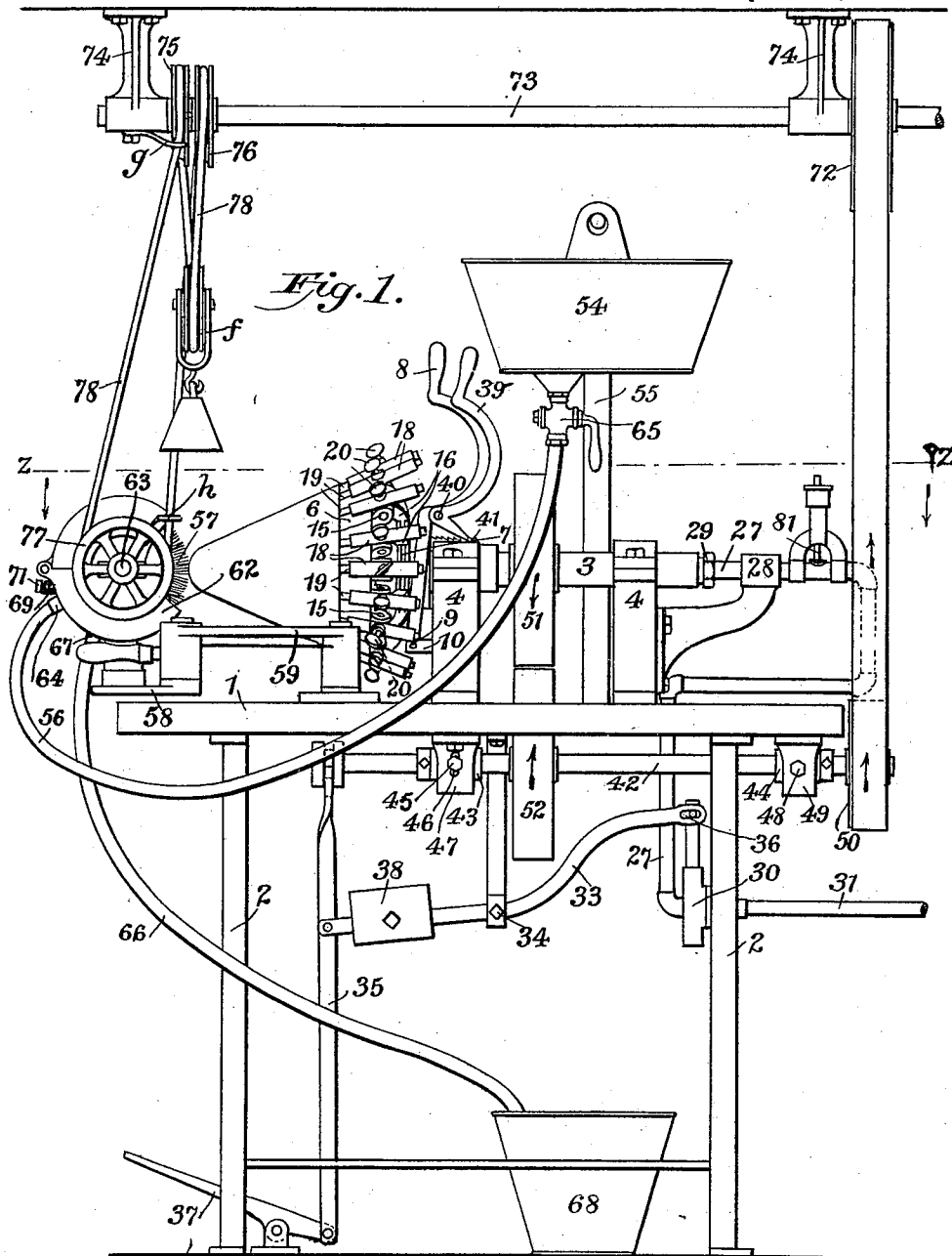


L. R. HEIM.

MACHINE FOR STIFFENING CROWNS OF HAT BODIES.

No. 581,554.

Patented Apr. 27, 1897.



WITNESSES:

J. F. Smith.
M. T. Longden.

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BY

J. M. Smith Jr.

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(No Model.)

5 Sheets—Sheet 2.

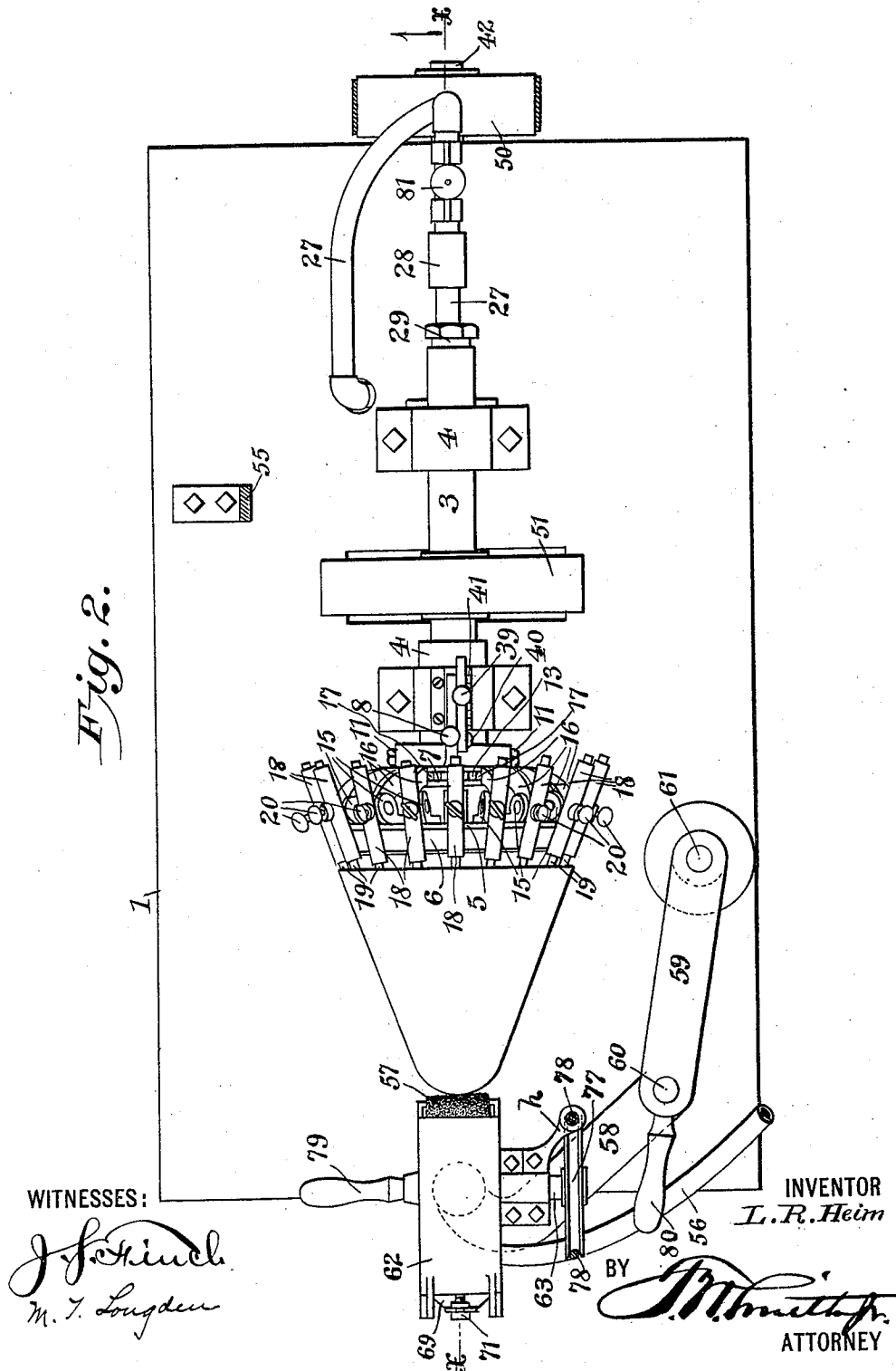
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Fig. 2.



(No Model.)

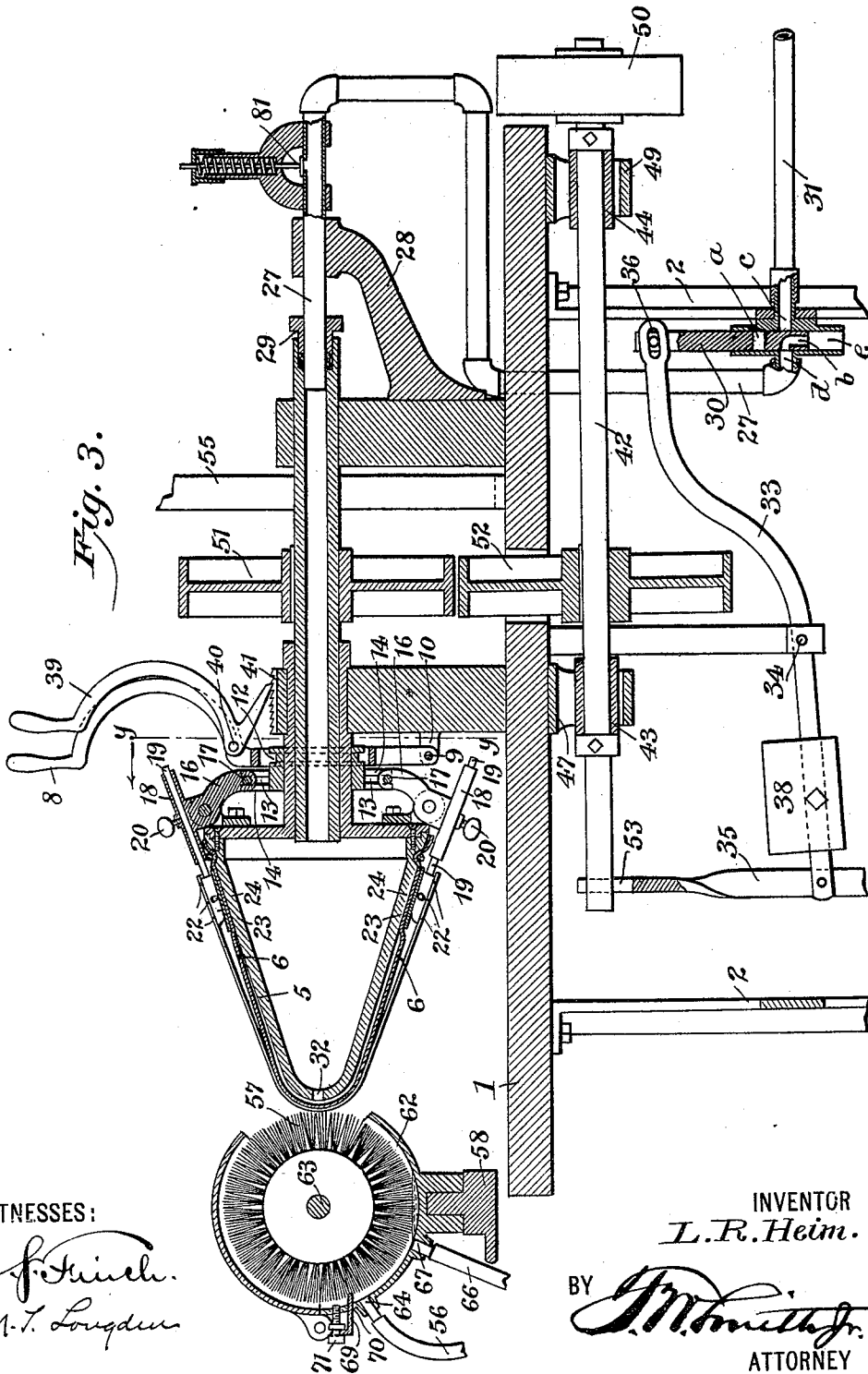
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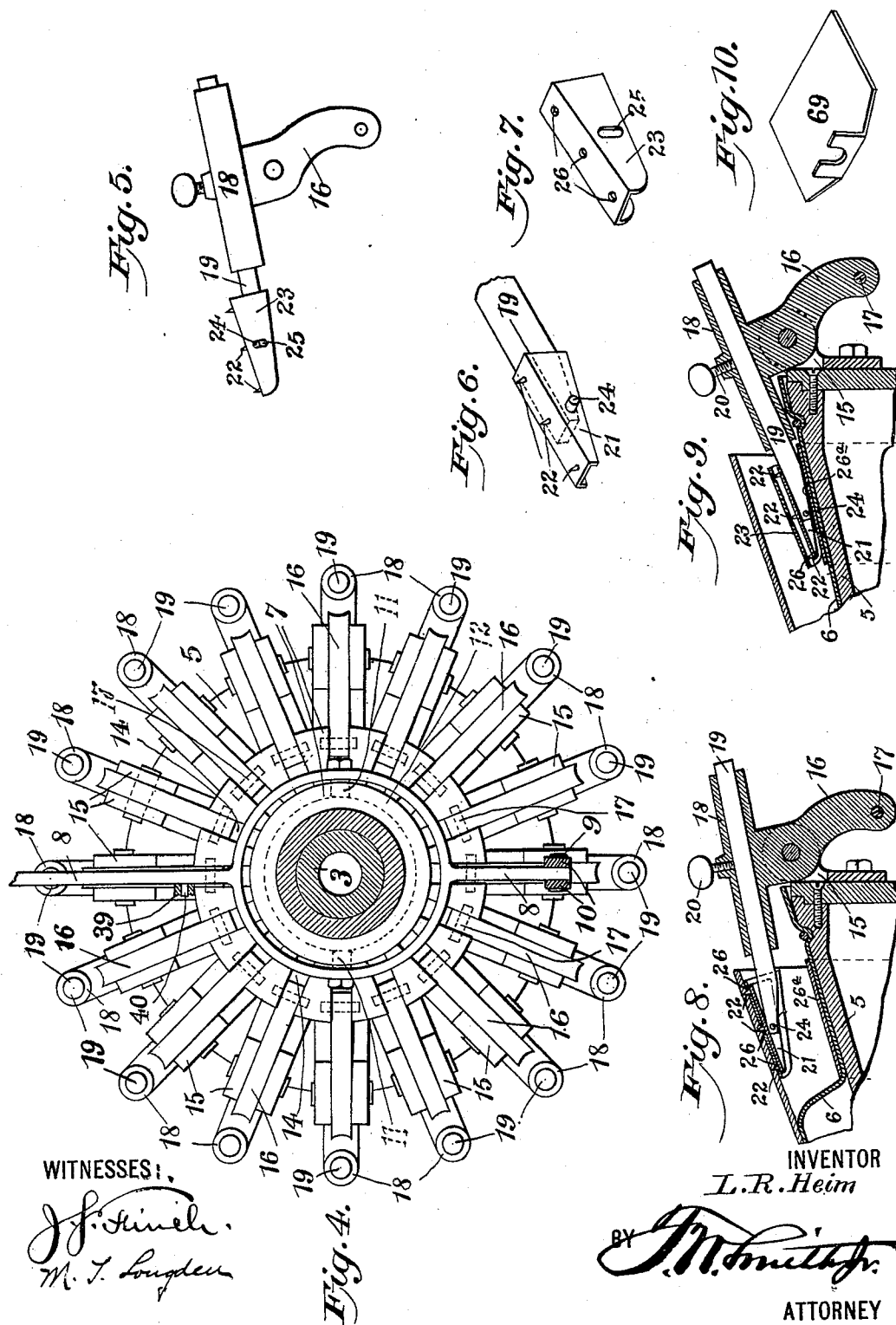


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(No Model.)

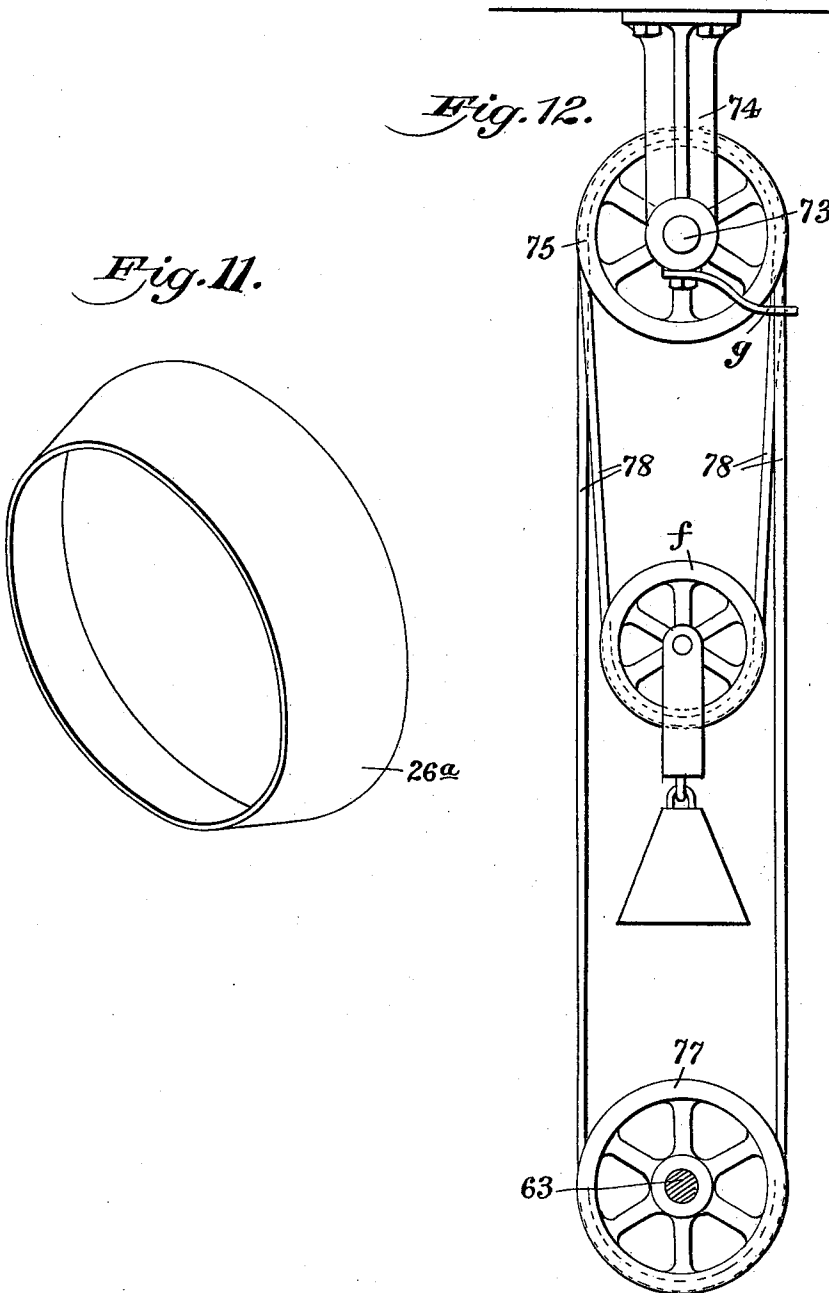
5 Sheets—Sheet 5.

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UNITED STATES PATENT OFFICE.

LEWIS R. HEIM, OF DANBURY, CONNECTICUT.

MACHINE FOR STIFFENING CROWNS OF HAT-BODIES.

SPECIFICATION forming part of Letters Patent No. 581,554, dated April 27, 1897.

Application filed August 14, 1896. Serial No. 602,742. (No model.)

To all whom it may concern:

Be it known that I, LEWIS R. HEIM, a citizen 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 the Crowns of Hat-Bodies; 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.

My invention relates to certain new and useful improvements in machines for stiffening the crowns of hat-bodies, and has for its object to provide a machine of this description which will apply the stiffening compound evenly and uniformly on the hat-body and to also greatly increase the capacity of such machine.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of my improved machine; Fig. 2, a horizontal sectional elevation taken on the line *z z* of Fig. 1, but drawn to a somewhat larger scale than the latter figure; Fig. 3, a sectional elevation taken on the line *x x* of Fig. 2; Fig. 4, a section taken on the line *y y* of Fig. 3, and showing particularly the construction of the devices for clamping the hat-body upon the cone or hat-block; Fig. 5, a detail side elevation of one of the clamping-levers; Fig. 6, a detail perspective of the end of one of the clamping-levers, showing particularly the part which carries the spurs and engages the hat-body, the stripper which forces the hat-body off of said spurs being removed; Fig. 7, a detail perspective of said stripper; Figs. 8 and 9, detail sectional elevations illustrating, respectively, the operation of the clamping devices in securing the hat-body upon the hat-block and releasing the same; Fig. 10, a detail perspective of the adjustable wiper or scraper, which is adapted to remove the surplus stiffening compound from the brush before the bristles of the latter come in contact with the hat-body; Fig. 11, a detail perspective view of the ring which is placed around the hat-block to prevent the expansible bag thereon from interfering with the action of the clamping devices in securing the hat-body upon the hat-block; and Fig.

12, a detail elevation of the mechanism for transmitting motion from a counter-shaft to the shaft of the rotary brush for applying the stiffening to the hat.

1 is a table which is supported by any suitable frame 2. 3 is a hollow shaft journaled in suitable bearings 4 on said table.

5 is a hollow cone-shaped hat-block rigidly mounted on the end of the shaft 3, and 6 is an expansible bag, preferably of rubber, which fits over the hat-block 5 and is secured thereto at the base of the latter in such manner that an air-tight joint is effected between said block and bag.

7 is a collar loose on the shaft 3 immediately in the rear of the hat-block 5, and said collar is capable of sliding freely on said shaft.

8 is an operating-lever pivoted at 9 between ears 10, extending from one of the bearings 4. The operating-lever 8 has two studs 11, (shown in dotted lines in Fig. 4,) which project within an annular groove 12 in the collar 7, and when said lever is moved to and fro the collar 7 will be caused to slide back and forth on the shaft 3, as will be readily understood by reference to Figs. 3 and 4.

39 is a latch-lever pivoted at 40 to the lever 8, and 41 is a short rack-bar rigidly secured to one of the bearings 4, with which said latch-lever engages. When the operating-lever 8 is drawn forward to cause the hat to be clamped upon the block 5, the latch-lever 39, engaging the teeth of the rack-bar 41, will prevent said operating-lever from returning to its normal position until said latch-bar is released from engagement with the teeth of said rack-bar.

The clamps for holding the hat in position on the block comprise a series of radially-disposed levers pivoted to said hat-block and carrying pivoted blocks provided with spurs which engage the interior surface of the hat-body, and said clamping-levers are rocked on their pivots to engage and disengage the hat-body by the sliding collar 7, as will hereinafter appear. 13 is a deep annular groove in the collar 7, and 14 are radial slots within the periphery of said collar.

Pivoted between ears 15 on the hat-block are the clamping-levers 16, whose inner ends depend within the radial slots 14 in the col-

lar 7, and each of said levers has at one end a pin 17, which tracks within the groove 13 and serves to connect said levers with the collar 7, so that the sliding movements of the latter will cause the levers to be rocked upon their pivots, as will be readily understood by reference to Figs. 3 and 4.

The outer ends of the levers 16 are formed into sockets 18, within which fit rods 19, which are adjustably secured within said sockets by set-screws 20.

21 are blocks which carry spurs 22 and are pivoted to the extremities of the rods 19. The object in pivoting the spur-carrying blocks 21 is to enable them when in engagement with the hat-body to conform nicely to the shape of the latter, as will be readily understood by reference to Fig. 8.

23 are strippers which are secured in position over the blocks 21 by the pins 24, which also serve to pivot said blocks to the ends of the rods 19. The slots 25, through which the pins 24 pass, are somewhat elongated to permit of a slight movement of the strippers independent of said blocks. 26 are holes in said strippers, through which the spurs 22 project when in engagement with the hat-body. (See Figs. 7, 8, and 9.)

26^a is a flat ring placed around the hat-block near the base thereof and over the expansible bag 6, which prevents said bag when expanded from interfering with the strippers 23, as shown in Fig. 8. When the clamps are disengaged and contracted tightly around the hat-block, the spurs 22 will be withdrawn through the holes 26 in the strippers, as shown in Fig. 9, and with the clamping devices in this position the hat-body may be easily and quickly removed and a new one substituted therefor without said spurs interfering in the least with this operation.

In removing a hat-body from the machine the clamps are contracted tightly around the hat-block, and in so doing the strippers operate to force said hat-body off the spurs, as will be readily understood by reference to Fig. 9.

When the hat-body has been properly clamped upon the hat-block, an air-pressure is introduced within the expansible bag 6 to expand it against the interior of the hat-body, so as to completely fill and support the same.

27 is a pipe which fits within the end of the hollow shaft 3 and is supported by a bracket 28.

29 is an ordinary stuffing-box at the end of the shaft 3 and surrounding the pipe 27, whereby an air-tight journal is effected between said pipe and shaft.

30 is a valve secured to the frame in any suitable manner, and 31 is the air-supply pipe, which communicates with said valve. The pipe 27 also communicates with said valve 30 and serves to conduct the compressed air from said valve to the expansible bag through the hollow shaft 3.

32 is a port in the end of the hat-block 5,

through which the air enters and escapes from the expansible bag.

The valve 30 is provided with two ways *a b*, which alternately establish communication between the passages or ports *c d e*. When said valve is in its lowest position, the way *a* will register with the ports *c d* and communication will be established between the pipes 27 and 31 and the bag 6 will be inflated and expanded, but when said valve is in its highest position, as shown in Fig. 3, the way *b* will register with the ports *d e* and communication will be established between the pipe 27 and the outside air, whereby the compressed air contained in the bag 6 will be free to exhaust through said port *e*. Of course when the ports *c d* are in communication with each other the exhaust-port *e* will be closed, and likewise when the port *d* is in communication with the exhaust-port *e* the supply-port *c* will be closed.

33 is a lever pivoted at 34 to a bracket secured to the under side of the table, and 35 is a vertical rod to which one end of said lever is pivoted. The other end of said lever is loosely connected to the valve 30, as shown at 36.

37 is a treadle to which the lower end of the rod 35 is pivoted. (See Fig. 1.)

38 is an overpoise on the lever 33, nearest the end which is pivoted to the rod 35, the object of such overpoise being to keep the valve 30 normally raised.

42 is the power-shaft, which is journaled in bearings 43 44 on the under side of the table. The bearings 43 44 are of such construction as to permit the inner end of the shaft 42 to be raised and lowered a short distance. The bearing 43 has a bolt 45 tapped therein on either side, and said bolts pass through and are capable of sliding within vertical slots 46 (only one shown) in a hanger 47, secured to the under side of the table, as will be readily understood by reference to Fig. 1. The bearing 44 likewise has two bolts 48 tapped therein, (only one shown,) but these last-mentioned bolts pass through plain round holes in the hanger 49 and serve as a pivot or fulcrum upon which said power-shaft may be rocked, as will be seen by reference to Fig. 1.

50 is the power-pulley, secured on the end of the power-shaft 42, and 51 52 are friction-pulleys secured, respectively, on the shaft 3 and said power-shaft 42, whereby motion is transmitted from said power-shaft to the shaft 3. Normally the friction-pulleys 51 52 do not touch each other, so that no motion of the power-shaft will be transmitted to the shaft 3 until said pulleys 51 52 are brought into contact, and the means for effecting this I will now describe.

The rod 35 is extended upward, and its extremity is slotted and straddles the inner end of the power-shaft 42, as shown at 53. The slot 53 in the upper end of said rod is of a length sufficient to permit said rod to be elevated far enough to bring the way *a* in the

valve in communication with the supply-port *c* and port *d*, leading to the expansible bag, before the lower wall of said slot will strike against the under side of the power-shaft.

5 The object in thus making the slot 53 in the end of the rod 35 of a particular length with respect to the movements of the valve 30 is to cause said valve to communicate the air-pressure to the expansible bag 6 before said bag and the hat supported thereon have been set in motion, which will of course enable the operator to see that everything is in proper order before the hat is caused to revolve and the stiffening compound applied thereon.

15 The stiffening compound is contained within a tank or reservoir 54, elevated a sufficient distance above the hat-block 5 and supported by a bracket 55, secured to the table, and said stiffening compound flows by gravity through a flexible pipe 56 to a rotary brush 57, by which it is applied to the hat-body, the construction of which brush and the mechanism by which it is operated I will now describe.

25 58 59 are two levers pivoted together at 60. The lever 59 is pivoted to the table at 61, and at the outer extremity of the lever 58 is pivoted a feed-tank 62.

63 is a short shaft journaled in any suitable manner within the feed-tank 62, and rigidly mounted on said shaft within said feed-tank is the brush 57. The flexible pipe 56 is attached to the feed-tank 62 at 64, and the flow of stiffening compound from the reservoir 54 through said pipe is regulated by a cock 65.

35 66 is a flexible pipe communicating with the tank 62 at 67, and said pipe leads to and empties within a vessel 68. By reference to Fig. 3 it will be observed that the point at which the pipe 66 communicates with the tank at 67 is slightly above the bottom of said tank, so that a small quantity of the stiffening compound will always be contained at the bottom of the tank, into which the bristles of the brush 57 are dipped as the brush is revolved.

45 The stiffening compound flows continuously to the feed-tank 62 through the pipe 56 and supplies said tank as fast as the stiffening compound is used therefrom. Should the supply of stiffening compound to the feed-tank exceed the quantity necessary to properly feed the brush, such excess will be conveyed by the pipe 66 to the vessel 68, from which it may be returned to the reservoir, so that it will be understood that the bristles of the brush are at all times dipped a predetermined distance in the stiffening compound contained in the bottom of said feed-tank.

60 69 is a wiper which is fitted within a slot 70 in the feed-tank in such manner as to be capable of sliding to and away from the brush, and 71 is an adjusting-screw tapped into said tank, by means of which the wiper may be adjusted with respect to the brush.

The brush in revolving is first dipped into

the stiffening compound at the bottom of the feed-tank. The wiper then operates to remove the surplus liquid from the ends of the bristles of said brush, as will be readily understood by reference to Fig. 3.

The power-pulley 50 is belted up to a pulley 72 on a counter-shaft 73, journaled in hangers 74, secured to the ceiling. The brush 57 also receives its motion from this counter-shaft, and the means for transmitting the motion of said shaft to said brush I will now describe.

75 76 are two pulleys tight on the counter-shaft 73, and 77 is a pulley tight on the end of the shaft 63 on which the brush is mounted.

78 is a belt which is passed around the pulleys 75 76 77 and also around a weighted pulley or sheave *f*, as shown in Figs. 1 and 12. The weighted sheave *f* acts as a take-up or tightener for the belt 78 as the brush is swung around in its various positions with respect to the hat-block.

g h are belt-guides secured, respectively, to the hanger 74 and feed-tank 62, and said guides prevent the belt 78 from being shipped from the pulleys around which said belt passes.

79 is a handle swiveled to the end of the shaft 63 on which the brush is mounted, and 80 is a handle attached to the end of the lever 59. After the hat-body has been secured in proper position on the hat-block 5 the operator grasps the handles 79 80, so as to swing the brush against said hat-body, and said handles are then manipulated in such manner as to cause the brush to travel along the hat-body and apply the stiffening thereto.

In operating my machine the operator first contracts the hat-clamps tightly around the hat-block. The hat-body is then placed upon said hat-block and said clamps expanded against the hat-body to clamp the same by pulling upon the operating-lever 8. The treadle 37 is then depressed sufficiently to permit the air-pressure to enter and expand the bag 6 tightly against the interior of the hat-body. The operator, after ascertaining that the hat-body is properly supported on the hat-block, then further depresses the treadle 37 to bring the two friction-pulleys 51 52 together, whereby the hat-body is caused to revolve. The stiffening compound is then applied to said hat-body by manipulating the brush 57 in the manner previously described. When the operation of applying the stiffening compound has been completed, the treadle is then released, which causes the friction-pulleys 51 52 to be separated and the revolving hat-block brought to a standstill, while at the same time the valve 30 is operated to permit the compressed air in the expansible bag 6 to escape, thus causing said bag to collapse. The lever 8 is then operated to release the clamps and the hat-body is removed.

81 is a safety-valve placed in convenient position on the pipe 27, which is used to prevent either the hat-body or the expansible

bag 6 from becoming injured by too great a pressure of air.

Of course the air-pressure is taken from some storage-tank conveniently located and supplied by an air-pump; but I have not shown either said tank or pump, as they do not form a part of my invention.

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

1. In a machine for stiffening hats, the combination of the hollow shaft journaled in suitable bearings on the table, the hat-block secured on the end of said shaft, the expansible cone-shaped bag secured around said hat-block and adapted to be inflated and expanded as described, a series of radially-disposed clamping-levers pivoted around said hat-block, means—as a sliding collar and operating-lever—for rocking said clamping-levers on their pivots, and instrumentalities for rotating said hollow shaft, substantially as described.

2. The combination of the hollow rotary shaft journaled in suitable bearings on the table, the hat-block secured on the end of said shaft, the expansible bag around said hat-block and adapted to be expanded against the interior of the hat-body as described, a series of radially-disposed clamping-levers pivoted around said hat-block at the latter's base, a sliding collar on said hollow shaft adapted to engage the inner ends of said clamping-levers, whereby said levers are contracted and expanded around said hat-block, an operating-lever for moving said collar back and forth, and a latch-lever pivoted to said operating-lever and engaging the teeth of a stationary rack-bar, substantially as set forth.

3. The combination of the hat-block mounted on the end of a hollow rotary shaft suitably journaled, a series of radially-disposed clamping-levers pivoted around said hat-block and adapted to be rocked on their pivots by a sliding collar operated from a pivoted hand-lever, the said clamping-levers being provided at their outer extremities with sockets within which are adjustable rods provided on their ends with spur-shod pivoted blocks which are adapted to engage the inner surface of the hat-body, and strippers secured over said spur-shod pivoted blocks, whereby when said clamping-levers are contracted tightly against said hat-block the hat-body will be disengaged from said spur-shod blocks, substantially as described.

4. The combination of the hat-block mounted on the end of a hollow rotary shaft suitably journaled, an expansible bag around said hat-block and adapted to be inflated and expanded as described, a series of radially-disposed clamping-levers pivoted around said hat-block and adapted to be rocked on their pivots by a sliding collar operated from a pivoted hand-lever, the said clamping-levers being provided at their extremities with spur-shod pivoted blocks which are adapted to en-

gage the inner surface of the hat-body, strippers secured over said spur-shod pivoted blocks which are adapted to cast off the hat-body from engagement with said spur-shod blocks when said clamping-levers are contracted, and a ring placed around said hat-block over said expansible bag whereby said bag is prevented from interfering with the clamping devices when said bag is expanded, substantially as set forth.

5. The combination of the hat-block mounted on the end of a hollow rotary shaft, the expansible bag around said hat-block, means for clamping the hat-body on said hat-block, a pipe through which air under pressure passes on its way to and from said expansible bag, a valve constructed as described from which said pipe leads, a lever pivoted to a bracket secured to the under side of the table, said lever being at one end connected to said valve and at the other end pivoted to a vertical rod the lower end of which is pivoted to a treadle while the upper end of said rod is adapted to engage the power-shaft to lift the same, and a friction-pulley on said power-shaft adapted to engage a similar pulley on the hollow shaft which carries the hat-block when said power-shaft is lifted, substantially as described.

6. In a machine for stiffening the crowns of hat-bodies, the combination of instrumentalities for supporting and revolving the hat-body, a pair of levers pivoted together the free end of one of such levers being pivoted to the bed of the machine and capable of swinging in a horizontal plane, a feed-tank pivoted at the free end of the other lever and capable of swinging only in a horizontal plane, a brush journaled within said tank and capable of rotation in a plane at right angles to the plane in which said tank swings, handles attached respectively to the first-mentioned lever and to the shaft of the brush, and means for supplying said tank with the stiffening compound, substantially as set forth.

7. In a machine for stiffening hats, the combination of instrumentalities for supporting and revolving the hat-body, a rotary brush journaled within a feed-tank pivoted at the end of a series of levers whereby said brush may be swung into proper position with respect to the hat-body, a supply-pipe leading from a reservoir containing the stiffening compound and communicating with said feed-tank, a pipe communicating with said feed-tank at a point somewhat above the bottom of the latter whereby a predetermined quantity of said stiffening compound is maintained at the bottom of said feed-tank into which the bristles of the brush are dipped as they revolve, and instrumentalities for revolving said brush, substantially as set forth.

8. In a machine for stiffening hats, the combination of instrumentalities for supporting and revolving the hat-body, a rotary brush journaled within a feed-tank pivoted at the end of a series of levers, whereby said brush

may be swung into proper position with respect to the hat-body, a supply-pipe leading from a reservoir containing the stiffening compound and communicating with said feed-tank, a pipe communicating with said feed-tank at a point slightly above the bottom of the latter and adapted to carry off any excess of stiffening compound that may be supplied thereto, a wiper projecting within said feed-tank and adapted to engage the bristles of the brush after they have been dipped in the stiffening compound and before said bristles come in contact with the hat-body, whereby the surplus stiffening compound is removed from said brush, and instrumentalities for revolving said brush, substantially as set forth.

9. In a machine for stiffening hats, the combination of instrumentalities for supporting and revolving the hat-body, the levers 58, 59, pivoted together the lever 59 being also pivoted to the table, the feed-tank pivoted on the end of the lever 58 and having a rotary brush journaled therein, means for supplying the stiffening compound to said brush, and

instrumentalities for revolving said brush, substantially as set forth.

10. In a machine for stiffening hats, the combination of instrumentalities for supporting and revolving the hat-body, the levers 58, 59, pivoted together, the lever 59 being also pivoted to the table, the feed-tank being pivoted on the end of the lever 58 and having a rotary brush journaled therein, means for supplying the stiffening compound to said brush, the pulleys 75, 76, mounted on a counter-shaft journaled in hangers depending from the ceiling, the pulley 77 mounted on the end of the shaft carrying the brush, the belt 78 passing around said pulleys and also around a weighted sheave, substantially as and for the purpose set forth.

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

LEWIS R. HEIM.

Witnesses:

J. S. FINCH,

THOS. E. AVERY.