(No Model.) 6 Sheets—Sheet 1.

# A. NEWELL.

## VENEERING PRESS.

No. 423,074. Patented Mar. 11, 1890.

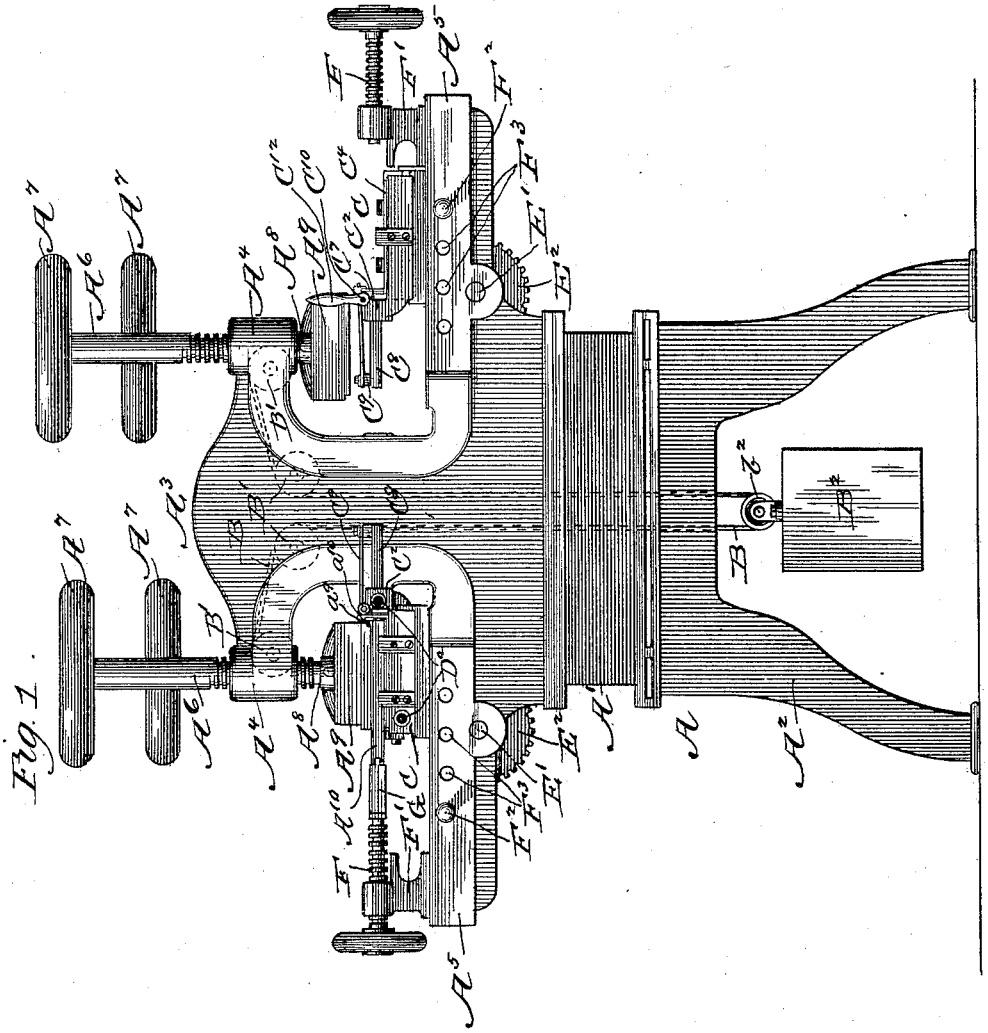

Fig. 1.

Witnesses:
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F. F. Bridgman.

Inventor:
Augustus Newell
by Cyrus A. Bach
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(No Model.) 6 Sheets—Sheet 2.

# A. NEWELL.

## VENEERING PRESS.

No. 423,074. Patented Mar. 11, 1890.

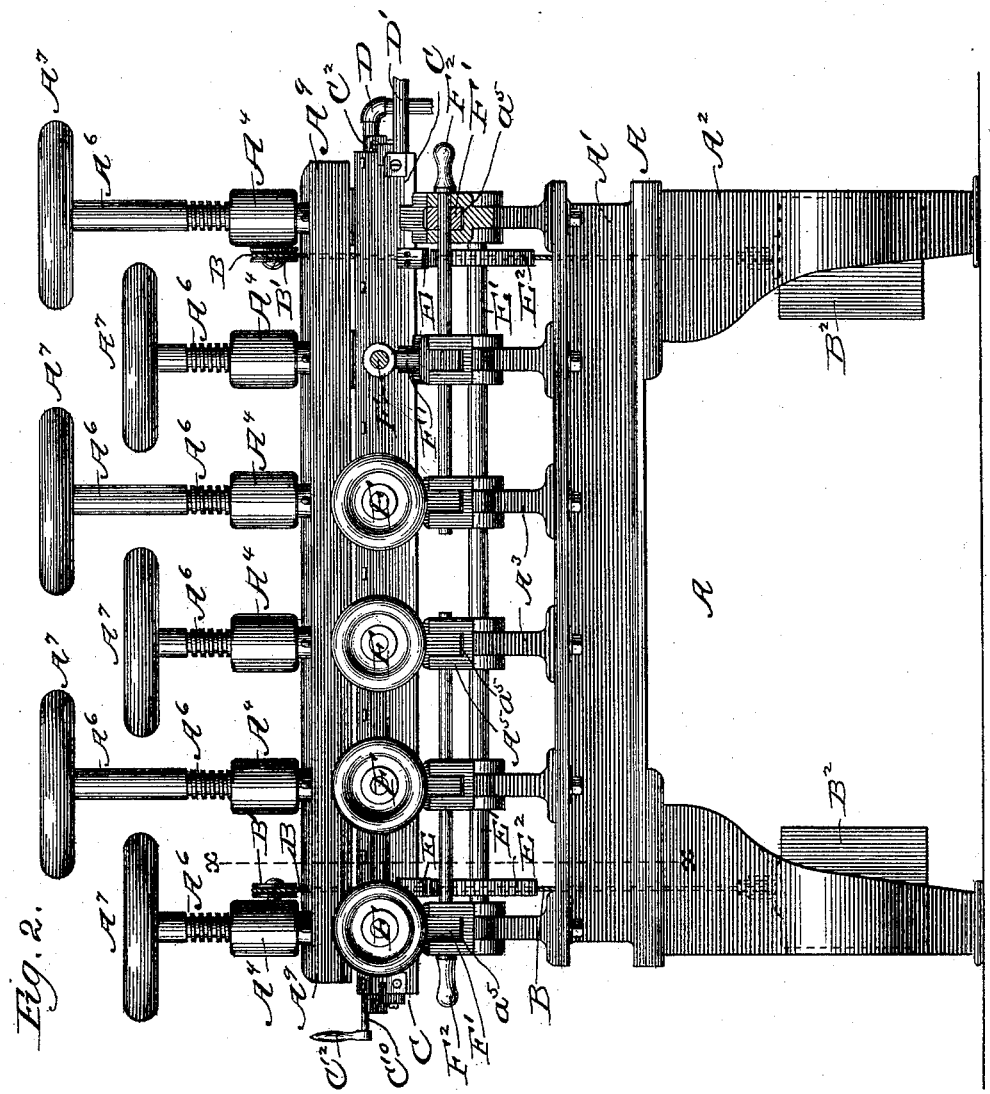

Fig. 2.

Witnesses:
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(No Model.)

6 Sheets—Sheet 3.

# A. NEWELL.

## VENEERING PRESS.

No. 423,074. Patented Mar. 11, 1890.

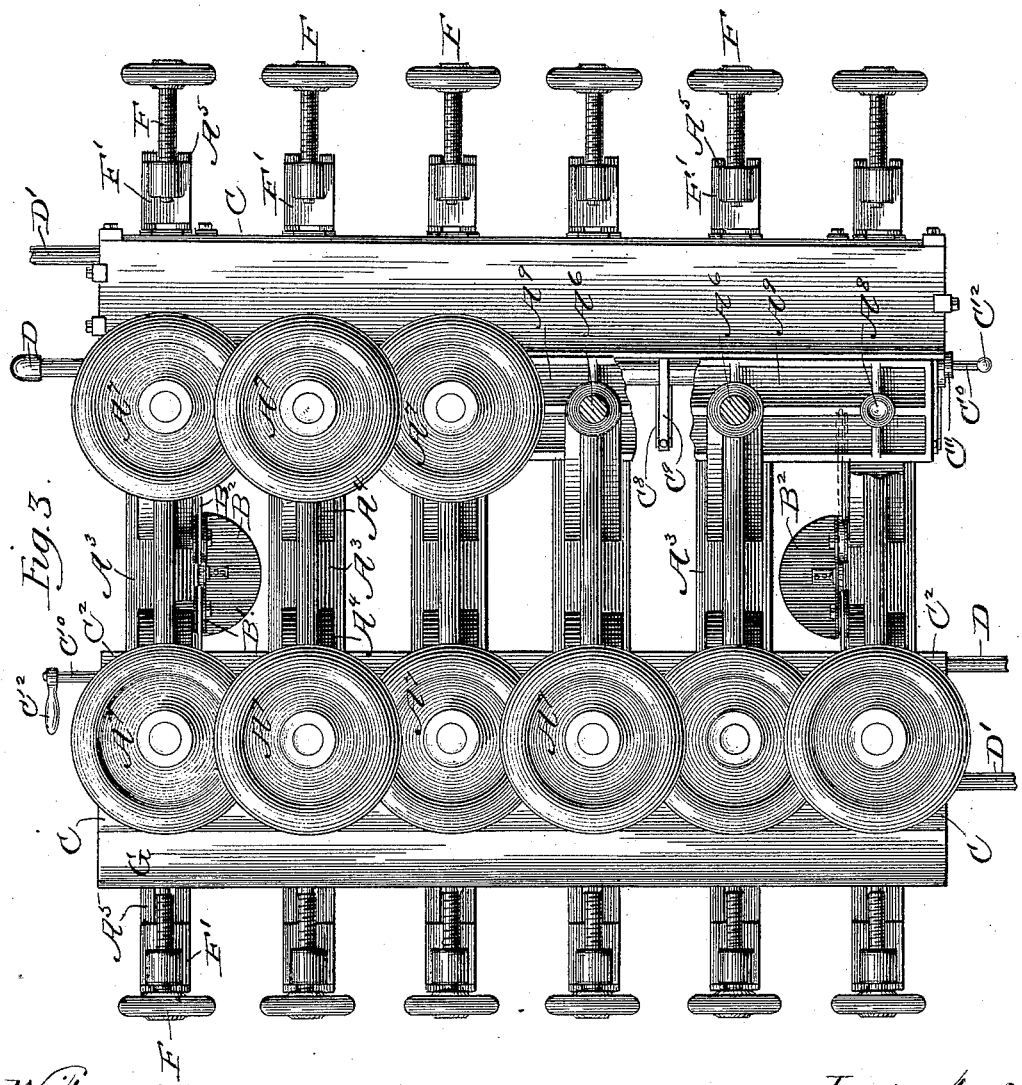

Fig. 3.

Witnesses:
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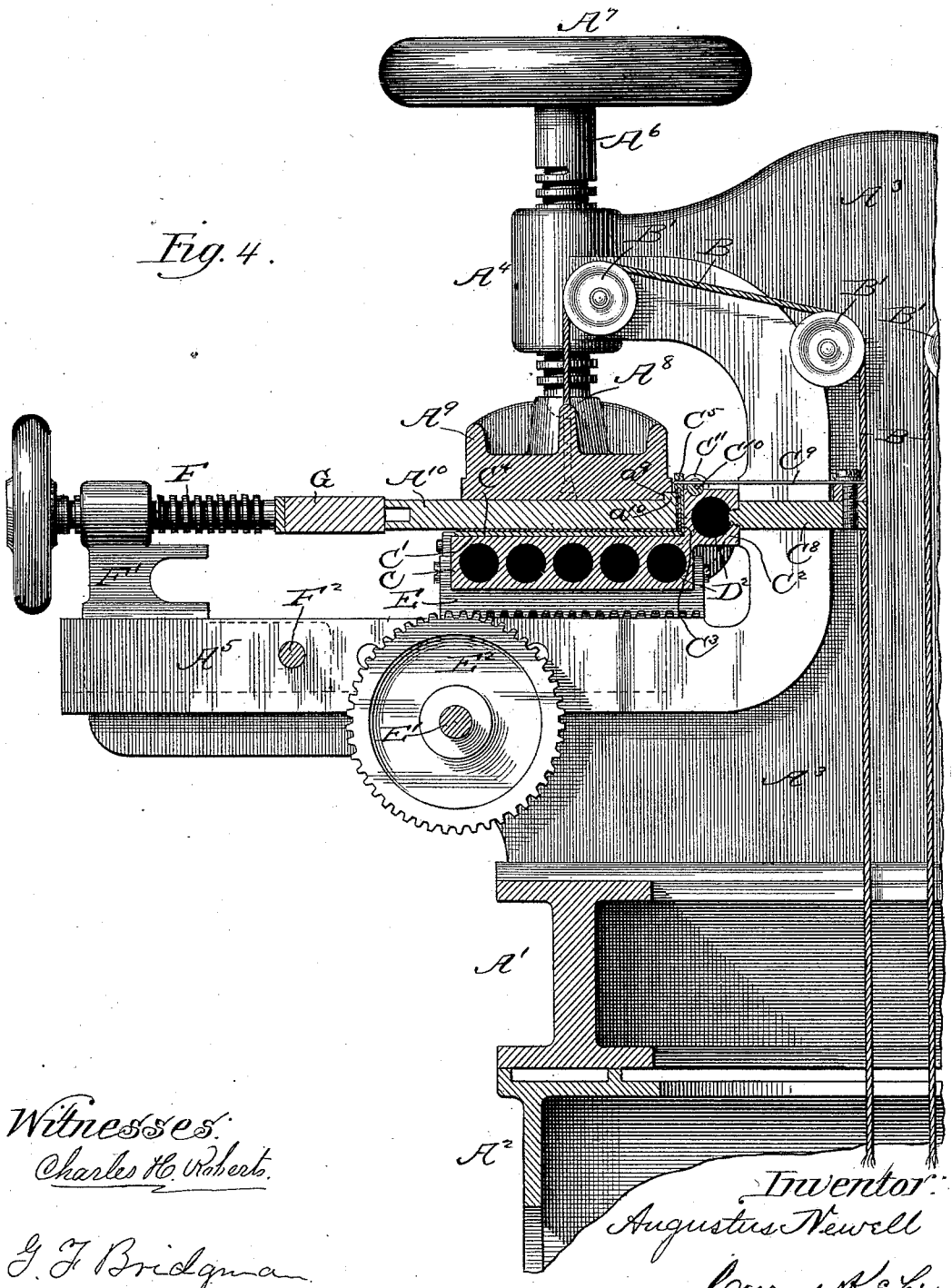
(No Model.) 6 Sheets—Sheet 4.

# A. NEWELL.

## VENEERING PRESS.

No. 423,074. Patented Mar. 11, 1890.

Fig. 4.




Witnesses.
Charles H. Roberts.
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Inventor:
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(No Model.) 6 Sheets—Sheet 5.

# A. NEWELL.

## VENEERING PRESS.

No. 423,074. Patented Mar. 11, 1890.

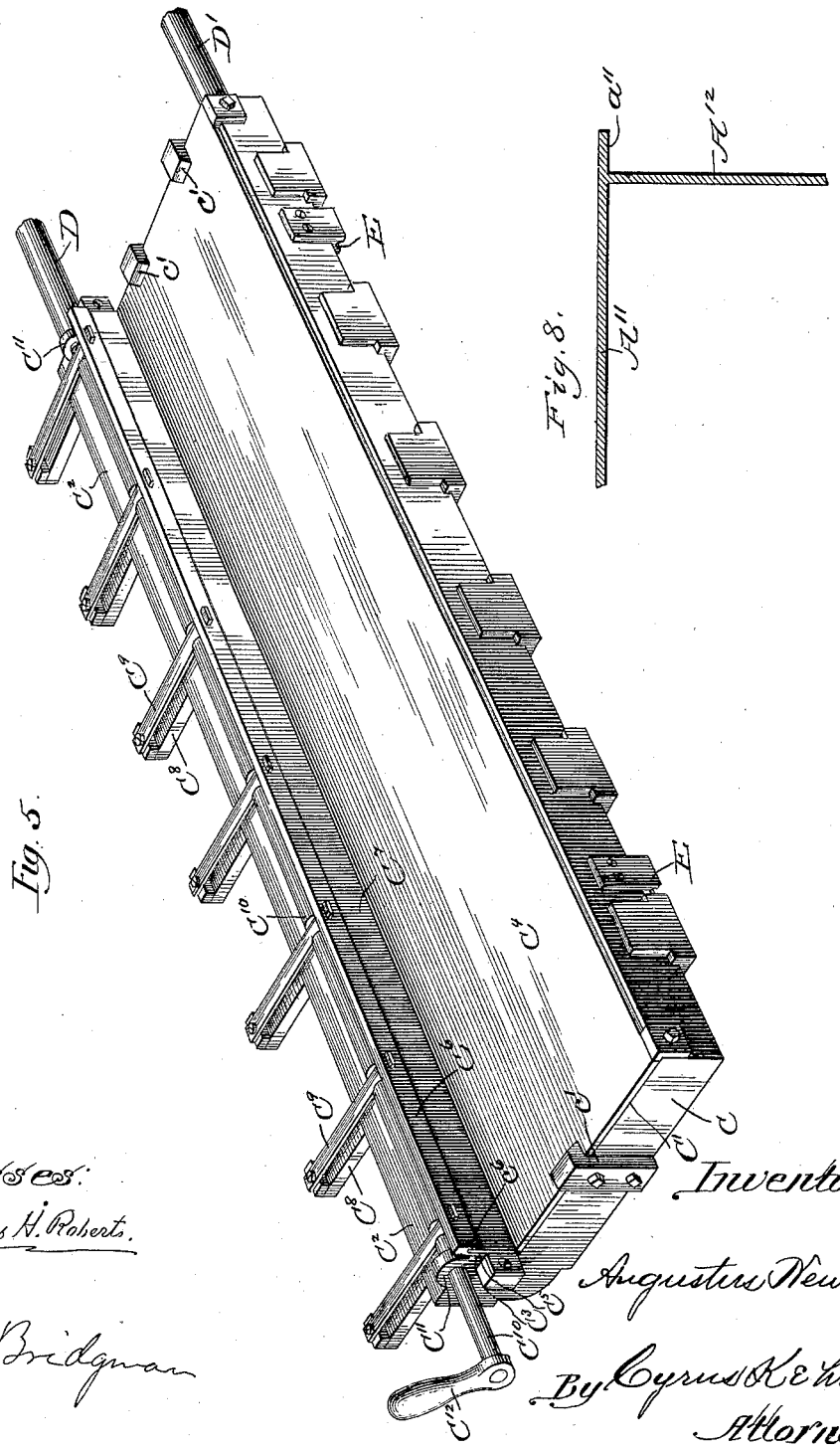

Fig. 5.



Fig. 8.

Witnesses:
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(No Model.) 6 Sheets—Sheet 6.

# A. NEWELL.

## VENEERING PRESS.

No. 423,074. Patented Mar. 11, 1890.

Fig. 6

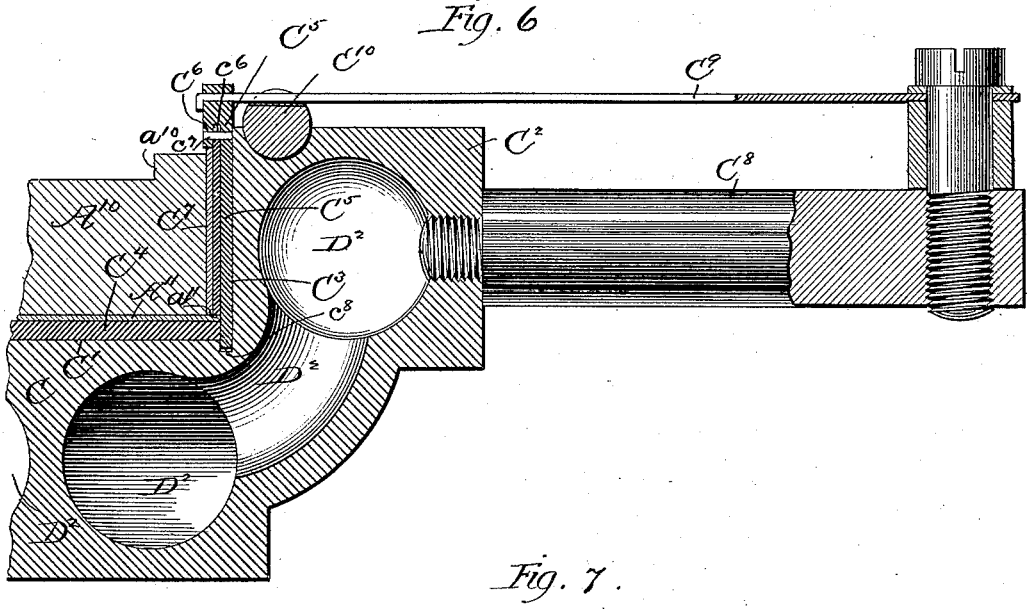
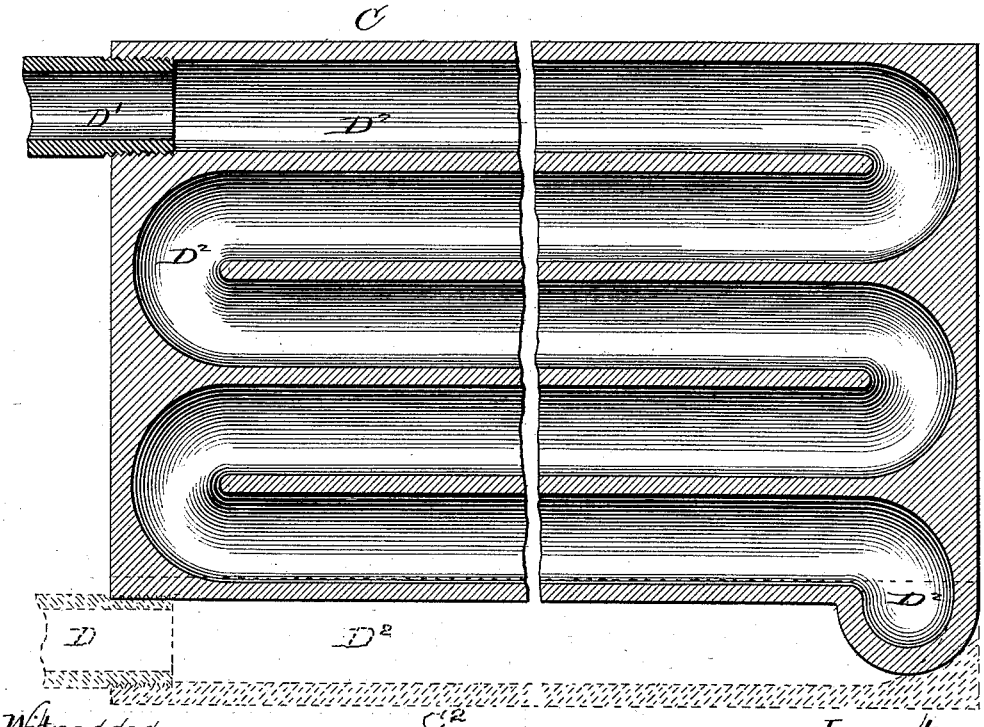



Fig. 7.




Witnesses:
Charles H. Roberts.
G. F. Bridgman

Inventor:
Augustus Newell
By Cyrus Keys,
Attorney.

# UNITED STATES PATENT OFFICE.

AUGUSTUS NEWELL, OF CHICAGO, ILLINOIS.

## VENEERING-PRESS.

SPECIFICATION forming part of Letters Patent No. 423,074, dated March 11, 1890.

Application filed August 3, 1888. Serial No. 281,905. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUSTUS NEWELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Veneering-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My improvements are applicable to presses used in veneering organ and piano key-boards and other articles, and are designed more particularly to apply to presses used in veneering organ and piano key-boards with celluloid, zylonite, chrolithium, or other similar material. I am using one of these presses in the work of applying sheets of celluloid to organ key-boards and effecting the adhesion of the celluloid to the wood by the method described in Letters Patent of the United States No. 373,001, granted to William Carl Zeidler November 8, 1887, and in another application for Letters Patent executed by me of even date herewith. Among the requirements for such work may be mentioned a uniform pressure over the portions of the key-board which are to be veneered and highly-polished hard surfaces to lie in contact with the celluloid, which surfaces may be quickly heated uniformly throughout their area and quickly cooled.

Certain features of the press described herein form the subject-matter of Letters Patent of the United States No. 300,725, granted to me June 17, 1884, for improvements in veneering-presses.

In the accompanying drawings, Figure 1 is an end elevation of my improved press. Fig. 2 is a side elevation of the same. Fig. 3 is a plan of the same. Fig. 4 is a vertical transverse section in line $x\,x$ of Fig. 2. Fig. 5 is a perspective view of the heating-plate and the polished plates. Figs. 6 and 7 are sectional views of the heating-plate and the polishing-plates, Fig. 6 being enlarged. Fig. 8 is a section of a portion of the celluloid removed from the wood after the two strips have been united.

The drawings illustrate the press in duplex form. It may, however, be made duplex or single.

In said drawings, A is a bench composed of the body A′ and the legs $A^2$, supporting said body. Upon this bench are arranged transversely and vertically a series of double clamp-arches $A^3$, each having the upper horizontal arm $A^4$ and the lower horizontal arm $A^5$. The arms $A^4$ on each side of the press are horizontally in line, and the same is true of the arms $A^5$.

In my Letters Patent No. 300,725 the bench A is not used, but each clamp-arch has its own legs, upon which it is supported independently of the other arches. In such construction it is sometimes difficult to keep all the arches in line, it being necessary to support them upon an even floor. This trouble is obviated by the use of the bench A.

A screw $A^6$ extends vertically through each arm $A^4$ and terminates at its upper end in a hand-wheel $A^7$. The alternate screws $A^6$ are made longer than the rest, in order that the hand-wheels $A^7$ may overlap and yet be far enough from each other to avoid contact when being turned up or down. By overlapping these wheels they may be made so large and heavy that they may be started by hand and caused to run to their upper or lower limit by their momentum. The lower end of each screw $A^6$ is hemispherical, and each such end rests loosely in a corresponding socket $A^8$ in a plate $A^9$, the latter being of sufficient length to extend beneath the entire series of screws, and its lower side forming the surface which is to rest against the key-board blank $A^{10}$ from above. The rear edge of the lower side of the plate $A^9$ is provided with a longitudinal groove $a^9$ of a proper width and depth to receive the lip $a^{10}$ of the key-board blank $A^{10}$. By making the ends of the screws $A^6$ hemispherical and fitting them into corresponding sockets in the plate $A^9$ the latter is allowed to oscillate and adapt itself to any slight departure from uniformity in thickness of the key-board blank, whereby the plate is prevented from pressing excessively upon one side of the key-board and insufficiently upon

the other side. In other words, by this construction the plate is caused to press evenly upon every portion of the key-board blank. Since the screws $A^6$ and plate $A^9$ are not joined to each other, the raising of said screws will not lift said plate. I have provided a counter-balance to draw upwardly on said plate and cause it to follow the screws $A^6$ when the latter ascend. A cord B, attached to the plate $A^9$ near one end of the press, extends upwardly over one or more rollers B′, and thence downwardly to a weight $B^2$. Said weight, drawing upon said cord, counterbalances one end of the plate $A^9$ and holds it against the screws $A^6$. A similar cord, roller or rollers, and weight are arranged at the other end of the plate $A^9$.

Referring to Figs. 1 and 4, it will be seen how the adjacent ends of the two plates of a duplex press may be counterbalanced by a single weight $B^2$. A single cord B may extend from one plate $A^9$ over the roller or rollers B′ toward the middle of the clamp-arch $A^3$, and thence downwardly around a roller $b^2$, attached to the weight $B^2$, thence upwardly over the other rollers B′ to the other plate $A^9$. Under this arrangement the weight $B^2$ will draw equally upon both ends of the cord B at all times, and consequently draw equally upon both plates $A^9$ whether they are raised or lowered. If one plate $A^9$ is raised or lowered while the other remains stationary, the weight $B^2$ changes its position upon the cord B to occupy the lowest point.

For the sake of convenience in operation the side of the key-board blank to which the "top strip" of celluloid (marked $A^{11}$) is to be applied is turned downward in the press and the edge (called the "front") which is to receive the "front strip" of celluloid (marked $A^{12}$) is placed inward in the press.

For the purpose of applying the pieces of celluloid to the top and front of the key-board blank at one operation by the process described by me in said other application for Letters Patent, executed of even date herewith, I have made provision in this press for simultaneously pressing against said top and front a polished surface, which may be first heated uniformly and then rapidly cooled. To this end the lower plate C has a broad horizontal upper surface C′ and at the rear an upward extension $C^2$, having at its front a surface $C^3$ continuous with the surface C′. Upon the surface C′ lies a highly-polished and even metal plate $C^4$, extending almost to the surface $C^3$. From the space between the rear edge of the plate $C^4$ and the surface $C^3$ rises a plate $C^5$, which extends a short distance above the extension $C^2$ and is thickened above to extend forward and downward to form a lip $C^6$ and channel $c^6$. Said plate $C^5$ may extend below into a channel $c^8$, formed in the plate C. From within said channel $c^6$ another polished metal plate $C^7$ extends downwardly along the plate $C^5$ almost to the plate $C^4$. Said plate $C^7$ is held in said channel $c^6$ by pins $c^7$, and the space between its lower edge and the upper surface of the plate $C^4$ is equal to the desired thickness of the lip $a^{11}$ of celluloid projecting outwardly as a continuation of the top strip $A^{11}$ of the key-board. A series of arms $C^8$ extend rearwardly from the extension $C^2$ a few inches, and from the rear end of each such arm $C^8$ a spring $C^9$ extends forward and has its front end joined to the upper edge of the plate $C^5$ by extending through the latter or otherwise. Immediately behind the plate $C^5$ an eccentric rock-shaft $C^{10}$ lies beneath the springs $C^9$. Said shaft is held in place in bearings $C^{11}$, Fig. 5, or merely in grooves in the arms $C^8$. One of the ends of said rock-shaft is provided with a handle $C^{12}$, by which it may be rocked. By rocking said shaft all the springs $C^9$ are crowded upwardly a little, and the plates $C^5$ and $C^7$ are raised sufficiently to allow the rear edge of the top strip $A^{11}$ of celluloid to be inserted beneath the lower edge of said plate $C^7$. The relative size of the parts should be such as that the plate $C^5$ will not be raised sufficiently to allow its lower edge to escape from behind the plate $C^4$, nor from the channel $c^8$ when the latter is used. The plate $C^4$ may be retained in place upon the plate C by blocks c′. To provide for the heating and cooling of the polished surfaces, said plate C is made hollow to receive first steam and afterward cold water.

D is a pipe for the induction, and D′ a pipe for the eduction, of steam and water. In hollowing said plate C, I prefer to extend a passage $D^2$ lengthwise through said plate from the front edge back and forth, as shown in Fig. 7, thence transversely upward into one end of the extension $C^2$, thence lengthwise through said extension, and out at the opposite end, the pipes D and D′ being tapped into the ending and beginning, respectively, of said passage. The steam or water entering the pipe D passes first through the extension $C^2$ and thence through every portion of the body of the plate and out through the pipe D′. The pipe D communicates with other pipes (not shown) leading to sources of steam and water supply, which are provided with suitable valves, whereby the steam and water may be turned on or off at pleasure. The pipe D′ is continued as a waste and exhaust pipe for conducting the steam and water escaping from the plate C out of the room or building.

The plate C may be fixed immovably upon the arms $A^5$, directly beneath the plate $A^9$; but for convenience in operation I have provided for the shifting of said plate forward upon the arms $A^5$, in which position the pieces of celluloid and the key-board blank to which they are to be attached and the adhesive which is to produce the adhesion may all be put in place. The plate, with its work, is then returned to its position beneath the plate $A^9$.

In shifting the plate C it is important that it be kept parallel. For this purpose I attach a toothed rack E to the lower surface of the

plate C, at each end of the latter, and I extend a stationary rotary shaft E′ horizontally through the arms $A^5$, parallel to said plate C, and mount upon each end of said shaft a spur-wheel $E^2$, which is of sufficient diameter to mesh with the rack E. The wheels $E^2$, being mounted upon the same shaft E, must rotate in unison. Consequently the racks E and the ends of the plate C must also move in unison, the result being that the plate shifts parallel. To allow for this shifting of the plate C, the pipes continued from the pipes D and D′ may be suitably hinged or provided with sections of hose.

Since, as above stated, the operation requires pressure against the front strip $A^{12}$ of celluloid, as well as against the top strip $A^{11}$, I provide another series of screws F, extending inwardly in the horizontal plane in which the key-board lies when in the press. Said screws bear against the outer edge of the key-board blank $A^{10}$ and force it against the front strip $A^{12}$, whereby the latter is in turn forced against the polished plate $C^7$.

To adapt the press to receive key-boards of different widths, it is desirable that the seats of the screws F be adjustable. To this end I have formed a channel $a^5$ into the upper face of each arm $A^5$, and have loosely fitted into each such channel a chair F′, which latter supports the screw F. Said chair may be shifted back and forth in said channel and secured in any one of several positions by a transverse pin $F^2$, extending through one of the holes $F^3$ in the arm $A^5$. A board G may be interposed between the screws F and the key-board $A^{10}$ to prevent said screws from indenting the edge of the key-board.

The operation is as follows: The steam and water being both turned off and the screws $A^6$ being all raised, and the plate $A^9$ raised by the weights $B^2$, and the screws F being retracted and the plate C shifted forward from beneath the plate $A^9$, and the plates $A^5$ and $A^7$ being raised by the rocking of the shaft $C^{10}$, the top strip of celluloid $A^{11}$ is laid upon the polished plate $C^4$, with its rear edge extending beneath the polished plate $C^7$ and against the plate $C^5$. The front strip $A^{12}$ is then placed against the polished plate $C^7$, its lower edge resting upon the other sheet of celluloid. The shaft $C^{10}$ is now turned and the plates $C^5$ and $C^7$ let down, so that the lip $C^6$ will be pressed with considerable force down upon the front strip $A^{12}$ by the springs $C^9$. By means of a brush an adhesive containing a latent solvent of celluloid, as described in said Letters Patent to William Carl Zeidler, is now applied to the exposed surface of the celluloid, or the adhesive may be applied to the surface of the key-board blank. The key-board blank $A^{10}$ is next placed with its top down against the top sheet of celluloid and its front against the front strip of celluloid. The plate C, with the work, is now shifted rearwardly beneath the plate $A^9$, the screws F driven inward against the key-board blank, and the screws $A^6$ driven downward, so as to force the plate $A^9$ upon the key-board blank. By this means both pieces of celluloid are simultaneously pressed closely against the wood of the key-board blank, and the adhesive is caused to penetrate and incorporate itself with the fiber of the wood and to enter the joint between the two strips of celluloid, and the outer faces of both pieces of celluloid are simultaneously brought into close contact with the polished-metal surfaces while the lower edge of the front strip of celluloid is being forced into close contact with the upper face of the top strip of celluloid. Steam is now turned on from the source of steam-supply and allowed to fill every portion of the plate C, including its extension $C^2$. Thus said plate is quickly heated and heat transmitted therefrom to the plates $C^4$ and $C^7$, whereby the celluloid is softened and made to conform to the polished surface of the plates $C^4$ and $C^7$, and the alcohol in the adhesive is rendered fully active, so that it will soften or liquefy the adjacent surface of the celluloid to a sufficient degree to establish a continuity or union between said adhesive and said celluloid, and whereby the excess of alcohol is finally dissipated and the adhesive and the celluloid reduced to a form in which they will solidify under ordinary temperature—that is to say, when the heat is withdrawn and the adhesive, the celluloid, and the wood allowed to cool. In the joint between the strips $A^{11}$ and $A^{12}$ the adhesive thus rendered active by the heat softens or liquefies both of the meeting surfaces of the celluloid, so that, aided by the pressure of the springs $C^9$, a continuity is established between the two strips of celluloid and they become virtually one piece. In other words, the two pieces may be said to be welded together.

In forcibly tearing the celluloid from the board when taken from the press the two strips adhere to each other, and a section cut through the two strips shows a continuous mass of celluloid. This is illustrated in Fig. 8. By repeated experiment I have found that this union cannot be effected without bringing the two strips into very close contact. I therefore cut the strip $A^{12}$ in a machine which will make it of uniform width and strictly straight, and then press said strip upon the strip $A^{11}$. The strip $A^{12}$ would, when softened by the heat, bend in response to the pressure of the springs $C^9$ were it free to do so; but the plate $C^7$ retains it at the side.

When it is desired to make the lip $a^{11}$ thicker than the body of the strip $A^{11}$, the plate $C^7$ is set at such height that its lower edge will not quite reach the edge of the strip forming said lip. Then, when heat and pressure are applied, the softened celluloid will be pressed into the space beneath the lower edge of the plate $C^7$. Thus the two pieces are united and the lip $a^{11}$ is thickened at one operation. The steam is now turned off and

the cold water turned on and allowed to run through the plate C, whereby the latter and the plates $C^4$ and $C^7$ are cooled. The cooling of said plates cools the celluloid, the adhesive, and the wood, and entirely overcomes the softening action of the heat, the ordinary constituents of the celluloid being hardened and the small portion of alcohol remaining being rendered latent or non-solvent.

In the operation the channel $c^8$ retains the lower edge of the plate $C^5$ and prevents it from being drawn forward and bent by the withdrawal of the key-board, when, as is occasionally the case, a little of the adhesive has been pressed through the joint between the strips of celluloid and adheres to the plate $C^5$.

Believing that by illustrating the operation of my press in the application of a celluloid veneer to key-board blanks it will be understood how to use the press generally for veneering, I deem it unnecessary to illustrate the use of the press further.

It will be understood that some features of my press may be modified without changing the principles involved, and that some features may be dispensed with without foregoing the uses and benefits of remaining features. For example, means other than the cords and weights shown in the drawings may be substituted for automatically lifting the plates $A^9$. A separate weight and cord might be substituted for each plate; or such plates are not necessarily provided with means for raising them automatically. For some kinds of work they will be so short and thin when made of metal as to be light enough to be taken out of and returned into the press by hand. For some kinds of work these plates may be made of wood, in which case they could easily be handled by the operator.

I claim as my invention—

1. In a veneering-press, the combination of the horizontal arms $A^4$, arranged in line, a plate $A^9$, arranged beneath said arms, and screws $A^6$, extending upwardly from said plate through said arms to unequal heights and having at their upper ends overlapping hand-wheels $A^7$, substantially as shown and described.

2. The combination, with the duplex clamp-arches supported in line and having at each side the horizontal arms $A^4$ and $A^5$, screws $A^6$, extending through said arms $A^4$ toward the arms $A^5$, and plates $A^9$, extending beneath said screws, of a cord B, applied to each end of one of the plates $A^9$ and extended over one or more rollers B′, thence down toward the floor, thence up and over one or more rollers B′ to the adjacent end of the other plate $A^9$, and a weight $B^2$, suspended from the lower portion of said cord in such manner as that said weight may shift upon said cord, substantially as and for the purposes set forth.

3. In a press, a series of screws arranged in line, two plates opposite the ends of said screws, one of said plates having an upward extension directed toward the other plate, and a series of horizontal screws opposite said extension and in a plane passing between said plates and through said extension of one of the plates, substantially as shown and described.

4. In a press, a series of screws arranged in line, two plates opposite the ends of said screws, one of said plates being hollow and having a hollow upward extension directed toward the other plate, and a series of horizontal screws opposite said extension and in a plane passing between said plates and through said extension of one of the plates, substantially as shown and described.

5. In a press having the horizontal arms $A^4$ and $A^5$, the combination, with said arms, of screws $A^6$, extending downwardly through said arms $A^4$, a plate $A^9$, extending beneath said screws, a plate C, located on the arms $A^5$ beneath the plate $A^9$ and having the upward extension $C^2$ at its rear, and the horizontal screws F, supported by the arms $A^5$ and directed toward the extension $C^2$ of the plate C, substantially as shown and described.

6. In a press having the horizontal arms $A^4$ and $A^5$, the combination, with said arms, of screws $A^6$, extending downwardly through said arms $A^4$, a plate $A^9$, extending beneath said screws, a plate C, located upon the arms $A^5$ beneath the plate $A^9$ and arranged to be moved forward upon said arms $A^5$, and having the hollow upward extension $C^2$ at its rear, and the horizontal screws F, supported by the arms $A^5$ and directed toward the extension $C^2$ of the plate C, substantially as described.

7. In a press having the horizontal arms $A^4$ and $A^5$, the combination, with said arms, of screws $A^6$, extending downwardly through said arms $A^4$, a plate $A^9$, extending beneath said screws, a plate C, located upon the arms $A^5$ beneath the plate $A^9$ and having the upward extension $C^2$ at its rear, and the horizontal screws F, directed toward the extension $C^2$, and chairs F′, through which such screws extend, seated adjustably upon the arms $A^5$, substantially as shown and described.

8. In a press having the horizontal arms $A^4$ and $A^5$, the combination, with said arms, of screws $A^6$, extending downwardly through said arms $A^4$, a plate $A^9$, extending beneath said screws, a plate C, located loosely upon said arms $A^5$, a rack E, applied to the bottom of the plate C at each end, a stationary rotary shaft E′, extending beneath the plate C, and a spur-wheel $E^2$, fixed upon said shaft E′ beneath each rack E and meshing into the latter, substantially as and for the purposes set forth.

9. In a press having the horizontal arms $A^4$ and $A^5$, the combination, with said arms, of screws $A^6$, extending downwardly through said arms $A^4$, a plate $A^9$, extending beneath said screws, a plate C, located loosely upon said arms $A^5$ and having the upward extension $C^2$ at its rear, a rack E, applied to the bottom of the plate C at each end, a stationary rotary shaft

E′, extending beneath the plate C, a spur-wheel $E^2$, fixed upon said shaft E′ beneath each rack E and meshing into the latter, and the horizontal screws F, supported by the outer ends of the arms $A^5$ and directed toward said extension $C^2$, substantially as and for the purposes set forth,

10. In a veneering-press having the arms $A^4$ and $A^5$ and downwardly-directed screws $A^6$, supported by said arms $A^4$, and horizontal screws F, supported by said arms $A^5$, the combination, with said arms and screws, of a plate $A^9$, extending beneath the screws $A^6$, and a hollow plate C, located beneath the plate $A^9$ and having the hollow upward extension $C^2$ at its rear communicating with the main portion of said plate, and a pipe D leading into and a pipe D′ leading from the interior of said plate, substantially as shown and described.

11. In a veneering-press having the arms $A^4$ and $A^5$ and downwardly-directed screws $A^6$, supported by said arms $A^4$, and horizontal screws F, supported by said arms $A^5$, the combination, with said arms and screws, of a plate $A^9$, extending beneath the screws $A^6$, and a plate C, having the upward extension $C^2$ at its rear, and a passage $D^2$, leading back and forth through the horizontal portion of said plate and thence into and longitudinally through the extension $C^2$, and induction and eduction pipes D and D′, substantially as shown and described.

12. The combination with the plate C, having the horizontal surface and an upward extension at the rear with a vertical inner surface, of a plate lying against the inner surface of said extension and adapted to be raised to allow one edge of a sheet of veneer to enter beneath said plate, substantially as herein set forth.

13. The combination, with the hollow plate C, having the horizontal surface C′ and a hollow upward extension $C^2$, which latter has a vertical inner surface $C^3$, of a polished plate $C^4$ lying upon the surface C′, and a polished plate $C^7$, resting against the extension $C^2$ and arranged to be raised to allow one edge of a sheet of veneer to enter beneath said plate, substantially as herein set forth.

14. The combination, with the hollow plate C, having the horizontal surface C′ and the vertical surface $C^3$, of a polished plate $C^4$, lying upon the surface C′, a plate $C^5$, extending from behind the rear edge of the polished plate $C^4$ upwardly along the surface $C^3$ and supporting a polished plate $C^7$, extending down to rest above the inner edge of the horizontal strip of veneer, and having a projecting lip to rest upon the upper edge of the vertical strip of veneer, and a spring or equivalent device for pressing said lip downwardly, substantially as and for the purposes described.

15. The combination, with the hollow plate C, having the horizontal surface C′ and the vertical surface $C^3$, of a polished plate $C^4$, lying upon said horizontal surface, the vertical plate $C^5$, extending behind the edge of the plate $C^4$ and bearing the polished plate $C^7$, extending downwardly almost to the plate $C^4$, and a lip to rest upon the upper edge of the vertical strip of veneer, springs or equivalent device to press down upon said plates and lip, and a rock-shaft for controlling said springs, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTUS NEWELL.

Witnesses:

SAMUEL DESPRES,

CYRUS KEHR.