

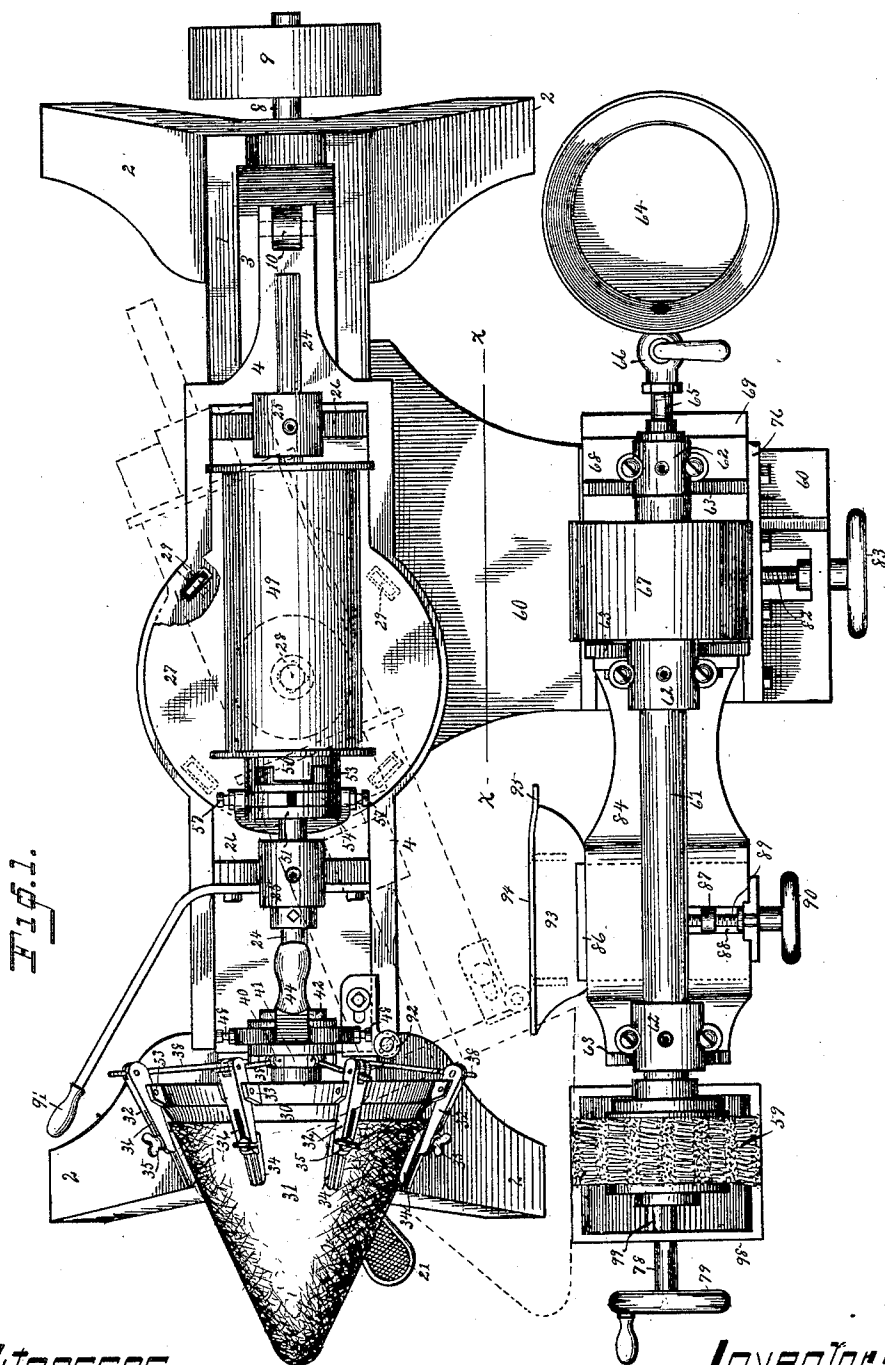
(No Model.)

3 Sheets—Sheet 1.

F. J. MURPHY & A. M. RUNDLE.
MACHINE FOR STIFFENING HATS.

No. 426,135.

Patented Apr. 22, 1890.



WITNESSES

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Edna F. Pettit

INVENTORS

Frank J. Murphy and
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By A. M. Wooster, atty.

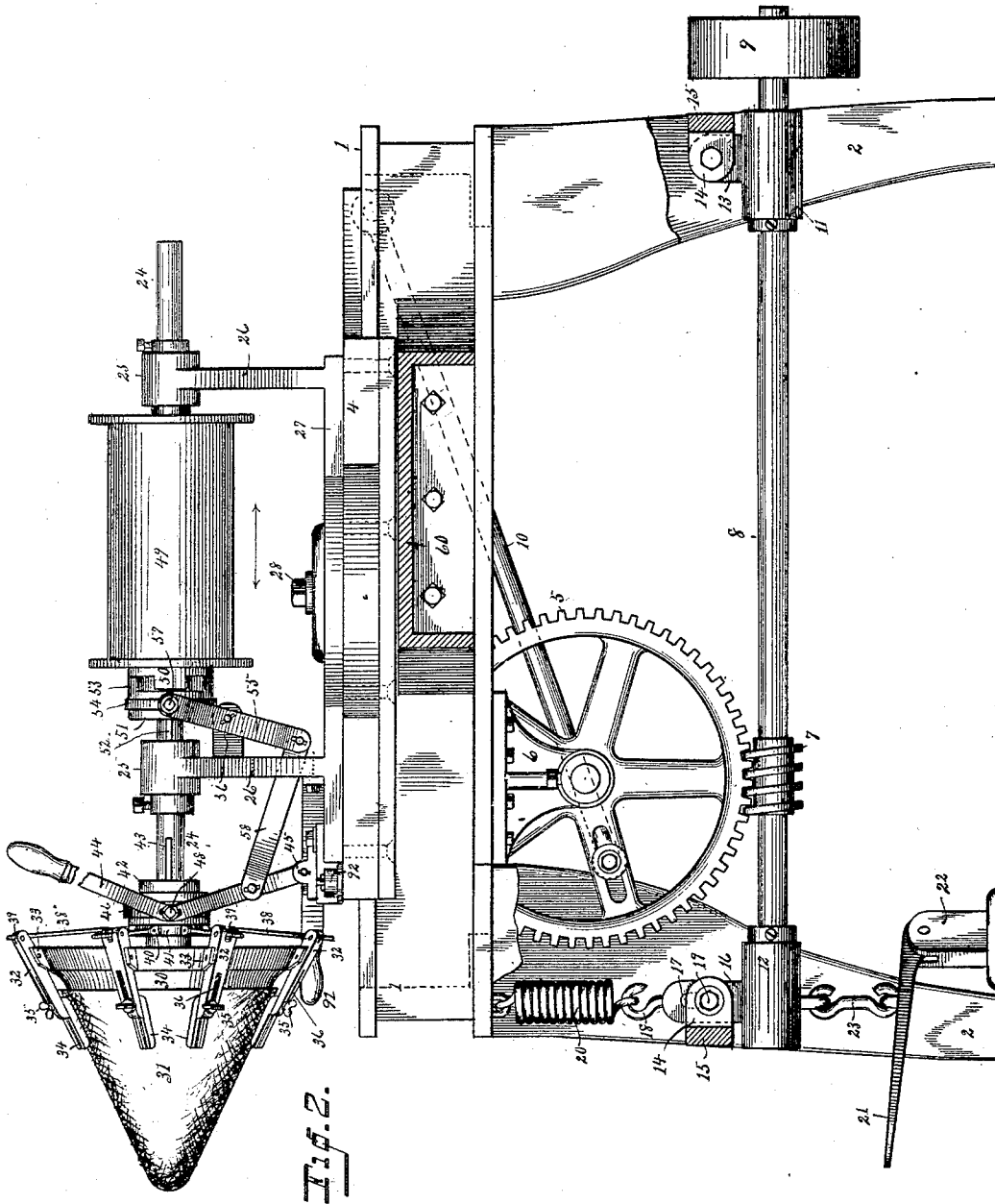
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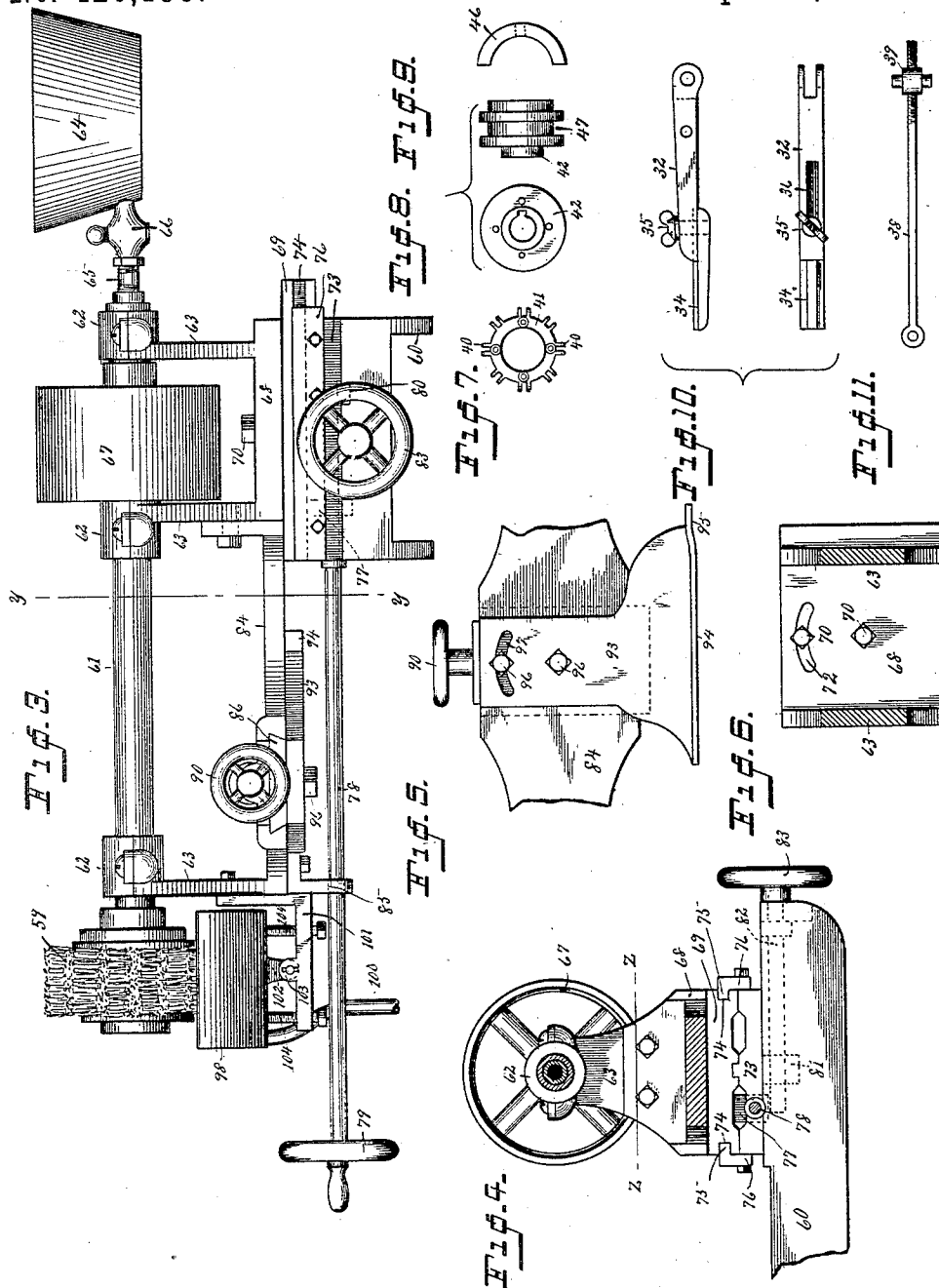
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UNITED STATES PATENT OFFICE.

FRANK J. MURPHY AND ANTHONY M. RUNDLE, OF DANBURY, CONNECTICUT.

MACHINE FOR STIFFENING HATS.

SPECIFICATION forming part of Letters Patent No. 426,135, dated April 22, 1890.

Application filed August 9, 1889. Serial No. 320,319. (No model.)

To all whom it may concern:

Be it known that we, FRANK J. MURPHY and ANTHONY M. RUNDLE, citizens of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Stiffening Hats; and we 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.

Our invention relates to the class of machines described in our former Letters Patent, Nos. 361,073, dated April 12, 1887, and 396,829, dated January 29, 1889, and has for its object to simplify and improve the construction and operation of the machine.

With these ends in view we have devised the novel improvements in the details of construction, which we will now describe, referring by numbers to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of the entire machine; Fig. 2, a section on the line xx in Fig. 1, the legs being broken away, showing the spindle, belt-pulley, cone, clutch mechanism, &c., in elevation; Fig. 3, a side elevation of the portion of the machine that is removed in Fig. 2—that is, the tank, brush-shaft, brush, and adjusting mechanism for said parts; Fig. 4, a section on the line yy in Fig. 3, looking toward the right, the tank, however, not being shown; Fig. 5, a detail inverted plan view of the mechanism for determining the throw of the cone; Fig. 6, a detail sectional view on the line zz in Fig. 4, looking down; and Figs. 7 to 11, inclusive, are detail views illustrating the parts of the clamping mechanism detached.

1 denotes the bed of the machine, which is supported by suitable legs 2 and is provided with a slot 3, extending through it.

4 denotes a carriage, which is adapted to reciprocate longitudinally of the bed, and 5 is a gear-wheel journaled in brackets 6, bolted to the under side of the bed. This gear-wheel is adapted to mesh with a worm 7 on a shaft 8, extending longitudinally of the machine. Power is applied to this shaft by a

belt (not shown) passing over a pulley 9, and the carriage is reciprocated by means of a connecting-rod 10, one end of which is pivoted to the carriage and the other to gear-wheel 9, the point of attachment to said gear-wheel being adjustable, so that the throw of the carriage may be regulated at will.

In order that the movement of the carriage may be stopped at any instant, which would be impossible if depending upon a shifting of belts, we provide for disengaging worm 7 from the gear-wheel in a manner which I will now describe.

11 and 12 denote, respectively, the rear and front boxes, in which shaft 8 is journaled. The rear box is provided with an arm 13, which is pivoted to a bracket 14 on a cross-piece 15, extending between the two rear legs of the machine. It will be seen that this construction permits oscillation of the shaft and boxes in the vertical plane. The front box 12 is provided with an arm 16, having a slot 17 and at its upper end a hook 18. A bolt 19 passes through slot 17 and through a bracket 14, attached to a cross-piece 15, extending between the two front legs of the machine.

20 denotes a strong spring, one end of which is connected to the under side of the bed and the other to hook 18 upon the front box of the shaft.

21 is a foot-lever pivoted to a suitable bracket 22, and 23 is a link connecting said foot-lever to box 12. The foot-lever extends outward beyond the front of the machine in such a position that an operator standing at the front of the machine may readily place his foot upon it. It will be seen from Fig. 2 that the action of spring 20 will be to hold the worm in engagement with gear-wheel 5, so that the carriage will reciprocate continuously until its movement is stopped by the operator pressing down upon the foot-lever and disconnecting the worm from the gear-wheel.

24 denotes the spindle, which is mounted in boxes 25 on standards 26, extending upward from a turning plate 27, which is secured to the carriage by a bolt 28. Anti-friction rollers 29 are preferably placed in the carriage, upon which the turning plate rests, so as to permit said plate to oscillate freely. At the

forward end of the spindle is a cone 30, shown as having a hat-body 31 thereon. The body upon the cone is held in position by clamping-arms 32, pivoted between ears 33 at the rear end of the cone and provided with adjustable clamping-surfaces 34. These clamping-surfaces are preferably secured in position by means of thumb-screws 35, which pass through slots 36 in the clamping-arms.

The clamping-arms are operated by means of rods 38, the outer ends of which are threaded to engage hubs 39, which are journaled at the rear ends of the arms, turning freely therein. (See Figs. 1 and 11.) The other ends of the rods are pivoted between ears 40 on a ring 41, which is rigidly secured to a sleeve 42 upon the spindle, the latter being provided with a spline 43, engaging a corresponding groove (not shown) in the sleeve, whereby the latter is held against rotation independently of the spindle, but is allowed to slide longitudinally thereon. It will be seen that by means of the threaded outer ends of the rods and hubs 39 we are enabled to adapt the clamping-surfaces to different thicknesses and qualities of hat-bodies, and by means of bolts and slots 35 and 36 we are enabled to adjust the clamping-surfaces to different sizes of hat-bodies.

44 is an operating-lever, the central portion of which is bifurcated, and then reunited to permit it to embrace sleeve 42. The lower end of this lever is pivoted to ears 45 upon the turning plate, and the upper end is provided with a handle for convenience in operation.

46 denotes half-collars, which lie in a groove 47 in sleeve 42. The opposite sides of the central portion of the operating-levers are connected to these half-collars by bolts or pins 48.

49 denotes a belt-pulley, which is adapted to turn on the spindle, and is provided at its forward end with clutch projections 50.

51 denotes a sleeve on the spindle, which engages a spline 52, whereby it is held against rotation independently of the spindle, but allowed to slide freely longitudinally thereof. Upon the back face of this sleeve are clutch projections 53, which are adapted to engage projections 50 upon the belt-pulley. Sleeve 51 is provided with a groove, (not clearly shown,) in which are half-collars 54. (See Fig. 2.)

55 is a lever pivoted to an arm 56, projecting backward from the front bracket 26. The upper end of this lever is bifurcated, and the arms are secured to half-collars 54 by bolts or pins 57.

58 is a link, one end of which passes through the front bracket 26 and is pivoted to the lower end of lever 55, the front end thereof being pivoted to operating-lever 44 at a distance above its pivotal point to ears 45. The operation of this mechanism will be clearly understood from Fig. 2. It will be seen that when operating-lever 44 is moved toward the left the rear ends of the clamping-arms will

be raised, which will press the clamping-surfaces down upon a hat-body on the cone, thereby holding it firmly in position. This movement of the operating-lever will also draw the lower end of lever 55 toward the left, which will throw the upper end thereof toward the right, and will force the two sets of clutch projections 50 and 53 into engagement, as shown in Fig. 2, thereby communicating the rotary movement of belt-pulley 49 to the spindle. The belt by which motion is imparted to belt-pulley 49 and the spindle extends from a suitable main or counter shaft. Neither shaft nor belt is deemed to require illustration. It will be noticed that the belt-pulley is made long enough so that in the longitudinal movements of the carriage and parts carried thereby said belt merely has to slip along said pulley, its actual position being the same at all times.

59 denotes the brush, which is constructed in substantially the same manner as in our former patents, Nos. 361,073 and 396,829, the essential principle being a hollow shaft or spindle through which the stiffening material is supplied to the brush. This brush is fully described and claimed in our said patent, No. 361,073, and therefore is not thought to require description in detail, the operation of the brush itself being the same as in that patent. In the present machine the brush, shaft, and tank are supported by an extension 60, which is bolted rigidly to the bed.

61 denotes the hollow shaft by which the brush is carried and by which the stiffening material is supplied thereto, said shaft being journaled in boxes 62 upon standards 63.

64 denotes the tank for the stiffening material, which is supported by one of said standards and is connected to the shaft by a suitable union 65, a cock 66 being provided to cut off the flow of stiffening material from the brush when not in use. Motion is imparted to shaft 61 by means of a belt (not shown) extending over a pulley 67 on said shaft.

It will of course be understood that machines of this class are required to operate upon different sizes, qualities, and thicknesses of hat-bodies. We have, therefore, in our present machine provided adjustments for the various parts to adapt it to all classes of work.

The two principal standards by which shaft 61 is supported are shown as made integral with an upper plate 68, which is secured to an intermediate plate 69 by set-screws 70, one of which passes through a curved slot 72 in plate 68, so as to permit said plate, together with the shaft and brush, to be oscillated upon plate 69. This is in order to permit the hollow shaft and the brush to be adjusted in a position other than parallel to the spindle carrying the cone, so that any desired contact may be secured between the brush and the hat-body upon the cone, it being of course understood that the cones necessarily

vary in size considerably in changing from one style of hat to another. Having secured the necessary adjustment, plate 68 and the parts carried thereby are rigidly locked to plate 69 by tightening up the set-screws. Under plate 69 is a lower plate 73.

74 denotes grooves or ways in the sides of plate 69, which are engaged by ribs 75, which project inward from plates 76, bolted to the sides of plate 73. Upon the under side of plate 69 is a lug 77, which is engaged by a quick thread (not shown) at the inner end of a rod 78, which extends to the front of the machine and is provided with a hand-wheel 79 for convenience in operation. It will be seen that by turning rod 78 through the engagement of the screw-thread thereon with lug 77 plates 68 and 69 will be moved toward the right or left, as may be. This adjustment enables us to vary the position of the brush longitudinally to the cone. Upon the under side of plate 73 is a rib 80, which engages a corresponding groove in the upper side of extension 60. (See Fig. 3.) 81 is a lug also extending downward from plate 73, which is engaged by a quick thread (not shown) upon the inner end of a rod 82. (See dotted lines in Fig. 4.) At the outer end of this rod is a hand-wheel 83 for convenience in operation. By turning this hand-wheel toward the right or left, as may be, we are enabled to move the lower, intermediate, and upper plates and all the parts carried thereby inward or outward relatively to the cone. 84 denotes an extension which is rigidly bolted to plate 68. At the forward end of this extension is one of the standards 63, by which the hollow shaft is supported. 85 is a bracket on the under side thereof, which supports the forward end of rod 78. 86 is a dovetail slide fitted in corresponding ways in extension 84 and adapted to move transversely to said extension. A lug 87, projecting upward from said slide through a slot 88 in the extension, is engaged by a threaded rod 89, which is held against endwise movement, as clearly shown, and is provided with a hand-wheel 90 for convenience in operation.

It will be apparent that in order to stiffen a hat-body it is necessary to swing the cone with the body thereon inward into contact with the stiffening-brush. We have already explained the construction and arrangement of the cone, spindle, turning plate, &c.

91 is an operating-handle rigidly secured to any suitable portion of the turning plate, near the forward portion thereof. When the operator desired to place a hat-body in contact with the stiffening-brush, he seizes this handle and swings the turning plate, cone, &c., into the desired position. At the forward end of the turning plate is an anti-friction roller 92, which is adapted to engage a suitable stop-plate 93 to determine the inward movement of the turning plate, cone, &c. The operative face of this plate is preferably provided with a steel strip 94 and with a slight

incline 95, the action of which, when roller 92 rides down it, is to throw the extreme tip of the hat-body closely against the brush, so that the tip will become thoroughly stiffened, as is fully explained in our former patent, No. 396,829. Stop-plate 93 is connected to slide 86 by means of set-screws 96, one of which passes through a curved slot 97 in the stop-plate, so as to permit the latter to oscillate upon the slide. This construction is clearly shown in the inverted plan view Fig. 5. When it is desired to adjust the stop-plate to change the position of the cone and hat-body relatively to the brush when the cone is thrown to its extreme inward position, it is accomplished by turning hand-wheel 90 in either direction, as may be required; and should it be required to change the position of the stop-plate by oscillating it in the horizontal plane, this may be accomplished by loosening set-screws 96, turning the stop-plate to the desired position, and then locking it by tightening up the set-screws.

98 denotes a trough placed under the stiffening-brush, which is provided with a scraper-plate 99, with which the bristles of the sizing-brush come in contact in use. The action of this scraper is to remove surplus sizing material from the brush, thereby preventing spattering and waste of the sizing material, and also preventing the sizing material from being deposited upon the hat-body faster than it can be absorbed thereby. A drainage-pipe 100 leads out of the trough, and the surplus sizing material which passes out from the trough is caught in a suitable receptacle (not shown) placed beneath. This trough is supported by a bracket 101, which is rigidly bolted to extension 84. The trough is secured to the bracket by means of a lug 102, which is pivoted between ears 103 on the bracket.

104 denotes adjusting-screws, which pass up through the bracket and engage the opposite ends of the trough. By turning these screws upward or downward, as may be required, the trough may be tilted so as to cause either end of the scraper-plate to engage more or less positively with the brush. This arrangement enables us to graduate the quantity of sizing material applied to different portions of the hat-body. For instance, a greater quantity may be applied at the lower portion of the body than at the tip, or vice versa.

It will be seen that by adjusting the trough at an angle the quantity of sizing material deposited upon a hat-body may be made to increase or decrease gradually in any direction, this being an important feature in stiffening certain grades of hats.

Having thus described our invention, we claim—

1. The combination, with the bed, a gear-wheel pivoted thereto, a sliding carriage, and a rod connecting said carriage with the gear-wheel, of a shaft provided with a worm

adapted to mesh with said gear-wheel and oscillating boxes for said shaft, whereby the worm and gear-wheel may be disconnected to instantly stop the movement of the carriage.

5 2. The combination, with the carriage, gear-wheel, and connecting-rod, of a shaft having a worm adapted to engage said gear-wheel and boxes for said shaft, one of which is provided with an arm 13, by which it is sus-
10 pended, and the other with a slotted arm engaging a fixed pin, a spring connected to said arm to hold the worm in engagement with the gear, and a foot-lever connected to said box, whereby the shaft may be swung down-
15 ward against the power of the spring and the worm disconnected from the gear.

3. The combination, with the carriage, gear-wheel, and connecting-rod, of shaft 8, having a worm engaging said gear-wheel, boxes 11
20 and 12, in which said shaft is journaled, cross-pieces 15, having brackets 14, an arm 13 on the box 11, pivoted to one of said brackets, a slotted arm 16 on box 12, a bolt passing through said slot and the bracket, a spring
25 connected to the upper end of the arm, a foot-lever 21, and a link connecting said lever to box 12, as and for the purpose set forth.

4. The combination, with the sliding carriage and a plate 27 turning thereon, of a
30 spindle mounted on the turning plate, and having at its forward end a cone, a belt-pulley adapted to turn on said spindle, and clutch mechanism on said spindle and belt-pulley, whereby rotary movement is commu-
35 nicated to the spindle.

5. In a machine of the class described, a reciprocating carriage having rollers 29 and a turning plate mounted on said carriage and turning on the rollers, in combination with a
40 spindle mounted on the turning plate, a belt-pulley adapted to turn on the spindle, and clutch mechanism on said belt-pulley and spindle, whereby rotation is communicated to the latter.

6. Plate 27, standards 26, and a spindle
45 mounted therein and carrying a cone, in combination with a belt-pulley adapted to turn on said spindle and having clutch projections, a sleeve adapted to slide on said spindle, but
50 to rotate therewith, and having clutch projections adapted to engage those upon the belt-pulley, operating-lever 44, and intermediate connections, substantially as described, whereby the clutch members are engaged and
55 disengaged.

7. The spindle, the cone rigidly secured thereto, and a belt-pulley adapted to turn on said cone and provided with clutch projec-
60 tions, in combination with clamping-arms pivoted to the cone and adapted to hold a hat-body thereon, sleeves 42 and 51, the latter having clutch projections which slide on the spindle, but turn therewith, rods 38, connect-
65 ing the clamping-arms with sleeve 42, operating-lever 44, and connections, substantially as described, between the operating-lever and sleeve 51, whereby said sleeves are moved to-

ward or from each other, so that when the clamping-arms are caused to engage a body upon the cone the clutch members are also
70 caused to engage and rotation is imparted to the spindle and cone.

8. The spindle, cone, belt-pulley having clutch projections, and the clamping-arms pivoted to the cone, in combination with sleeve
75 51, having clutch projections adapted to engage the belt-pulley, sleeve 42, rods 38, pivotally connected to said sleeve and to the rear ends of the clamping-arms, operating-lever 44, connected to said sleeve, lever 55, connected
80 to sleeve 51, and a link connecting said lever with the operating-lever, as and for the purpose set forth.

9. The combination, with the spindle, the cone rigidly secured thereto, clamping-arms
85 pivoted to the cone, and operating mechanism, substantially as described and shown, of clamping-surfaces 34, adjustably secured to said clamping-arms, whereby different sizes and thicknesses of hat-bodies may be secured
90 upon the cone.

10. The combination, with the cone, the spindle, and the clamping-arms pivoted to the cone and having slots 36, of clamping-sur-
95 faces 34 and thumb-screws passing through said slots, whereby the clamping-surfaces are adjustably secured to the arms.

11. The combination, with the spindle, the cone rigidly secured thereto, clamping-arms,
100 and hubs 39, pivoted at the rear ends thereof, of a sleeve 42, adapted to slide on the spindle, and rods 38, pivoted to said sleeve and threaded to engage the hubs, as and for the purpose set forth.

12. Plate 27, having standards 26, the spin-
105 dle mounted therein and carrying the cone, clamping-levers pivoted to the cone, and a belt-pulley having clutch projections and adapted to turn on the spindle, in combination with a sleeve 51, having corresponding
110 clutch projections, a sleeve 42, arms pivotally connected to said sleeve and to the rear ends of the clamping-arms, an operating-lever also connected to said sleeve, lever 55, pivoted to sleeve 51, and a link connecting said lever
115 with the operating-lever, as and for the purpose set forth.

13. The combination, with the spindle, cone, clamping-arms pivoted thereto, and a belt-
120 pulley having clutch projections, of sleeves 42 and 51, the latter having clutch projections, half-collars engaging said sleeves, an operating-lever bifurcated to inclose the spindle and connected to one set of half-collars,
125 lever 55, connected to the other set of half-collars, and a link connecting said levers, substantially as described.

14. The combination, with the cone, the brush, and the hollow shaft by which stiffen-
130 ing material is conducted thereto, of an adjustable plate 68, carrying standards 63, in which said shaft is mounted.

15. The combination, with the cone, the brush, and the hollow shaft by which sizing

material is conducted thereto, of a plate 68, carrying standards in which said shaft is mounted and having a curved slot 72, a plate 69 under plate 68, and set-screws 70, whereby
 5 said plates are secured together, one of said screws passing through said slot, so as to permit plate 68 to be oscillated in the horizontal plane to adjust the brush relatively to the cone.

10 16. The combination, with the cone, the brush, the hollow shaft, and plate 68, on which it is mounted, of a longitudinally-adjustable plate 69, to which plate 68 is secured.

15 17. The combination, with the cone, the brush, the hollow shaft, and plate 68, on which it is mounted, of a plate 69, to which said plate is secured and having upon its under side a lug 77, and a rod 78, engaging said lug, whereby the brush may be given longitudinal
 20 adjustment relatively to the cone.

18. The cone, the shaft, plate 68, on which it is mounted, and plate 69, to which said plate is secured, and which is provided with grooves 74, in combination with plate 73 and plate
 25 76, bolted thereto and having ribs engaging the grooves in plate 69.

19. The cone, brush, shaft, plate 68, by which it is carried, and longitudinally-sliding plate 69, to which plate 68 is adjustably secured, in
 30 combination with a laterally-sliding plate 73, whereby oscillating, longitudinal, and lateral movement may be imparted to the brush relatively to the cone.

20. The combination, with the brush, shaft, and plate 68, by which it is carried, of longitudinally-sliding plate 69 and rod 78, by which it is adjusted, laterally-sliding plate 73, to which plate 69 is attached, and rod 82, by which plate 73 is adjusted, substantially as
 40 described.

21. The combination, with the turning plate carrying the cone and provided with a roller 92, the brush, shaft, and plate 68, by which they are carried, of an extension 84, secured
 45 to plate 68, and an adjustable stop-plate 93, carried by said extension, which is engaged by roller 92 to limit the oscillation of the turning plate.

22. The combination, with the turning plate

having roller 92, of stop-plate 93, which is en- 50
 gaged by said roller and is provided with a curved slot 97, slide 86, and set-screws 96, by which the stop-plate is secured to the slide, one of said screws passing through the curved slot, whereby oscillation of the stop-plate is 55
 permitted, as and for the purpose set forth.

23. The combination, with the turning plate carrying the cone and having a roller 92 and a stop-plate by which said roller is engaged, of slide 86, to which the stop-plate is adjust- 60
 ably secured, and which is provided with a lug 87, and a threaded rod engaging said lug, by which the slide and stop-plate are adjusted relatively to the turning plate to limit the movement of the cone toward the brush. 65

24. The combination, with the turning plate having a roller 92 and a stop-plate having a strip 94 and incline 95, of a slide upon which the stop-plate is adapted to oscillate, set-screws for securing it in position, and a threaded 70
 rod and lug whereby the slide may be moved to give lateral adjustment to the stop-plate.

25. The combination, with the brush, the hollow shaft, and the trough having a scraper-plate, of adjusting-screws 104, whereby the 75
 trough may be tilted to adjust the position of the scraper-plate relatively to the brush.

26. The combination, with the rotating brush, of a trough having a lug 102, a bracket to which said lug is pivoted, and adjusting- 80
 screws engaging the opposite ends of the trough, as and for the purpose set forth.

27. The brush and the hollow shaft by which sizing material is supplied thereto, in combination with a trough having a scraper-plate 85
 adapted to engage the brush, adjusting-screws for tilting said trough and scraper-plate relatively to the brush, and a drainage-pipe by which the surplus size is conducted away without waste. 90

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK J. MURPHY.
 ANTHONY M. RUNDLE.

Witnesses:

HENRY S. TAYLOR,
 A. M. WOOSTER.