(No Model.) 2 Sheets—Sheet 1.

A. D. EMERY.

PICKING MECHANISM FOR LOOMS.

No. 503,470. Patented Aug. 15, 1893.

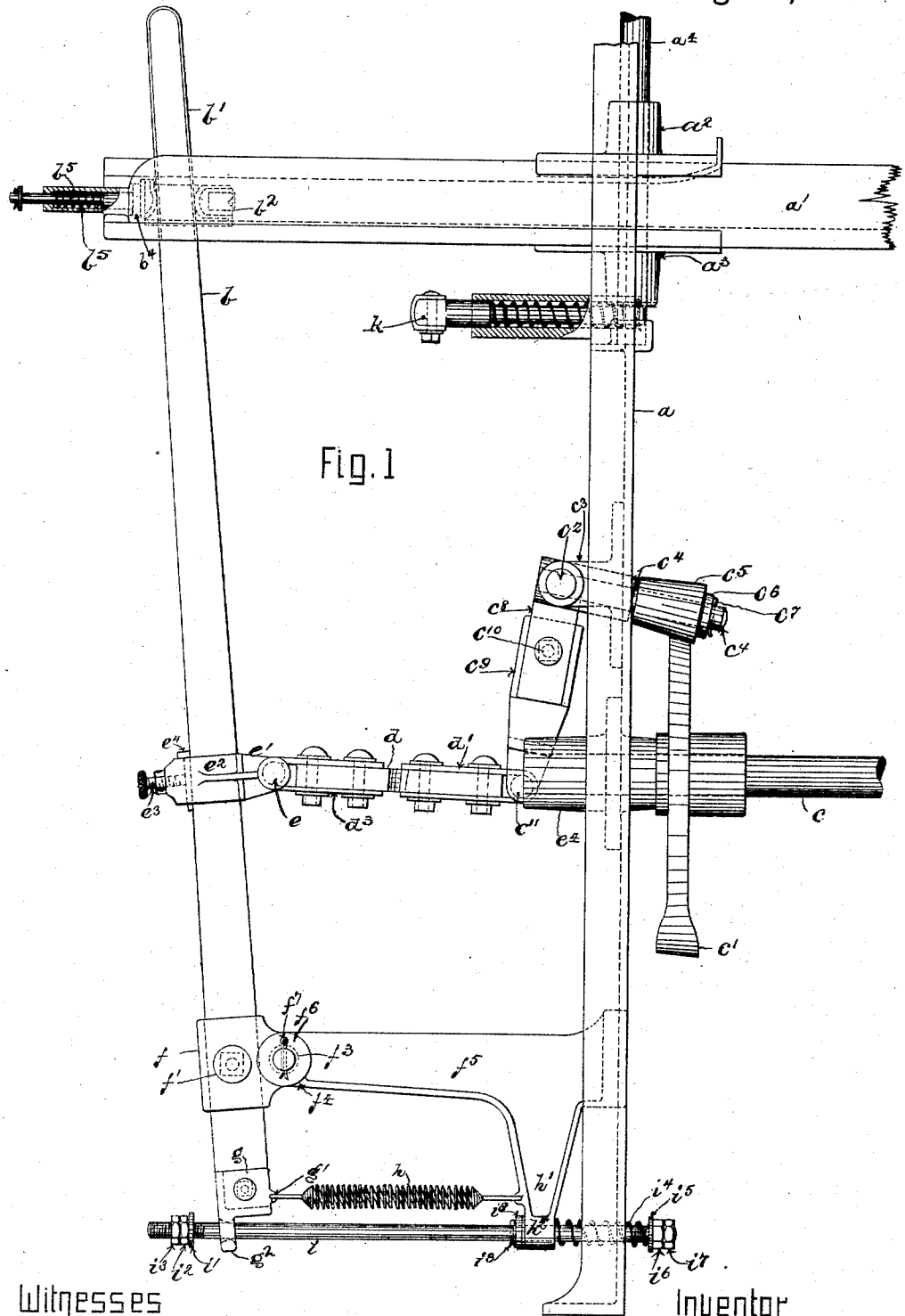

Fig. 1

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(No Model.) 2 Sheets—Sheet 2.

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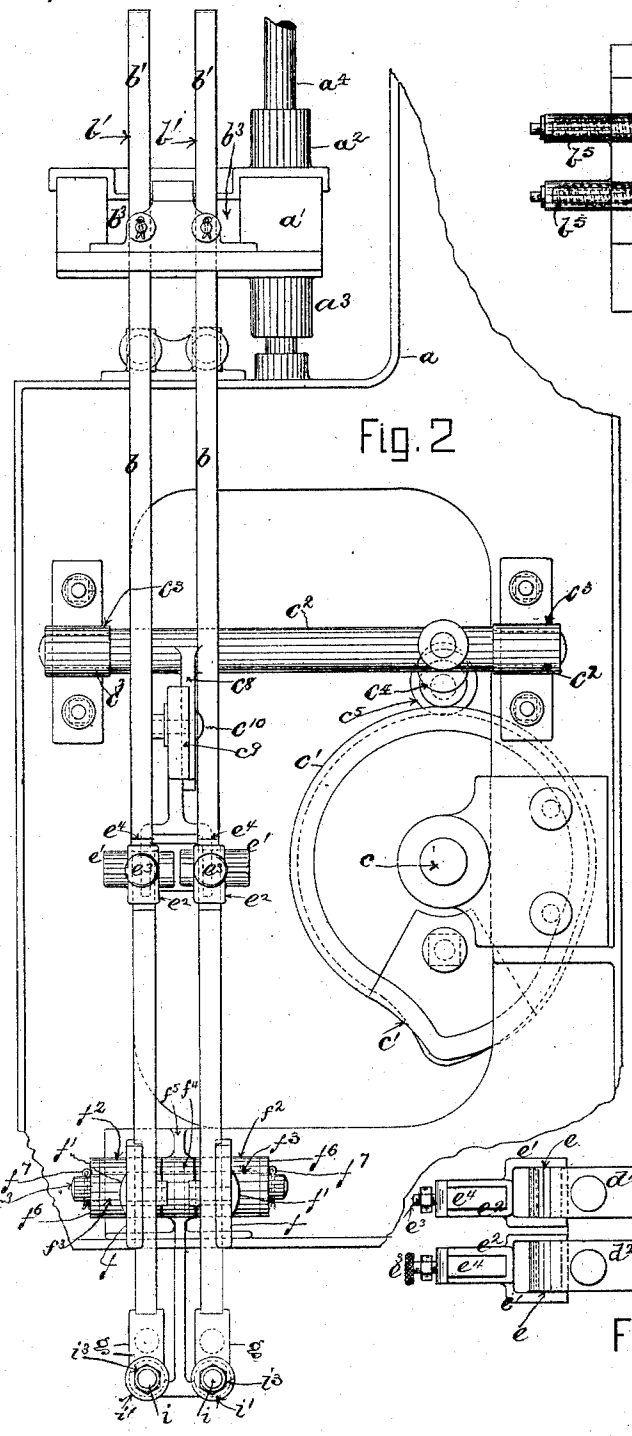

Fig. 2

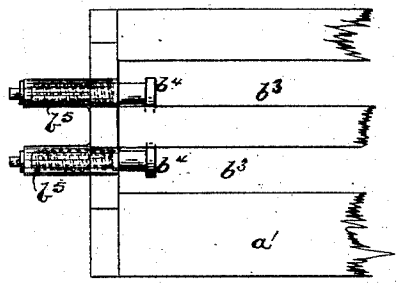

Fig. 3

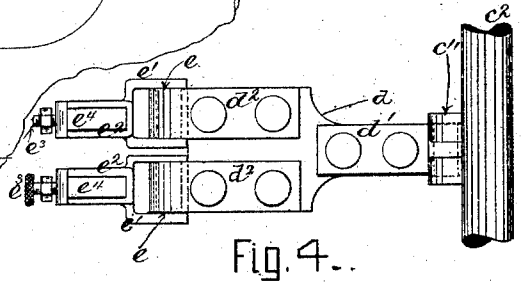

Fig. 4.

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UNITED STATES PATENT OFFICE.

ABRAM D. EMERY, OF TAUNTON, MASSACHUSETTS.

PICKING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 503,470, dated August 15, 1893.

Application filed October 18, 1890. Renewed February 25, 1892. Again renewed December 1, 1892. Serial No. 453,697. (No model.)

To all whom it may concern:

Be it known that I, ABRAM D. EMERY, of Taunton, Massachusetts, have invented certain Improvements in Picking Mechanism for Looms, of which the following is a specification.

This invention embraces an improvement (applicable to looms generally) which consists of a preferably adjustable and resilient check, adapted to receive the impact of a part of the picker staff relatively near the axis of oscillation, just before the conclusion of the working stroke of the picker staff, and to thereby cause the final portion of the working stroke to be imparted to the picker, and shuttle by the resultant springing action of the free end of the picker staff, and to then induce a strong and quick initiatory return movement of the picker staff and picker.

The invention also embraces an improvement especially applicable to looms in which two pieces of cloth are woven side by side, and in which two shuttles are thrown simultaneously through two parallel paths; which said improvement consists in the employment of picker-driving mechanism embracing a single cam and suitable connections which include a bifurcated pitman for simultaneously imparting to two picker staffs their forward movements, or working strokes.

The accompanying drawings of picker mechanism embodying the improvements, applied to a loom for weaving two fabrics side by side by means of two shuttles thrown simultaneously through parallel paths, together with so much of the loom as is necessary to illustrate the construction and mode of operation of the improvements, are as follows:

Figure 1 is a rear elevation of a portion of the loom, affording a side view of one of the picker staffs. Fig. 2 is an end elevation of a portion of the loom, affording a view of the two picker staffs. Fig. 3 is a top view of the end portions of the adjoining shuttle boxes; and Fig. 4 is a top view of the bifurcated pitman, or so-called lug-straps, for communicating to the picker staffs the motion derived from the picker cam, and thereby imparting to the picker staffs their working strokes.

Letters of reference are employed in the drawings to indicate the several parts of the structure, as follows:

a indicates a portion of the frame of the loom; a', the vertically reciprocating lay, provided near its opposite ends with the sleeves a^2 and a^3, for engaging vertical guide rods, one of which, a^4, is shown in the drawings; b b, the two picker staffs, arranged side by side, and having their edges, adjoining their free ends, sheathed with the metallic strips, b' b'. The free ends of the picker staffs extend through slots in the pickers, b^2, which pickers slide in parallel paths, respectively, in the adjoining shuttle boxes, b^3 b^3, and are cushioned at the end of their return stroke against the buffers b^4 b^4, which are rendered resilient by having their stems inserted in the expanding spiral springs b^5 b^5. The pairs of picker staffs at the opposite sides of the loom have their working strokes communicated to them by cams appropriately arranged upon the picker cam shaft c. One of these cams, c', is shown in the drawings, together with the train of devices by which its motion is transmitted to the picker staffs. These devices embrace the rock shaft, c^2, the opposite ends of which are journaled respectively in the boxes c^3 c^3, bolted to the side frame of the loom. A radius arm, c^4, affixed to the rock shaft c^2, has mounted upon its free end the truncated conical roller, c^5, which is retained upon its axis by the washer c^6 and cotter pin c^7. The conical roller c^5 bears upon the periphery of the cam c'. The rock shaft c^2 also has affixed to it the radius arm c^8, which projects therefrom in a direction substantially at a right angle to the direction of the radius arm c^4. The radius arm c^8 is provided with the adjustable sliding arm c^9, which is secured to the radius arm c^8 by means of the transverse bolt and nut c^{10}. The free end of the sliding arm c^9 is bifurcated, and has extending transversely across it the wrist pin c^{11}.

It is customary to use flexible straps, ordinarily called "lug-straps," for connecting the picker staffs with the instrumentality by which the picker staffs are operated. In the present case, while leather lug straps may be used if desired, the organization is such that the pitman connecting the picker staffs with the radius arm c^8 may be constructed entirely

of inflexible materials. In the present case, as two picker staffs are to be actuated, what is practically a bifurcated pitman, d, is employed. This is provided at one end with the strap d', which is looped around the wrist-pin c^{11}, and at its opposite end is provided with the parallel straps d^2 and d^3, which are looped respectively around wrist-pins, e e, extending across the bifurcated arms e' e', which are respectively secured to, or formed in one piece with, the sleeves e^2 e^2. The sleeves e^2 e^2 are respectively slipped on to the picker staffs b b. Each of these sleeves is secured in the position to which it may have been adjusted upon the picker staff by means of a set screw, e^3, the inner end of which abuts against a gib, e^4, which is interposed between the shell of the sleeve and the edge of the picker staff. It will be seen that the wrist pins, c^{11}, e, e, are respectively seated in the bights of the straps d', d^2, and d^3, and that ample room is afforded for the play of the wrist pins between the end of the pitman and the bights of the straps in which they are seated. Near their lower ends, the picker staffs are seated in grooves formed in the opposed faces of the wings f f, in which they are secured by the bolts f' f', respectively. The wings f f are respectively cast, or otherwise formed in one piece with, the collars f^2 f^2, which are loosely mounted upon the opposite ends of the pins f^3, inserted transversely through the perforated boss f^4 cast on the bracket f^5, projecting laterally from the frame of the loom. The collars f^2 f^2 are respectively held upon the pin f^3 and against the opposite ends of the boss f^4 by means of the washers f^6 f^6 and cotter pins f^7 f^7. The pin f^3 constitutes the axis upon which the picker staffs vibrate.

Each picker staff is securely stepped at its lower end in a shoe, g, provided upon its inner edge with the perforated ear g', for connection with one end of the contracting spiral spring h, the opposite end of which is connected to the arm h' of the bracket f^5. The pull of the spring h, when contracting, is slightly overbalanced by the push of the buffer spring b^5. Each shoe g is also provided with the downwardly-projecting flange g^2, which is perforated to allow the passage through it of the check rod i. The check rod i is provided with the adjustable loose collar i', which by means of the jam nuts, i^2 and i^3, is secured in position to receive the impact of the front face of the flange g^2 at a prescribed stage, near the conclusion of the working stroke of the picker staff. The check-rod i is inserted through the perforated boss h^2, cast upon the lower extremity of the arm h' of the bracket f^5. The inwardly-projecting portion of the check rod i is surrounded by the expanding spiral spring i^4, abutting at one end against the boss h^2, and at its opposite end against the adjustable collar i^5, which is loosely applied to the check rod, and which is supported against the thrust of the spring i^4 by the jam nuts i^6 and i^7. The check rod is also provided with a collar i^8, held in place by the cotter pin i^9, which collar i^8 is normally held against the outer face of the lug h^2 by the expanding force of the spring i^4. The tension of the spring i^4 can be changed by varying the position of the collar i^5, and its supporting jam nuts i^6 and i^7.

It will be perceived that increasing the tension of the check spring i^4 increases the violence of the shock when the flange g^2 at the lower end of the picker staff strikes against the check collar i', and hence intensifies the whip-like action manifested in the resultant springing forward of the upper end of the picker staff; and it will also be seen that the adjustability of the check collar i' and its supporting jam nuts i^2 and i^3 constitutes an effective means of definitely fixing the stage in the forward movement of the picker staff at which the collision with the check collar i' shall occur. Hence the accurate regulation of the range of forward movement of the picker is placed under perfect control. This mode of inducing the concluding portion of the working stroke of the picker and shuttle permits the nose of the picker cam to be rounded off, and thereby renders it less subject to wear.

The accurate administration to the picker staff of the pulling force derived from the picker cam is greatly facilitated by the fact that such force is made to act upon the staff at a fixed radial distance from the axis of oscillation of the staff, to wit, upon the wrist pin, e, instead of being administered by a lug strap looped around the picker staff; and it is also to be remarked that the pitman connection with the picker will be found to be specially durable in use.

For abundant caution, a spring buffer, k, is provided for each picker staff, in order to cushion the staff at the conclusion of its forward movements, and prevent its being broken in case the loom should be run for a time without such adjustment of the picker-driving mechanism as would prevent the staffs from being overthrown by the communication to them of a too violent forward impetus.

The employment of a buffer to cushion the picker at the end of its return stroke is desirable in any loom but has an especial relation to the employment of the present improvements in connection with a loom for weaving two fabrics by the use of two simultaneously-thrown shuttles. In any case, the buffer provides for an easy stoppage of the shuttle, and, in case the shuttle, in boxing, does not come fully home, the buffer spring keeps the buffer in contact with the shuttle, so that at the next forward stroke the picker does not strike against the shuttle with a sharp blow, as it would if it were not in contact with the shuttle. When the picker buffers are employed, the shuttles do not rebound; hence one shut-

tle may come home considerably harder than the other without interfering with the perfect boxing, nor with the next following picking motion.

The two buffers, by forming an easy stop for the shuttles, tend to prevent the splitting of the cops, which would be likely to occur if one shuttle should stand clear of the picker, leaving the other shuttle to be acted upon by the entire force of the picker cam.

What is claimed as the invention is—

1. A picker, a picker staff, an endwise-reciprocating pitman, and a strap and wrist-pin connection for connecting said pitman to said picker staff, in combination with an adjustable yielding check for opposing, at a prescribed stage near the conclusion of the forward movement or working stroke of said picker staff, a prearranged degree of resistance to the continued movement of a part of said picker staff relatively near the axis of oscillation of said picker staff, and thereby causing a whip-like springing action of the free end of said picker staff, for imparting to the picker the concluding portion of its working stroke.

2. A picker, a picker staff, a cam, and suitable connections for imparting to said picker staff its forward movement or working stroke, and a spring for imparting to said picker staff its return movement, in combination with an adjustable check collar for opposing, at a prescribed stage in the forward movement or working stroke of said picker staff, a prearranged degree of resistance to the continued movement of a part of said picker staff relatively near the axis of oscillation of said picker staff, and thereby causing a whip-like springing action of the free end of said picker staff, and a resultant strong and quick initiation of the return movement of said picker staff and picker.

3. The combination, as herein set forth, of the check rod i, provided with the stationary collar i^3, the perforated boss h^2, through which said check rod extends, the spiral spring i^4, the adjustable collar i^5, for adjusting the tension of the spring i^4, the adjustable check collar i', and the shoe g, secured to the lower end of the vibrating picker staff b, and provided with the flange g^2, perforated to admit the extension through it of a part of the check rod, i, between the adjustable check collar i' and the stationary collar i^3, as and for the purpose set forth.

4. The picker mechanism, for a loom in which two shuttles are simultaneously thrown through two parallel paths for the weaving of two fabrics side by side, hereindescribed, consisting of a lay having at each end two parallel shuttle boxes provided at their outer extremities with resilient buffers for cushioning the return strokes of pickers adapted to slide in said shuttle boxes, respectively, and at each side of the loom two picker staffs for actuating said pickers, respectively, and a single cam with suitable connections, embracing a bifurcated pitman for simultaneously imparting to said two picker staffs their forward movements or working strokes.

5. The picker mechanism, for a loom in which two shuttles are simultaneously thrown through two parallel paths for the weaving of two fabrics side by side, hereindescribed, consisting of a lay having at each end two parallel shuttle boxes, four pickers adapted to slide in said shuttle boxes, respectively, and at each side of the loom two picker staffs for actuating said pickers, respectively, and a single cam with suitable connections, embracing a bifurcated pitman for simultaneously imparting to said two picker staffs their forward movements or working strokes.

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