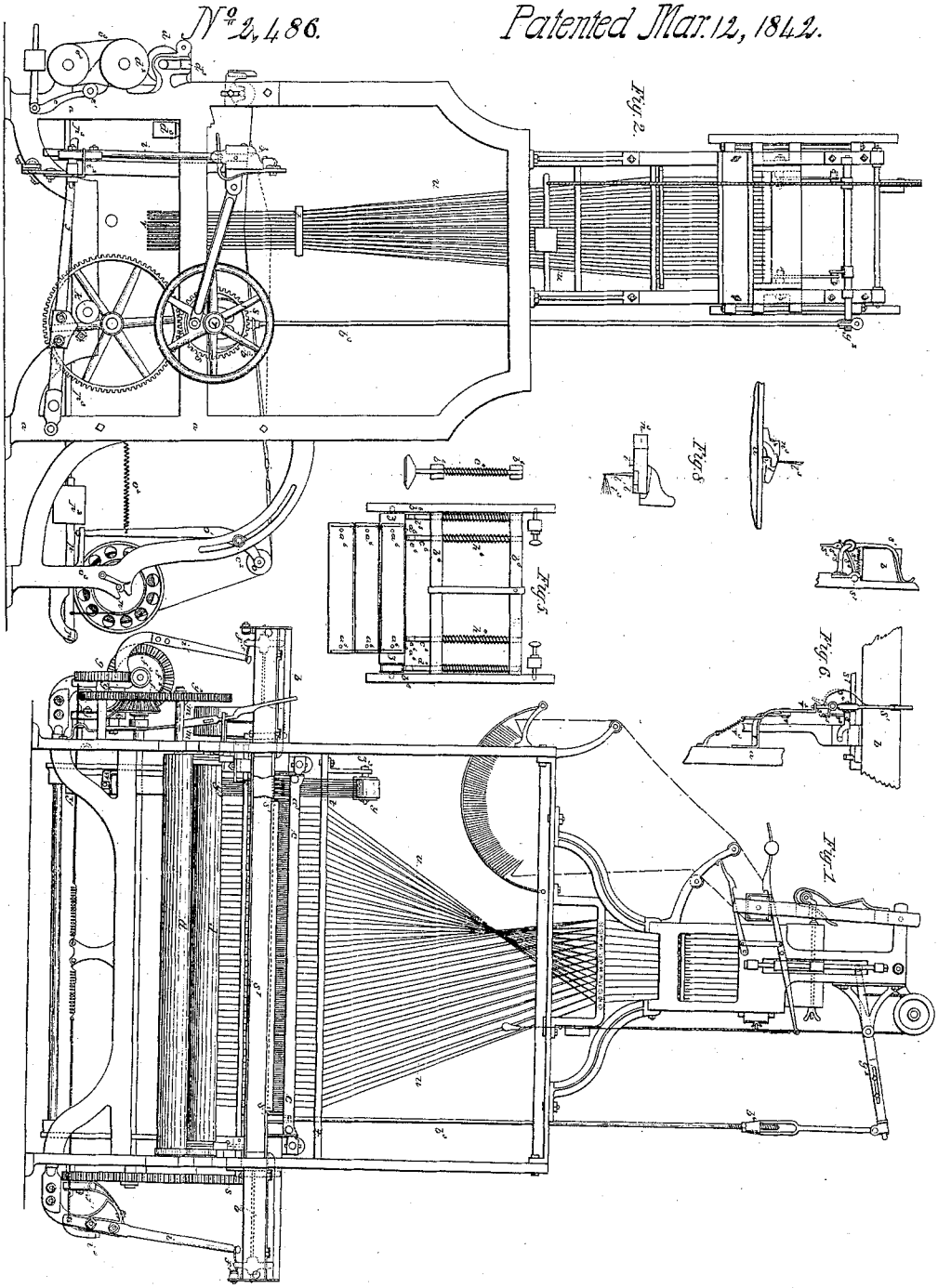
C. G. Gilroy.

Loom.

No. 2,486. Patented Mar. 12, 1842.



Sheets,
2 Sheets.

C. G. Gilroy.

Loom.

No. 2,486. Patented Mar. 12, 1842.

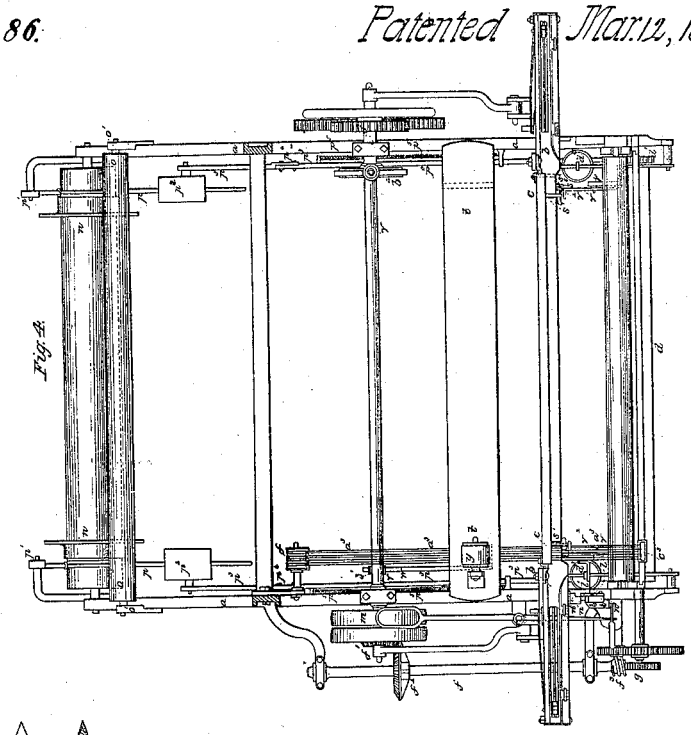


Fig. 4.

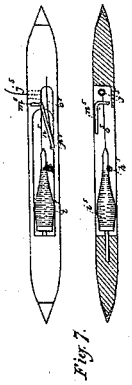


Fig. 7.

Fig. 3.

UNITED STATES PATENT OFFICE.

CLINTON GREY GILROY, OF GREAT BRITAIN, ASSIGNOR TO JEREMIAH WILBUR, OF GREAT BRITAIN.

LOOM FOR WEAVING FIGURED AND OTHER FABRICS.

Specification of Letters Patent No. 2,486, dated March 12, 1842.

To all whom it may concern:

Be it known that I, CLINTON GREY GILROY, a subject of the Queen of Great Britain, have invented new and useful Improvements in Looms, and that the following is a full and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, represents a front elevation of my improved loom. Fig. 2, represents a side elevation; Fig. 3, represents a longitudinal vertical section; Fig. 4, represents a plan of a part of the loom; Fig. 5, represents a front view of the Jacquard cylinder showing the card protectors. Fig. 6, is a detached section of the lay, &c., showing a front and side view of the weft puller or tightener; Fig. 7, shuttle; Fig. 8, the slide of the stop motion detached showing another modification.

On the different figures of these drawings, the letters of reference are the same; *a*, *a*, the frame of the loom; *b*, the lay, *c* the reed, all formed similar to those of the ordinary loom. The take-up rollers *d*, *d*, placed one above the other, just under the breast-beam, are geared together by the cog-wheels *d'*; (see Fig. 4,) the upper take-up roller is pressed down by a lever and weight d^3; on the axis of the lower one is a pulley d^2 from which a band e^3 passes down to a similar pulley e^2 on the cloth roller *e;* this band is tightened with more or less force by the pressure of the pulley *e'* attached by a stud to the bent lever *e'*, governed by a movable weight; *f* is a horizontal shaft on the outside of the frame, placed at right angles to, and on a level with the lower, or cam-shaft, on the end of which is a bevel-wheel *f'* meshing into the bevel wheel f^2 on the shaft *f;* (it will be perceived that by changing the relative size of these wheels, different relative velocities will be given to the shafts,) on the forward end of shaft *f*, is a worm-wheel f^3 working into a stud-wheel *g*, on which is a pinion *g'* meshing into a cog-wheel g^2 on the axis of the lower take-up roller *d*.

i, *i*, are picker staves; *j* are the shuttle-levers, by which the picker-staves are moved; *k* are the cams to put the shuttle-levers in motion; *m* fast and loose pulleys connected with a driving belt in the usual way. *n*, warp-beam; *o* warp-roller; this roller is suspended on the top of two levers *o'*, having their fulcra at o^2 and extending down nearly perpendicular; the ends of these levers rest against stops o^3, and are held there by springs o^4; this allows the warp to give way at every beat of the lay and on its return takes up the slack.

The warp-beam *n* is surrounded at each end by the usual friction strap, to each of which is appended a lever *p* having its fulcrum at *p'* and running under the warp-beam, toward the front of the loom; on this lever is a sliding weight p^2, to which is attached a connecting rod p^3 (colored red in the drawing) these rods have eyes in their forward ends in which the journals of a horizontal roller *q* turns; p^5 (see Fig. 4) are springs attached to the rods p^3, which draw them forward and bear the roller *q*, firmly against the cloth-roller and the weight p^2 to the extreme end of the lever. The warp runs from the beam *n*, over the roller *o*, through the harness and reed over the roller of the breast beam; the cloth then passes down under both rollers *d*, *d*, and around the lower one, up between them, over the upper one and down to the cloth roller *e;* (this is clearly shown in Fig. 3,) as the cloth roller increases in size by the winding on of the cloth, the roller *q* is pushed back, carrying along with it the rod p^3 and weight p^2 thereby lessening the tension on the warp-beam as the roll diminishes; on taking a "cut" from the cloth-roller the rod p^3 is lengthened by means of the coupling at p^4 so as to retain the weight in the same position when the cloth is taken from the roller; the cloth is regularly drawn forward as it is woven, by means of the take-up rollers, connected as above described with the cam shaft; the cloth is wound on the cloth-roller with any degree of tension, as fast as it is delivered from the take-up rollers, by means of the band c^3 and tightening pulley *e'* the revolutions of this roller being regulated by the quantity of cloth given out.

On the driving shaft *r* is placed an eccentric b^2 surrounded by a collar, to which an inflexible rod b^3 is attached having a governing screw b^4 to regulate its length; the upper end of this rod is connected with the jacquard lever g^2; it will be perceived by this arrangement that the harness, leads, weights, &c., receive a more regular motion than can be given by a cam, or other similar contrivance; but, as the shed in this case closes down, when the lay has been brought

forward half the beat, the eccentric above described could not be used, but for another invention which I call the "weft puller" or "tightener" constructed in the following manner: To the underside of the lay is attached an iron s, (Figs. 3, and 6,) which projects forward, and is formed into a fulcrum, on which turns a finger or lever s'; this finger runs up in front of the lay, and curves back lying in a channel cut across the race-board, the extreme end curving up at, or behind the reed; the finger is held in this position by a spring s^2 attached thereto above the fulcrum, and passing under the lay; the end of the finger below the fulcrum is flattened out, and a short rod s^3 is jointed to it, so as to vibrate sidewise parallel to the lay; this is kept in a vertical position by the spring s^4; from its opposite side projects a stud s^5, on which an arm s^6 from the shaft s^7, of the stop motion rests (this is connected with the shuttle box and is of the common construction); from the front upright of the loom I extend out an arm v under the breast beam, the end of which forms a fulcrum at v' for the lever catch v^2; this lever, at its lower and forward end, is bent so as to rest on the arm v, and is held down to it by the spring v^3; the other end of this lever is bent up so as to come in contact with the rod s^3, when the lay is thrown forward, carrying the finger forward of the lay, and pushing the weft thread up to the cloth and straightening it before the shed descends; as soon as the rod passes over the catch, the spring s^2 brings it into place again; as the lay returns, the lever v^2 is depressed by the rod s^3 till it clears it; if the shuttle does not pass entirely into the box, the arm s^6 bears down on the stud s^5 and turns the rod s^3 to one side, so that it does not strike the lever catch v^2 and the finger remains at rest till the loom stops, thereby preventing the damage that might be caused by forcing it forward.

The jacquard, in its general construction is similar to those now in common use, except in the following particulars, which are clearly shown in Fig. 5, in which z is the cylinder, and b^6 the frame that supports it; this cylinder is worked and affixed in the ordinary way having two presses d^6 to bring it to its square or level, as in other jacquards; my improvement consists in what I term card protectors; these are similar in shape to the press d^6 and are shown at c^6 on the drawing; they are two in number and placed just inside the studs or knobs a^6 one at each end; the feet of these protectors have a smooth wire on their under edge, to prevent the cards from catching; the rods of these protectors run up through the cross braces of the cylinder frame; the rods pass through spiral springs h^6 between the braces, which serve to press them down to the pattern card; it will be seen that by this simple method I prevent the cards from being misplaced or injured when the loom is in rapid operation.

In a shuttle of the ordinary construction (see Fig. 7) I attach a brush, or tuft of hair, or similar fibrous material, h^5, on one side, just under the end of the bobbin or quill i^5; this brush, pressing against the bobbin, prevents the thread from coming off in loops or kinks. I also affix a small pin m^5 in the side of the shuttle, against which the bent wire n^5 is pressed by the spring o^5, the pivot being at p^6; the weft thread after unwinding from the bobbin passes between the bent wire n^5 and pin m^5 giving it the tension required which may be regulated by the curve of the spring o^5; the weft thread then passes out of the shuttle through the eye in the usual way. Near the pivot on which the picker staves (made like those in common use) vibrate, I attach to the journal of the lay an adjustable iron i^2, with set screws so as to allow its position to be changed the upper end being bent horizontal; this rises above the fulcrum of the picker staff, which strikes against it, and stops the picker at any desired distance from the end of the shuttle box, which prevents the rebounding of the shuttle and stopping the loom.

The manner of stopping the loom, when the weft thread breaks, is as follows: two pulleys y one affixed over the cumber board, the other just below the lower cross brace of the loom; around each of these pulleys I pass a short strap and connect their ends together by the heddles y^3; to the front of the lower strap I fasten one end of a bent lever w, the fulcrum of which is nearly under the lower or cam shaft, the other end extends up above the shaft, on which and in contact with the lever is placed a cam z'.

a^3 is a series of strings fastened into an iron on the breast beam; these pass over the race board, which is here cut out so that the shuttle will pass over the strings without rubbing them through suitable dents in the reed; thence through the mails in the heddles q^3, one half going into the front and lower mails, and the other half into the back ones, as in plain warp; they are then extended over two grooved pulleys h, placed one above the other, so that all the strings which are kept separate by the grooves on the pulleys shall be entirely clear from each other, and passing down through a plate q^3 are each attached to a separate lead weight h^3 they are thus prevented from twisting and entangling as those heretofore used.

On the protector n' of the common stop motion, I form a notch n^2 (see Figs. 3 and 4) and to the slide n^3 constructed in the usual manner for throwing off the shipper I attach a button l so as to vibrate easily; from this

button I extend an arm l' under the strings a^3 having an eye in its end; to each of the lower strings I connect a small thread or wire l^3, the lower ends of which are fastened into the eye of arm l'; over the button l is a regulator l^2 fastened either to the loom frame or to the slide, which prevents the button from being lifted too high when in action; it will be perceived, that as the cam z' revolves, it throws back the upper end of the bent lever w, and raises the lower end which is united to the strap connecting the heddles, causing the front ones to ascend, and the rear ones to descend, thus reversing the position of the strings, from that shown in the drawing; by this action the button l will be raised above the slide n^3 so as to be struck by the protector n', and throw off the shipper; but while the weft thread is unexpended, or unbroken, it will lie across the lower strings, intercept their rising above the upper ones, and thus prevent the button from coming in contact with the protector.

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

1. The take-up rollers d d geared together, and the cloth roller e having the pulley d^2 and e^2 on their axes connected by the belt e^3 in combination with the bent lever e' and governing weight for the purpose and in the manner described.

2. I claim the roller q and rods p^3 connected to, and in combination with the weight p^2 sliding on the lever p of the drag or friction strap for the purpose of regulating the tension on the warp-beam as herein described.

3. I claim the "weft pullers" for drawing forward and straightening the thread as described and in combination therewith the eccentric b^2 connected with the Jacquard by an inflexible rod b^3 in the manner and for the purpose herein set forth.

4. I claim the "card protectors" c^6 placed in the cylinder frame of a Jacquard so as to bear upon the card to insure their accurate adjustment on the cylinder as above described.

5. In the shuttle I claim the bent wire n^5 acted on by the spring o^5 in combination with the brush or tuft of hair h^5 for regulating the delivery of thread.

6. I claim the regulating iron i' in combination with the picker-staves, in the manner and for the purpose described.

7. In the stop thread motion I claim suspending a weight to each string separately instead of connecting all of them to one weight for the purpose and in the manner described.

8. I also claim the button l attached to the slide and connected by the arm l' to and combined with the lower strings a^3 arranged in the manner set forth.

C. G. GILROY.

Witnesses:
J. J. GREENOUGH,
B. K. MORSELL.