

No. 615,532.

R. CROMPTON & H. WYMAN.

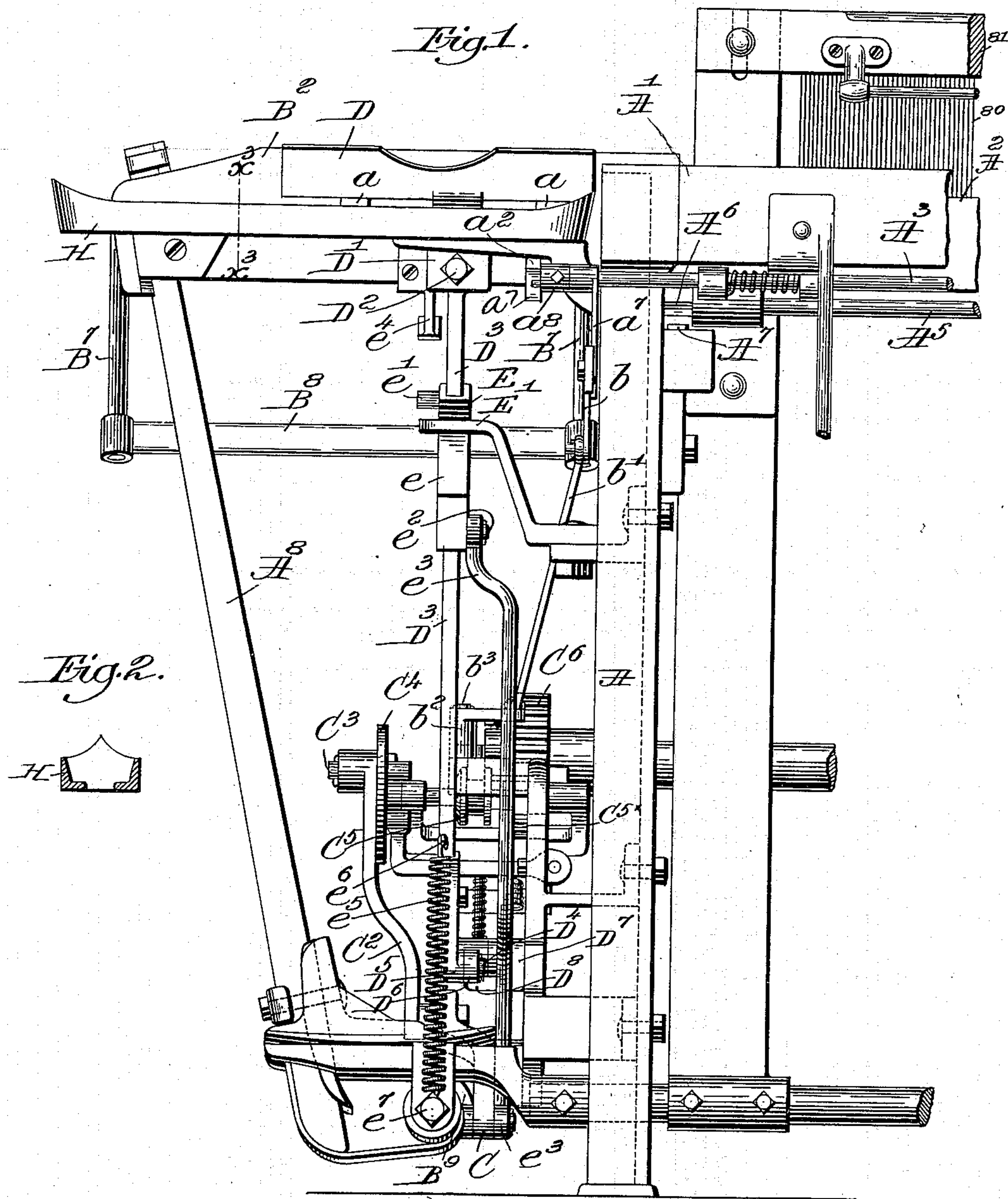
Patented Dec. 6, 1898.

LOOM.

(Application filed Dec. 13, 1897.)

(No Model.)

5 Sheets—Sheet 1.



witnesses:

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Walter E. Lombard.

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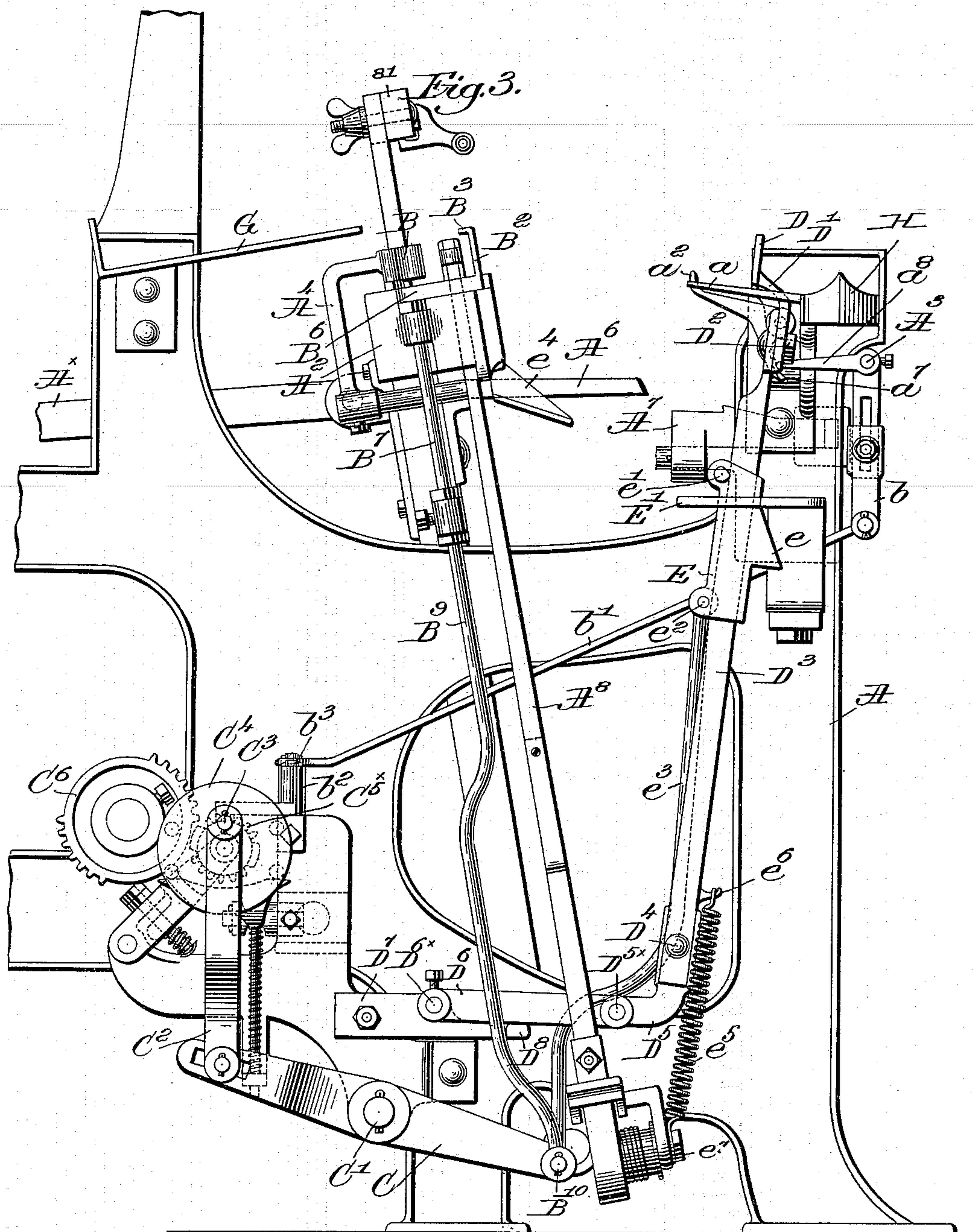
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5 Sheets—Sheet 2.



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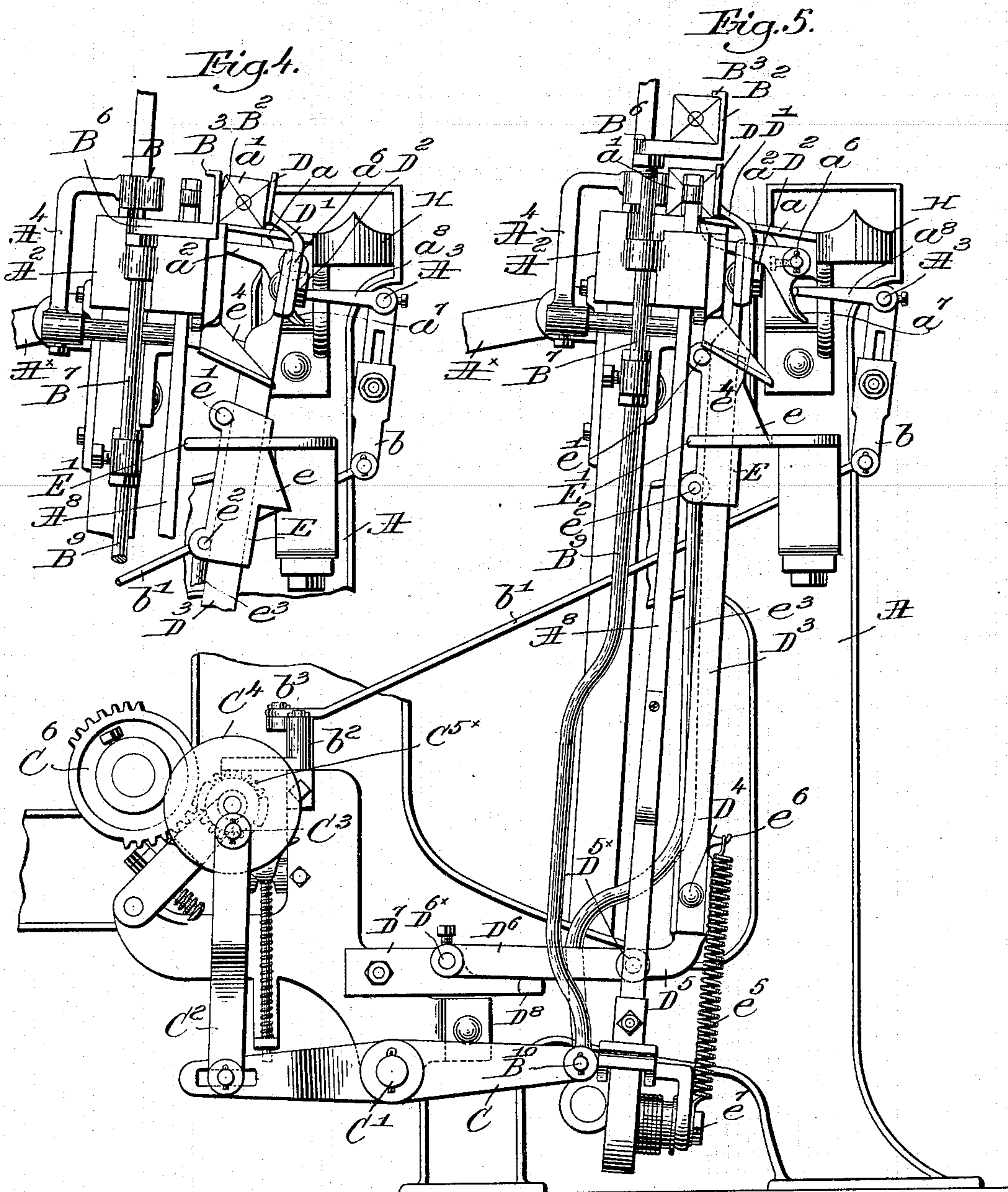
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5 Sheets—Sheet 3.



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5 Sheets—Sheet 4.

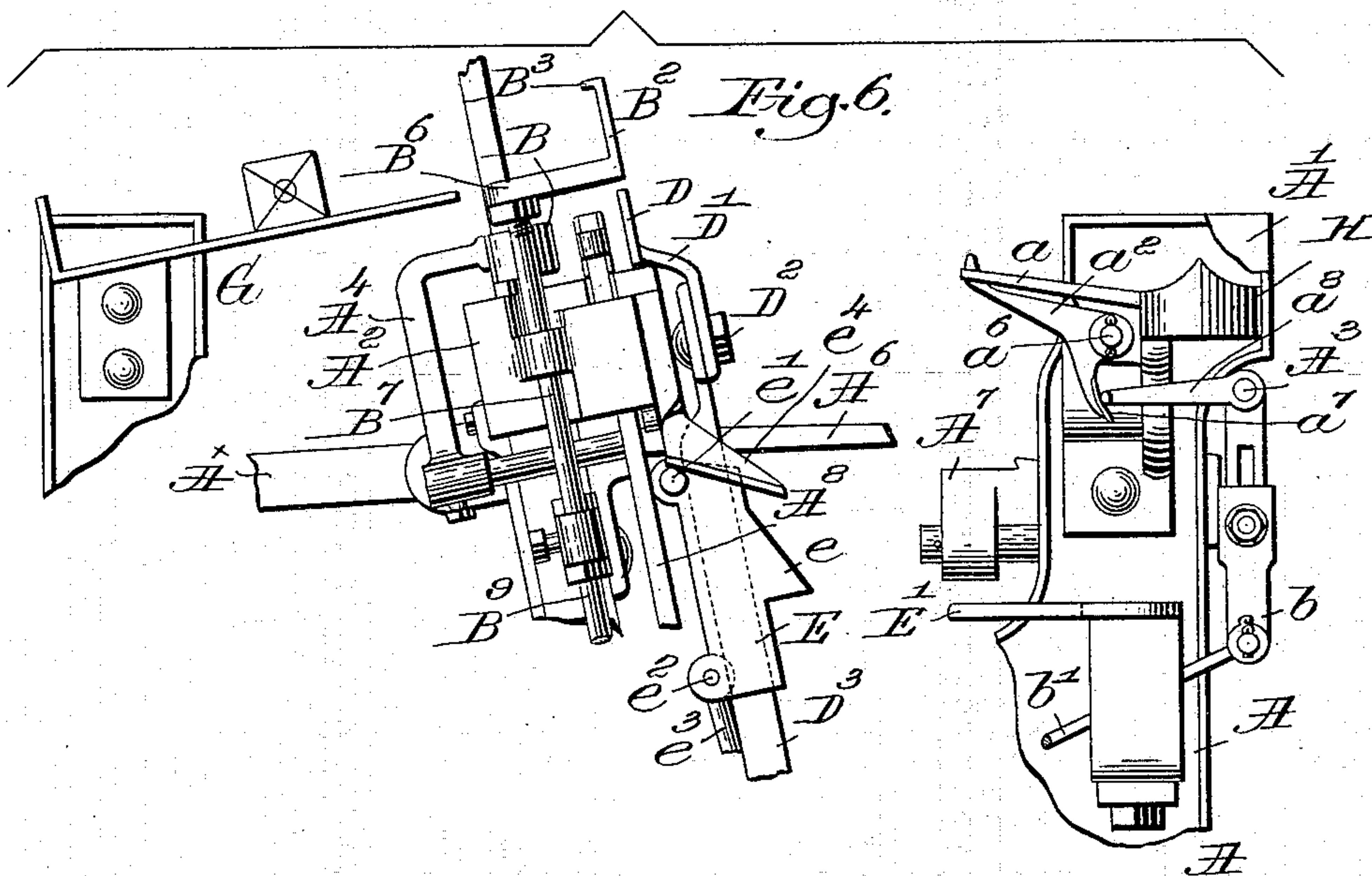


Fig. 7.

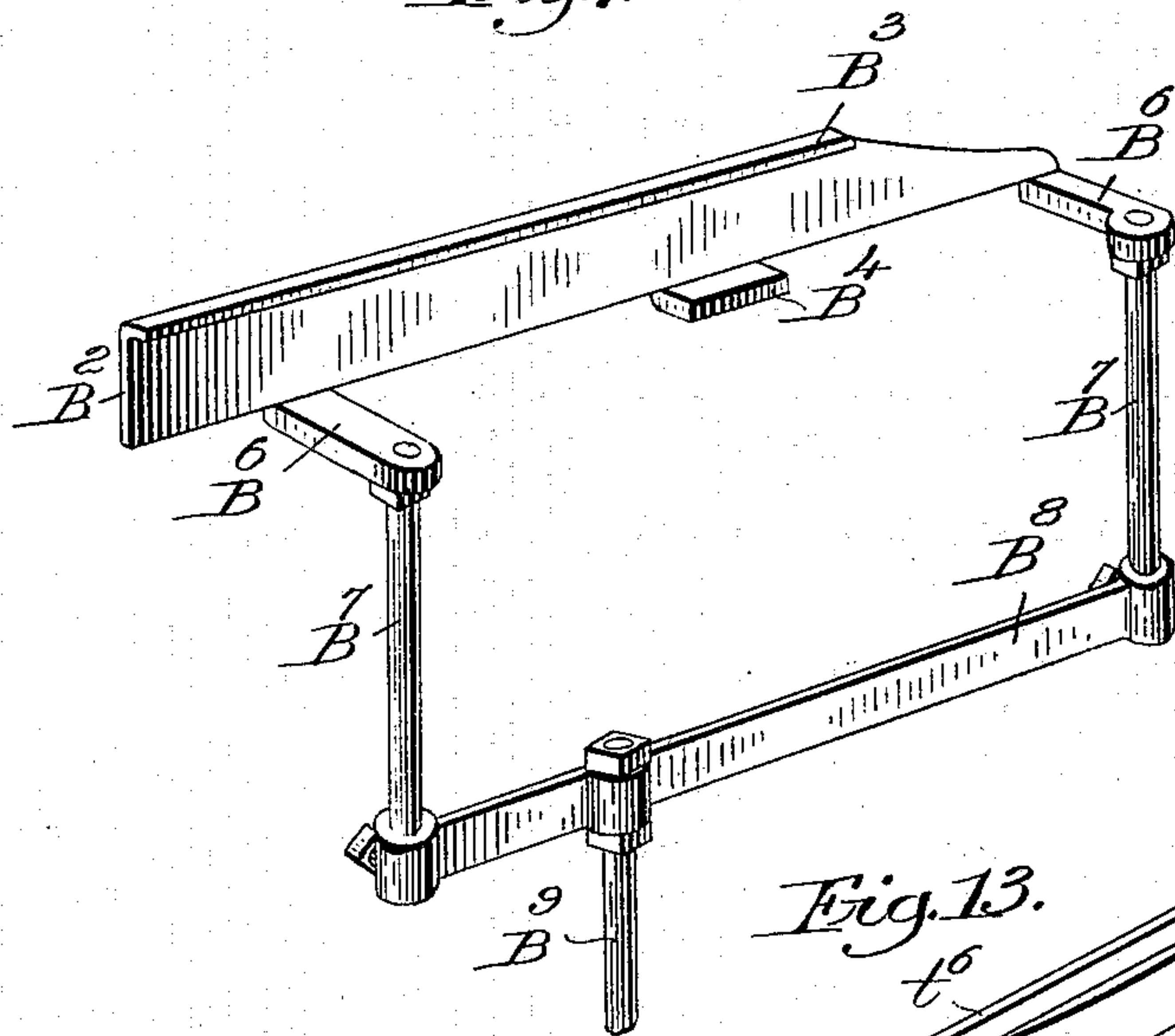


Fig. 7^a.

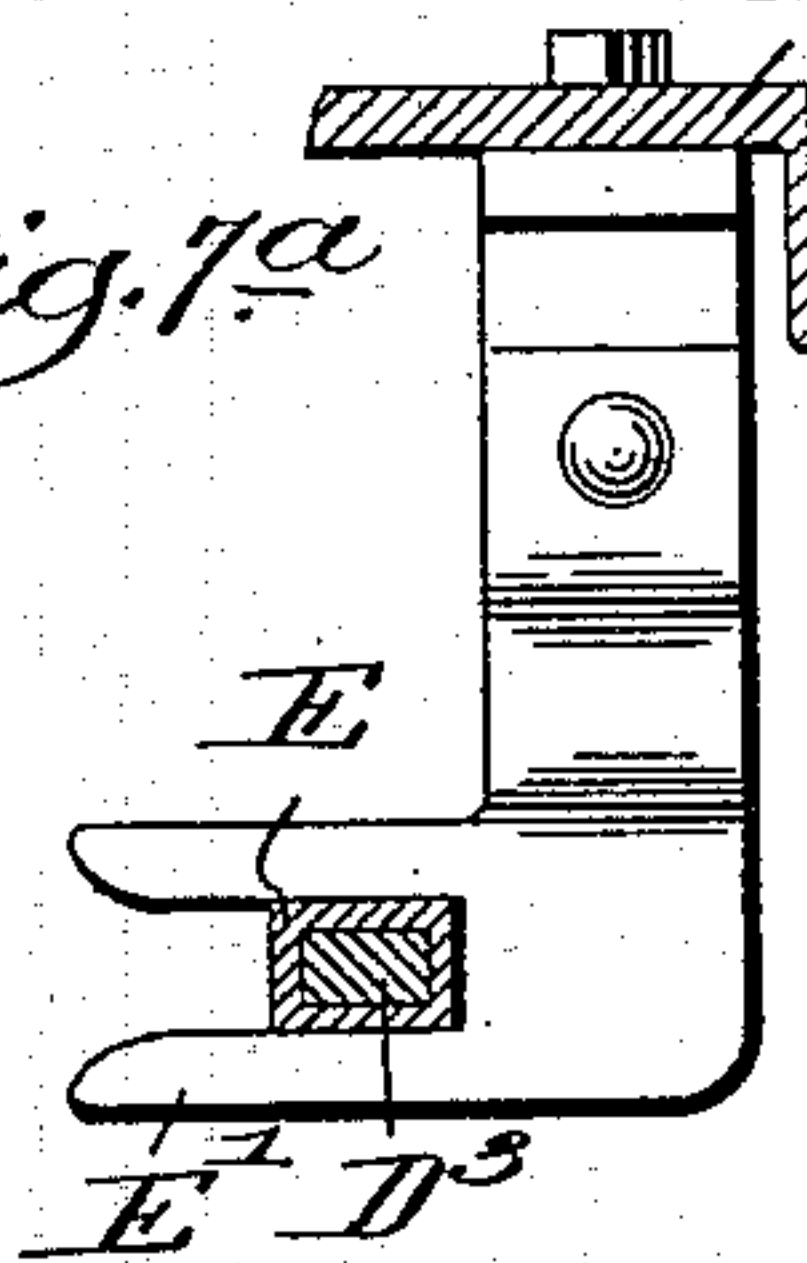


Fig. 13.

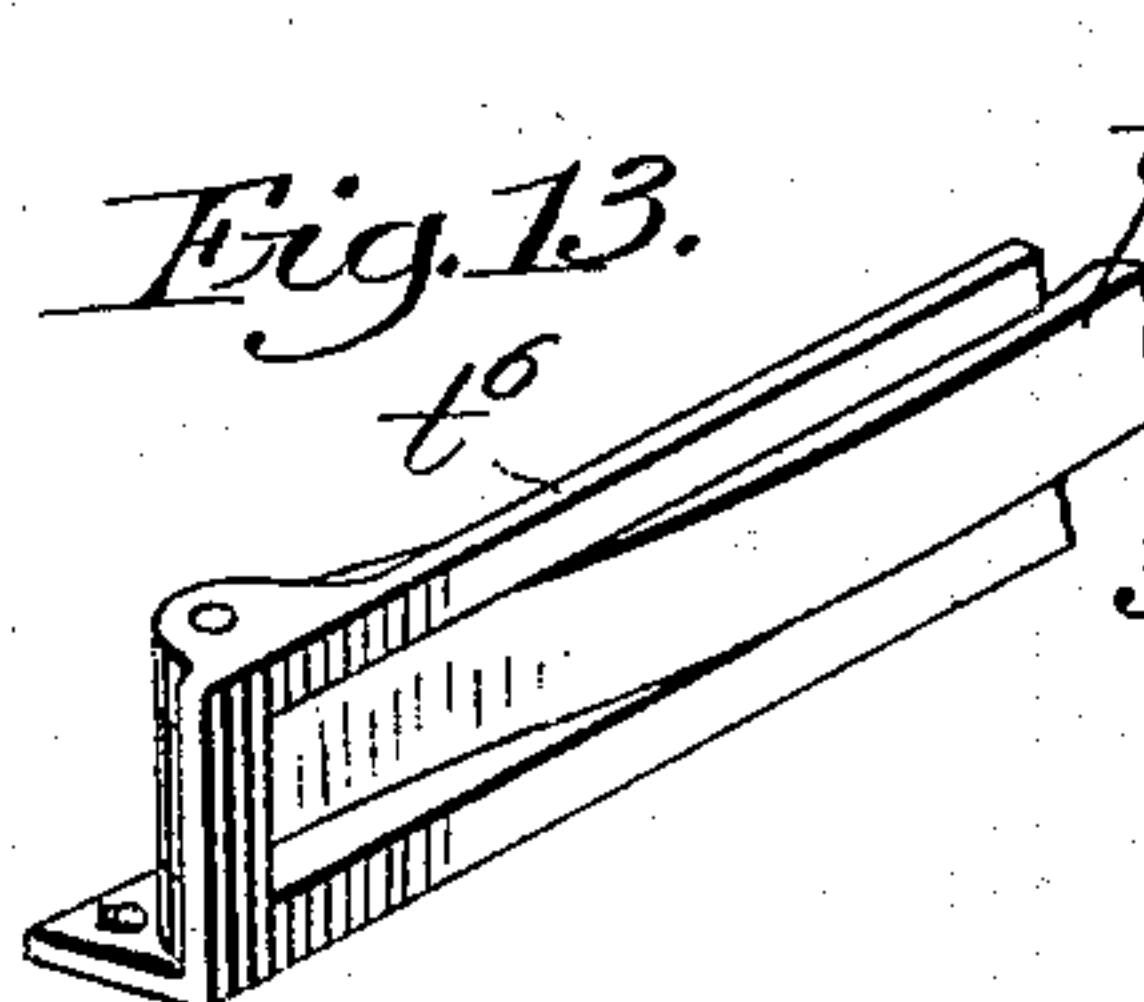
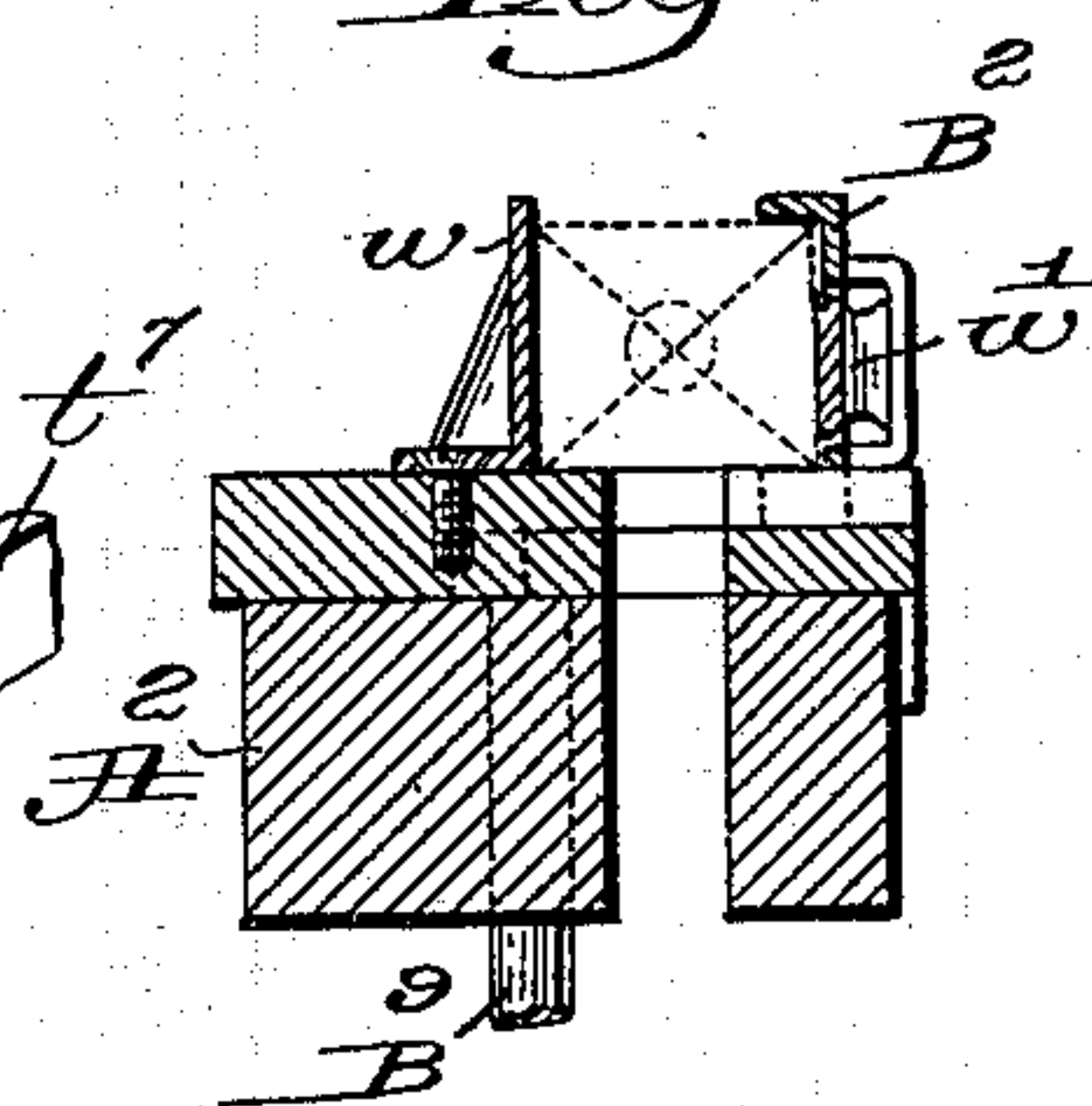


Fig. 12.



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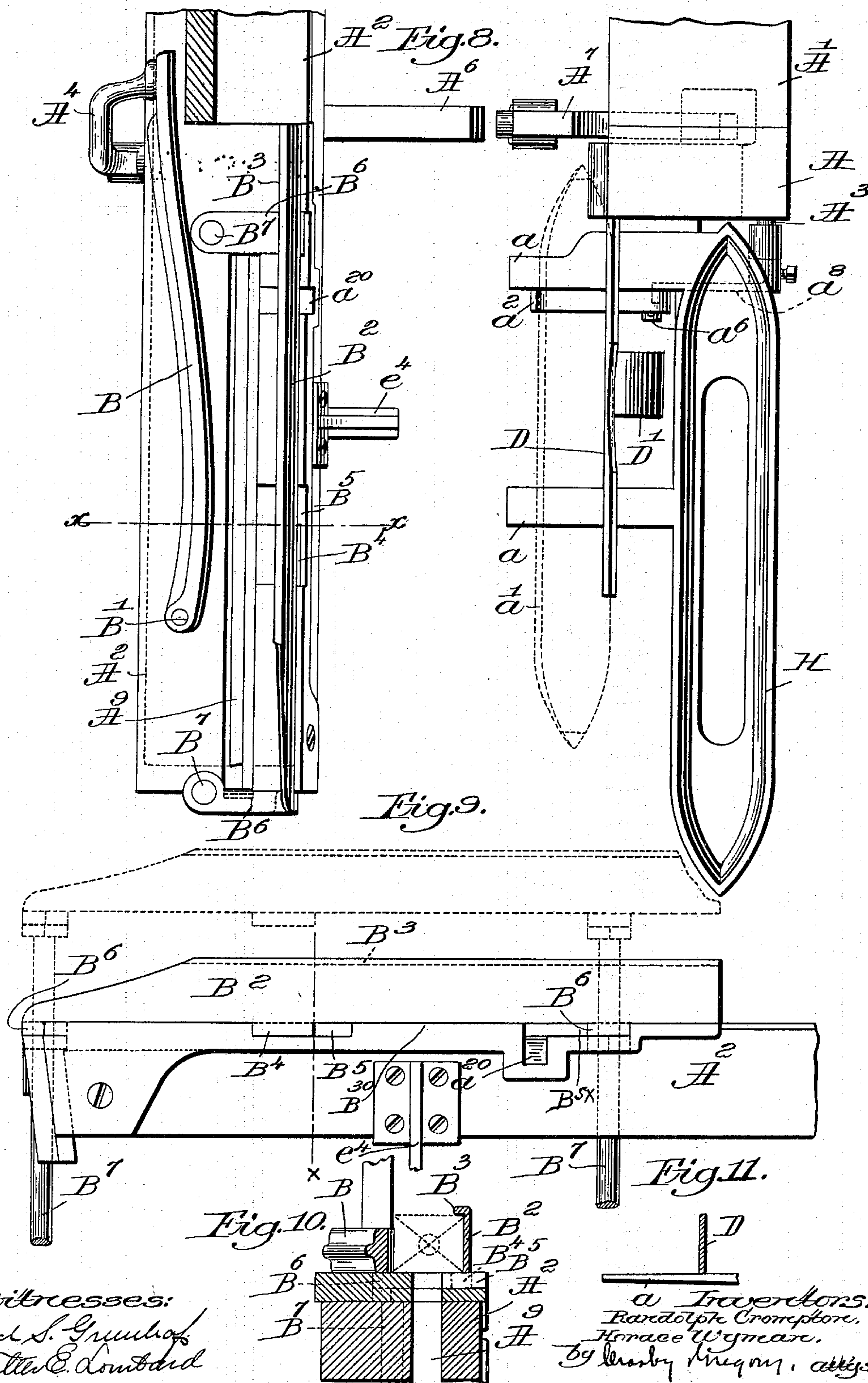
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(No Model.)

5 Sheets—Sheet 5.



witnesses:
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UNITED STATES PATENT OFFICE.

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

LOOM.

SPECIFICATION forming part of Letters Patent No. 615,532, dated December 6, 1898.

Application filed December 13, 1897. Serial No. 661,597. (No model.)

To all whom it may concern:

Be it known that we, RANDOLPH CROMPTON and HORACE WYMAN, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in 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 is intended as an improvement upon the class of looms represented in United States Patents Nos. 600,489 and 600,490, dated March 8, 1898.

The loom to be herein described has a lay provided with a running shuttle-box composed, essentially, of a substantially vertical side wall next the front side of the lay, (the side nearest the breast-beam,) said wall being provided at or near its upper and lower edges with lips extended backwardly toward the rear side of the lay and the crank-shaft, the lip at the lower edge of said wall serving to lift the shuttle when the running shuttle-box is to be put into its inoperative position, the lip at the upper edge of said wall serving to retain the shuttle in line with the race of the lay so long as said shuttle (it being supplied with filling) is running regularly, the side of the shuttle opposite that acted upon by the side wall of the running shuttle-box being guided and retained in operative position by means of a wall carried by the lay and located at the top of the lay at the rear side of the usual picker-stick slot of the lay, and said wall may be pivoted at one end on the lay and also serve as the binder for the running shuttle-box. This running shuttle-box will be moved automatically to put it into its inoperative position whenever the filling fails in the shuttle controlled by it, the movement of said running shuttle-box into its inoperative position being effected on the failure of said filling through any usual or suitable devices under the control of any usual filling-stop-motion mechanism, said filling-stop-motion mechanism causing devices—for instance, devices such as are commonly employed for actuating drop or shifting shuttle-boxes—to start into operation and move the said running shuttle-box into its inoperative position. When the running shuttle-box is lifted after

the failure of the filling in the shuttle controlled by it, the shuttle in said box (it having been returned into said box after the filling-stop-motion mechanism, located, as usual, at the opposite side of the loom, has been operated) is by the upward movement of said shuttle-box carried above the wall or binder referred to as mounted on the lay and immediately thereafter (the lay at such time being on its back stroke) the said shuttle escapes or passes out from said running shuttle-box over the top of said binder, it lodging upon a suitable shelf or receptacle located at the loom side.

In the Patent No. 600,490 referred to we have shown an auxiliary shuttle-presenter normally held in its inoperative position next the breast-beam and in the particular manner in which we have therein illustrated said shuttle-presenter. It occupies when in its inoperative position a position somewhat below the level of the raceway of the lay, and when coming into its operative position to place its auxiliary or spare shuttle in position to be thrown therefrom across the lay it is somewhat elevated as it is swung forward toward the lay; but herein the auxiliary shuttle-presenter when in its inoperative position (it holding a shuttle to be supplied to the race of the lay on the failure of the filling) occupies a position substantially at the level of the race of the lay, so that in coming from its inoperative into its operative position it is simply moved in a forward direction, and having met the said lay it is locked thereto through devices to be described, so that the said shuttle-presenter follows the lay in its next back stroke, during which time the auxiliary or spare shuttle is thrown from the shuttle-presenter across the lay, and the running shuttle-box (it having the failed shuttle) is at the same time put into its inoperative position to discharge the spare shuttle.

The shuttle-presenting device is composed, essentially, of a substantially upright wall to act against the auxiliary or spare shuttle, supported at one side of said wall on a suitable rest, said rest being preferably stationary and having its inner ends next the lay preferably so shaped as to enter a suitable recess at the top of the lay as the latter completes its for-

ward stroke, said rest acting as a bridge over which the shuttle is passed onto the top of the lay. When the shuttle-presenter is actuated to put the shuttle then under its control onto the lay, the running shuttle-box is in its described elevated or inoperative position and the rear side of the auxiliary or spare shuttle is pressed against the wall or binder referred to, so that one and the same wall and binder acts in controlling the direction of flight of the shuttle being used, the under side of the elevated running shuttle-box then acting to keep the shuttle down on or close to the race of the lay while it is thrown from the shuttle-presenter.

The auxiliary shuttle-presenter is attached, as herein shown, to the upper end of a lever, which may and preferably will be suitably pivoted near or in line with the pivotal point of the lay, and to effect the forward movement of this lever with the shuttle-presenter we have combined with the means herein shown to effect the raising of the running shuttle-box a shoe or device which is raised in unison with the running shuttle-box, said shoe or device in its movements swinging said lever about its pivot toward and to meet the lay, a projection connected with or forming a part of said shoe as it rises cooperating with a suitable hook or projection carried by the lay to thus lock the shoe and with it the lever carrying the auxiliary shuttle-presenter to the moving lay and hold it in place at the race of the lay until the shuttle put onto the lay by said presenter has been thrown therefrom onto the lay. This invention is not, however, to be limited to the particular shape of the shoe or moving device employed to act upon and turn the lever and its connected shuttle-presenter.

The shuttle is thrown from the shuttle-presenter onto the race of the lay at a back stroke of the lay, and thereafter the lay and the shuttle-presenter are moved forward in unison so that the usual reed of the lay may beat in the first shot of filling from the shuttle just supplied to the lay, and during said forward stroke said shoe is lowered and the auxiliary shuttle-presenter is permitted to retire from the lay under the action of a suitable spring, and at the same time the running shuttle-box is again dropped or put into its operative position, so that as the lay next reaches its back stroke the shuttle just put onto the lay from the shuttle-presenter is received into the running shuttle-box.

The particular features of which our invention consists will be hereinafter more fully described and will be defined in the claims at the end of this specification.

Figure 1 is a partial front side elevation showing part of the left-hand end of a loom containing our invention. Fig. 2 is a detail showing the shuttle-holder H in section in the dotted line x^3 of Fig. 1. Fig. 3 is a view of the left-hand end of the loom, the lay being back with the running shuttle-box in its op-

erative position and the auxiliary shuttle-presenter in its inoperative position. Fig. 4 is a partial view of the left-hand end of the loom, showing the lay on its forward stroke and the running shuttle-box in its operative position, the auxiliary shuttle-presenter occupying its inoperative position. Fig. 5 is a view of the same parts, showing the running shuttle-box in its inoperative position on its front stroke and the auxiliary shuttle-presenter as coming into its operative position, said figure also showing the devices instrumental in moving the running shuttle-box up and down. Fig. 6 shows a part of the lay and running shuttle-box and part of the loom-frame at the breast-beam, the lay being on its back stroke with the shuttle-presenter in its operative position at the lay, the running shuttle-box being in its inoperative position, said figure showing the failed shuttle as having been discharged from the running box. Fig. 7 is an enlarged detail of the inner side of the running shuttle-box. Fig. 7^a is a detail showing in plan view the guide or stand projected from the loom side to guide the lever carrying the auxiliary shuttle-presenter and its cooperating actuating-shoe. Fig. 8, on an enlarged scale, shows the end of the lay, the guide wall or binder pivoted thereon, and the running shuttle-box carried by the lay, together with the part of the breast-beam, and the auxiliary shuttle-presenter occupying its inoperative position. Fig. 9 shows in elevation a part of the lay, looking at the same from the breast-beam, the running shuttle-box being shown by full lines in its operative position and by dotted lines in its inoperative position, the lay being cut away to receive the shelf or projection on which normally stands the auxiliary or spare shuttle. Fig. 10 is a section of the lay and binder in the line x , Fig. 8. Fig. 11 is a section of the auxiliary shuttle-presenter in the line x , Fig. 8, continued, said figure showing part of the rest. Fig. 12 shows a modification to be described, and Fig. 13 yet a further modification.

The loom-frame A, the breast-beam A', the lay A², carrying the reed 80 and cap 81, the arms A^x of the lay to be attached to the usual crank-shaft (not shown) by which to move the lay, the rock-shaft A³, contained in suitable bearings below the breast-beam and deriving its rocking motion by or through any usual filling-fork—such, for instance, as shown in said Patent No. 600,490—which may be moved backwardly on the failure of the filling in the shed, the binder-finger A⁴, carried by a binder-shaft A⁵, suitably supported in usual bearings under the lay and having a dagger or finger A⁶ cooperating with a shoe A⁷ to knock off the loom and stop the same in the absence of a shuttle against which the binder may work as the lay goes forward, and the picker-stick A⁸, it working in a picker-slot A⁹ in one end of the raceway of the lay A², said slot being shown in Fig. 8, are and

may be all as common in any usual loom and need not, therefore, be herein further described.

The picker may be swung to throw the shuttle by or through any usual or suitable devices, and we shall not herein describe such devices.

In the preferred form of our invention a binder B is pivoted at B' on the top of the lay at that side of the picker-slot A⁹ next the rear side of the lay, and the binder-finger A⁴, acting upon it, normally keeps the said binder pressed toward said picker-slot, causing said binder to contact with the side of the shuttle and press it against the alining side or wall of the running shuttle-box, said binder acting in like manner against the side of the shuttle of the auxiliary shuttle-presenter when put at the level of the race of the lay, whichever is operative at the time, the under side of said shuttles resting at such times upon the lay.

The shuttle has to be alined in the shuttle-box with the faces of the dents of the reed 80 before the shuttle is thrown, and in the construction Figs. 1 to 10 the walls of the running shuttle-box and of the auxiliary shuttle-presenter constitute these necessary alining-surfaces.

The running shuttle-box in this present instance of our invention is represented detached in Fig. 7, where it is shown as composed of a substantially solid or unyielding wall B², having at its upper edge a lip B³, which is extended horizontally therefrom toward the rear side of the lay, the under edge of said wall having a second lip B⁴, which when the said running shuttle-box is in its operative position enters a slot B⁵ in the upper side of the lay, as best represented in Fig. 9, so that the upper edge of said lip B⁴ rests substantially flush with or it may be a little below the top of the lay. The lower edge of the said wall B² is also provided with ears B⁶, extended laterally therefrom or connected thereto in suitable manner, one of said ears lying in a suitable slot B^{5x}, like the slot B⁵ in the lay, said ears B⁶ being attached to rods B⁷, in turn attached to a cross-bar B⁸, to which is connected a rod B⁹, the lower end of said rod being jointed at B¹⁰ to a lever C, pivoted at C' and having connected to it at its opposite end a link C², attached to a suitable crank, as C³, carried by a disk C⁴, which may be moved intermittingly a half-rotation at a time by or through a collar C⁵, having arms provided with teeth which may be put into line with the teeth of a mutilated gear C^{5x}, so that a continuously-rotating gear C⁶, having a plurality of series of teeth, may engage the teeth of said arms and start and turn them from the position Fig. 3 into the position Fig. 5, leaving it there for an instant or while the auxiliary shuttle-presenter occupies its operative position at the level of the race of the lay and the running shuttle-box is in its inoperative position above the level of the

race of the lay, and thereafter the said crank is again immediately started and is taken from the position Fig. 5 into the position Fig. 3, (the position in which it normally stands when the loom is running regularly.) 70

We shall not herein specifically describe the means for raising and lowering the rod B⁹, as, instead of the particular means herein represented and partially described, the sliding toothed gear C⁵ being old and common, we may use any usual, suitable, or well-known means commonly employed to effect the raising and lowering of shuttle-boxes in looms, and by the term "box-operating mechanism" we intend to include any such usual devices, the particular devices employed not being of the gist of this invention. 80

The auxiliary shuttle-presenter D is composed, essentially, of a solid or unyielding wall having, as represented, a shank D' suitably attached, as by a bolt D², to the upper end of a lever D³, said lever being herein represented as held by a suitable bolt D⁴ in an open guideway of a short arm D⁵, pivoted at D^{5x}, at one end of a link D⁶, pivoted at D^{6x}, on a suitable stand D⁷, bolted to the loom side, said stand having a lip or projection D⁸, on which the said link D⁶ normally rests. 85 The lever D³ has coöperating with it and preferably sliding on it a shoe E, having, as shown, an inclined or wedge-shaped projection e, said shoe being shown in Fig. 7^a as surrounding said lever, the wedge entering an open slot in a stand or arm E', bolted to the loom side in any usual or suitable manner. The upper end of this shoe has a projection e', and its lower end has a bolt e², embraced by a rod e³, jointed in this instance of our invention to the stud B¹⁰, (the same stud which connects the rod B⁹ with the lever C,) so that as the said lever C is moved to raise the rod B⁹ and the running shuttle-box the shoe E is also raised from the position Fig. 3, and during the time that it so rises the wedge e, acting in the slot of the arm E', causes the said lever to be swung to the left, viewing Fig. 3, toward the then-advancing lay, and the running shuttle-box is elevated into its inoperative position, leaving below it an open space in which the auxiliary shuttle-presenter enters, as shown in Fig. 5, by the time the lay completes its forward stroke, and at such time, it will be noticed, viewing Fig. 5, that the projection e', connected with the shoe, has passed under the lower side of the inclined hook or holding projection e⁴ of the lay, said holding projection insuring the locking of the auxiliary shuttle-presenter to the lay, so that it moves backwardly therewith, it remaining connected with the lay until the lever C is again moved from the position Fig. 5 into the position Fig. 3. 110 115 120 125

A spring, as e⁵, connected with a stud e⁶ of the lever D³ and at its lower end to some fixed or other stud e⁷, normally acts to keep the lever D³ down and prevent it from rising, the auxiliary shuttle-presenter connected with 130

the upper end of said lever moving simply in the arc of a circle nearly coincident with the circle in which the lay moves, so that the auxiliary or spare shuttle laid on a suitable rest a , composed, preferably, of two independent fingers, in the movement of said auxiliary shuttle-presenter toward the race of the lay, slips the spare shuttle (represented by dotted lines in Fig. 8) from said rest onto the top of the lay in the position, as herein shown, below the running shuttle-box then in its inoperative position.

When the loom is running regularly, the running shuttle-box occupies the position shown in Figs. 3 and 4 and the lever C is in the position Fig. 3; but as soon as the filling-stop-motion mechanism is operated by the backward movement of any usual filling-fork the rod A^3 is partially turned, moving with it the connected lever b , causing it through the rod b' , connected with the bell-crank b^2 , mounted on a stud b^3 , to move one arm of said bell-crank, so that said arm entering the annular groove in the exterior of the collar C^5 , having the toothed arms before referred to, causes said teeth to come into the spaces of the partial gear C^{5x} to be engaged by the teeth of the gear C^6 , causing the latter to impart a semirotation to the disk C^4 , carrying the crank C^3 , and said disk will remain at rest for a space equal to the distance between the two sets of teeth of the gear C^6 , when it will be again taken up and rotated a half-rotation, putting the lever C again into its starting position, Fig. 3. The lever C will not be moved to elevate the running shuttle-box until after the filling-stop-motion mechanism has operated, due to the absence of filling in the shed; but as soon as the failed shuttle arrives back in the running shuttle-box then the lever C will be started, as described, and will lift the running shuttle-box into the position Fig. 5, so that as the lay comes forward the auxiliary shuttle-presenter may be moved toward and to meet the lay and take the spare or auxiliary shuttle from the rest a and put it onto the lay against the binder B, (the same binder which cooperated with the shuttle controlled by the running shuttle-box when in its operative position.) The auxiliary shuttle-presenter having arrived in the position Fig. 5, the lay will be moved backwardly, and at that back stroke the shuttle having the failed filling and resting in the running shuttle-box then in its inoperating position will be thrown across the top of the wall or binder mounted on the lay onto the shelf G, connected with the loom end A, and at the same time the picker-stick will operate and will throw the auxiliary or spare shuttle, (it then lying between the wall of the auxiliary presenter and the said wall or binder B, pivoted on the lay at the rear side of the picker-stick slot,) from said auxiliary shuttle-presenter across the loom into the opposite box and the lay will be immediately started forward; but during this forward

movement the lever C will be again moved, this time from the position Fig. 5 into the position Fig. 3, so that the shoe E will be lowered, permitting the spring e^5 to act and withdraw the auxiliary shuttle-presenter from its operative position at the top of the lay, and the running shuttle-box will be again lowered into its operative position and the lay will be again started back, leaving the auxiliary shuttle-presenter in its inoperative position, Fig. 3, at the breast-beam, and by the time that the shuttle just thrown from the auxiliary shuttle-presenter across the lay comes back it enters the running shuttle-box then in position at the level of the race of the lay, and the shuttle will continue to be thrown from the running shuttle-box and between its vertical wall and the wall or binder B until the filling again fails in said shuttle, when the operation just described will be repeated.

To prevent the auxiliary or spare shuttle from escaping accidentally from the rest a , we have provided a hooked lever a^2 , pivoted at a^6 and having a curved end a^7 , against which acts a small lug at the end of an arm a^8 , fixed to one end of the filling-stop-motion shaft A^3 , so that when the loom is running regularly the said arm will stand in the position Fig. 3, with the end of the hooked lever a^2 above the rest a ; but when the said rock-shaft a^3 is turned into the position Fig. 5 a spring connected with the said lever a^2 turns it so that the projecting end of said lever is put below the top surface of the rest a , letting the shuttle pass freely therefrom.

The ends of the rest a are of sufficient length, preferably, to enter the notches B^5 and B^{5x} , cut in the top of the race of the lay next the breast-beam, so that there will be no gap or space against which the edge of the shuttle may strike when passing onto the top of the lay, and the lay has also a notch a^{20} , in which enters the hooked end of the lever a^2 as the lay comes forward.

The filling-fork mechanism may be that commonly employed in usual looms.

The operator for convenience may lay a second spare shuttle on the holder H, connected with the loom end, so that when the auxiliary shuttle-presenter has moved to take the shuttle (shown by dotted lines, Fig. 8) and put it on the lay the operator may without any effort take the shuttle from the said holder H and lay it upon the rest a as soon as the auxiliary shuttle-presenter again comes back into its inoperative position.

The top of the lay between the transverse notches B^5 and B^{5x} presents an elevated table B^{30} , on which the under side of the shuttle lies as it comes into and goes out of the box during the operation of the loom, said rest lying wholly at one side the slot A^9 .

In Fig. 12 we have shown a part of the lay with an upright wall w at the rear side of the picker-slot instead of the binder, said wall constituting the shuttle-alining surface, and

in such case the wall of the running shuttle-box will be provided with a binder *w'* and the wall of the shuttle-presenter may be substantially as shown in said Patent No. 600,490.

5 In Fig. 13 we have shown yet another modification, wherein the lay has at the rear side of the vertical picker-slot a wall *t'*, provided with a binder *t'*, and with such a wall the running shuttle-box may be as shown in
10 Fig. 3.

Any of the described forms of walls or binders may be used with a running shuttle-box open at its rear side for the passage of the shuttle therethrough.

15 Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a loom, a lay having a reed, and a binder mounted on the lay substantially in
20 the line of the dents of the reed, combined with a running shuttle-box carried by and movable on said lay from its operative into its inoperative position and vice versa, said shuttle-box being open at its rear side next
25 said binder, the vertical wall of said shuttle-box being located parallel to the faces of the dents of the reed and in front of the same to constitute an alining-surface for the shuttle acted on by said binder, and means to actu-
30 ate said running shuttle-box to put it into its inoperative position and enable the escape of its shuttle from the rear side of said box over said binder, substantially as described.

2. In a loom, a lay slotted in its raceway for
35 the reception of a picker-stick, and a binder pivoted on said lay at the rear side of said slot, combined with a running shuttle-box open at its rear side and located at the opposite side of said slot, and means to move said shuttle-
40 box to enable the shuttle to escape therefrom across said binder, substantially as described.

3. A lay having a vertical slot in its raceway, a running shuttle-box open at its rear side, a vertical wall mounted on the top of said lay
45 opposite the open side of said running shuttle-box, a picker-stick, movable back and forth in said slot between said wall and the open side of said running shuttle-box, and means to lift said running shuttle-box in said
50 lay when the shuttle is to be changed, said shuttle-box as its open side is lifted above said wall enabling the shuttle to leave the open rear side of said running shuttle-box and be discharged from the lay, substantially as de-
55 scribed.

4. In a loom, a lay having a picker-stick slot in its raceway, a binder connected to said lay at the rear side of said slot, a running shuttle-box open at its rear side next said binder
60 for the escape of the shuttle, combined with an auxiliary shuttle-presenter and a rest for a spare shuttle, said presenter acting against the side of said spare shuttle opposed to said binder, means to move said running shuttle-
65 box from its operative into its inoperative position, and the said auxiliary shuttle-presenter

from its inoperative into its operative position, both the said running shuttle-box and said shuttle-presenter cooperating with and holding its shuttle against one and the same binder
70 when the shuttle is being thrown therefrom across the lay, substantially as described.

5. In a loom, the following instrumentalities, viz: a lay having a pivoted binder, a running shuttle-box open at its side next said
75 binder and cooperating therewith when said shuttle-box is in its operative position at the level of the race of the lay, means to move said running shuttle-box into its inoperative position to take with it the shuttle to be dis-
80 charged from the open side of the said shuttle-box, combined with an auxiliary shuttle-presenter composed of a wall and a lever carrying it, said shuttle-presenter being normally held stationary in its inoperative position, and
85 means to move said shuttle-presenter into its operative position at the level of the race of the lay and put the shuttle carried by it against said binder to be thrown from said shuttle-presenter across the lay, and means to lock
90 said shuttle-presenter to the lay, while the auxiliary shuttle is being thrown by the picker onto the lay, substantially as described.

6. In a loom, a lay having a slot for a picker-stick, a binder pivoted on said lay to move to-
95 ward and from said slot and act on the shuttle, a running shuttle-box composed of a wall provided at its upper and lower edges with short horizontal lips extended toward the rear side of the lay and said binder, said lips over-
100 lapping a portion of the upper and lower sides of the shuttle, said wall keeping said shuttle against said binder combined with means to move said shuttle-box transversely with relation to said binder to effect the discharge of
105 a shuttle, substantially as described.

7. In a loom, the following instrumentalities, viz: a lay, a running shuttle-box carried thereby and open at its rear side, means to move said shuttle-box into its inoperative po-
110 sition when the shuttle is to be discharged therefrom, a lever having an auxiliary shuttle-presenter attached to it, said shuttle-presenter being normally held in its inoperative position near the breast-beam, independent
115 devices operated by the means employed to put said running shuttle-box into its inoperative position, said independent means cooperating with and turning said lever carrying said shuttle-presenter about its pivot to
120 place the said auxiliary presenter with its shuttle in the position previously occupied by the running shuttle-box at the level of the race of the lay, while the spare shuttle contained thereon is thrown therefrom across the
125 lay, substantially as described.

8. A lay, a rest for an auxiliary or spare shuttle, a hooked lever to engage and retain said shuttle in stationary position on said rest, combined with an auxiliary shuttle-presenter
130 to remove said shuttle from said rest onto said lay, and means to operate said hooked

lever and enable the said shuttle to pass off from said rest onto the lay, substantially as described.

9. A lay, a rest for an auxiliary or spare shuttle, a hooked lever to engage said shuttle, and an auxiliary shuttle-presenter adapted to remove said shuttle from said rest onto said lay, combined with a filling-fork stop-motion shaft and means under its control to meet and turn said hooked lever, substantially as described.

10. In a loom, a lay having a slot for a picker-stick, and a recess in its top side, and a binder pivoted on said lay at one side of and adapted to move toward and from said slot, combined with a running shuttle-box open at its rear side and located at the opposite side of said picker-slot, said running shuttle-box having a lip at its upper edge to overlap a part only of the upper edge of the shuttle, and a second lip to act on the under side of said shuttle to lift it from the raceway of the lay, said second lip standing in the said recess of the lay and means to move said shuttle-box transversely with relation to said binder, substantially as described.

11. The lay, a lever, and an auxiliary shuttle-presenter carried thereby, a shoe having an inclined or cam surface, and a guide for said shoe, combined with means to move said shoe to effect the movement of said lever about its pivot, substantially as described.

12. The lay, its attached holding projection, an auxiliary shuttle-presenter mounted upon a lever, a shoe movable independently of said lever and having a wedge or cam surface and a projection, combined with means to move said shoe and turn said lever, the projection of said shoe engaging the projection of said lay to lock the said lever to said lay, substantially as described.

13. In a loom, the following instrumentalities, viz: a lay, a running shuttle-box carried thereby and open at its rear side and occupying normally its stationary operating position, a lever, and an auxiliary shuttle-presenter actuated therewith and occupying normally a stationary inoperative position in line with the level of the race of the lay, means to move said running shuttle-box, and independent means set in motion by the movement of said running shuttle-box to cooperate with and move the lever carrying said auxiliary shuttle-presenter toward and to meet the forwardly-moving lay, substantially as described.

14. The rest for the auxiliary or spare shuttle, a lever, an auxiliary shuttle-presenter actuated thereby, a shoe cooperating with said lever and provided with an inclined or cam surface, combined with a guide for said shoe, and means to move said shoe to thereby effect the turning of said lever upon its fulcrum, substantially as described.

15. In a loom, a lay notched at its top, a stationary rest extended from the front of the loom toward the lay and adapted to cooperate

with the notches in the top of the lay as the latter reaches the end of its forward stroke toward the breast-beam, combined with an auxiliary shuttle-presenter occupying its inoperative position above said rest at one side of the auxiliary shuttle thereon when the loom is running regularly, means on the failure of the filling in the running shuttle-box to move said shuttle-presenter and cause it to move the auxiliary shuttle over said rest onto the lay, a movable shoe, and means to move it to cause said auxiliary shuttle-presenter to be moved toward and be locked to the lay, and thereafter move with the lay while the said auxiliary shuttle is being thrown from the shuttle-presenter, substantially as described.

16. In a loom, a lay having a picker-slot made vertically therein, combined with a running shuttle-box composed of a wall occupying a position at one side of said slot, said wall having at its upper edge a horizontally-extended lip to more or less overlap only the top of the shuttle, and having at its lower edge a suitable ear which is extended horizontally therefrom across the said picker-slot and rods connected to said box and extended through guides in said lay, and means to move said rods and box vertically, substantially as described.

17. In a loom, the following instrumentalities, viz: a lay having a vertical slot or passage for a picker-slot, and presenting at the front side of said picker-slot a shuttle-supporting table having a notch at either end, and a wall erected on said lay at the rear side of said picker-slot; a running shuttle-box presenting a wall at the front side of said picker-slot, the latter wall having a lip at its top edge to overlap more or less of the top of the shuttle, and having at its lower edge a lip and two ears to enter said notches, said lip being located wholly at one side of said slot; means to move said running shuttle-box on said lay to cause the lip at its under edge to lift the shuttle from the lay and put it into a position above the wall erected on said lay, and a picker-stick working in said picker-slot between said ears, substantially as described.

18. In a loom, the following instrumentalities, viz: a lay having a vertical slot or passage for a picker-slot, and presenting at one side of said picker-slot a rest with a notch, and a wall erected on said lay at one side of said picker-slot, a running shuttle-box presenting a wall at the opposite side of said picker-slot, the latter wall having a lip at its top edge to overlap more or less of the top of the shuttle and having at its lower edge a lip to enter said notch, said lip being located wholly at one side of said slot, means to move said running shuttle-box on said lay to cause said lower lip to lift the shuttle from the lay and put it into a position above the wall erected on said lay, and a picker-stick working in said picker-slot, substantially as described.

19. In a loom, a lay having an elevated rest

at one side of the picker-stick slot on which the shuttle rests when thrown from the shuttle-box; a running shuttle-box having a substantially vertical side, and a lip at its upper edge to partially overlap the top of the shuttle, and a lip at its under edge located at one side of said picker-stick slot, said running shuttle-box being open at its inner side toward the said slot for its discharge of the shuttle; and a wall rising from said lay at the opposite side of said slot against which one side of the shuttle is borne, a binder forming a part of one of said walls, combined with means to move said running shuttle-box into its inoperative position and place its open side above said wall whereby the shuttle is free to fall out of said box over said wall, substantially as described.

20. In a loom, the following instrumentalities, viz: a lay, a running shuttle-box carried thereby and occupying normally its inoperative position; a lever, an auxiliary shuttle-presenter actuated thereby and occupying normally its inoperative position, a shoe free to slide longitudinally with relation to the lever carrying the said auxiliary shuttle-presenter, and means to move said shoe and said running shuttle-box, the movement of the shoe in unison with the running shuttle-box causing the auxiliary shuttle-presenter to meet the forwardly-moving lay, substantially as described.

21. In a loom, the following instrumentalities, viz: a lay having a picker-stick slot in its raceway; a reed carried by said lay; a running shuttle-box open at its rear side for the passage therefrom of a shuttle to be discharged from the loom, and the wall of said shuttle-box nearest the breast-beam occupying a position parallel to the line occupied by the faces of the dents of the reed, to constitute a fixed alining-surface; a binder pivoted on said lay at the rear side of said picker-slot, and acting on the shuttle opposite it to aline it against said alining-surface, means to throw the shuttle, and means to move said running shuttle-box to elevate its open rear side above said binder, in order that the shuttle may escape therefrom over said binder, substantially as described.

ties, viz: a lay having a picker-stick slot in its raceway; a reed carried by said lay; a running shuttle-box open at its rear side for the passage therefrom of a shuttle to be discharged from the loom, and the wall of said shuttle-box nearest the breast-beam occupying a position parallel to the line occupied by the faces of the dents of the reed, to constitute a fixed alining-surface; a binder pivoted on said lay at the rear side of said picker-slot, and acting on the shuttle opposite it to aline it against said alining-surface, means to throw the shuttle, and means to move said running shuttle-box to elevate its open rear side above said binder, in order that the shuttle may escape therefrom over said binder, substantially as described.

22. A lay having a vertical slot in its raceway for the reception of a picker-stick, a vertical picker-stick, movable in said slot, a running shuttle-box having a slot in its under side for the reception of said picker-stick, and means to lift said shuttle-box, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

RANDOLPH CROMPTON.
HORACE WYMAN.

Witnesses:

CHARLES M. THAYER,
GEORGE CROMPTON.