3 Sheets--Sheet 1.

R. EICKEMEYER.

Machine for Shaping and Blocking Hats.

No. 167,083. Patented Aug. 24, 1875.

Fig. 1.

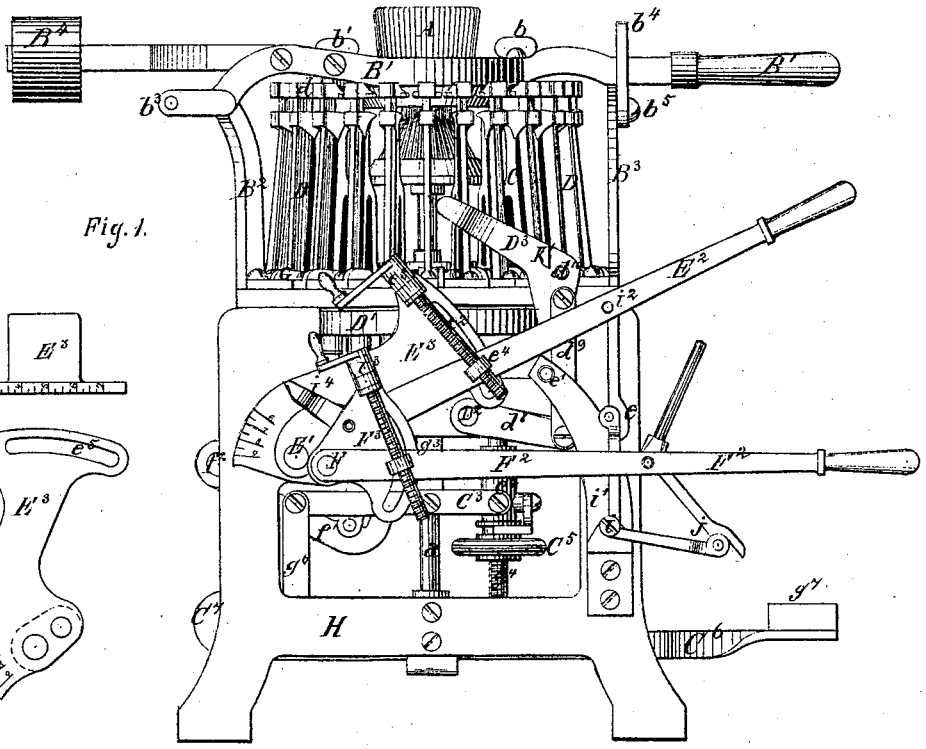


Fig. 2.

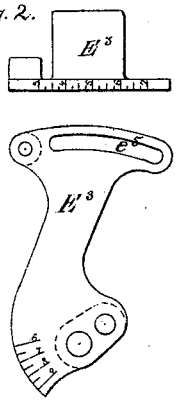
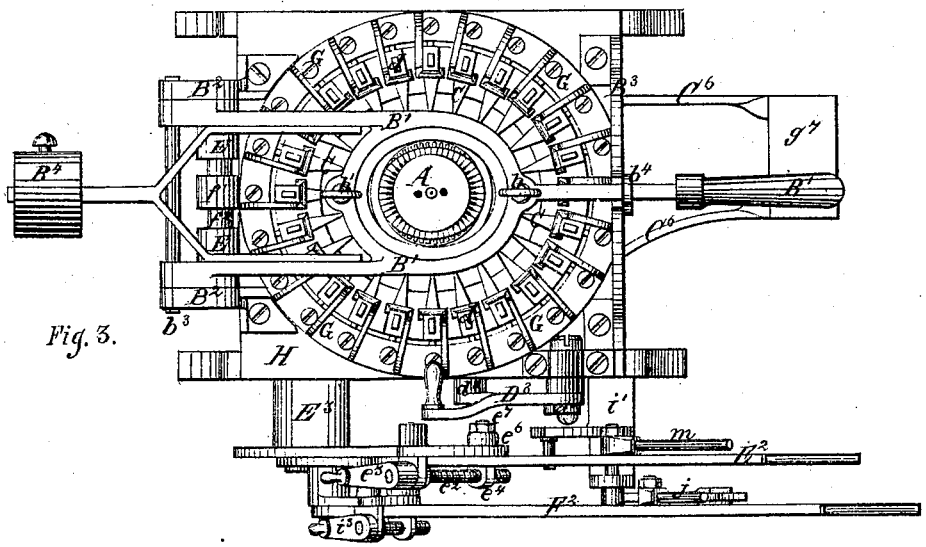


Fig. 3.



Witnesses.

Philip F. Larner

A. B. Cauldwell

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Fig. 4.

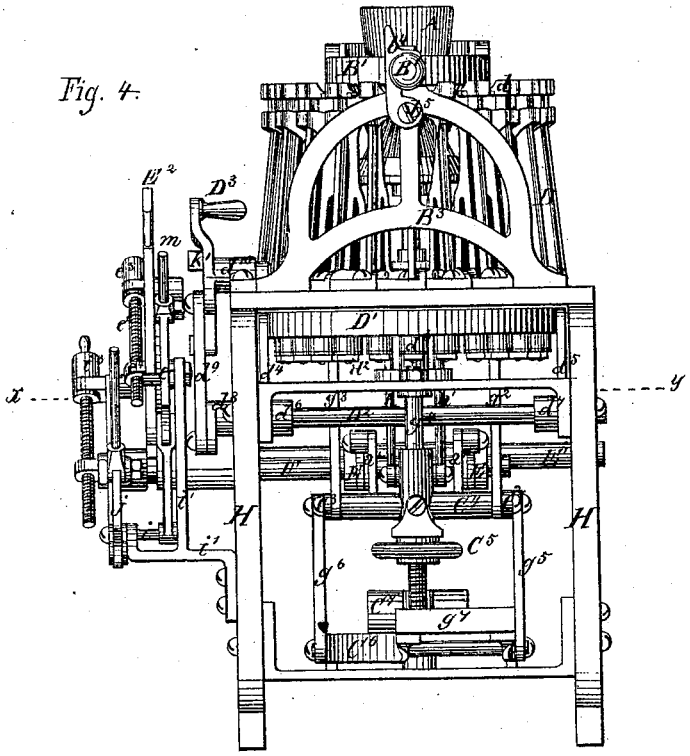
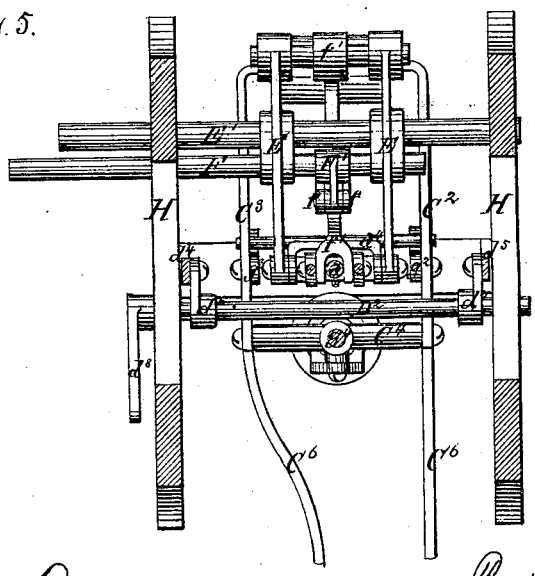


Fig. 5.



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3 Sheets--Sheet 3.

R. EICKEMEYER.

Machine for Shaping and Blocking Hats.

No. 167,083. Patented Aug. 24, 1875.

Fig. 6.

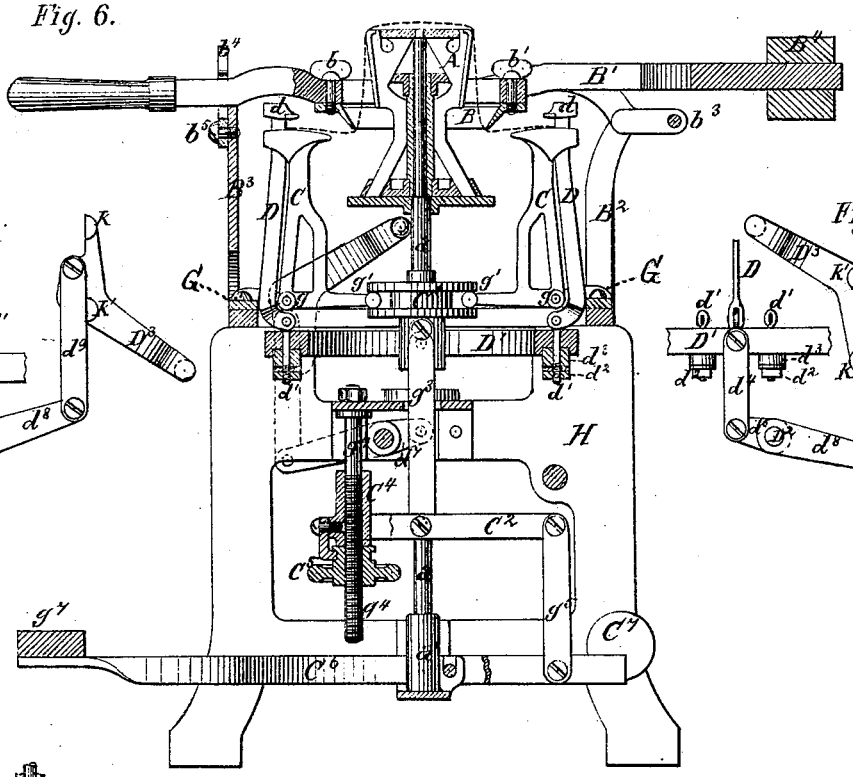


Fig. 8.

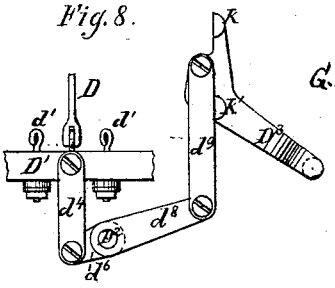


Fig. 7.

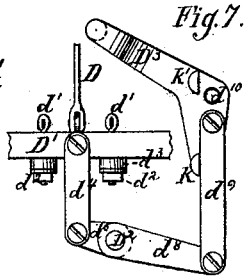


Fig. 9.

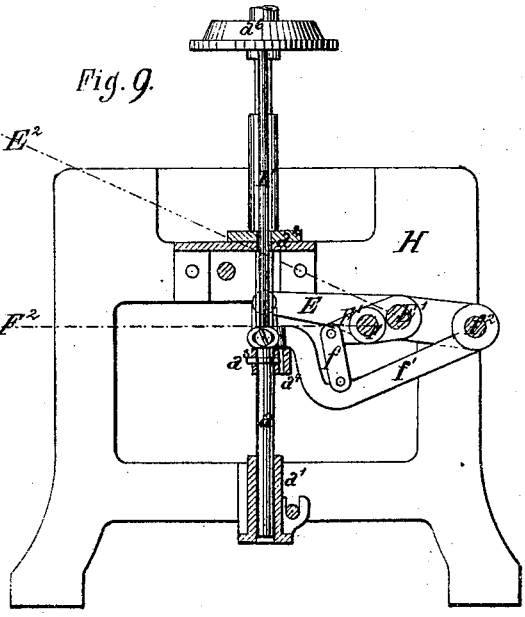


Fig. 10.

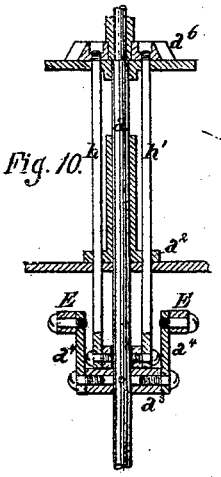
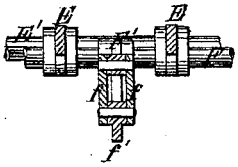


Fig. 11.



Witnesses.

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UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

IMPROVEMENT IN MACHINES FOR SHAPING AND BLOCKING HATS.

Specification forming part of Letters Patent No. **167,083**, dated August 24, 1875; application filed July 6, 1875.

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machine for Shaping and Blocking Hats; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, is a clear and exact description thereof.

My invention relates to that class of machines which are designed to give the hat-body its proper shape, and more particularly to develop or form what is known in the trade as the "band" of the hat, after the tip and brim have been stretched out flat with machinery or by hand. All machines of this class embody a hat-block, a clamp or tongs for holding the brim, and a banding-ring.

As heretofore constructed the hat-block has been capable of a vertical movement, and one feature of my present invention relates to the means employed in this connection; and it consists in the combination, with the hat-block mounted on a spindle, of lifting mechanism composed of a cross-head, links, double levers, a rock-shaft, and a hand-lever, whereby the block may be readily elevated and the co-operative mechanism necessary in such machines conveniently combined therewith; and, further, in the combination of the hat-block, its slide, and its lifting mechanism with adjusting mechanism and a scale or gage, whereby the operative is enabled to properly set the lifting mechanism for raising the block to the exact point desired.

My invention also consists in the combination, with mechanism for expanding an expansible hat-block and the mechanism for lifting the hat-block, of a rock-shaft, whereby the lifting and expanding mechanism are always maintained in the same positions with relation to each other, regardless of their positions with relation to other portions of the machine.

Another feature of my invention consists in the combination, with the hat-block-expanding mechanism, of a gage and adjusting mechanism, whereby the operative may readily adapt the block for blocking hats of different sizes.

In Letters Patent No. 141,338, issued to me July 29, 1873, I show a gage in combination with an expansible hat-block, which is provided with a sliding gage-block, a set-screw, and a hook for retaining the expanding-lever at any required point. In my present machine there is, in combination with the gage, an adjusting mechanism which directly controls the expanding-lever, and which, when the expanding hand-lever is stationary, can directly act upon the hat-block in expanding or contracting it.

My invention also consists in the combination, with the hat-block and its lifting mechanism, of stretching tongs, controlled by outstretching levers and a cross-head, and rendered adjustable in their outstretching movement by a hand-wheel nut and a stationary screw, whereby the hat may be clamped and centered before the hat-block is lifted.

Another feature of my invention consists in stretching-tongs, composed of numerous upper and lower jaws, which are capable of being opened, closed, and clamped upon the brim of the hat independently of the outstretching mechanism, in combination with a controlling-ring for outstretching, and an adjusting-screw, whereby the tongs may be closed on brims of various widths, and at the extreme edges thereof, independently of the outstretching mechanism or the banding-ring. In machines of this class, as heretofore constructed, the clamping of the tongs upon the brim has been effected either by the movement of the outstretching mechanism or by compression of the banding-ring.

Another portion of my invention consists in outstretching-tongs composed of a series of vertically-sliding short upper jaws, and vertically-stationary long lower jaws, whereby an extended foundation is afforded by the upper surfaces of the lower jaws, on which the brim of the hat is supported while being properly centered, and also whereby the edge of the brim is conducted directly along the surfaces of the under jaws into the spaces beneath the short upper jaws preparatory to being clamped in the tongs.

Another feature of my invention consists in the combination, with vertically-moving clamping-jaws, (of the tongs,) of a clamping

ring and levers, whereby the jaws may be simultaneously made to clamp or release the brim of a hat independently of the outstretching mechanism, and without the co-operation of the banding-ring or its lever.

Another feature of my invention consists in the combination, with said clamping-ring, of a hand-lever, which is, by means of a link and stops, so arranged that whether the jaws be opened or closed they may be securely maintained in such position.

My invention also consists in the combination, with the clamping ring and jaws, of eye-bolts and springs, so that said springs enable the jaws to properly close on the brim of a hat, whether it be thick or thin.

And, still further, my invention consists in the combination, with the several jaws composing the tongs, of a controlling-ring actuated by a lever, whereby said jaws, whether open or closed, may be moved outward and inward simultaneously.

To more fully describe my invention, I will refer to the accompanying three sheets of drawings, in which—

Figure 1, Sheet 1, represents a side view of the machine. Fig. 2, Sheet 1, represents two views of a segmental lever detached from the machine, showing the scales by which the block is adjusted. Fig. 3, Sheet 1, a top view of the machine. Fig. 4, Sheet 2, a front view. Fig. 5, Sheet 2, represents a top view of the machine in section, the upper parts being removed from line *x y*, Fig. 4. Fig. 6, Sheet 2, represents the machine in central vertical section, parts being removed. Figs. 7 and 8, Sheet 3, represent a part of the brim-clamping mechanism detached from the machine. Fig. 9, Sheet 3, represents a vertical section with parts of the machinery removed, and illustrates the rock-shaft and its connections. Figs. 10 and 11, Sheet 3, represent vertical sections detached, illustrating a portion of the hat-block elevating and expanding mechanism, and the rock-shaft through which these movements are effected; also illustrating the rock-shaft, and the hat-block lifting and expanding mechanism.

The expansible block shown in the drawings, and used in connection with the other elements in the machine, is fully described in the Patent No. 141,338 for improvement in expansible hat-blocks, granted to me on the 29th day of July, 1873; but I do not intend to confine myself to that particular construction of an expansible hat-block, as, although the block shown has so far proved superior to any known to me, yet other forms may be substituted for it.

The parts of the machine operating directly upon the hat are the expansible hat-block A, which shapes the tip and side crown of the hat, the banding-ring B, which operates to form or shape the band of the hat, and the outstretching-tongs C, which clamp and draw out the brim. All of these parts are connected with the main frame H of the machine, or the top plate or cross-pieces which form part of this frame. The expanding-block A, which is fully described in my patent dated July 29, 1873, is mounted upon the upright rod or spindle *a*, which constitutes a slide provided with suitable bearings a^1 a^2, formed in the cross-pieces of the main frame. As seen in Fig. 9, to this hat-block slide or spindle *a* the cross-head a^3 is fastened, which cross-head is connected by suitable screws to link a^4 and the levers E, as seen in Fig. 10. These levers E are fastened to the rock-shaft E^1, which has its bearings in the main frame, and is provided with the lever E^2 on its outer end, in such a manner that the raising and lowering of the lever E^2 will cause the spindle *a* with the hat-block A to be raised or lowered. To the outer end of the shaft E^1 an arm, E^3, (shown detached from the machine in Fig. 2,) is fastened, while the lever E^2 is loosely fitted to the end of the rock-shaft, and is limited in its upward movement, and maintained in position when elevated, by a toggle-joint, *e*, and is limited in its downward movement by a stud, e^1, on a bracket, i^1. The toggle-joint *e* is hinged to a screw-bolt, *i*, in the bracket i^1, which is fastened with suitable screws to the main frame, and by another screw-bolt, i^2, to the lever E^2. When the lever E^2 is raised to its highest position, the toggle-levers, being in a straight line, will hold the lever in that position. The upper end of the toggle-joint is provided with a round handle, as at *m*, so placed that it can be readily reached by the hand of the operator when he grasps the lever E^2 to lower it. A slight lift on this handle will throw the toggle-joint out of line, and permit the lever E^2 to be lowered until it rests upon the stud. The screw e^2 has a crank-handle, e^3, and is fitted at its upper end into a collar projecting from the side of the segmental lever E^3. Its lower end is screwed in the nut e^4, which is secured to and projects from the side of the hand-lever E^2. This nut is in the form of an eyebolt, and its shank projects through a segmental slot, e^5, in the lever E^3, and is provided with rubber spring e^6 and a nut, e^7, by means of which the inner side of the hand-lever E^2 is pressed against the front face of the lever E^3, as shown in Fig. 3.

When it is desired to change the position of the block relatively to the other parts of the machine, the screw e^2 is turned, and the position of the lever E^3 is thus changed. To lower the block, the screw is turned so as to lower the outer end of the lever E^3, and turned in the opposite direction to raise it. The height of the upper surface or top of the block above the lower edge of the banding-ring B determines the height of the crown of the hat, and as the hand-lever E^2 is at its highest position when the shaping of the hat is completed, it is only necessary to regulate the position of the lever E^3 by the screw e^2 relatively to the hand-lever E^2, according to the scale or gage-lines marked on the front edge of lever E^3, as seen in Fig. 2.

The lever E^3 and double lever E on the shaft E^1 form the bearing for the rock-shaft F, which has a short lever, F^1, connected by links f to the lever f^1, which is also pivoted at one end, as at f^2, to the levers E, and at its other end connected, by suitable screws, with the two rods h and h'. These rods are screwed into the expanding-plate a^6 of the expansible hat-block.

As clearly shown in detail in Figs. 9, 10, and 11, these rods, the expanding-plate, and an actuating-lever constitute an expanding mechanism suitable for an expansible block of the character described. The outer end of the shaft F is connected in a manner similar to that of the rock-shaft E^1 with a segmental lever, F^3, and, with a set-screw and nut, to another hand-lever, F^2. The lever F^2 is provided with a toggle-joint, j, constructed like a toggle-joint, e, of the lever E^2, and pivoted to the screw-bolt i in the bracket i^1, to which the toggle-joint e is pivoted, as shown in Fig. 1. A pointer, i^4, is fastened to the segmental lever, F^3, and a size scale or gage on the front face of the segmental lever E^3, as seen in detail in Fig. 2, is graduated to indicate the largest diameter of the hat-block, when both hand-levers are held by the toggle-joint levers in their highest positions.

To adjust the expansible hat-block to a given size, both hand-levers are raised to their full height. The segmental lever E^3 is now moved by the set-screw e^2 until the mark on the scale on its front edge, indicating the height of the hat to be shaped, is in a line with the upper edge of the hand-lever E^2. The segmental lever F^3 is adjusted in the same manner until the pointer i^4 indicates on the gage on front face of lever E^3 the desired diameter of the hat.

To facilitate the adjustment of the block still more, I have made the segmental levers E^3 and F^3 in such proportions that one-half of a turn of the handle e^3 will vary the height of the block one size, and one turn of the handle i^3 in the same direction will vary the diameter of the block one size.

After the operator has adjusted the block for the largest hat in a dozen by the scales on the segmental lever E^3, and has finished the number of hats of that size, he has only to turn the handle e^3 half a turn and the handle i^3 one turn to be ready for hats one size smaller, and so on through all the sizes in one or more dozens of hats.

The banding-ring B is attached to the lever B^1 by two thumb-screws, b and b', which are fitted into holes in the banding-lever, and secure the banding-ring in a central position. The banding-lever is pivoted, at b^3, to the standards B^2, which are permanently fastened to the top plate of the machine, and rests in front upon the bracket B^3, near its handle. A hook-latch, b^4, is hinged to the bracket B^3 at b^5. This hook may engage with the lever while the hat is being cooled off after it has been properly shaped, and the lever and banding-ring can thus be secured in a horizontal position. To facilitate the handling of the lever I have put thereon a counter-weight, B^4, which may be adjusted, as desired, to partly balance the lever upon its hinge. Each machine is supplied with a set of banding-rings, all fitted to the lever B^1—*i. e.*, a ring for each of the sizes of hats to be blocked. These banding-rings are selected by the operator, as occasion may require, for operating on hats of a certain size.

The portion of the invention to be next described consists of the outstretching-tongs, which consists of a series of upper and lower jaws, as clearly shown in Fig. 6. The bell-crank shaped lower jaws C are pivoted upon small brackets G, Fig. 3, as at g, Fig. 6, and the ends of their lower arms are fitted into the groove of the controlling-ring C^1 at g'. The upper ends of the jaws are T-shaped, so as to furnish on their upper faces an extended support for the hat-brim, and all of the jaws have vertical slots, which guide the shanks of the upper or clamping jaws D.

In the drawings the clamping-jaws of the tongs are raised and are open to receive the hat, as shown in dotted lines in Fig. 6. The jaws D of the tongs have heads, as at d, the under sides of which act as the clamping-surfaces, in conjunction with a portion of the upper sides of the T-shaped heads of jaws C. Each jaw D is connected to an eyebolt, as at d^1. These eyebolts d^1 are fitted loosely into holes in the elliptic clamping-ring D^1, and are provided with india-rubber springs d^3, which are compressed by the nuts d^2. The ring is attached by two links, d^4 and d^5, to two arms d^6 and d^7, Fig. 5, on the rock-shaft D^2, which has its bearings in the main frame, and has on its outer end another arm, d^8, which is by the link d^9 connected with the clamping-lever D^3. The clamping-ring lever D^3 is shown in Figs. 1, 3, 4, 6, and 7 raised to its highest position; the clamping-jaws of the tongs open to receive the hat-body. Fig. 8 represents the clamping-ring lever D^3 in position when the jaws are closed. The clamping-ring lever D^3 is pivoted, at d^{10}, to the main frame, and is provided with two stops, K and K′, which strike the link d^9 on opposite edges, and thereby limit the motion of the lever to about half a turn on its pivot. When in the position shown in Fig. 7, the pivot d^{10} of the clamping-lever is in a straight line with the two pivots of the link d^9. The clamping-ring D^1 and the upper jaws are thereby elevated, and so held ready to receive the brim of a hat. The pivot d^{10}, and the two pivots of d^9, are also in a straight line when the lever D^3 is in the position shown in Fig. 8, with the clamping-ring lowered and jaws closed on the brim of a hat, and so held by the clamping-lever. The link d^9, which is pivoted to the clamping-lever D^3 a short distance from the pivot d^{10}, operates the arms on the shaft D^2, the clamping-ring D^1, and the upper jaws. The motion of the link is, however, greater than is required to

close the tongs. When the lever and the arms d^6 and d^7 on the shaft D^2 are depressed the clamping-ring D^1 is lowered, and the heads d of the upper jaws caused to rest upon the hat-brim near its edge. To insure a strong hold upon the hat I have so constructed the arms d^6 and d^7 and d^8 that half a turn of the clamping-lever D^3 will force the clamping-ring D^1 lower than is requisite to close the jaws upon the hat. By this additional depression of the ring the springs d^3, at the foot of each jaw D, are brought into action. Fig. 8, as stated above, represents a part of the clamping-ring D^1, with its connections to the clamping-lever detached from the machine, and in the position it occupies when the hat is clamped. The lower ends of the jaws D no longer rest upon the ring D^1, but the heads d, which now rest upon the hat-body, (between them and the upper surfaces of the lower jaws,) are forced upon the hat-brim by their rubber springs, each of which is compressed between the under side of the ring and the nut which confines the spring on the eyebolt. Thus, while the brim is held between two metal surfaces, each pair of tongs can yield to the extent of the yielding action of the rubber springs, and can conform to any incidental variation of the thickness in different parts of the hat-body.

To be enabled to move the tongs radially from the center, I have constructed, as shown in Figs. 5 and 6, a system of levers connected with the controlling-ring C^1 by two links, g^2 and g^3. The levers C^2 and C^3 are pivoted to the cross-head C^4, which is fitted upon the stationary screw g^4, and can be moved up or down by the hand-wheel nut C^5. The links g^2 and g^3 are pivoted to the levers C^2 and C^3 near the center of the machine, and the other end of the lever is connected with the treadle-lever C^6 by two links, g^5 and g^6. To the front end of the lever C^6 I have fastened a foot-board, g^7, and to the rear end the counter-weight C^7. The lever is pivoted near the center of the machine, and the weight is sufficient to raise the front end of the lever and draw the tongs inward radially.

To close the tongs around a hat-body with a narrow brim, it is necessary to bring the tongs closer to the hat-block than they would have to be brought to take hold of a hat-body with a wider brim, but the outward motion of the tongs to flatten the brim would need to be about the same in both cases.

To adjust the tongs so that the foot-board will always be in about the same position from the floor, when the hat-brim is drawn out, I have introduced the adjustable cross-head C^4. When hats with narrow brims are to be blocked the cross-head is lowered until the treadle-lever strikes the floor, when the brim is drawn out, and, when changing to wider brims, it is raised so as to keep the treadle in the same position.

The machine is operated as follows: The hand-lever E^2 is raised to its full height, and the expansible hat-block set to the required height by the scale on the edge of the lever E^3. The hand-lever F^2 is next brought up, and the block is spread by the screw on the segment F^3 until the pointer i^4 indicates the required diameter. Both hand-levers are now lowered, and the banding-lever B' is raised and a banding-ring of the required size secured by the thumb-screws b and b'. The tongs are now opened and adjusted by the hand-wheel nut C^5, so that the weight C^7 will bring them close enough to the hat-block to have the hat-brim rest upon the heads d of the raised jaws when it is placed on the machine. The hat-body, having been previously stretched out on the tip and brim and thoroughly saturated with boiling-hot water or steam, is then placed over the block, with the brim resting upon the raised part of the tongs. The operator now places his foot upon the foot-board and pushes it down until the tongs are spread sufficiently to let the brim pass below the raised part, and rests upon the projections of the lower jaws. The foot is now lifted up, and the tongs are thereby contracted until all the sliding bars bear directly against the edge of the brim. The clamping-lever D^3 is now pulled down and the jaws closed upon the edge of the brim, thus clamping the hat firmly around the brim. The foot is kept upon the foot-board to hold the brim slightly drawn out. The banding-lever B^1 is now brought down over the hat, and the hand-lever E^2 is raised, and, while a light pressure is brought to bear upon the banding-lever B^1 and the foot-board, the hand-lever F^2 is raised and the block spread out. The hat is now in a position to develop the band, which is the real office of the blocking-machine, the operator having his foot on the foot-board, and, as both hand-levers are held up by the toggle-joints, he has both hands free to operate the banding-lever up and down, while the brim is gradually pulled out by the tongs until all the wrinkles have disappeared and the banding-lever rests upon the bracket B^3 at the front of the machine. The hook-latch b^4 is now thrown over the banding-lever to secure it, and, while the hat-brim is held out perfectly flat by the tongs, the hat is cooled off with cold water, to set the stiffening in the hat and keep the hat in shape. The tongs are now opened, the expansible block contracted and lowered, the banding-lever raised, and the finished hat removed, and then the operation may be repeated.

It is to be understood that I do not limit my invention to the precise construction of the parts shown, nor to the particular mechanism employed, as I am well aware that numerous variations may be made therein without materially affecting the results sought.

The machine as shown and described has been proven to possess practical value, not only in the character of the service performed, but in the facility with which it can be operated.

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

1. The combination, with the hat-block mounted on a sliding spindle, of the cross-head, links, double levers, rock-shaft, and hand-lever, substantially as described.

2. The combination, with the hat-block and lifting mechanism, of a graduated scale or gage and an adjusting-screw, substantially as described, whereby the operator may readily adjust the lifting mechanism for lifting the block to any required height.

3. The combination, with the hat-block, its expanding mechanism, and its lifting mechanism, of a rock-shaft, substantially as described, whereby, in operation, the expanding mechanism and the lifting mechanism are maintained at all times in the same position with relation to each other, regardless of their position with relation to other parts of the machine.

4. The combination of the hat-block and its expanding mechanism with the graduated scale and the adjusting-screw, which operates in conjunction with the expanding-lever substantially as described, whereby the expanding mechanism may be adjusted for blocking hats of a required size.

5. The combination, with the hat-block and its lifting mechanism, of the stretching tongs, their outstretching-levers, the cross-head, the hand-wheel nut, and the stationary screw for adjusting the levers, substantially as described.

6. The outstretching-tongs, composed of numerous lower and upper jaws, which are capable of being opened and closed independently of the outstretching mechanism, substantially as described, in combination with a controlling-ring and its adjusting-screw, substantially as and for the purposes specified.

7. The stretching-tongs, composed of a series of vertically-sliding short upper jaws, and vertically-stationary long lower jaws, substantially as described.

8. The vertically-moving clamping-jaws of the tongs, in combination with a clamping ring and levers, substantially as described, whereby the said jaws may be simultaneously made to engage with and clamp the brim of a hat, as set forth.

9. The combination of the clamping-ring, which opens and closes the jaws of the tongs, with the link and a clamping-lever provided with stops, substantially as described, whereby the jaws may be securely maintained in position whether opened or closed.

10. The combination, with the vertically-moving jaws and their clamping-ring, of the springs attached to each jaw, substantially as described, whereby said jaws may properly close upon brims of varied thickness.

11. The combination of the outstretching-tongs, composed of the series of upper and lower jaws, with their controlling ring and levers, substantially as described, whereby the outward and inward movement of said jaws may be simultaneously effected.

RUDOLF EICKEMEYER.

Witnesses:

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