

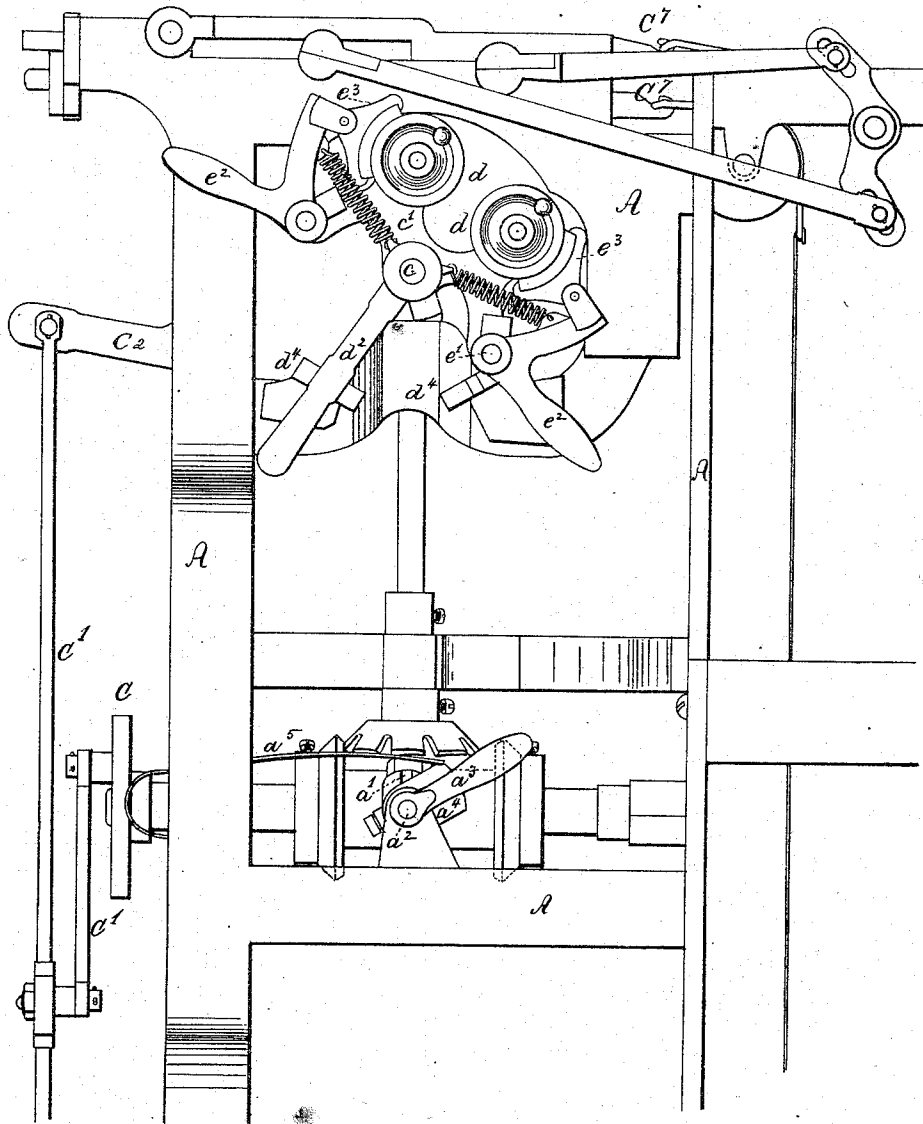
3 Sheets--Sheet 1.
G. CROMPTON & H. WYMAN.

Shedding and Pattern Mechanisms for Looms.

No. 158,362.

Patented Jan. 5, 1875.

Fig. 1.



Witnesses.
L. M. Scatimer,
Wm. Pratt.

Inventors.
Geo. Crompton
Horace Wyman

per
Crosby & Gregory Attys.

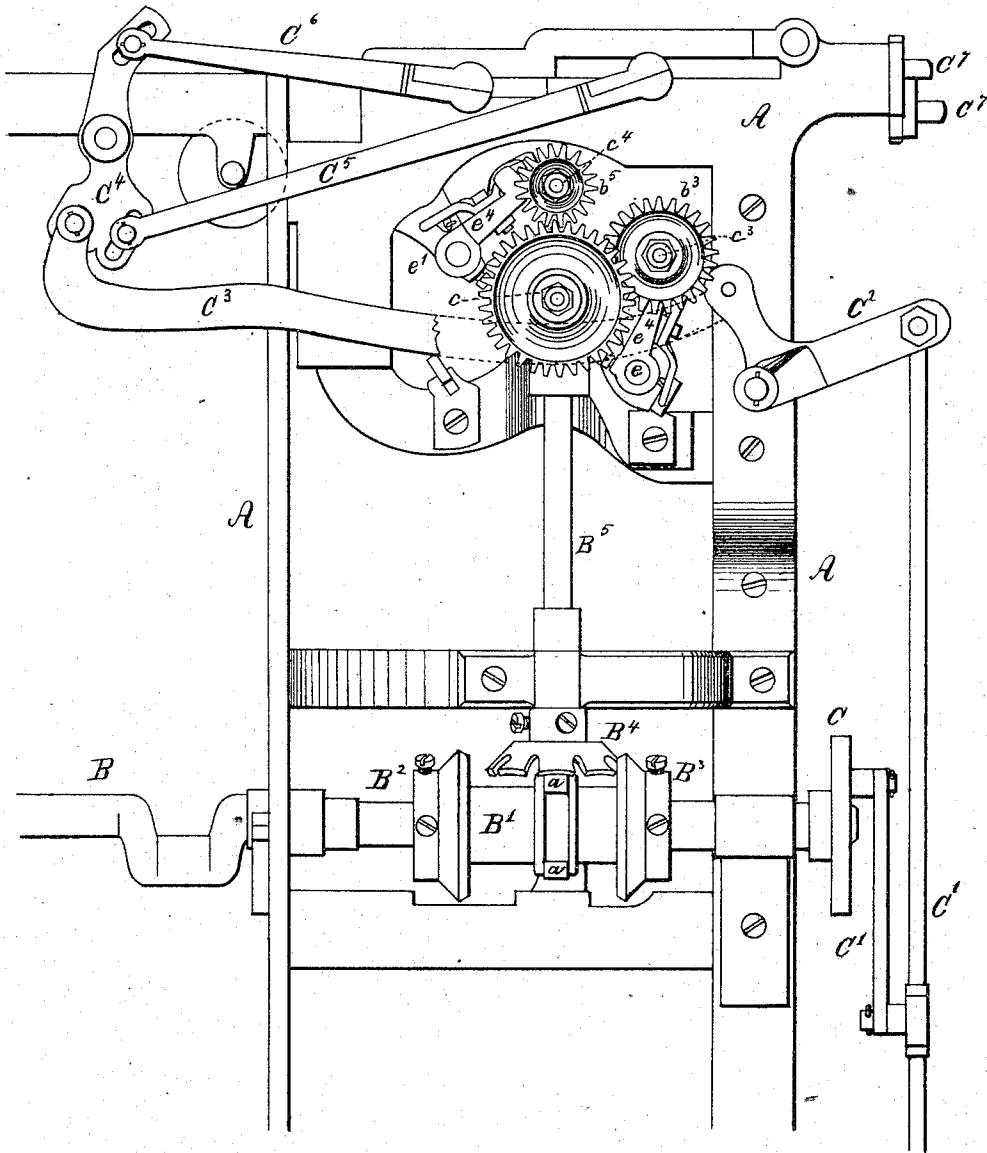
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Shedding and Pattern Mechanisms for Looms.

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Fig. 2.



Witnesses.

L. H. Stratimer.

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Fig. 3.

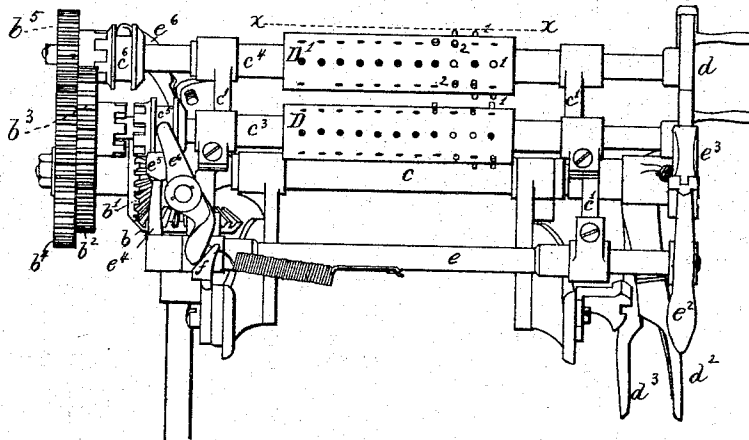
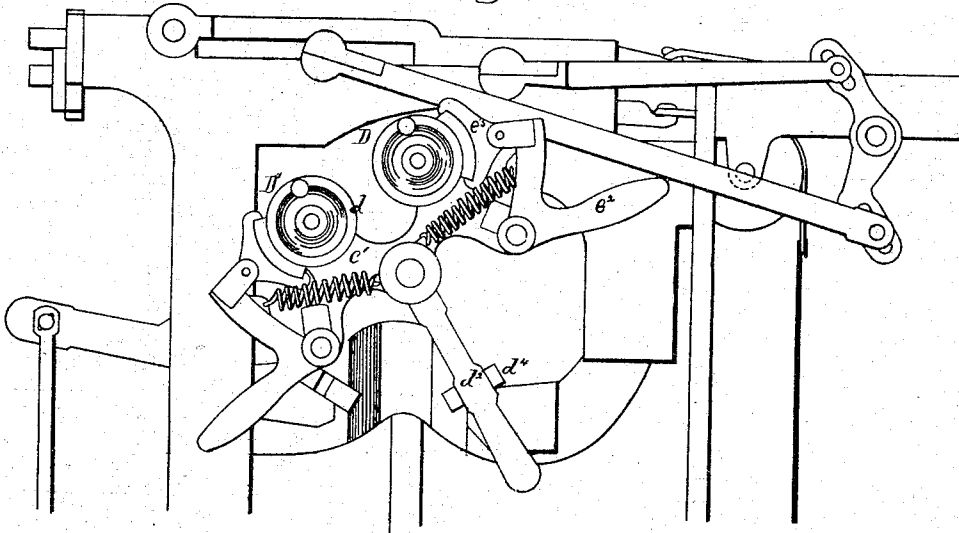


Fig. 4.



Witnesses.

L. M. Latimer.

Wm Pratt.

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UNITED STATES PATENT OFFICE.

GEORGE CROMPTON AND HORACE WYMAN, OF WORCESTER, MASS.

IMPROVEMENT IN SHEDDING AND PATTERN MECHANISMS FOR LOOMS.

Specification forming part of Letters Patent No. **158,362**, dated January 5, 1875; application filed November 16, 1874.

To all whom it may concern:

Be it known that we, GEORGE CROMPTON and HORACE WYMAN, both of the city and county of Worcester and State of Massachusetts, have invented Improvements in Harness-Operating and Pattern Mechanism for Fancy Looms, of which the following is a specification:

Letters Patent of the United States, No. 141,768, August 12, 1873, show notched jacks connected with harness-frames, and operated by means of horizontally-reciprocating lifter, depresser, and evener, and in this present instance of our invention the corresponding parts are the same as in the patent referred to, and this invention differs from that in the construction and operation of the pattern mechanism.

The object of this invention is to quickly change the pattern, being woven through the operation of two or more independent cylinders or chains, either of which may be thrown into operative position with relation to the notched jacks, and these cylinders may be reversed, if desired, to reverse the pattern being woven.

The pattern-cylinders, supported in a movable frame, have attached to their shafts clutches actuated by toothed wheels, and the movement of the movable frame causes these toothed wheels to move so as to engage the one or the other of these clutches, actuated, as hereinafter described, so as to turn the pattern-cylinder to such a point that, when in operative position, the row of pins or projections designed to indicate the pattern previously used will be in proper position.

Figure 1 represents a left-hand side elevation of that portion of a loom containing our invention; Fig. 2, an opposite side elevation, and Fig. 3 is a view of the pattern mechanism removed from the frame. Fig. 4 is also a left-hand side elevation, but with the movable frame in such position that the pattern-cylinder D is in operative position instead of the cylinder D', as shown in Fig. 1.

The frame A of the machine is of ordinary or suitable construction, having the crank or lay shaft B, supported in proper bearings, and connected through crank-wheel C and links C¹, and lever C², with the connecting-

link C³, to operate the rocker C⁴, connected through links C⁵ and C⁶ with elevator, depresser, and evener bars. The notched jacks C⁷ are connected as usual with, and are reciprocated horizontally to raise and lower, the harness-frames. On crank-shaft B is a sleeve, B¹, adapted to rotate with, and also to slide longitudinally on, the shaft, the connection being made through a spline. This sleeve has attached to it pin-wheels B² B³, or toothed wheels adapted to engage, when desired, a notched or crown wheel, B⁴, on a shaft, B⁵, supported in bearings attached to the loom-frame. The sleeve B¹ has a central annular groove to receive a forked piece, *a*, having a slot, *a*¹, (see Fig. 1,) to receive a pin projecting from the crank-like end of a shaft, *a*², moved by a handle, *a*³, and held in position by a spring, *a*⁵, that bears on the cam *a*⁴ attached to shaft *a*². By means of this handle *a*³ and shaft *a*² the sleeve may be moved laterally on its shaft, so as to engage wheels B² or B³, with the crown-wheel B⁴, to rotate shaft B⁵ in either desired direction. At the upper end of shaft B⁵ is a bevel-pinion, *b*, (see Fig. 3,) that engages a bevel-pinion, *b*¹, adapted to turn freely on the shaft *c* that supports the movable frame *c*¹ of the pattern mechanism. The sleeve or hub of this bevel-pinion *b*¹ has a spline, and attached to it through this spline are two toothed wheels, *b*² *b*⁴, that engage other toothed wheels. The toothed wheel *b*² engages a wheel, *b*³, provided with clutch-teeth, and turning loosely on the end of shaft *c*³, carrying one of the pattern-cylinders marked D, and wheel *b*⁴ engages a similar toothed wheel, *b*⁵, turning loosely on shaft *c*⁴ of pattern-cylinder D'. Connected by a spline, and so as to turn with and slide on these shafts *c*³ *c*⁴, are clutch-boxes *c*⁵ *c*⁶ that are moved to engage or free the wheels *b*³ or *b*⁵, so that the rotation of the wheels *b*² and *b*⁴ will move only one of the pattern-cylinders D or D' and their shafts *c*³ *c*⁴.

The moving frame of the pattern-cylinders is supported by shaft *c*, resting in bearings on the frame A, and has boxes or bearings for the shafts *c*³ *c*⁴ of the pattern-cylinders D D', and these shafts *c*³ *c*⁴, besides having the clutch-boxes and toothed wheels before mentioned, have also hand-wheels *d*. The moving frame

c^1 has also a handle, d^2 , for turning the frame, so that the pattern-cylinder D or D' will be in operative position under the jacks of the harness mechanism.

We will here state that we do not limit ourselves to any particular kind of jacks and harness connections with which our novel pattern mechanism may be used, as it may be used with many of the well-known jacks; and we do not limit ourselves to the use of a pattern-cylinder with projecting pins, as shown, for any other well-known pattern-indicating cylinder, barrel, or chain may be employed with good results. This handle d^2 has a catch-piece, d^3 , pivoted to it, and thrown by a spring so as to engage notches in the holders d^4 d^4 to hold the frame c^1 in adjusted position. This frame c^1 also carries shafts e e^1 , provided with handles e^2 , and connected with brakes e^3 , bearing on the peripheries of the hand-wheels of the pattern-cylinders D D'. These handles and brakes are held by springs (see Fig. 1) so that the brakes hold the shafts e^3 e^4 of the pattern-cylinders from turning when not positively moved, and in their normal position arms e^4 e^4 , at the opposite ends of shafts e e^1 , occupy the position shown in Fig. 2. These arms e^4 have their top faces e^5 (see Fig. 3) beveled, so that, when desired, they may be moved through shafts e or e^1 to act on levers e^6 at their upper ends, and turn them, and through them disengage their connected clutches e^5 e^6 from wheels b^3 b^5 , when it is desired to turn the pattern-cylinders D or D' independently through hand-wheels d to bring any desired row of pins on the cylinders in operative position under the jacks. These levers e^6 are, however, usually turned automatically, in order to engage or free the clutches from the toothed wheels, and this is accomplished as the moving frame c^1 is moved to change the position of the cylinders. Each lever e^6 has attached to it a spring, the tendency of which is to keep the clutches engaged; but, when a cylinder is moved from its operative position the lever e^6 , holding its clutch engaged, strikes, just as the other cylinder comes in operative position, an inclined piece, f , which moves such lever and disengages the clutch of the cylinder thrown out of action. These inclined pieces f are attached to the loom-frame, being placed in proper position to unclutch the clutches at the proper moment in their movement.

We do not desire to limit ourselves to any particular number of pattern cylinders or shafts, as more than two may be used. The boxes supporting the shafts of the cylinders are divided, so that the shafts and cylinders may be easily removed for the placement of new cylinders with any desired number of rows of pins or of patterns, and the relative sizes of the toothed wheels may be changed so as to move the pattern-cylinder to use each row of pins, or to skip from one row to a second or third row.

This invention is specially adapted to the

weaving of shawls and fancy goods having a variety of patterns, a portion of the figure being set up or indicated on one, and a portion on the other, pattern-cylinder, so that when the cylinders are changed through the movable frame the desired pattern will be produced, and in this way the capacity of the loom for weaving complicated patterns is greatly enlarged. The pattern-cylinders may also have two or more patterns set up on them, and then the cylinders will be moved through the toothed wheels two or more steps at one movement, to bring the pins of each pattern successively and properly under the jacks. By moving the sleeve B¹, the shaft B⁵ may be moved in either direction; and this is desirable in many cases, as, for instance, while the shaft and pattern-cylinder move in one direction a certain pattern is made, and if it is then desired to reverse the order of shedding to make the other half of the figure, which may be a diamond or other figure, then the reversal of the movement of the shaft through the reversal of the sleeve B¹, changes or reverses the figure. When the crown-wheel at the lower end of the shaft B⁵ is not engaged with the pin-wheels on the clutch, then the pattern mechanism may be changed or reversed, and the frame c^1 be moved freely. In this instance of our invention the pattern-cylinder D' (see Fig. 3) is uppermost. (See Fig. 2.) The cylinder D' has two patterns set up on it, and the toothed wheel b^4 engages and moves the wheel b^5 of the pattern-cylinder D', so as to skip a row of pins at each movement. One pattern may be designated by rows of pins 1, and the other by rows of pins 2, and then suppose the operator is weaving with pattern 1, then the cylinder is moved to bring the rows marked 1 under the jacks, and skip the rows 2. Now, we will suppose row 1 to be in use, the parts being as shown in Fig. 2, and the jacks being supposed to lie in the line xx , Fig. 3. In this position the clutch e^6 is engaged, and the clutch e^5 is disengaged, and as long as the loom runs pins 1 1 1 will come under the jacks. Now, if it were desired to use pattern 2 2, the operator would, through handle e^2 , shaft e , and arm e^4 , move lever e^6 , unclutch the clutch e^6 , and, by means of the hand-wheel d , turn the shaft e^4 so that rows of pins 2 would come under the jacks, then the continued movement of the cylinder would weave the pattern indicated by such pins, and it is evident that three or four rows of pins could be so employed. Now, suppose rows of pins 1 to be in operation, and it is desired to produce a pattern indicated or set up on the pattern-cylinder D, having connected with its shaft, but unclutched, the toothed wheel b^3 . Now, change the position of the movable frame through its handle d^2 , and bring pattern-cylinder D in operative position. During this operation the wheels b^5 b^3 move over their engaged wheels b^4 b^2 , the end of the lever e^6 , that operates the clutch of e^5 , leaving the inclined piece f , allowing the clutch to engage its half on wheel b^3 of pattern-cylinder D, thereby

clutching with it, and as the extent of movement of these wheels b^2 b^3 , in connection with each other, is just the same when the clutch is to be disengaged or engaged, it follows that each cylinder will, when engaged, be brought back into engagement, so as to occupy the same position that it occupied when it was disengaged, and this insures that the same pattern will be repeated by the two cylinders when simply changed in position. Were not this correct placement of the cylinders insured, then the operator would be obliged to carefully read the pins on the cylinder to see if the proper line of pins were in position before commencing to weave after a change of cylinder; but by our arrangement of parts this correct changing of the pattern is insured.

As this frame c moves from its position, (shown in Fig. 2,) to bring cylinder D in position, wheel b^5 travels over b^4 , and end of lever e^6 strikes an inclined stop, f , provided for it, and disengages the clutch c^6 just as the cylinder D comes into operative position. In this instance of our invention, pattern-cylinder D is set up with pins for one pattern, and it moves one row at a time, but it might contain two or more patterns. When a pattern-cylinder is in operative position, it is moved step by step through the toothed wheels and the bevel-wheels and shaft B^5 .

Having described our invention, we claim—

1. The combination, with a movable frame and two or more pattern cylinders or indica-

tors, of clutch-boxes and a series of toothed wheels, substantially as described, whereby any pattern-cylinder may be brought in position with the jacks and be moved through its clutch to operate the jacks of the harness or be allowed to remain at rest, as and for the purpose set forth.

2. The combination, with a movable frame and two or more pattern cylinders or indicators, of clutch-boxes, toothed wheels, levers, and inclines, whereby the clutches may be engaged and disengaged automatically by moving the pattern-cylinder carrying-frame, as and for the purposes set forth.

3. The combination of the shaft e and arm e^4 e^5 , with lever e^6 , and clutch and pattern-cylinder for disengaging the clutch to move the pattern-cylinder without turning the operating toothed wheel or other part of the loom, as and for the purpose set forth.

4. The crank-shaft, the sleeve B^1 , the pin or toothed wheels B^2 B^3 , the crown-wheel, the shaft B^5 and bevel-pinions, combined with the toothed wheels and pattern-cylinders, carried in a movable frame, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEO. CROMPTON.
HORACE WYMAN.

Witnesses:

J. A. WARE,
J. B. SYME.