

(No Model.)

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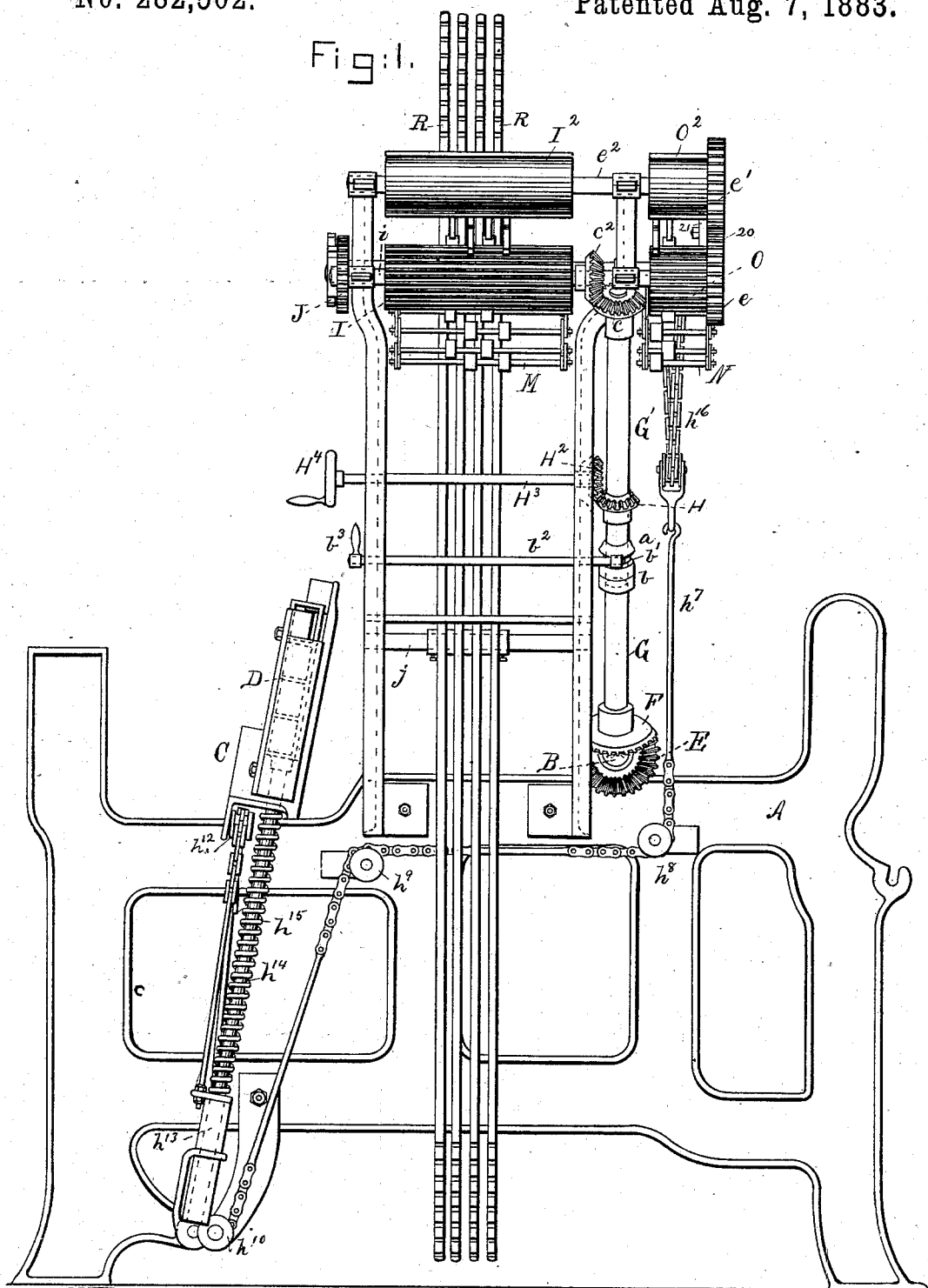
G. CROMPTON.

LOOM.

No. 282,502.

Patented Aug. 7, 1883.

Fig. 1.



WITNESSES

Arthur Reynolds
Emile J. Hayes.

INVENTOR

Geo. Crompton
by Crosby & Gregory Attys

(No Model.)

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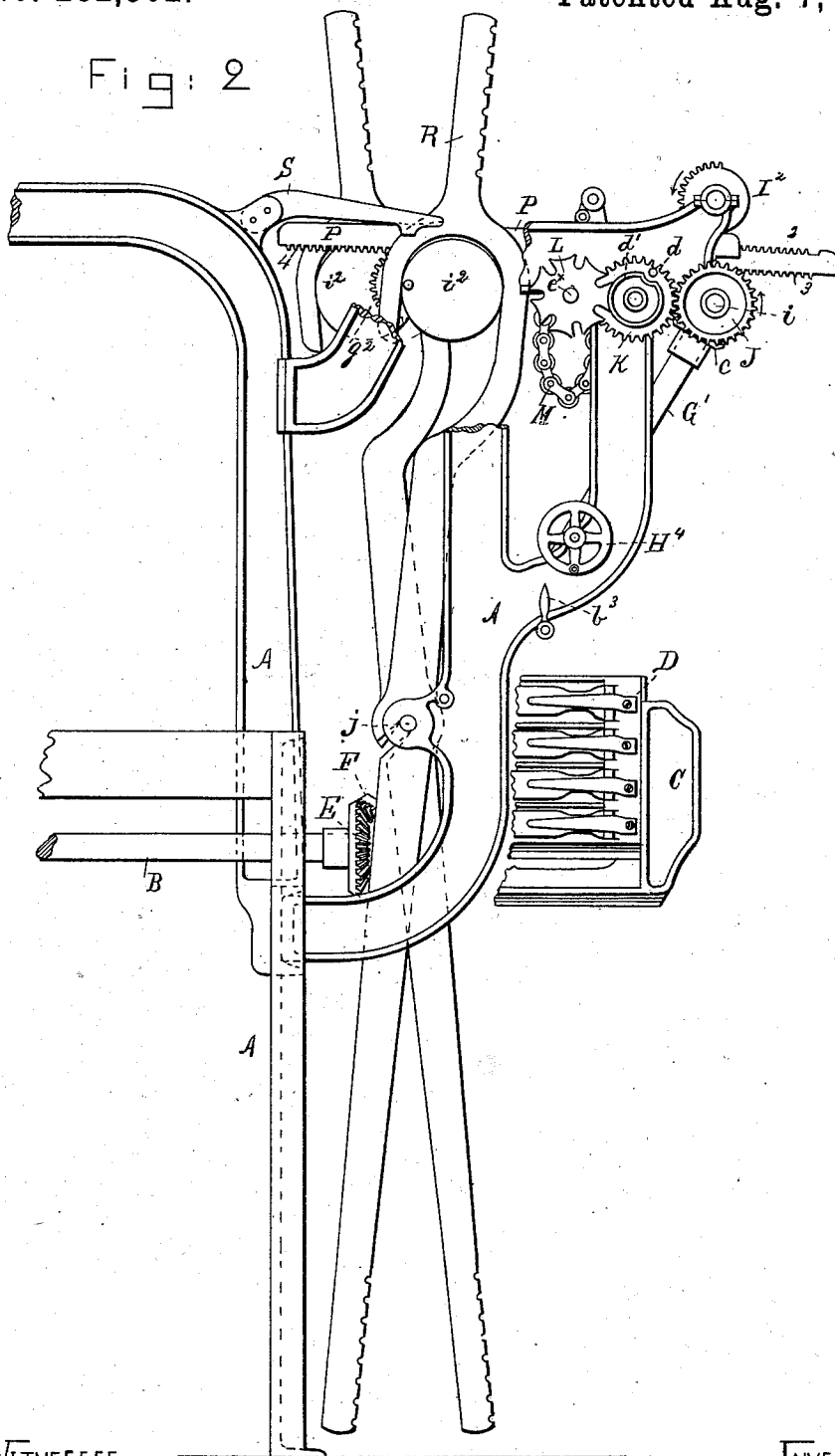
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Fig: 2



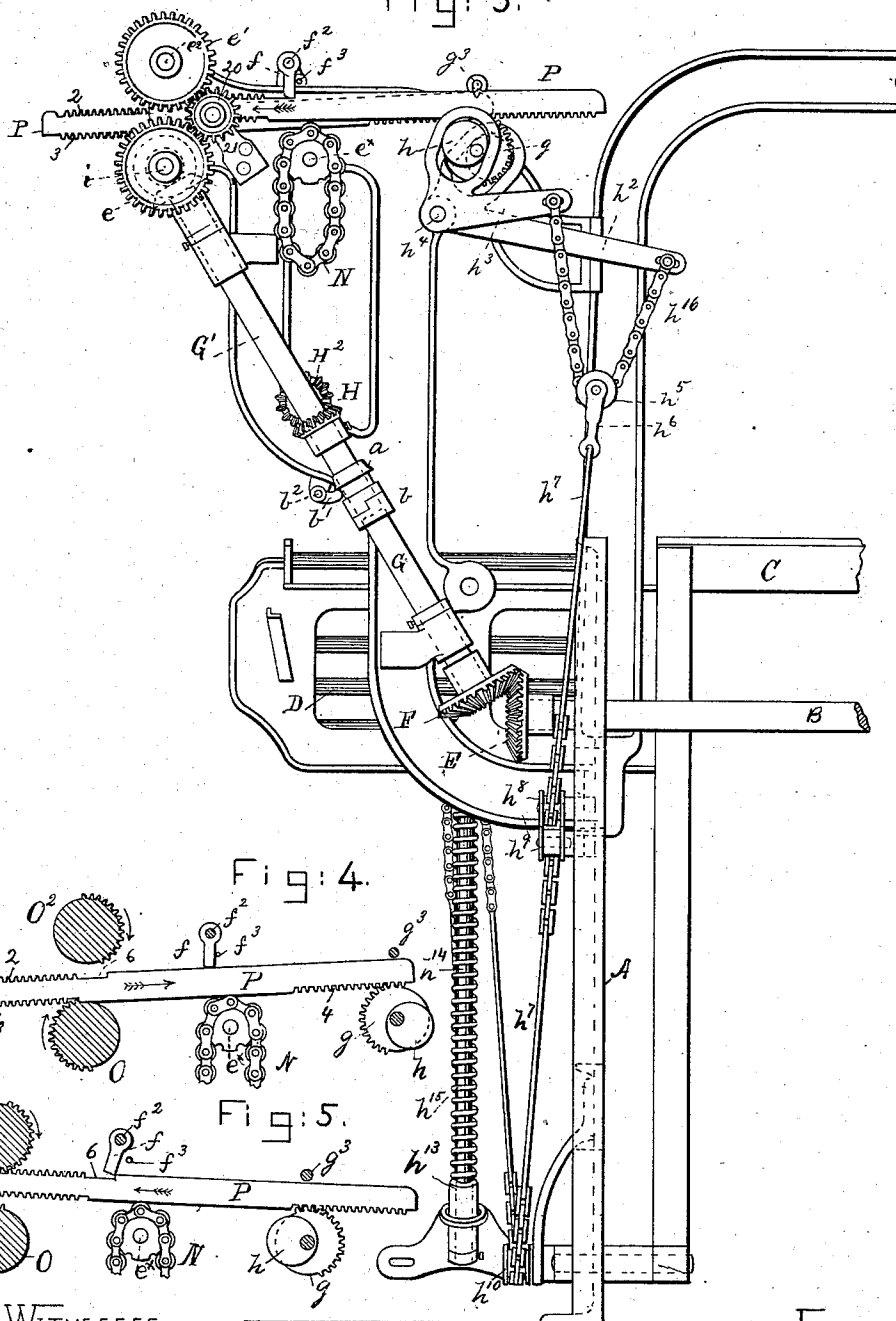
WITNESSES
Arthur Reynolds.
Bernice J. Hayes.

INVENTOR
G. Crompton
by Crosby & Gregory Attys

4 Sheets—Sheet 3.

Patented Aug. 7, 1883.

Fig. 3.



Arthur Reynolds
Bernice J. Boyes.

Geo. Grompston
by Crosby & Gregory Attys

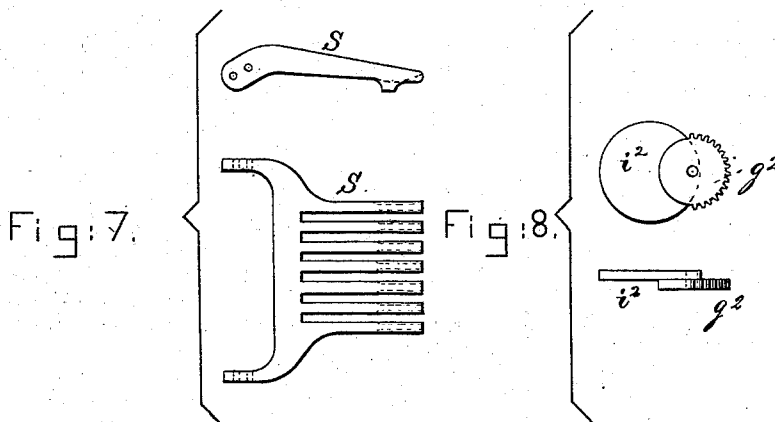
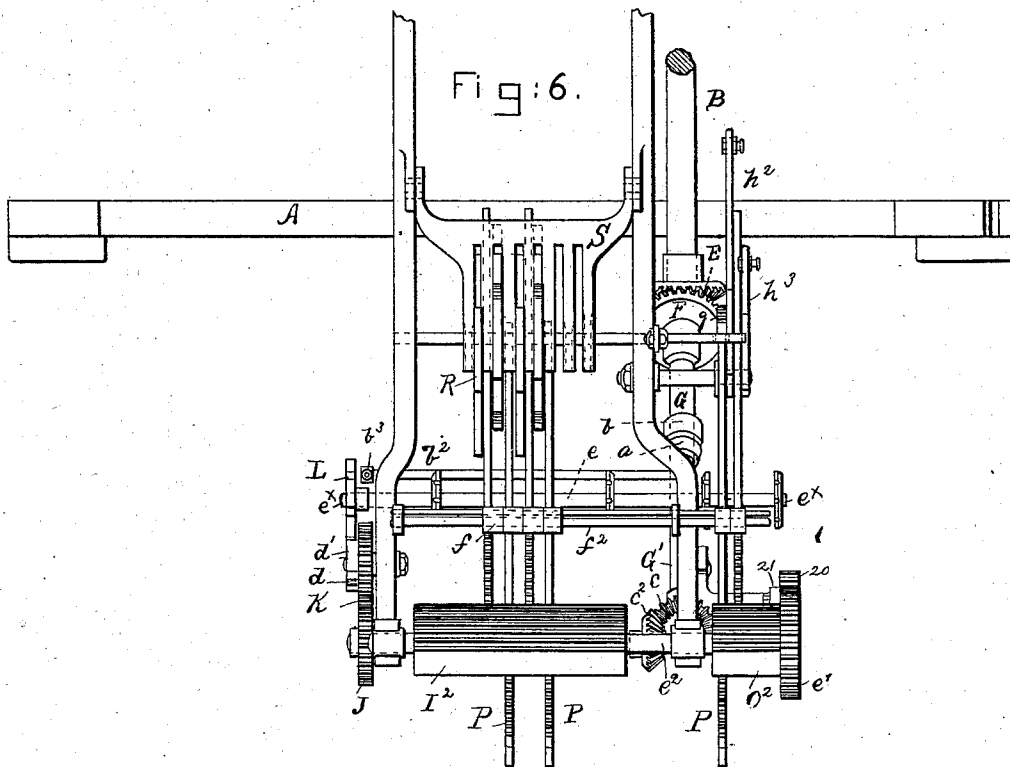
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4 Sheets—Sheet 4.

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WITNESSES
Arthur Reynolds
Bertrice J. Noyes.

INVENTOR
by Geo. Crumpton
Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

GEORGE CROMPTON, OF WORCESTER, MASSACHUSETTS.

LOOM.

SPECIFICATION forming part of Letters Patent No. 282,502, dated August 7, 1883.

Application filed December 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CROMPTON, of Worcester, county of Worcester, State of Massachusetts, have invented Improvements in Looms, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to fancy-loom, and has more especial reference to improvements in the shed-forming and shuttle-box mechanism, as will be hereinafter more fully described, and claimed at the end of this specification.

In United States Patent No. 240,304, dated April 19, 1881, to which reference may be had, I have shown and described the greater part of the mechanical devices presented in this case. In that patent one rotating toothed cylinder is shown placed between the toothed arms or forked jacks, each of said jacks having a third rack-arm extended backward therefrom to engage one of a series of pinions, having mounted upon the same shaft with them a series of eccentrics to operate both the upright heddle-levers and the shuttle-box levers, as in this present case.

One chief aim of this present invention is to simplify the construction of the jacks, which I have done by making them as narrow triple-racked bars, which, with their rack-teeth, may be cut from thin metal, preferably a low grade of steel or homogeneous or steelified iron. These bars forming the jacks are provided each with three series of rack-teeth, two series at their forward ends—one at bottom and the other at top—to be engaged by one or the other of two rotating toothed cylinders, they moving in opposite directions, while the third series of rack-teeth is at the under rear edge of each of the said jacks, the third rack engaging and turning toothed semi-gears, each semi-gear having connected with it an eccentric such as described in said patent, to operate both the heddle-levers and the shuttle-box levers common to the said patent. In the patent referred to, and in other looms having reciprocating jacks provided with rack-teeth and actuated by a toothed cylinder, whenever a jack has to be removed to be repaired, or for any other reason, it has been necessary to first remove the toothed cylinder; but a straight jack such as herein shown

may be removed or a jack be inserted without disturbing the toothed cylinders employed, which is a matter of very considerable importance in a factory, and saves very considerable time which would otherwise be lost in adjustment in case of accident to a jack. The jacks, being of wrought metal or a low grade of steel, may be made very cheaply, as they may be formed by a cutting-die, and they are strong, light, and durable, and occupy the smallest amount of space in and greatly simplify the loom.

Figure 1 represents the right-hand end of a loom provided with my present improvements; Fig. 2, a front view of Fig. 1, the shuttle-box and lay and a portion of the loom-frame being broken away, the shuttle-box mechanism being also omitted; Fig. 3, a rear elevation of Fig. 1, chiefly to show the shuttle-box mechanism and the shuttle-boxes. Figs. 4 and 5 represent details of the triple-racked straight jacks, the pattern surface or chain to raise and lower them, the two toothed cylinders to move the jacks backward and forward, and the toothed wheels and eccentrics to actuate the shuttle-box levers. Fig. 6 is a plan view of Fig. 1, the shuttle-box and lay being omitted. Fig. 7 is an end and top view of the comb or guide for guiding the upper ends of the heddle-levers; and Fig. 8, a detail showing a side and edge view of a toothed wheel and its eccentric for operating the heddle-levers, which latter are herein shown as provided with yokes, but are not herein claimed.

The loom-frame A, crank-shaft B, lay C, and series of drop shuttle-boxes D are all as usual. The bevel-gear E at the end of the crank-shaft engages the bevel-gear F at the lower end of the upright shedding-shaft, composed of two parts, G G', connected together by a clutch composed of two parts, a b.

The lower part, b, of the clutch, connected with the part G of the shedding-shaft, is provided with a recess to receive the lower end of the part G' of the said shaft. The part a of the clutch, grooved to receive the finger b' on the rod b², provided with a handle, b³, is keyed or splined upon the part G' of the shedding-shaft, to slide thereon, and when lifted through the medium of the handle and rod b², so as to disengage the part a of the clutch from the part b, the upper part, G', of the shedding-shaft

may be turned to find mispicks, while the lower part, G, and the crank-shaft B, with which the latter is always in gear, may remain at rest. To turn this upper part, G', of the shedding-shaft by hand at the desired times, I have provided it with a bevel-gear, H, in engagement with the bevel-gear H' on the shaft H³, provided with a hand-wheel, H⁴, at its outer end. The part G' of this shedding-shaft has a bevel-gear, c, which engages a bevel-gear, c', fixed upon the shaft i of the toothed cylinder I, the said shaft i having connected with its opposite end, outside the frame-work of the loom, a toothed gear, J, which engages a gear, K, having upon it a pin, d, and a curved locking-flange, d'. The pin d intermittingly enters one of the slots in the star-wheel L on the shaft e^x, which is employed to carry and move the pattern surfaces or chains M and N for the shedding and shuttle-box mechanism, respectively.

The locking-flange d' acts, as usual, against the concaved ends of the teeth of the star-wheel and holds it at rest intermittingly. The shaft upon which is fixed the toothed cylinder I has also secured to it (see Fig. 1) a toothed cylinder, O, made instrumental in the shuttle-box mechanism, and beyond the end of this cylinder is fixed a toothed gear, e, which engages an intermediate, 20, supported on a stud of bracket, 21, the said intermediate engaging a gear, e', on and rotating the shaft e², having fixed upon it two toothed cylinders, O² and I², like the cylinders I and O, the cylinders I and O serving to move the jacks P in one direction and the cylinders I² O² in the opposite direction at the proper times, in accordance with the projections and spaces upon the pattern-chains M and N. The shorter toothed cylinders O O² control the movement horizontally in one or the other direction of those two of the said jacks which are instrumental in imparting movement to the shuttle-box levers h² h³.

The jacks P being alike, I need to describe but one of them specifically. Each jack P, as before remarked, is made from thin wrought metal or low-grade steel, and has its upper outer edge provided with a series of rack-teeth, 2, its outer under edge with a series of rack-teeth, 3, and its under inner end, as at the right of Figs. 4 and 5, with a series of rack-teeth, 4, thus making triple-racked jacks. These jacks, made as narrow thin bars, may have their teeth formed by means of a proper die or punch. Each jack, at its upper side, is notched to form a space, 6. Each jack P, used both in the shedding and shuttle-box mechanism, rests directly upon one of the pattern chains or surfaces M or N, and when a series of teeth, 3, is engaged by a toothed cylinder the jack is held down in contact with the said cylinder and pattern-chain below it by means of a jack-holder, f, pivoted at f², the movement of the holder in one direction being arrested by a stop, f³.

When a jack has been moved sufficiently far toward the right (see Figs. 4 and 5) to bring

the space 6 under the holder f, the jack is free to be lifted by a roll of the pattern-chain under it, as in Fig. 5, but at no other time. This holder f operates as does the holder H in my patent referred to, and is not herein claimed.

The series of teeth 4 of each jack are at all times held in contact with the toothed or partial gears g (see Fig. 5) or g². (See Fig. 8.) These gears have connected with them, as in the said patent, eccentrics h i², which enter within the yokes of the heddle-levers R, as in Fig. 2, or in the open space or looped ends of the shuttle-box levers h² or h³, pivoted at h⁴ on the loom-frame, the said levers being of unequal length, one being shown twice the length of the other, and having connected with them a chain, h¹⁶, to receive upon it a sheave, h⁵, pivoted in a frame, h⁶, joined with a flexible shuttle-box connection, h⁷, or chain, extended about sheaves h⁸ h⁹ h¹⁰ on stationary studs, (see Figs. 1 and 3,) and thence upward about a sheave, h¹², carried by the lay, after which the opposite end of the said shuttle-box connection h⁷ is attached to the sliding sleeve h¹³, placed on the shuttle-box rod h¹⁴, provided with a sustaining-spring, h¹⁵. Each upright heddle-lever R, slotted and pivoted at j, is guided at its upper end by a guide or comb, S, all as in my said patent.

It is only necessary to turn aside the jack-holder f when a jack is to be removed for repair or other purpose.

I claim—

1. The straight triple-racked jacks P, pattern surface or chain, two toothed cylinders, I I², and suitable means to move the said cylinders and pattern-surface, combined with the harness-levers and means between them, actuated by the teeth 4 of the racked jacks, to engage and turn the harness-levers about their fulcra, substantially as described.

2. The straight triple-racked jacks P, a pattern surface or chain, two toothed cylinders to engage the said jacks, means to move the said cylinders and pattern surface or chain, the shuttle-box levers, and connections between them and the jacks to move the said levers, combined with a shuttle-box rod, a series of shuttle-boxes, and intermediate connections, whereby the levers, when moved, may actuate the shuttle-box rod and boxes, substantially as described.

3. Two toothed cylinders, means to rotate them, a pattern chain or surface, means to rotate it, a triple-racked jack having the series of teeth 2 3 4, a partial gear in engagement with the teeth 4 of the jack, and means to hold the said jack down in contact with the teeth of the said partial gear, substantially as and for the purposes set forth.

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

GEO. CROMPTON.

Witnesses:

J. A. WARE,
H. L. ADAMS.