

No. 661,752.

Patented Nov. 13, 1900.

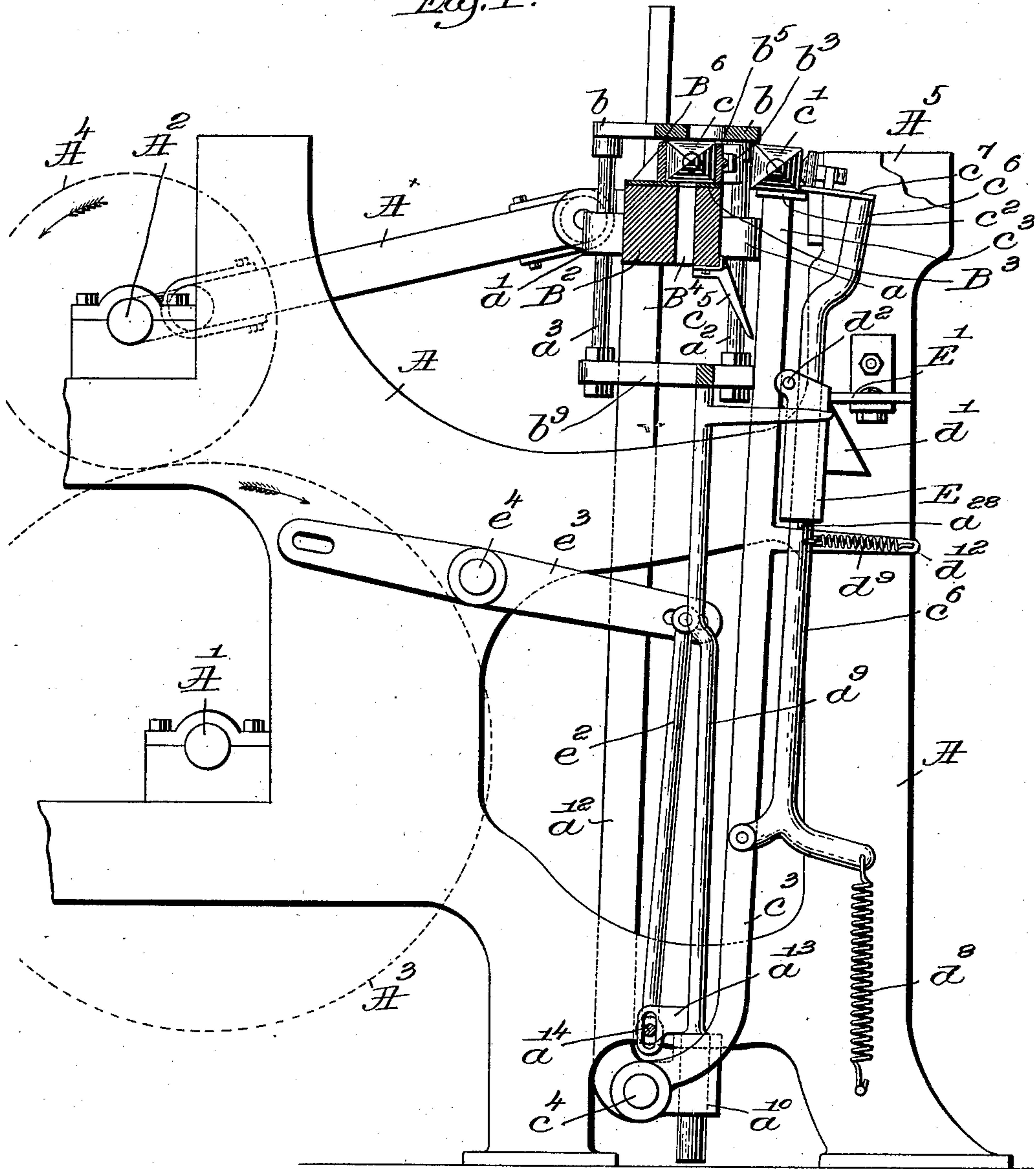
H. WYMAN.
SHUTTLE CHANGING LOOM.

(Application filed June 9, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



witnesses:

Frederick S. Greenleaf.

Thomas Drummond

Inverton
Horace Wyman,
by Crosby Gregory
attys.

No. 661,752.

Patented Nov. 13, 1900.

H. WYMAN.
SHUTTLE CHANGING LOOM.

(Application filed June 9, 1899.)

(No Model.)

3 Sheets—Sheet 2.

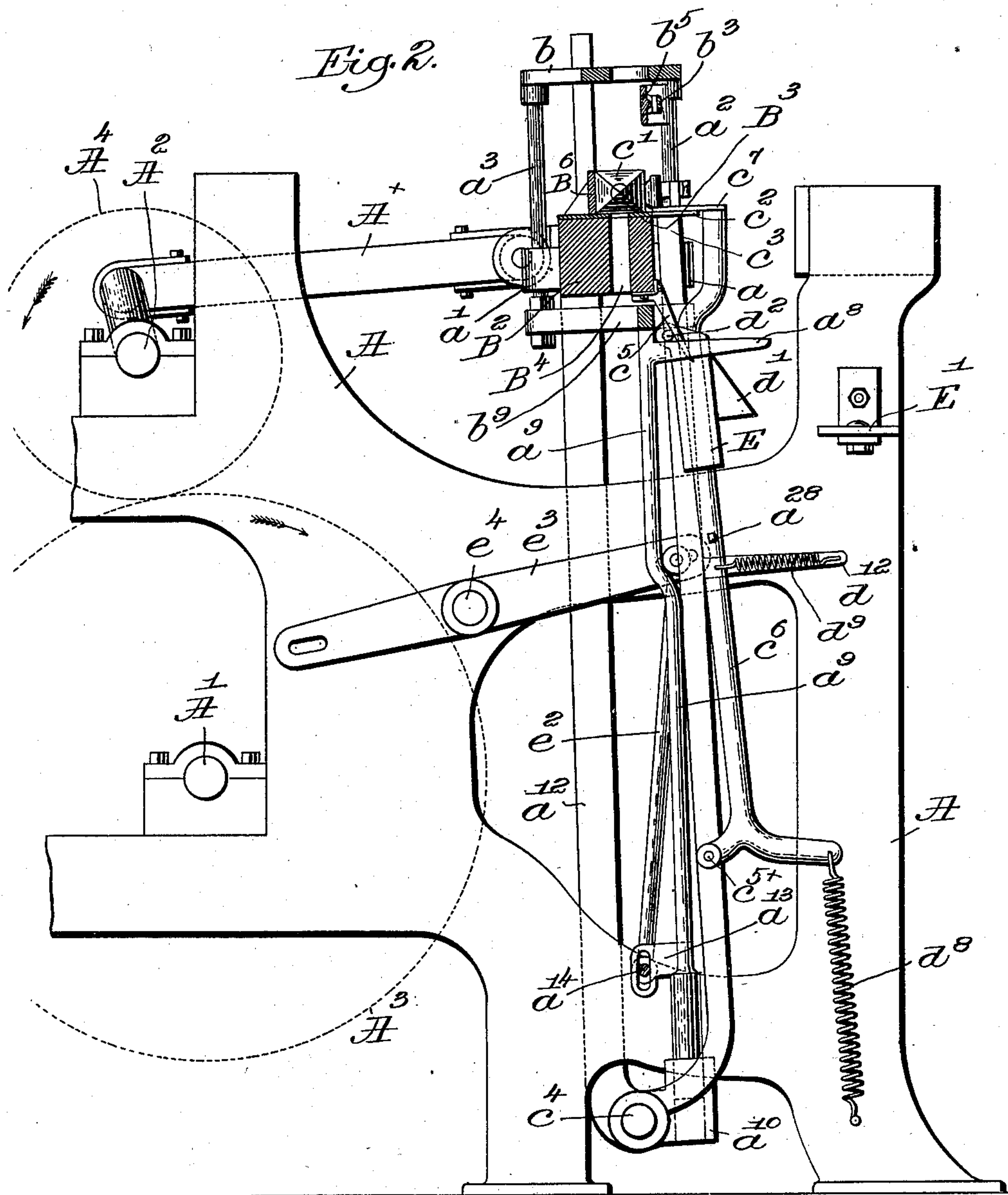
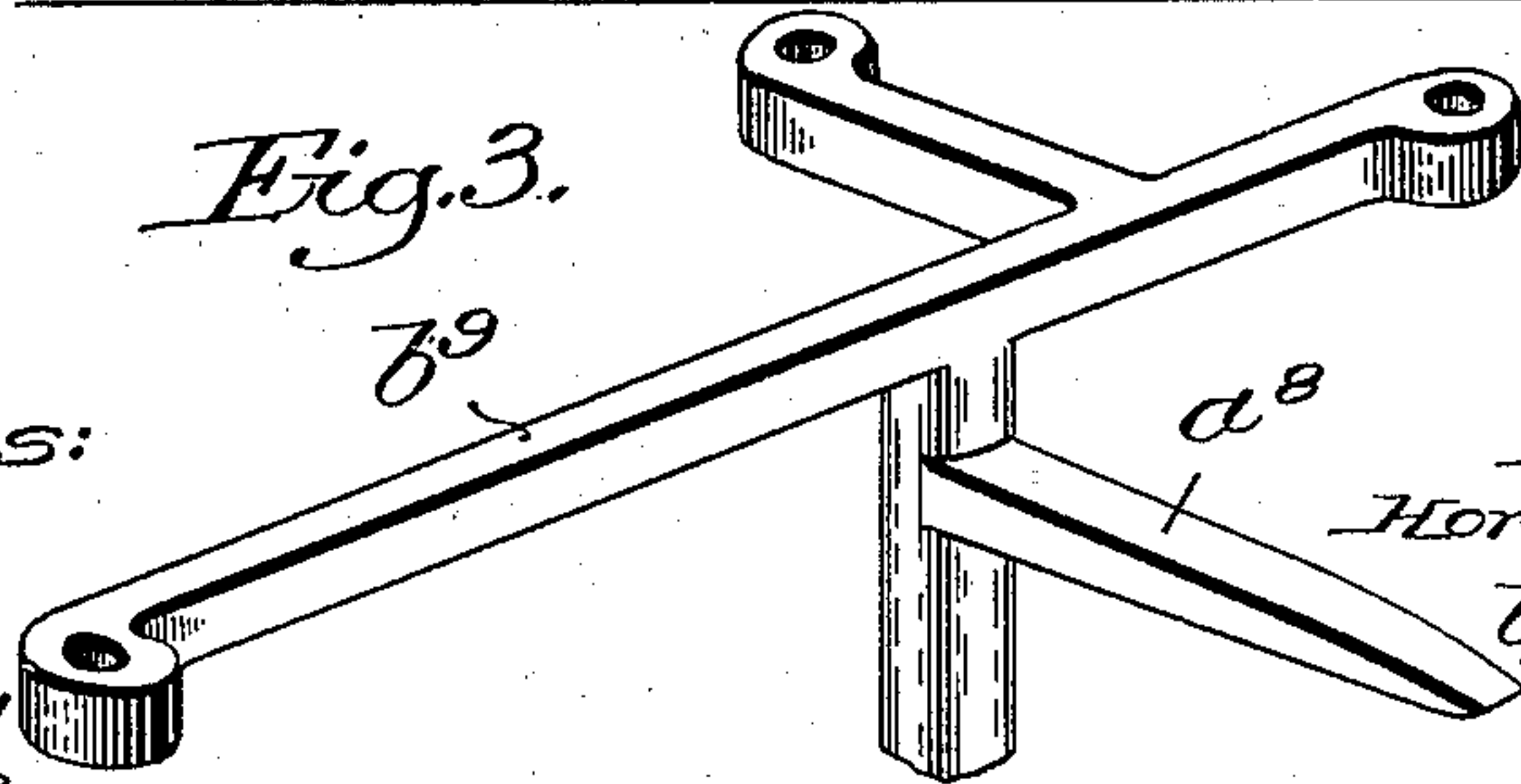


Fig. 3.



Witnesses:

Fred L. Greenhof.

Thomas J. Krummond.

Inventor:

Horace Wyman,

by Crosby & Gregory,

attys.

No. 661,752.

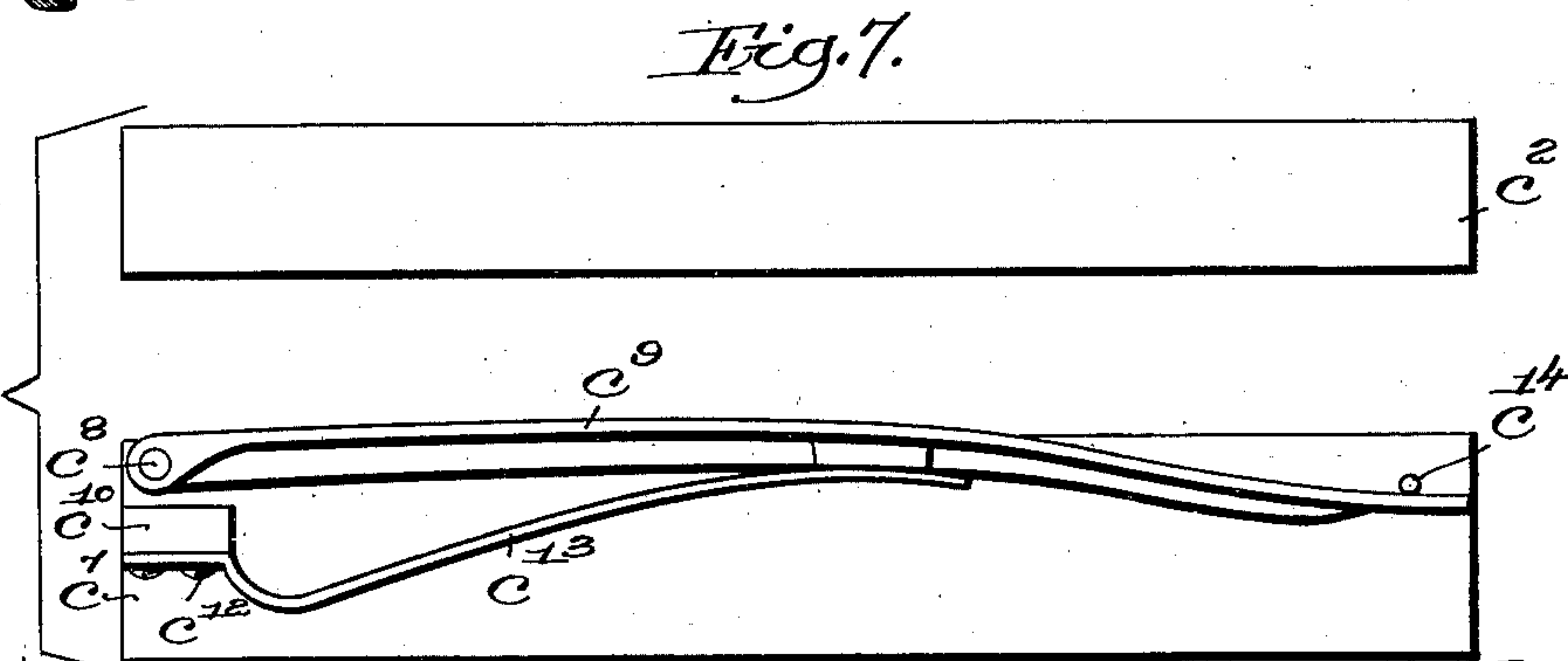
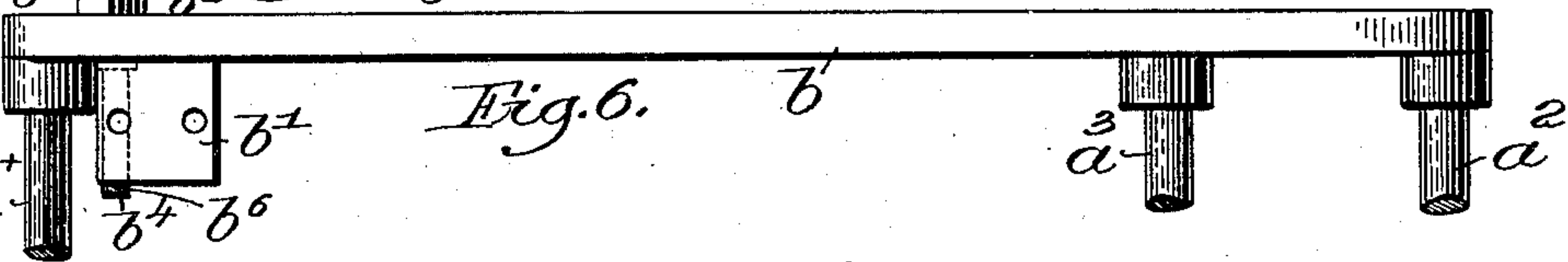
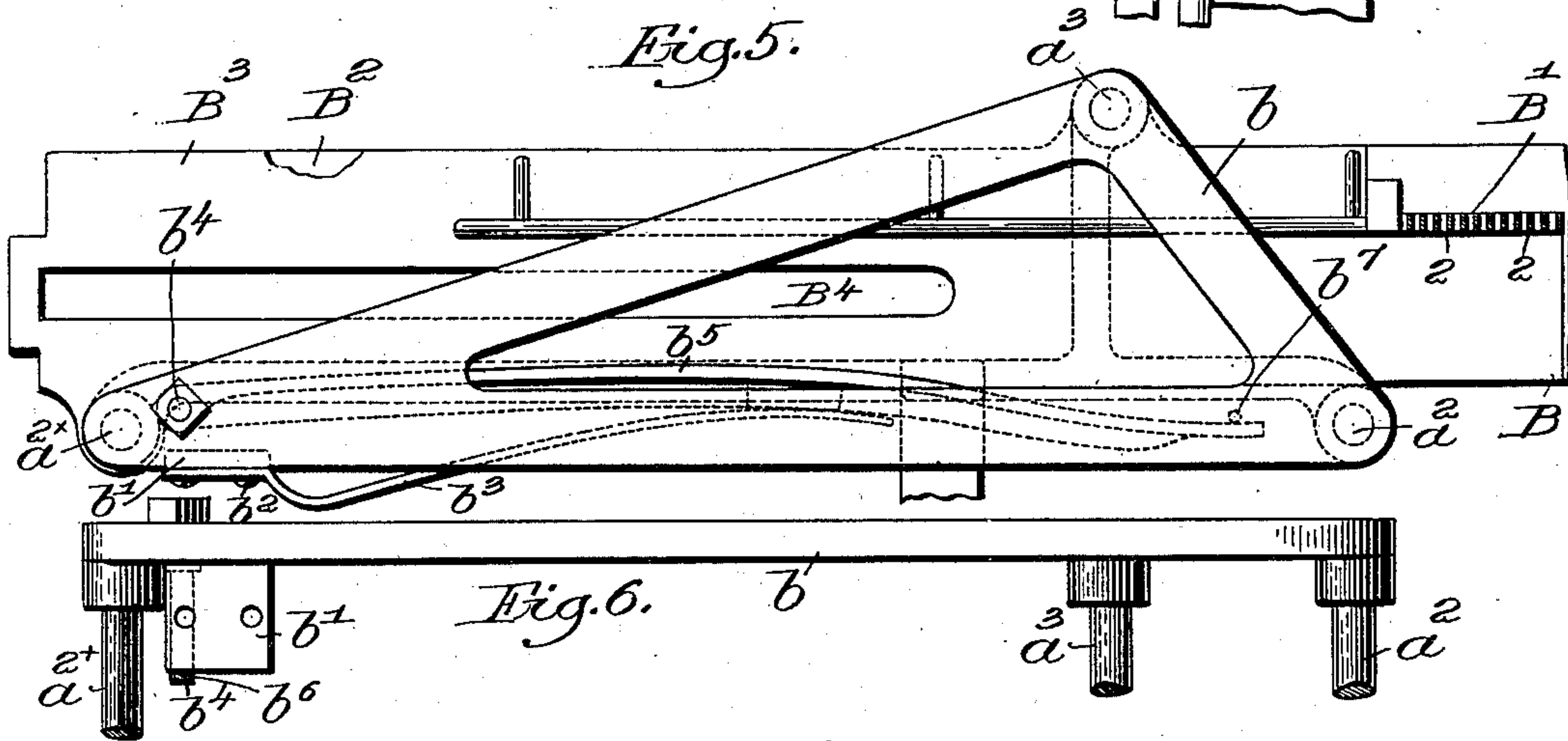
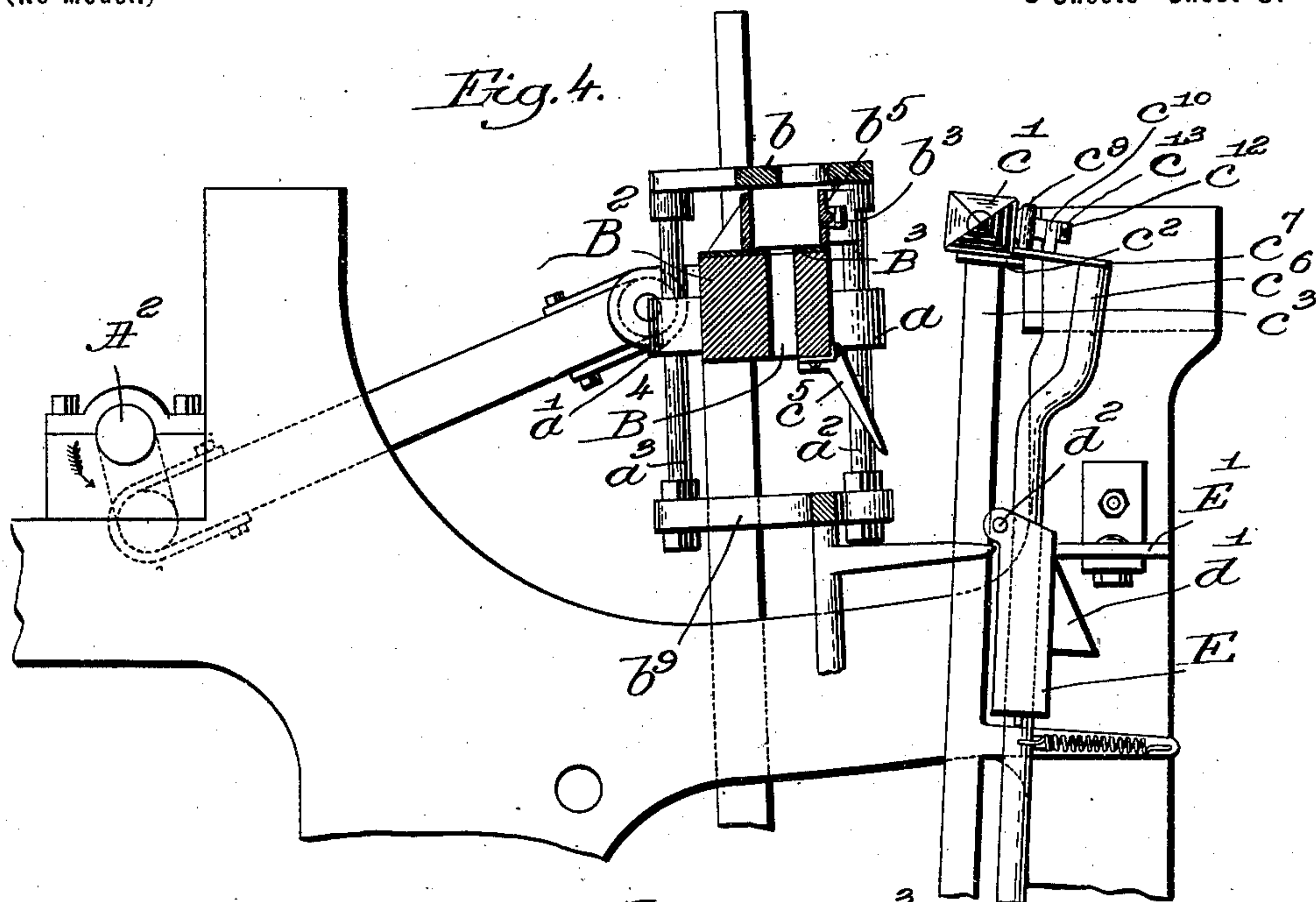
Patented Nov. 13, 1900.

H. WYMAN.
SHUTTLE CHANGING LOOM.

(Application filed June 9, 1899.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:
Fred S. Grunhof.
Thomas Drummond.

Inverdon
Horace Wyman,
by Crosby & Co., attys.

UNITED STATES PATENT OFFICE

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

SHUTTLE-CHANGING LOOM.

SPECIFICATION forming part of Letters Patent No. 661,752, dated November 13, 1900.

Application filed June 9, 1899. Serial No. 719,993. (No model.)

To all whom it may concern:

Be it known that I, HORACE WYMAN, of Worcester, county of Worcester, and State of Massachusetts, have invented an Improvement in Shuttle-Changing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention relates to that class of looms wherein provision is made for changing shuttles automatically.

The loom to be herein described contains a spare or auxiliary shuttle feeder occupying normally its inoperative stationary position at the loom side; a lay carrying a running or active shuttle and having at its ends a horizontal alining-surface coincident with the race of the lay, said surface supporting the running or active shuttle when its direction of motion is being reversed, and also a back wall to constitute a support or alining-surface for the rear side of the running or active shuttle to aline it with the reed; a vertically-movable front plate to contact with the front side of said shuttle as it comes upon and leaves the alining-surface coincident with the race of the lay; an indicating mechanism to determine when a running or active shuttle should be changed; means controlled as to its time of movement by said indicating mechanism to raise and lower the said front plate vertically, it being put into position to leave an open passage to said back wall when the running or active shuttle is absent from the feeding end of the raceway of the lay and occupying a position opposite said back wall during the regular operations of the loom after a spare shuttle has been supplied to the race of the lay instead of the ejected running or active shuttle, said front plate remaining in said position while the shuttle put on a spare-shuttle feeder is being thrown as the running shuttle; means to actuate the spare-shuttle feeders so that it may meet and partake of the movement of the lay in order that the spare shuttle may be fed onto the alining-surface of the lay when the front plate is put into position to uncover the way to said back wall and so that the shuttle-feeder may put and press said spare shuttle against the back

wall of the lay, and means to throw the spare shuttle across the lay, the front plate being put into position directly opposite the back wall after the spare shuttle has been thrown across the lay from its position between the back wall and spare-shuttle feeder, the latter retiring from the lay before the return of the spare shuttle to the feeding end of the lay, it thereafter becoming the running or active shuttle and coming into and going from between the back wall and the front plate then directly opposite and contacting with both sides of the shuttle.

The front plate of the lay referred to is attached to a front-plate carrier which in its movements does not, as heretofore, traverse vertically the path of the shuttle in coming on and off the horizontal alining-surface of the lay, and, as herein shown, said front plate depends from a plate-carrier which overhangs the back wall and crosses the lay above the path of travel of the shuttle, and to supply a spare shuttle to the horizontal alining-surface of the lay coincident with the level of the race thereof the front plate is simply moved vertically to afford opportunity for the spare shuttle to come into working position on the lay and be pressed against the back wall.

In the loom to be herein described it is supposed that the ejected running or active shuttle will be discharged from the loom at the end of the raceway opposite that upon which the spare shuttle is supplied; but I have not herein shown any particular mechanism for discharging or receiving the running or active shuttle, as I may use any devices commonly employed in looms for that purpose, my present invention referring chiefly to that end of the lay where the spare shuttle is put upon the lay to take the place of the running or active shuttle.

By the invention herein described it is possible to leave the horizontal alining-surface of the lay at the end of the raceway, said alining-surface constituting the only bottom of the shuttle-box in which both the spare shuttle and the running shuttle rest when being acted upon by the usual picker-stick absolutely free from any cross-grooves, said alining-surface being only a picker-stick slot.

Figure 1 of the drawings shows a sufficient

portion of a loom with my improvements added to enable my invention to be understood, the lay being in its forward position and the spare-shuttle feeder being in its inoperative position. Fig. 2 shows the lay on its back stroke, the spare-shuttle feeder having been operated to put a spare shuttle on the lay, the spare-shuttle feeder traveling with the lay. Fig. 3 shows the upper end of the cross-bar or connection detached. Fig. 4 is a detail showing the lay on its way forward, the projection a^8 of the lay having arrived with its end under the projection of the actuator which moves the spare-shuttle feeder, the movement of the operating-lever by the indicating mechanism at such time being about to act to lift the front plate of the lay between its movements from the position Fig. 4 into the position Fig. 2. Fig. 5 represents a top or plan view of the feeding end of the lay, enlarged, and the back wall and front plate. Fig. 6 shows a front edge view of the front-plate carrier and some of its parts. Fig. 7 represents in top view the spare-shuttle feeder and spare-shuttle support separated in their normal inoperative position.

The loom-frame A, the cam-shaft A', the crank-shaft A², having suitable connecting-arms A^x to actuate the lay, the gears A³ and A⁴, secured, respectively, to the cam-shaft and the crank-shaft in order that they may be operated in unison, and the breast-beam A⁵ are and may be all as usual in looms.

The operating-lever e^3 , having its fulcrum at e^4 is common to United States Patent No. 614,369, dated November 15, 1898, and in practice said lever may be actuated by means provided for in said patent, said lever being started by or through gearing under the control of indicating mechanism, in turn controlled by the filling—such, for instance, as a filling-fork or other instrument common to said patent and mounted on the breast-beam at the end of the lay most remote from that at which new filling comes onto the lay—said lever being moved whenever it is necessary or desired to put new filling or a spare shuttle upon the horizontal alining-surface to be described at the end of the raceway of the lay and coincident therewith. It is unnecessary herein to show and describe the means employed for actuating said lever e^3 and the filling-fork and its actuating means, as they are all fully shown and described in said patent.

The lay B carries a reed of usual character, having usual dents 2, and the end of the lay is extended, as at B², and is provided with a smooth horizontal alining-surface B³, which may be a metal plate, to support a running or active shuttle, such as described in said patent, at the time that the direction of motion of said shuttle is being changed on the lay. The alining-surface B³ has a horizontal slot B⁴, in which may move a picker-stick of usual construction, such as shown in said patent. The slotted horizontal alining-sur-

face of the raceway of the lay constitutes the bottom of a shuttle-box and serves as a support for the running or active shuttle throughout the operation of the loom, and it also receives directly upon it and supports the spare shuttle as it is put upon the said alining-surface preparatory to being struck by the picker-stick to be thrown across the lay and to be thereafter thrown and operated as the running or active shuttle. The slotted horizontal alining-surface B³ of the lay is provided with a suitable back wall B⁶, the face of which stands substantially coincident with the face of the dents 2 of the reed. The lay shown has at its front side two like suitable ears a , while at its rear side it has a similar ear a' . The ears a receive slide-rods a^2 a^{2x} and the ear a' a slide-rod a^3 , and the lower ends of said rods are shown as united by a suitable cross-bar or connection b^9 , the shape of which is shown in Fig. 3, said cross-bar being of the same shape as the cross-bar designated by like letter in said patent. The cross-bar b^9 has extended from it forwardly between its ends a suitable lifter or projection a^8 , and it is shown as having attached to it a rod or bar a^9 , depending therefrom and entering a guide a^{10} , connected with the lay-sword a^{12} , pivoted at c^4 , said rod having a projecting ear a^{13} , slotted for the reception of a screw a^{14} , said screw passing through one end of a link e^2 , common to said patent and connected with the lever e^3 , the movement of said lever reciprocating the rod a^9 and cross-bar, and with them the two rods a^2 a^3 . The under side of the lay has extended from it a horn or projection c^5 , common to said patent. The rod a^3 is shown as located to slide in a vertical plane in the ears a' at the rear side of the picker-slot and the rods a^2 a^{2x} in the like ears a at the front side of the picker-slot, and said rods have connected with them a front-plate carrier b .

The carrier b referred to is herein shown as connected with the upper ends of the rods a^2 a^3 and overlaps the alining-surface B³ of the lay at a point above the back wall B⁶ thereon, and the front edge of said carrier is provided with a lip b' , (shown by full lines in Fig. 6 and in dotted lines in Fig. 5,) said lip having fastened to it by suitable screws, as b^2 , a suitable binder-spring b^3 , said carrier supporting a suitable stud b^4 near the rod a^{2x} , on which is loosely mounted the hub of the front plate b^5 , shown as a binder, said front plate being retained on said stud by a suitable cotter-pin or device b^6 , the opposite or free end of the binder being adapted when a shuttle is absent from between the said front plate or binder and the wall B⁶ to contact with a depending stud or stop b^7 , attached to said carrier.

When a shuttle is between the front plate or binder b^5 and the wall B⁶, the said front plate or binder acts against the front side of the shuttle, pressing it in a yielding manner

against the said wall and in such condition that the end of the front plate or binder does not touch the depending stud b^7 .

The front-plate carrier instead of lying normally in cross-notches in the extension at the end of the lay and in its movements traversing the space above and in front of the back wall is so located as to lie wholly without the said space and in its movements to place the front plate or binder in a position where it is not opposed to the back wall the space referred to is left entirely unobstructed.

In Fig. 1 the running or active shuttle is marked c and the spare shuttle c' . The spare shuttle c' is sustained normally by a suitable support or plate c^2 , carried by a lever c^3 , having its fulcrum on the fulcrum-rod c^4 of the lay, so that said lever and support may swing coincident with the lay when a fresh shuttle is to be supplied to the horizontal alining-surface of the lay. When the support c^2 is coupled with the lay, it occupies a position substantially in alinement with the horizontal alining-surface B^3 of the lay. (See Fig. 2.) The lever c^3 has a stud c^{5x} , upon which is mounted part of the shuttle feeder or supplying device, shown as composed of a lever c^6 , having at its upper end a plate c^7 , provided with a stud c^8 , on which is pivoted a spare-shuttle presser or binder c^9 , said plate also having a lug c^{10} , to which is connected by screws c^{12} a binder-spring c^{13} , said plate also having a stud c^{14} , against which the free end of the binder may act. The lever c^6 has coöperating with it an actuator E , represented as a shoe or slide, which may be like that designated by like letter in United States Patent No. 615,532, dated December 6, 1898, said actuator having an incline or cam d' and a stud or projection d^2 , said stud resting normally upon a suitable stud a^{28} , extended from said lever.

In the normal position of the actuator the upper end of the cam part of the actuator rests substantially in contact with a projection E' , common to the last-named patent and fixed with relation to the loom-frame and the support c^2 , carrying the spare shuttle, and the spare-shuttle feeder stands normally in its inoperative position at the loom side, as in Fig. 1, when the loom is running regularly and the filling is being supplied from the running shuttle c .

Whenever for any reason a spare shuttle lying on the support c^2 is to be put upon the horizontal alining-surface B^3 of the lay in place of a running shuttle c , the operation of which is to be discontinued, said spare shuttle taking the place of and being thereafter thrown as the running shuttle, the lever e^3 is actuated and its forward end is lifted, as provided for in said United States Patent No. 614,369, and the rod a^9 , cross-bar b^9 , and rods a^2 and a^3 are lifted, causing the front-plate carrier, as herein shown, to be raised and carry up with it the front plate or binder b^5 , it constituting a movable front wall for a

shuttle-box composed of the horizontal alining-face A^3 and the back wall B^6 , putting said front wall in a position substantially above the horizontal alining-surface B^3 of the lay and opening a clear space to permit a spare shuttle c' to be put upon said alining-surface with the rear side of the shuttle against the back wall B^6 , this being done in the following manner, viz: As the bar a^9 rises in the forward movement of the lay the projection a^8 thereof meets the stud or projection d^2 of the actuator E and slides the same vertically on the bar c^6 of the spare-shuttle feeder, causing the cam part of said actuator to meet the projection E' and turn said bar c^6 about its pivot c^{5x} in opposition to its holding-spring d^8 . Such movement of the bar c^6 causes it to strain a suitable spring d^9 , connected therewith and with an extension d^{12} of the lever c^3 , the straining of said spring causing the lever c^3 , having the spare-shuttle support, to move immediately toward the lay until the left-hand edge of the spare-shuttle support c^2 (see Fig. 2 of the drawings) meets the right-hand edge of the alining-surface of the lay, thus closing up the space between said support c^2 and said alining-surface B^3 , and instantly thereafter the lever c^6 , forming part of the spare-shuttle feeder, by its continued movement causes its wall or binder c^9 , resting against the front side of the spare shuttle c' , to push said spare shuttle from the spare-shuttle support onto the horizontal alining-surface B^3 of the lay and against the upright back wall B^6 , and during this operation the plate c^7 of the spare-shuttle feeder traverses substantially the support c^2 . (See Fig. 2.)

The spare shuttle is put onto the horizontal alining-surface of the lay while the carrier and front plate b^5 are removed from the position opposite the back wall B^6 , said front plate being shown as lifted in Fig. 2, this being done while the running shuttle is at the opposite end of the lay, where it may be taken therefrom and discharged in any usual or suitable manner common to this class of looms.

The loom herein to be described will have an indicating device, which may be a filling-fork, as provided for in said Patent No. 614,369, and when said indicating device is moved, as it will be by the absence of filling in the shed, the lever e^3 , as provided for in said patent, will be started at the next forward stroke of the lay immediately following that forward stroke during which the indicator or filling-fork was actuated, and during this succeeding forward stroke of the lay the lever e^3 is started upwardly about as the lay arrives in the position Fig. 4 and while completing its forward movement starts upwardly the cross-bar, thus removing the carrier and the front plate from its normal operative position facing the back wall B^6 , leaving a free and clear open space opposite said back wall and above the horizontal alining-surface of the lay, the shuttle-box at the re-

ceiving end of the lay being at such time empty, the running shuttle to be changed having been taken care of at the opposite end of the lay in any usual or suitable manner, as stated, and by the time that the lay arrives at its second forward stroke or the stroke next following that in which the indicating apparatus or filling-fork was moved, or just after the lay starts back again, the actuator E, through the projection a^8 , has been raised far enough to turn the lever c^6 toward the lay and put the rising projection d^2 of the actuator E behind the horn or locking device c^5 ; the further movement of the lever e^3 being continued and moving the lever c^6 , causing it to remove the spare shuttle c' from the support c^2 , the said support during such operation having been moved about the fulcrum c^4 to contact with the lay or the race-plate thereof, and the spare shuttle is put by said feeder on the horizontal alining-surface of the lay under the then elevated front plate or binder, the feeder pressing the rear side of said spare shuttle against the back wall B^6 , as in Fig. 2. During this upward movement of the actuator the stud or projection d^2 came into position behind the horn c^5 , connected with the lay, and the spare-shuttle feeder was securely locked to the lay, so that as the lay moves in its next back stroke, as in Fig. 2, the lever c^6 and the plate or binder c^9 , acting on the spare shuttle, keep the rear side thereof pressed against the back wall B^6 until the usual picker common to said Patent No. 614,369 and adapted to be moved in the slot B^4 has been actuated to strike the spare shuttle and throw it across the lay through the open shed. The spare shuttle having been thrown across the lay, the lay is again started forward and the means for operating the lever e^3 is again started and finishes the rotation previously half completed, letting the actuator descend, the spring d^8 acting to put the spare-shuttle feeder in its normal inoperative position, and by the time that the lay arrives at the end of that forward stroke the spare-shuttle feeder and its support have resumed their normal inoperative positions (see Fig. 1) and the front plate or binder b^5 comes again into position between the back wall and spare-shuttle feeder to again complete a shuttle-box in which the spare shuttle just put upon the lay may be received as the lay again goes back, said spare shuttle entering the space between the back wall B^6 and the front plate or binder b^5 , to be thereafter thrown continually therefrom as the running shuttle until it is to be again changed.

Prior to this invention looms have been made wherein the shuttle is changed when the filling has been exhausted to a predetermined point, and many devices have been invented and patented for feeling for the quantity of filling on the filling-carrier in the shuttle, the feeler serving the purpose of indicating mechanism. I consider within the

scope of this invention the use of any such contrivances instead of the filling-fork to indicate when a shuttle should be changed.

In this invention it will be noticed that I have dispensed with what is designated in United States Patent No. 614,369 as a "running-shuttle box," it acting to lift the running shuttle to be discharged from the raceway at the end of the lay at which it was received; but instead of said running-shuttle box I employ only a front plate or binder and a carrier with which it is connected, and I lift said front plate when the running shuttle to be discharged is not at the shuttle-receiving end of the lay. Herein the horizontal alining-surface of the lay is without transverse grooves to receive waste or lint. Some of the features of this invention might be employed to advantage with the running-shuttle box described in said patent.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a shuttle-changing loom, the following instrumentalities, viz: a lay having a horizontal alining-surface coincident with the level of the race of the lay, and a back wall; a carrier having a front wall or binder and movable in a plane entirely without the space in front of said back wall in which the shuttle moves as it is being thrown from said horizontal alining-surface through the shed; a spare-shuttle feeder normally occupying an inoperative position at the loom side; and means to actuate said carrier and its connected front plate or binder to remove it from opposite said back wall, thereby leaving an open space at the front of the lay through which the spare-shuttle feeder may put a spare shuttle onto the horizontal alining-surface of the lay, said spare-shuttle feeder in such operation pressing said spare shuttle against the back wall of the lay and maintaining pressure thereon until the spare shuttle has been thrown from that end of the lay upon which it was applied, substantially as described.

2. In a shuttle-changing loom, a lay having a back wall, and a horizontal alining-surface to sustain the under side of the shuttle; a front plate or binder, means to move the same from its position opposite the back wall when a spare shuttle is to be put upon the horizontal alining-surface of the lay and against said back wall; a spare-shuttle feeder, and an independent movable spare-shuttle support located between said spare-shuttle feeder and the lay, and means to actuate said spare-shuttle feeder when said front plate is put out of position opposite the back wall, causing said shuttle-feeder to act against the spare shuttle sustained by the movable support and move said support and shuttle for a short distance and finally move the spare shuttle from said support onto the horizontal alining-surface of the lay, and means to lock said spare-

shuttle feeder and its movable support to the lay to move therewith on a back stroke while the spare shuttle is thrown from the said horizontal alining-surface across the lay, substantially as described.

3. In a shuttle-changing loom, a lay, a spare-shuttle feeder normally stationary at or near the breast-beam and provided with a binder, an independent spare-shuttle support also normally stationary between the shuttle-feeder and the lay, and means when a shuttle is to be changed to move the spare-shuttle feeder and the support toward the lay and cause the said feeder to sweep the spare shuttle from the said support onto the lay.

4. In a shuttle-changing loom, a lay, a spare-shuttle support to support a spare shuttle substantially at the level of the race of the lay when the latter is in its forward position; combined with a spare-shuttle feeder normally stationary near the breast-beam and presenting a plate or binder, the lower end of which is located normally substantially at or above the level of the race of the lay and above the face of the shuttle-support, whereby said feeder in its movements to supply the race with a spare shuttle is adapted to be moved over the face of the support to the front of the lay.

5. A lay, a movable spare-shuttle support normally stationary at the loom side and sustaining a spare shuttle, and a spare-shuttle feeder also normally stationary at the loom side and provided with a binder, combined with means to move said spare-shuttle feeder and said spare-shuttle support putting the spare-shuttle support at the level of the race of the lay and causing the spare-shuttle feeder to traverse the spare-shuttle support and put the spare shuttle on the lay.

6. A lay, having a horizontal alining-surface coincident with its raceway, a back wall, and a front plate opposed to said back wall to constitute a shuttle-box; a spare-shuttle feeder normally occupying its inoperative position near the breast-beam, an interposed independent movable spare-shuttle support occupying normally its inoperative position between the spare-shuttle feeder and the lay, suitable means to remove the front plate carried by the lay from its position opposite the back wall thereof; and means to start the spare-shuttle support and feeder to move in unison with the lay at a backward stroke, the spare-shuttle feeder putting a spare shuttle on the race of the lay, substantially as described.

7. A lay having a vertical alining-surface to align the shuttle with the reed, and a smooth unbroken horizontal alining-surface coincident with the race of the lay and located at opposite sides of the picker-stick slot of the lay to support the shuttle as it is being thrown; an auxiliary shuttle-presenter made as a lever having a presser or binder, and means to move said lever and presser or binder automatically to hold a spare shuttle against the

vertical alining-surface of the lay during backward movement of the lay, substantially as described.

8. A lay, a pivoted support for a spare shuttle, an independent pivoted lever having a plate or binder and adapted to serve the purpose of a spare-shuttle feeder; means to retain said spare-shuttle support and feeder normally at the loom side, an operating-lever, and means controlled by it to move the lever of the spare-shuttle feeder and with it the spare-shuttle support to meet the lay, the further movement of the spare-shuttle feeder causing the spare shuttle to be removed from the spare-shuttle support onto the horizontal alining-surface of the lay, substantially as described.

9. In a loom, a lay having a horizontal alining-surface coincident with the level of the race of the lay, a back wall, a front plate or binder; a pivoted spare-shuttle feeder presenting a plate or binder, an intermediate movable spare-shuttle support, an operating-lever, and an actuator; and means under the control of said actuating-lever to move the front plate or binder from its position opposite the back wall of the lay and to immediately thereafter move the spare-shuttle feeder and the spare-shuttle support toward and to meet the lay and to further move the spare-shuttle feeder to sweep the spare shuttle from its support onto the horizontal alining-surface of the lay and against its back wall.

10. In a loom, a lay, a pivoted spare-shuttle support, a spare-shuttle feeder in turn pivoted upon said spare-shuttle support; means to retain the spare-shuttle support and spare-shuttle feeder in a normal stationary inoperative position at the loom side; an operating-lever, and means controlled by it to effect the movement of the spare-shuttle feeder and the spare-shuttle support toward the lay, causing the spare-shuttle feeder to sweep the spare shuttle from the spare-shuttle support onto the horizontal alining-surface of the lay, substantially as described.

11. In a loom, a pivoted lever having at its upper end a plate to sustain a spare shuttle, a pivoted lever having a spare-shuttle feeder at its upper end and pivoted to said first-mentioned lever, means to connect the lever of the spare-shuttle feeder with the lever sustaining the spare-shuttle support, and means to positively turn one of said levers about its fulcrum causing it to turn the other of said levers in the same direction, substantially as described.

12. In a loom, a lay having a horizontal alining-surface and a back wall, and a movable front plate or binder; a movable spare-shuttle support located substantially at the level of the race of the lay when the latter is in its forward position, an independent spare-shuttle feeder adapted to be moved in a horizontal plane above the level of the support for the spare shuttle; combined with means to move said spare-shuttle feeder toward the

advancing lay and sweep the spare shuttle from the spare-shuttle support onto the alining-surface of the lay, substantially as described.

- 5 13. In a shifting-shuttle loom, a lay having a vertical alining-surface to aline the shuttle with the reed; a horizontal alining-surface coincident with the level of the race to sustain the under side of the shuttle; a front
10 plate or binder; means to move it from its position opposite the vertical alining-surface when a spare shuttle is to be put upon the horizontal alining-surface of the lay and against said vertical alining-surface; a mov-
15 able shuttle support and feeder to support and move the spare shuttle, and means to ac-

tuate the same when said front plate is put out of position opposite the vertical alining-surface to move the spare shuttle onto the horizontal alining-surface and against the
20 vertical alining-surface and retain it there during the backward stroke of the lay or while the spare shuttle is thrown from the horizontal alining-surface across the lay.

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

HORACE WYMAN.

Witnesses:

HERBERT S. LELAND,
EMMA L. PARMENTER.