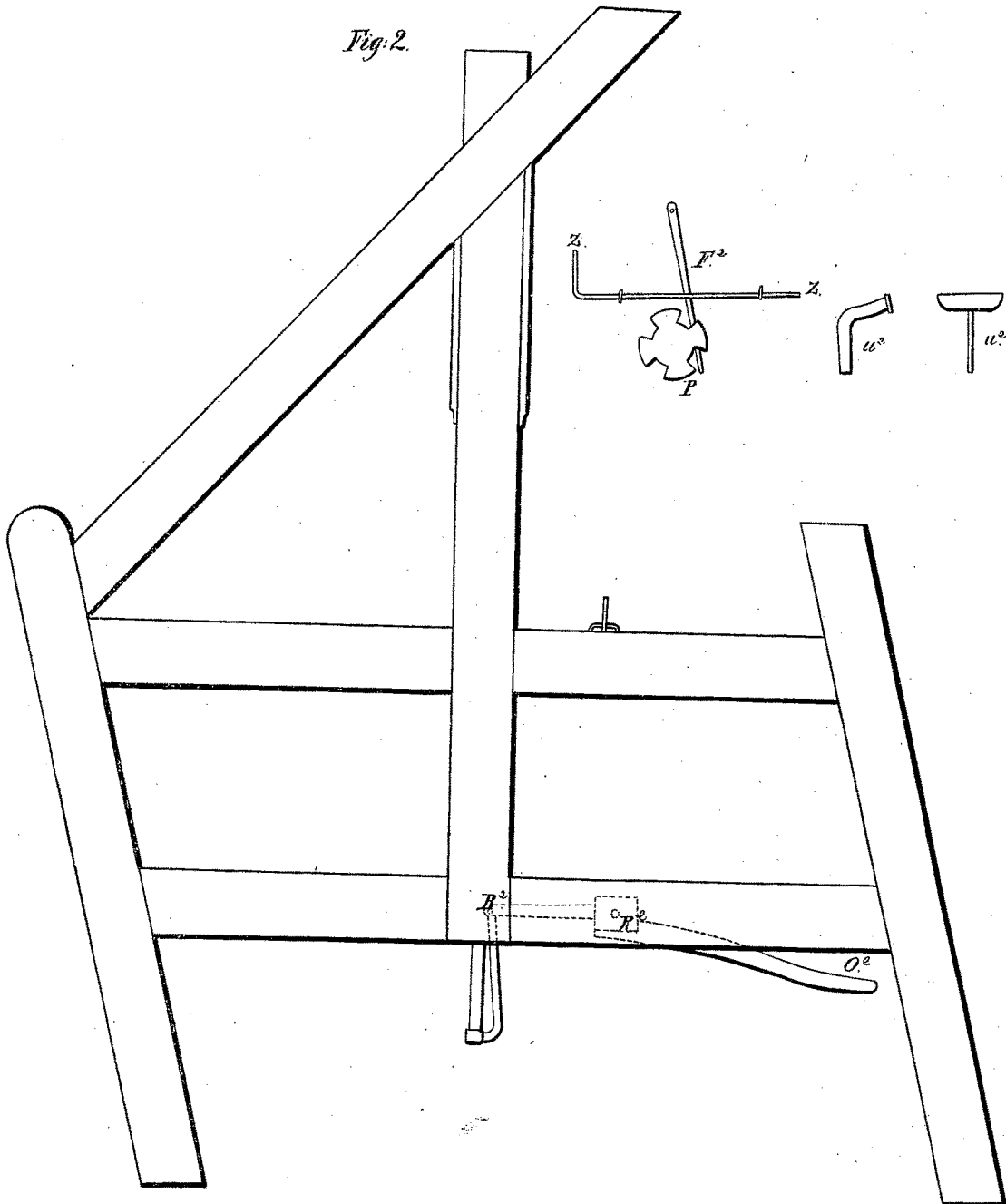


A. Calderhead. Loom.

N^o. 964.

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UNITED STATES PATENT OFFICE.

ALEXANDER CALDERHEAD, OF PHILADELPHIA, PENNSYLVANIA.

JACQUARD MACHINERY FOR WEAVING ALL KINDS OF FIGURED CLOTH.

Specification forming part of Letters Patent No. 1,964, dated February 3, 1841; Reissued May 13, 1857, No. 202.

To all whom it may concern:

Be it known that I, ALEXANDER CALDERHEAD, of the city of Philadelphia and State of Pennsylvania, have invented a new, 5 easy, and cheap Mode of Weaving All Kinds of Figured Cloth; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this 10 specification.

The nature of my improvements consists first in lifting and lowering the threads of the warp with what I call independent metallic heddles or heylds, instead of the 15 weights mails and twines composing the lower mounting, or harness of the draw loom. Second—in constructing the cylinder or pattern apron so as to directly lift and receive the said heddles so as to form 20 the sheed or shire; or in constructing a trunk and pattern web, both to direct what shall be the shed as it does in the jacquard and other drawing machines by trapping or 25 untrapping the hooks or knot cords to be drawn up—whereas mine directly lifts the heddles up. I make the heddles for a three ply or imperial carpet of No. 13 wire the length of which is 24 inches. A head (A, 30 Figure 1,) or boull is made at the one end of them. 14 inches below the head they are flattened (M Fig. 1,) wherein eyes are punched or bored. They work perpendicular in two boards (C and D, Fig. 1,) one of 35 which (C,) suspends them by the heads, the other (D,) directs their points into the holes in the cylinder (B,) on which the pattern apron works. I make the boards (C and D) one inch thick, 5½ inches deep and 40 four feet broad, or long enough to work on the slides (E E Fig. 1). I bore the holes in said board large enough to admit wires about two numbers coarser, than that of 45 the trunk and pattern web one fourth of an inch. Each row of holes in the boards trunk and pattern web, contains 12 in depth on four inches, and must be slanted in the rows so that the back hole of the one row 50 shall come near square with the front one of the other row, so that the threads of the warp may pass straight through their own heddles. The trunk, pattern web and boards must be the breadth of the web, and the

trunk hollow the depth of the shed. The 55 trunk may be cast or made of plates of sheet brass, brazed together, and fixed or screwed on blocks with an axle or center which passes through slides (E E) which is 60 inches long, 25 above and 35 inches 60 below, from where the axle or center of the trunk pass through the slides, which slides pass through brackets or guides (F F) and are attached by straps to beams (L L) which are suspended from the top of the 65 frame by straps (I I). To the other end of the beams (L L) is suspended four rods (H H) (two of which only can be seen) on which hangs the heddle rest or suspension board (C). 70

n n is a metallic rod which passes through board (C) and is screwed into guide board (D). The heads (2) of said rods suspend the board (D) so that the heddle point shall be one half inch through it when the trunk 75 is down. The lower end of slides (E E) are attached to the points of the lever (R) (which is also seen at Fig. 2, B²). Attached on the ends of the axles of the trunk or centers is a four toothed wheel (P P) 80 as (is also seen on Fig. 4 P). It is for the purpose of turning the trunk, being caught in its descent by hooks (T T) which are attached to the frame of the loom at (S S).

W W, are levers which work in the slides 85 (E E) and are pressed by the springs (*k k*) which bring and keep the trunk square. These levers are more fully shown in Fig. 3.

(L L) are two slides shown in Figs. 1 and 4 which pass the hooks from one side 90 of the wheels P P to the other, to make the trunk revolve in different directions.

The operation of the machine is as follows: The foot board O of the lever R being 95 pressed down raises up the slides with the trunk, which also takes up the guide board and lowers the rest board which makes the heddles pass into the trunk where the pattern web is cut or perforated, and raises them (the heddles) where it is not. Again, 100 when the pressure is taken off the foot board of the lever the wheel on the axle of the trunk is caught by the hooks which makes the trunk turn the fourth of a revolution.

I claim the right to make the above specified machinery to suit all kinds of flowered 105 cloth. It is easily fixed or attached in any loom.

easily in two holes through the wooden traverse rail 25, that slides upon two rods 26, that run across the spindle box parallel with the spindles, but far enough below so as not to interfere with the bobbins P and 60. Upon this traverse rail there is a metal slide for each of the bobbins. One end 27 is bent up at right angles to the other part, which is fastened to the traverse rail. The turned up part projects into the groove R²⁸ between the head S²⁹ and the whirl T³⁰ of the bobbin, so that as the eccentric moves the first lever and the second lever the rail and slide it moves the bobbins also and winds the silk uniformly upon the whole length of the bobbin between the heads S and 29 and U. The head in the drawing No. 2 is obscured by the cylinder.

V and 33 the boiler; W, the door; X, the plate of metal or sheet iron that is under the whole length of the boiler and turns up at the end 34 and is fitted to receive the funnel 35 to carry off the smoke. Above the plate *x* there is a grate. The under part of the boiler is made with a cavity through its whole length. This cavity may be made square, circular or of any other form, plain or fluted, to increase the surface for the action of the fire. In this cavity and upon the grate the fire is made to heat the water in the boiler, and the smoke passes out through the hole in the plate that stops the end of the cavity under the boiler into the funnel that conveys it away. Y and 36, a metal strainer that just fits into the boiler. (It is shown in the drawing No. 2 with part of the end of the boiler off and the end of the strainer off also, so as to show the partition.) This strainer prevents what remains of the cocoons that the silk is spun off from sinking and to remove the cocoons from the water when the spinning is stopped. This strainer has two movable partitions Z, Z, and 37 to keep the cocoons for each spindle separate from the others. The fibers of silk from the cocoons pass up between the pointed wires *a* and 38 (of which there are 5 pointed and two with the ends rounded and turned out to receive the fibers of silk from the hand of the operator more readily,) through the guide *b* and 39, where it receives the required degree of twist, and then passes into the end of the spindle *d* and 40 and out through the side of the spindle (41 of drawing No. 3 of a spindle complete, showing the thread passing in through the hole and out over the hook 42 through the querl at the end of the fier arm 43 onto the bobbin) over the hook *e* and through the querl *f* onto the bobbin P, upon which it is wound by the spindle and fier or cylinder revolving faster or slower than the bobbin. The spindle is carried by the band *g* and 42 from the large pulley N and 16 running over the whirl *h* and 61 upon the first spin-

dle and under the second and over the third, under the fourth and over the fifth onto the large pulley N, also a section showing the band whirl and pulley. This large pulley is made sufficiently heavy to serve for a fly wheel and pulley. It has several grooves in it of different sizes to vary the twist as it may be wanted. The band *i* and 44 runs in one of these grooves and then into a groove in the whirl T and 30 of the first bobbin and under the second, and so on the same manner as the band runs that carries the spindles.

There are metal cylinders or tubes upon part of the spindles as at *j* and 45 in the drawing open at one end and large enough for the bobbin to pass in and out freely. There is a hole 46 in the hub of the cylinder that corresponds to the one in the spindle. It is represented in the drawing No. 2 with the side of the spindle left off, so as to show it plainly where the silk passes out and then along the side of the cylinder through a notch onto the bobbin. The air does not resist this cylinder when it revolves so much as it does the fier and it is not liable to spread like the fier when it revolves fast. Therefore it can be run much faster with less power.

The guide *b* and 39 and the pointed wires *a* and 38 are all fastened to the slide *k* and 49, which may be drawn out or shoved in at pleasure. This slide is shown in drawing No. 2 shaded darker than the rest of the spindle box, also a section of it to drawing No. 1.

As the spindles are all carried by one band and the bobbins are all carried by another and the bands running under some and over others it makes part of them revolve in one direction and part in the opposite and makes the spindles that do not revolve in a proper direction to spin revolve in a proper direction to double and twist that which has already been spun. The bobbins that are filled with spun silk are taken from the spindle by unscrewing the nut that holds the whirl and slipping off the whirl and bobbin of silk that is to be doubled and twisted, which bobbins are put upon skewers (the ends of the skewers may be seen projecting out of each end of the bobbin 50) and set in the creel *l* and 51 under the spindle box. The threads pass through a guide to the top of the pulley *m* and 52 and around the pulley and over the glass rod *n* and 53 into the end of the spindle. In drawing No. 2 the end of the spindle box is left off and the spindle is shown open with the thread in it and one of the pieces that support the glass rod and the bearing of the pulley, so as to show the pulley and thread as it is conducted onto the bobbin. One edge of the pulley *m* and 52 runs in the basin of water *o* and 54 to wet

Fig. 2, is a view of one side of the frame of my loom, the principal difference is its being made with a bevel instead of a square, and the cross rails laid in flat.

5 I claim as my invention—

The principle of lifting the shed or shire with metallic heddles directly by the pat-

tern apron and trunk, roll or receiver, or by lowering the heddles into the same, as described.

ALEXANDER CALDERHEAD.

Witnesses:

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