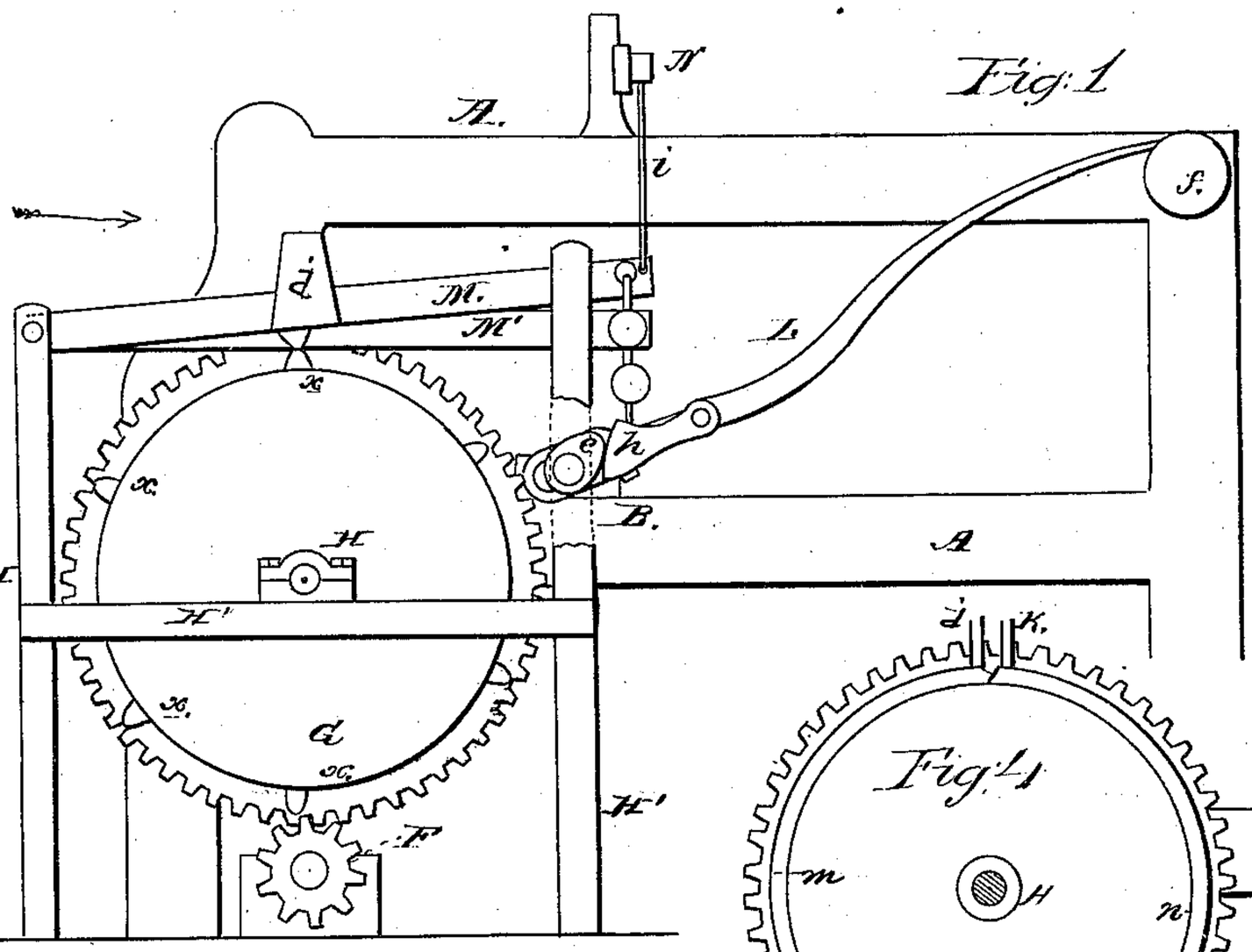


Fig. 4

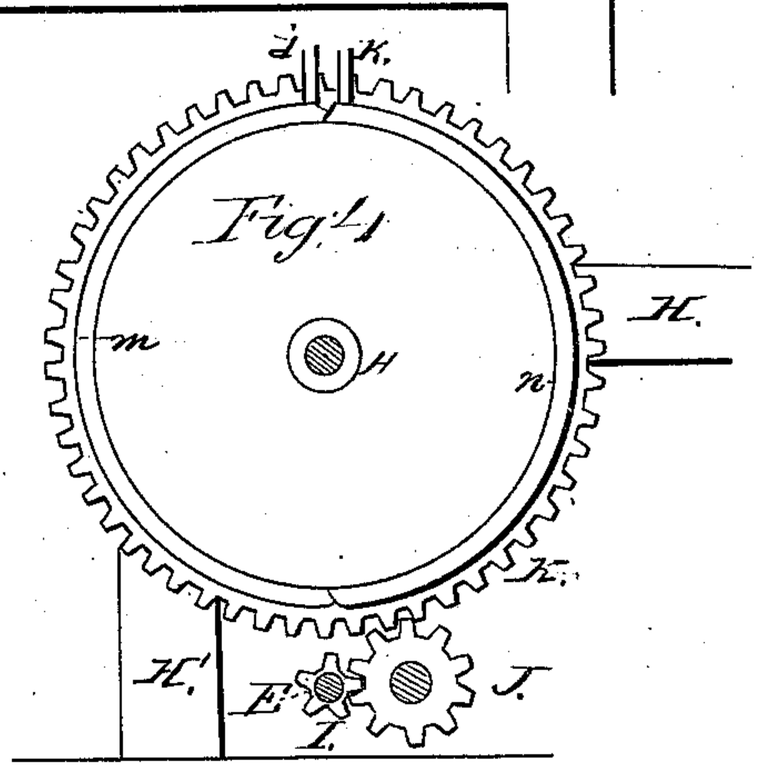


Fig. 2

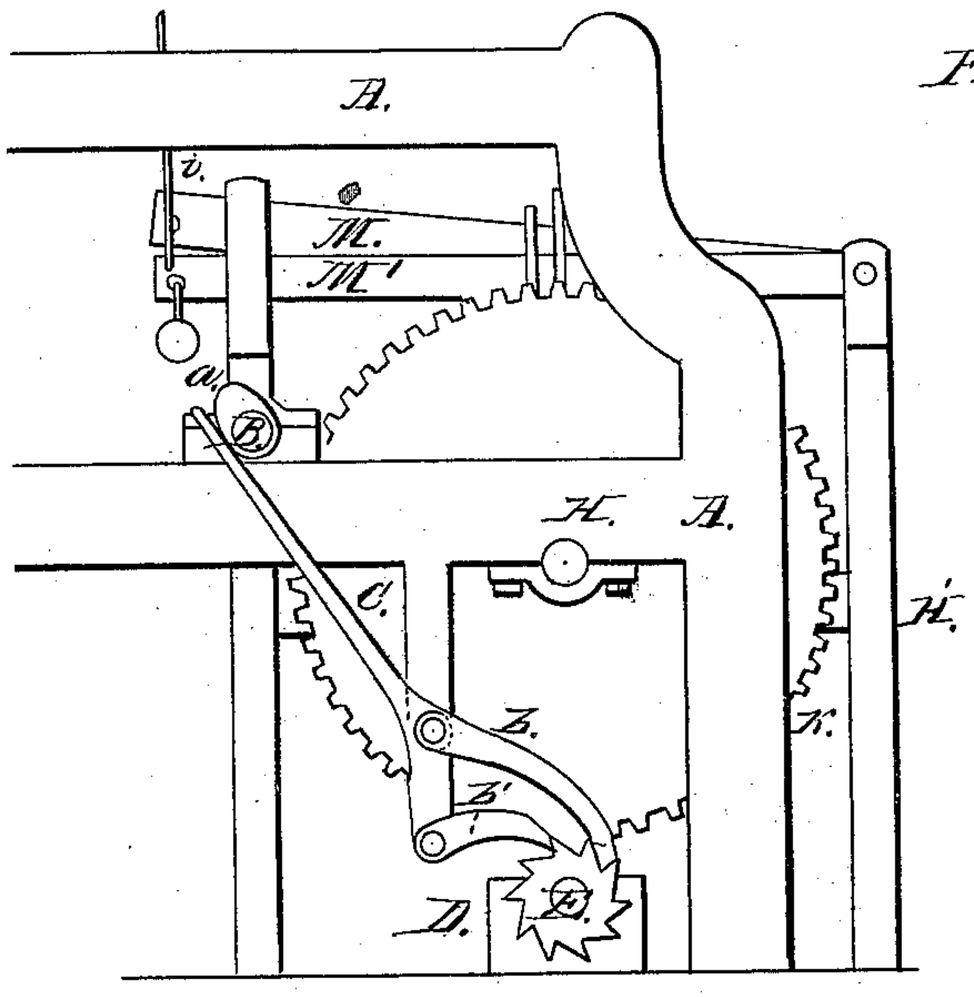
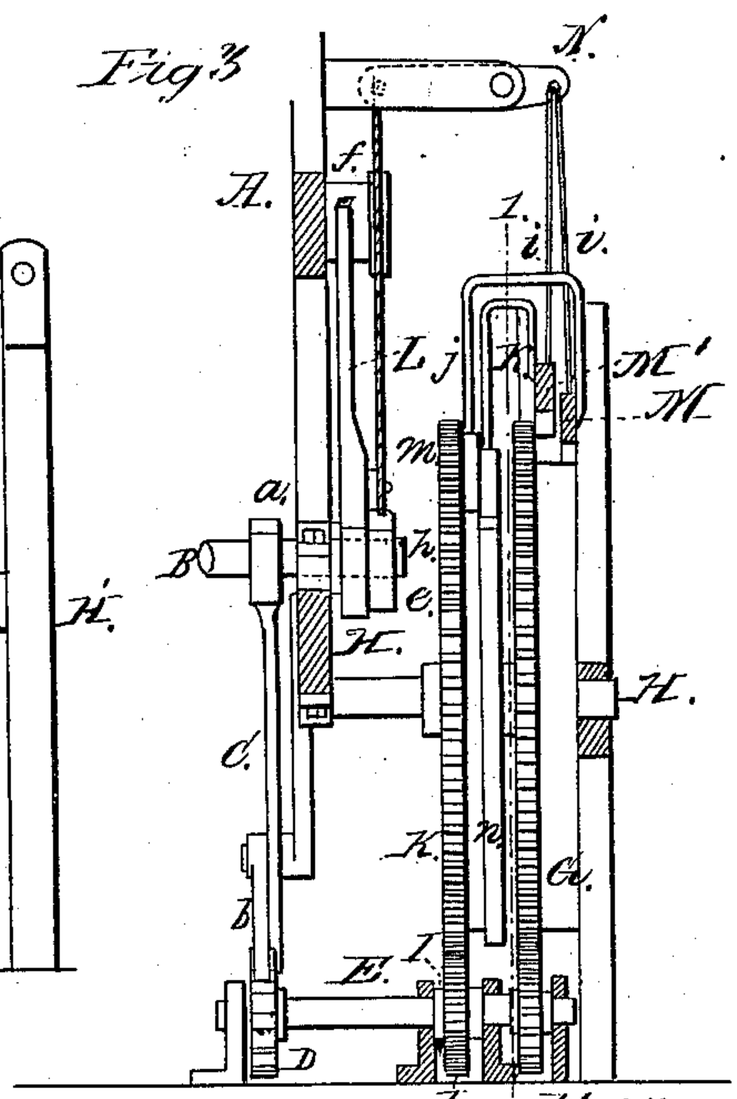


Fig 3



Witnesses.

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United States Patent Office.

ARCHIBALD NIMMO, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND THOMAS MORAN, OF SAME PLACE.

Letters Patent No. 93,637, *dated August* 10, 1869.

IMPROVEMENT IN MECHANISM FOR OPERATING SHUTTLE-BOXES OF LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ARCHIBALD NIMMO, of Philadelphia, Pennsylvania, have invented an Improvement in Looms; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of looms in which a pattern-chain or pattern-wheel and drop-boxes for the shuttles are used; and

My invention consists of mechanism fully described hereafter for determining the pattern independently of the chain, which is employed simply as a device for operating the drop-boxes, in accordance with the pattern determined by the controlling-mechanism, the latter being such as to increase the capacity of the loom as regards the production of varieties and extent of patterns.

In order to enable others skilled in the art to make and use 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 represents a side view of part of the frame of a loom, with my improvements;

Figure 2, a side view, the reverse of fig. 1;

Figure 3, an end view, looking in the direction of the arrow, fig. 1; and

Figure 4, a vertical section on the line 1–2, fig. 3.

Similar letters refer to similar parts throughout the several views.

A represents part of the frame of the loom, and

B, the lower shaft of the same, from which the pattern-wheels or chains are usually worked.

On this shaft is a cam, *a*, by which the lever *c* is actuated in one direction, while a suitable spring moves it in the contrary direction.

To this vibrating lever, which is hung to the frame of the loom, are hinged the pawls *b* and *b'*, adapted to a ratchet-wheel, D, on a shaft, E, to which an intermittent rotary motion is thus imparted.

On this shaft is a pinion, F, gearing into a wheel, G, on the shaft H, and on the same shaft E is a small pinion, I, gearing into a larger pinion, J, the teeth of which are adapted to those of the wheel K, the latter being loose on the above-mentioned shaft H, which turns at one end in the frame A, and at the other end in a suitable frame, H', secured to the main frame.

The peculiar construction of these wheels and their functions will be explained hereafter.

On the outside of the loom-frame A is an arm, L, the inner end of which is arranged to slide on the shaft B, the outer end being adapted to the links of the usual endless pattern-chain, which passes over the stud *f* on the frame, and which is arranged to actuate the shuttle-boxes, in a manner too well understood to need explanation here.

To this arm L is hung a dog, *h*, so constructed and arranged that it can be brought within range of a cam, *e*, on the shaft B, or can be elevated free from the range of that cam, in which case the movement of the arm L, and consequently of the pattern-chain, will cease, but on permitting the dog to fall, the cam will operate the arm L, and consequently the pattern-chain.

The mechanism for operating this dog, and consequently for controlling the movements of the chain, form the special features of my invention, and I will therefore proceed to describe the same.

To the frame H', and above the wheels G and K, are loosely hung two levers, M and M', both of which are connected, near their outer ends, by cords *i i*, to one arm of a lever, N, hung to a projection on the frame A, the outer arm of this lever being connected to the above-mentioned dog *h*.

Both these levers are so arranged as to be operated by pegs, *x*, on a flange of the wheel G, but both levers are never in operation at the same time, the wheel K determining which of the levers shall operate and which shall remain quiescent.

On this wheel K, near the periphery of the same, are two segments, *m* and *n*, each of which is about semi-circular in the present instance, and on the segment *m* bears a yoke, *j*, on the outer lever M, while the yoke *k* of the inner lever M' is arranged to bear on the segment *n*; in other words, the latter segment serves to support the inner lever M', and the segment *m* to support the outer lever M, until this support, owing to the revolving of the wheel K, ceases.

The segments are so arranged, however, that when one ceases to support one lever, and that lever consequently becomes the operating-medium owing to being depressed within range of the pegs *x*, the other segment will elevate the other lever and retain it in a quiescent state.

It should be understood that owing to the system of gearing above described, the wheel K revolves at half the speed of the wheel G, in which there are, in the present instance, sixty teeth and sixty holes, for pegs *x* to operate one lever, and as many holes for the operating-pegs for the other lever.

When the lever, which is in operation, is elevated by a peg, the movement of the pattern-chain and change of shuttles takes place, but as long as the lever remains undisturbed by the pegs, the same shuttle will continue in operation. When another peg elevates the lever, however, another shuttle will go into action and will remain in action, and so on.

It will be seen, therefore, that if one set of pegs be arranged in a peculiar manner to operate one lever and the other set of pegs be arranged in a different manner to operate the other lever, the result will be a pattern determined by the action of both levers, one-

half of this pattern being accomplished by the action of one lever, and when this action ceases the pattern will be continued and completed by the other lever.

It will now be understood that what I have termed the pattern-chain does not in reality determine the pattern, but is simply a device for operating the shuttle-boxes, the character of the pattern being determined by the pegged wheel G, and by the wheel K, which controls the levers operated by the pegged wheel.

As one link only of the chain is used for each change of shuttle, instead of for each revolution of the lower shaft, as in ordinary looms, it will be evident that a short chain may be employed in producing a lengthened pattern, which pattern, as before remarked, is determined by the wheels and levers described, and not by the chain.

In the present instance, I have shown the wheel G as having sixty teeth, and two sets of sixty pegs each set, but in most looms I propose to make the wheel large enough to contain holes for four hundred and eighty pegs in each set. More than two sets of pegs and two levers may be used, however; for instance, there may be four sets of pegs and four levers, but in this case the lever-controlling wheel K must revolve at one-fourth of the rate of the wheel G, and there must be four segments, *m* and *n*, on the said wheel K, each segment being in extent one-fourth of the circumference of the circle with which it coincides, and each segment devoted to one lever.

As the number of levers and sets of operating-pegs is increased, a corresponding increase will be effected in the capacity of the mechanism for producing varieties and extent of pattern.

It will be evident that my invention may be employed in connection with an ordinary pattern-wheel, with the results described above, and that perforations in the wheel will serve the same purpose as pins.

Without confining myself to the precise construction and arrangement of parts herein described,

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

1. Two or more levers M M′, in combination with a wheel, G, having as many sets of pegs or openings as there are levers, each set being devoted to one lever, when the levers are rendered operative and inoperative by the mechanism herein described, or any equivalent to the same, and when the lever which operates is caused to control the pattern-chain, all substantially as set forth.

2. In combination with the wheel G, the lever-controlling wheel K, operating substantially as specified.

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

ARCHIBALD NIMMO.

Witnesses:
JOHN WHITE,
HARRY SMITH.