

(No Model.)

4 Sheets—Sheet 1.

L. R. HEIM.

MACHINE FOR STIFFENING BRIMS OF HATS.

No. 580,396.

Patented Apr. 13, 1897.

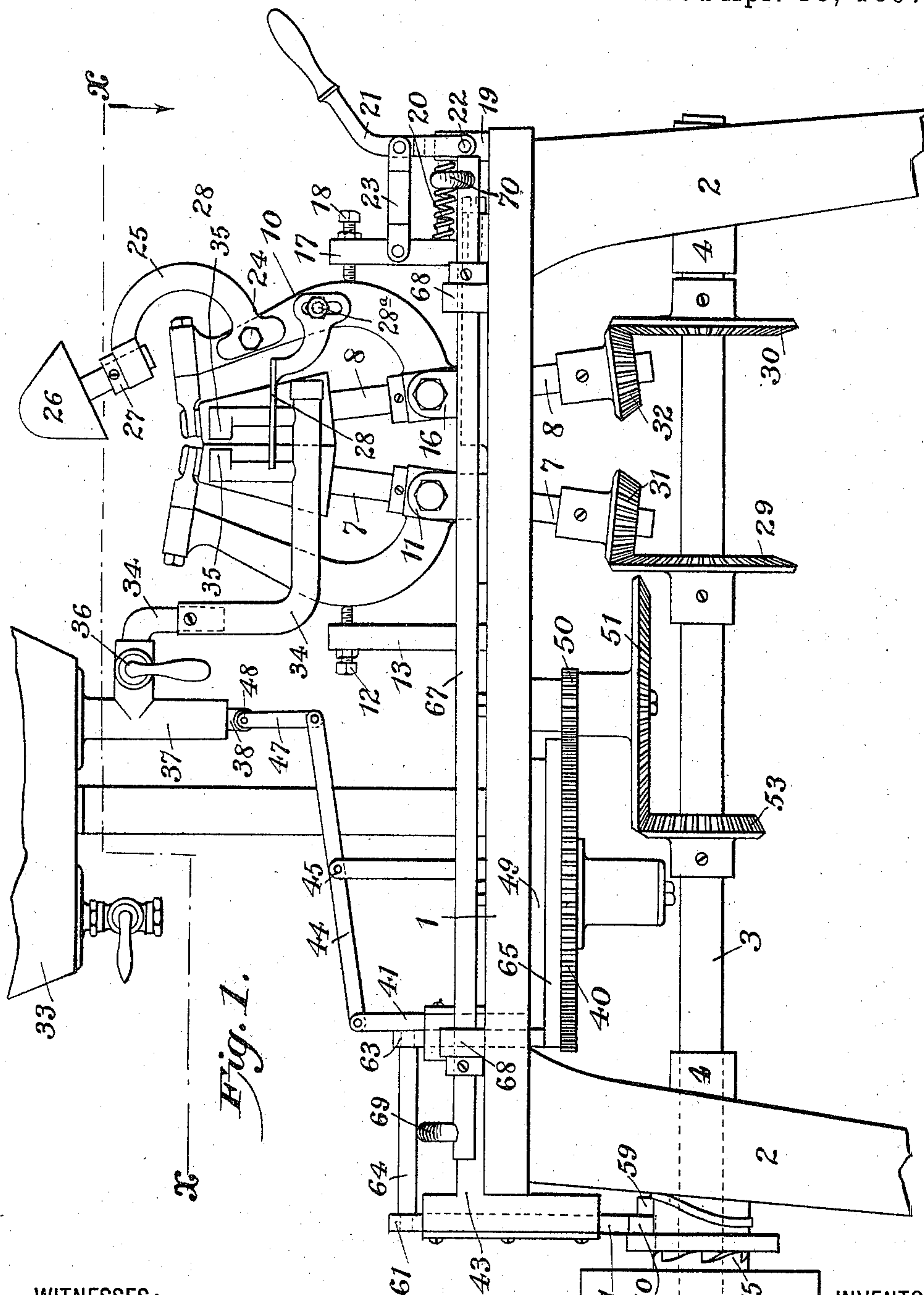


Fig. 1.

WITNESSES:

J. F. Finch.
M. L. Longden.

INVENTOR
L. R. Heim

By

J. M. Smith
ATTORNEY.

(No Model.)

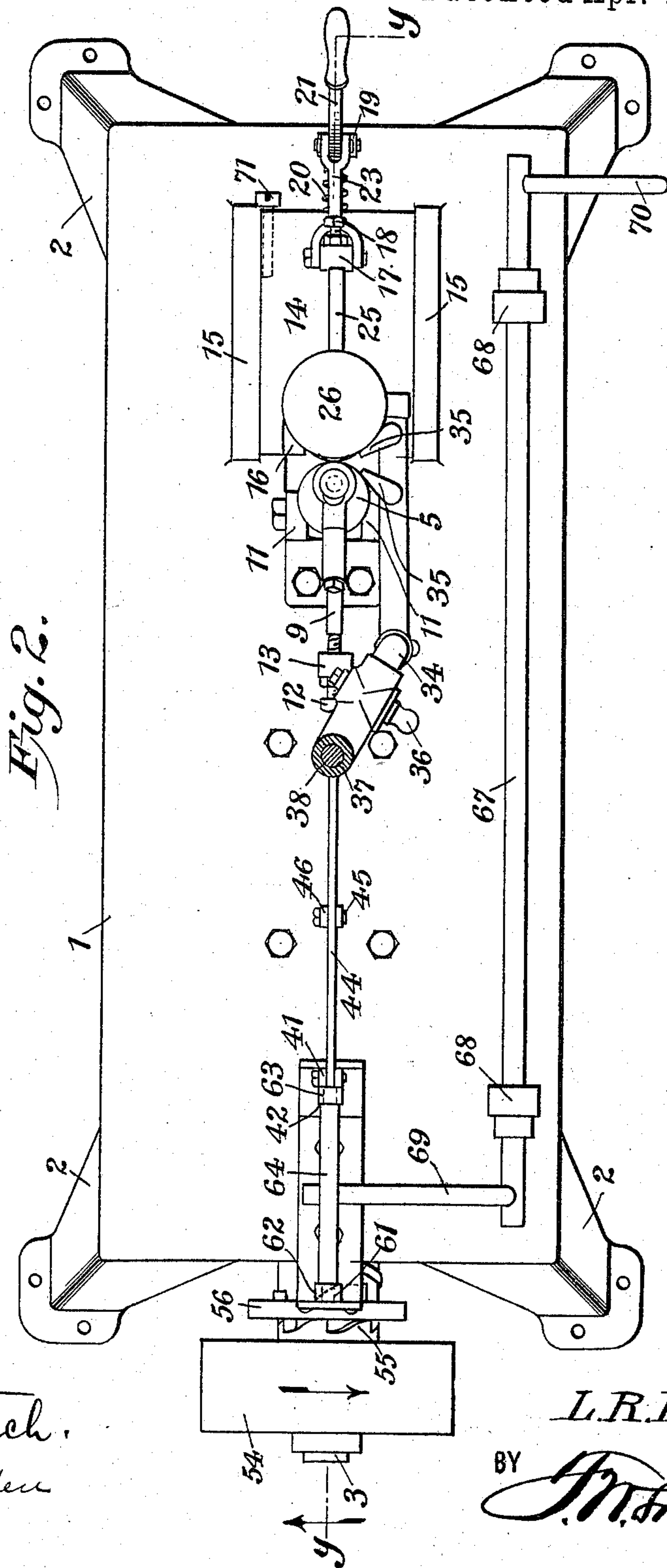
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WITNESSES:

J. F. Finch.
M. T. Longden

INVENTOR

L.R. Hein

BY

BY *M. Smith Jr*
ATTORNEY

(No Model.)

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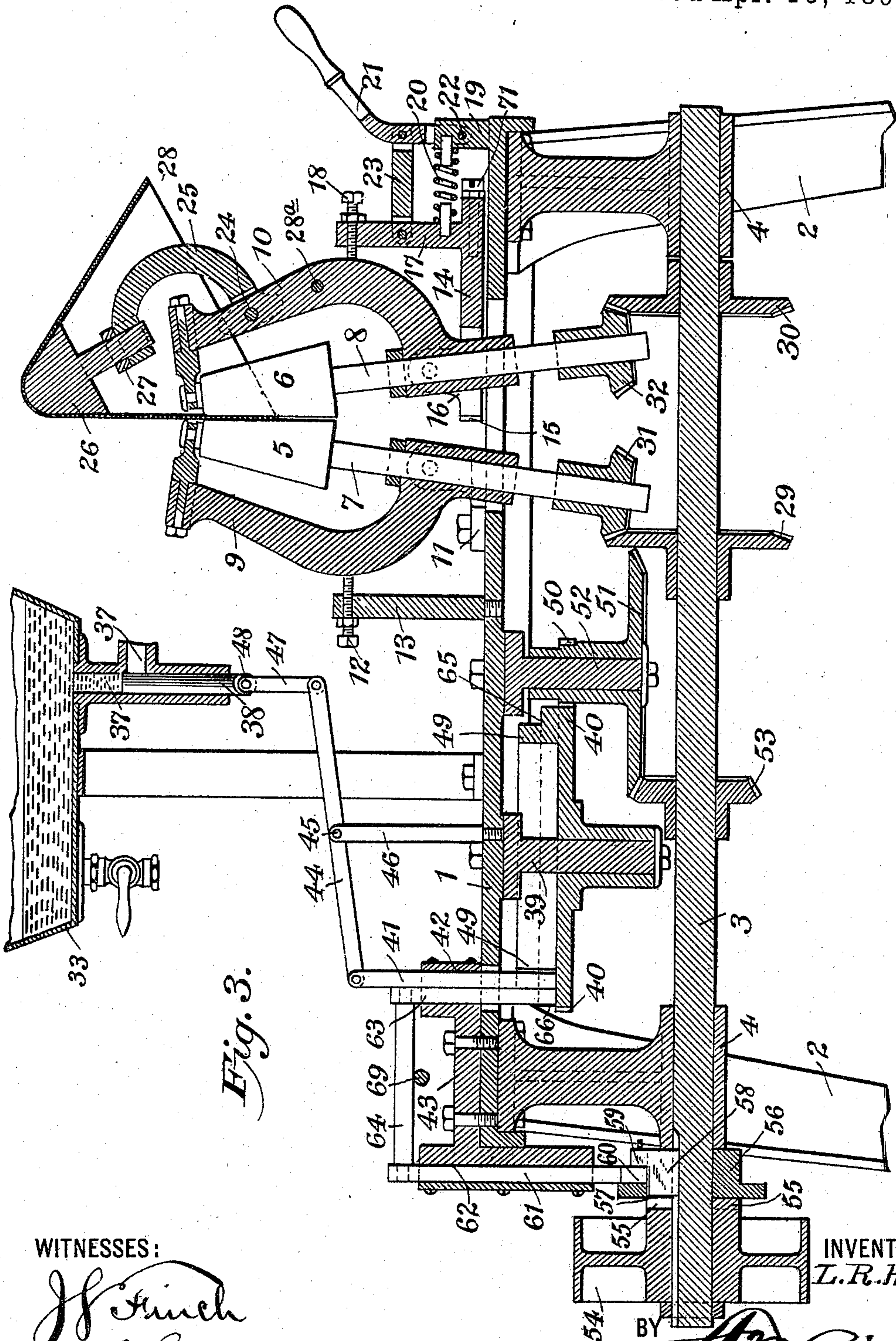


Fig. 3.

WITNESSES:

J. H. Finch
M. S. Longden

INVENTOR
L. R. Heim

BY

M. S. Longden
ATTORNEY

(No Model.)

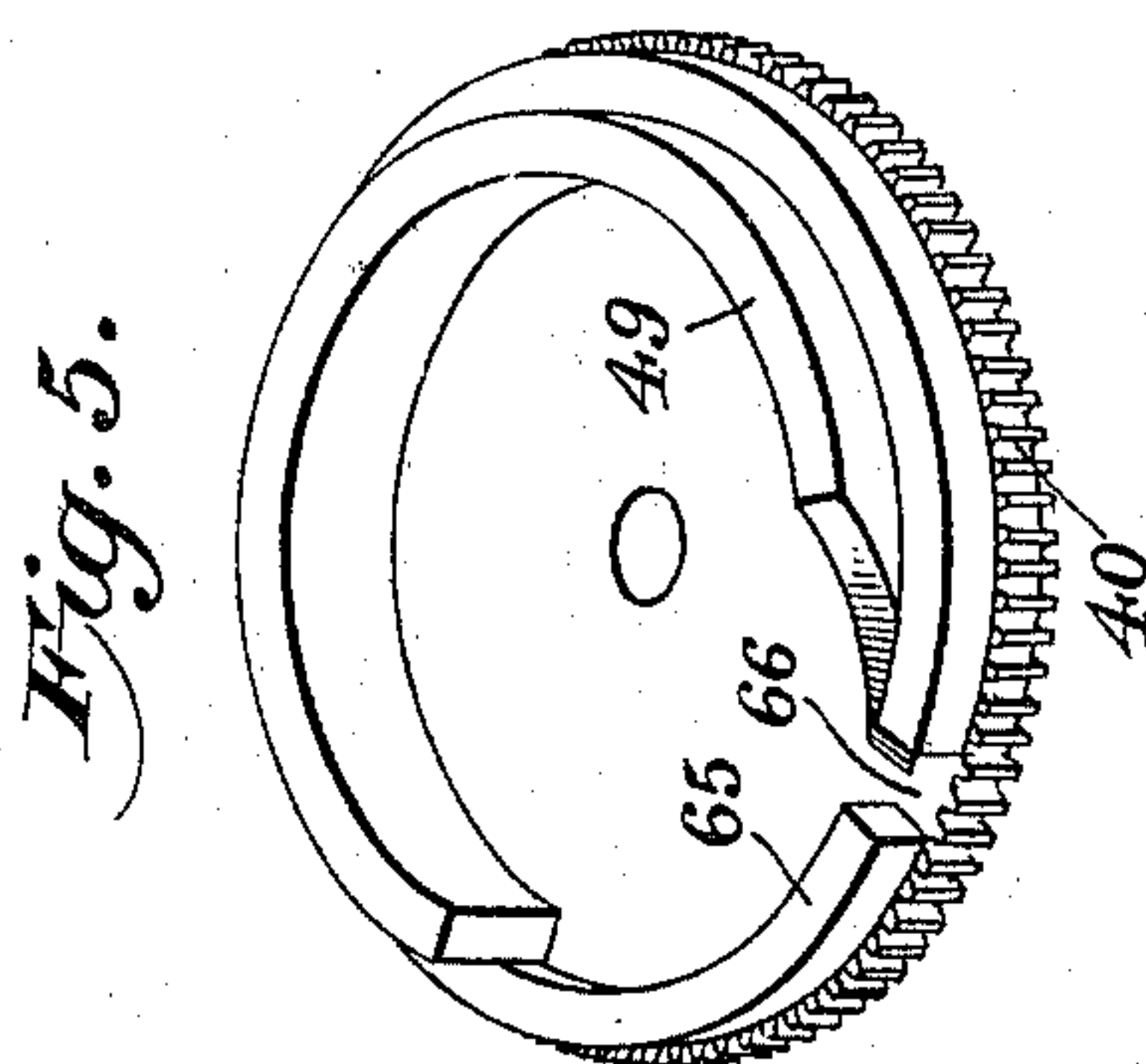
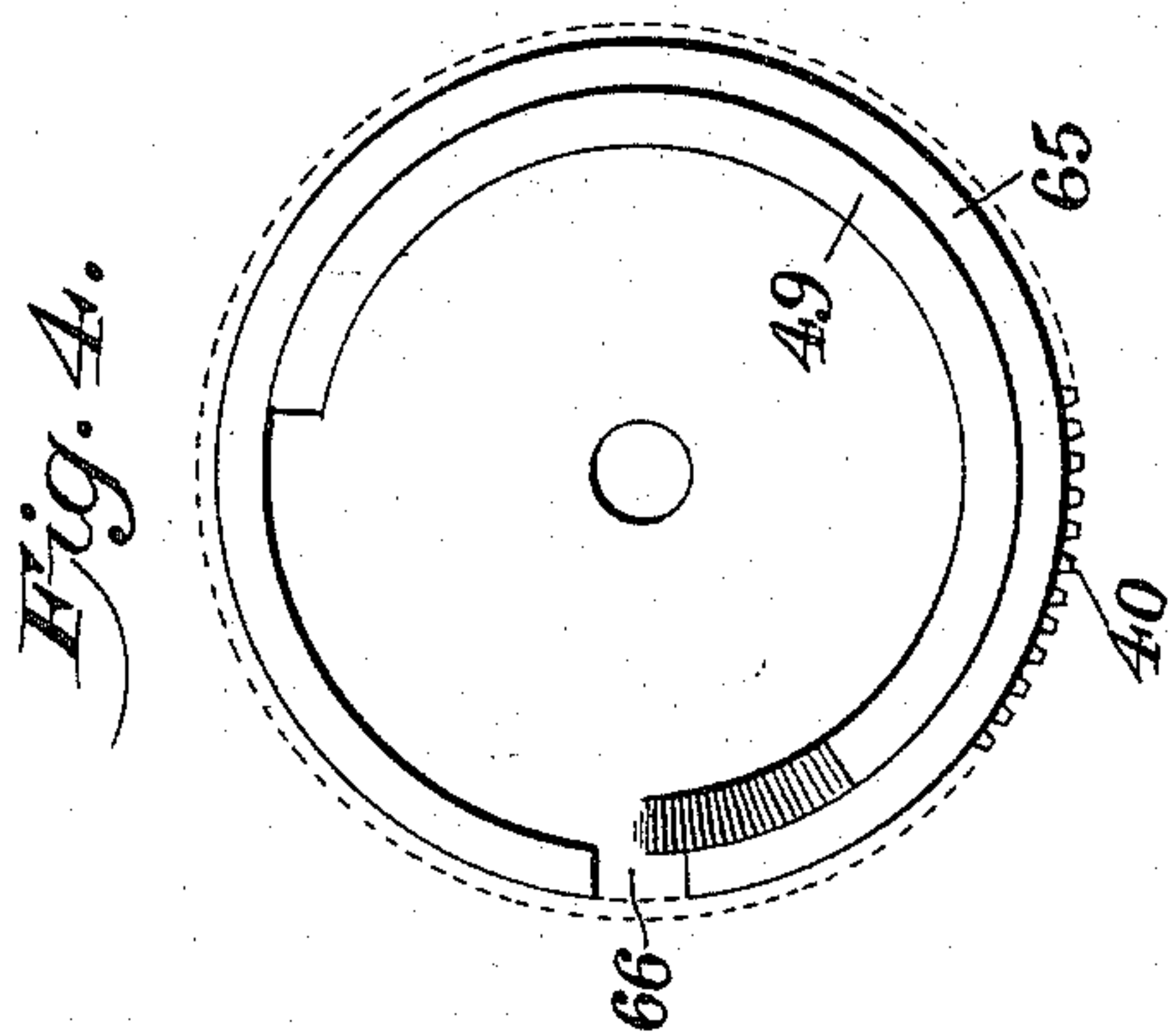
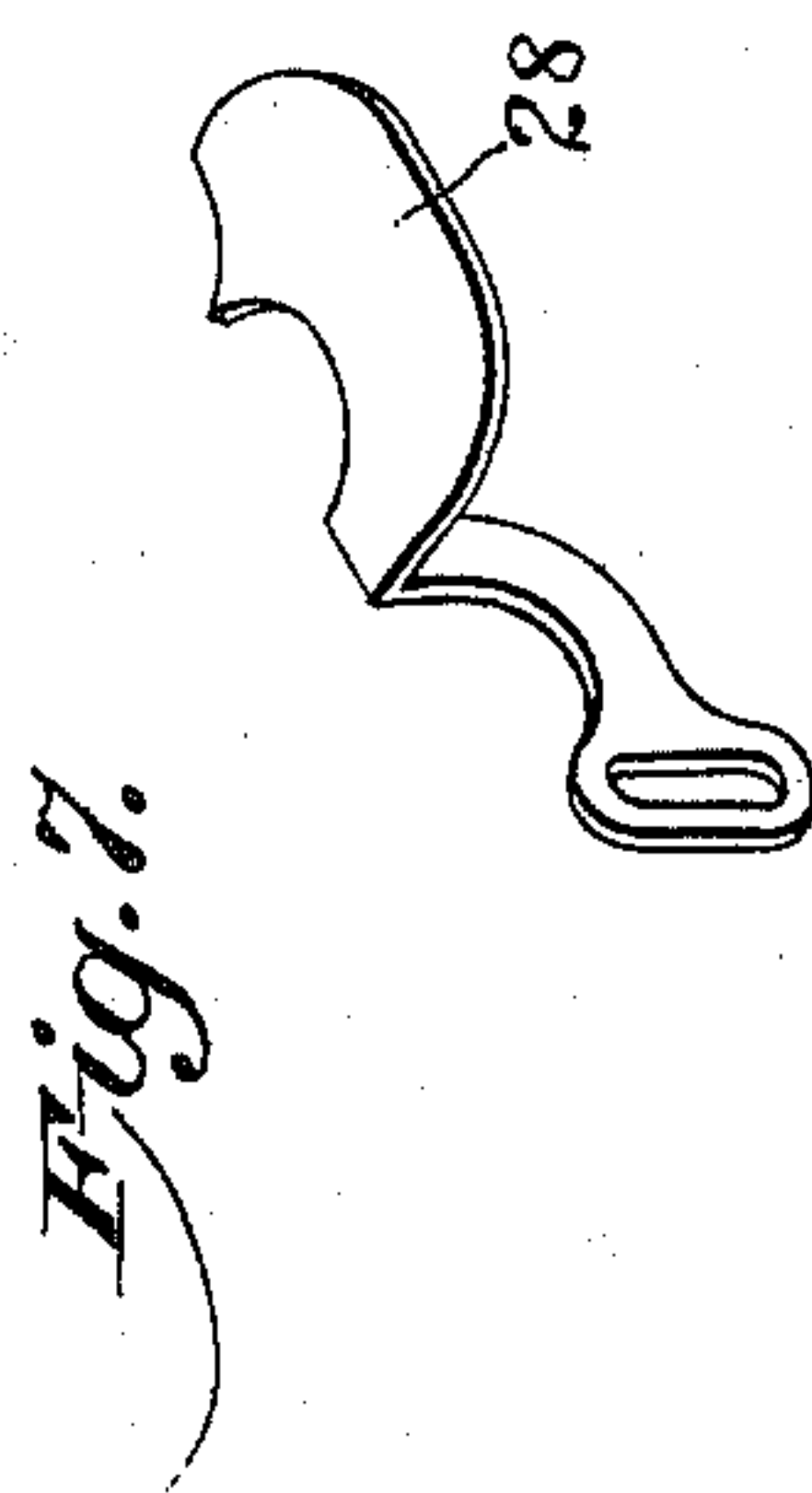
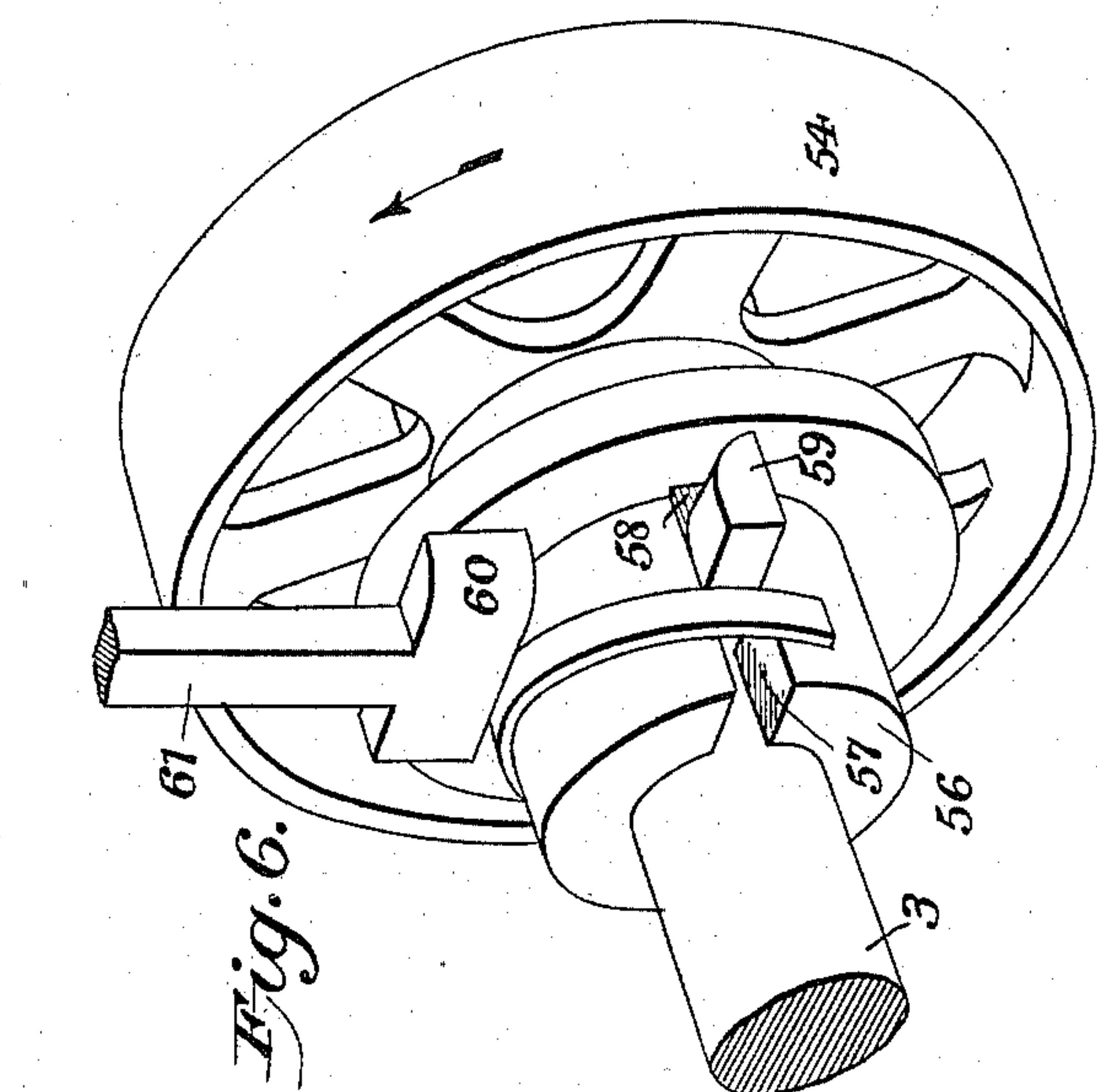
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WITNESSES:

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

INVENTOR

L. R. Heim.

BY

J. F. Smith
ATTORNEY

UNITED STATES PATENT OFFICE.

LEWIS R. HEIM, OF DANBURY, CONNECTICUT.

MACHINE FOR STIFFENING BRIMS OF HATS.

SPECIFICATION forming part of Letters Patent No. 580,396, dated April 13, 1897.

Application filed August 14, 1896. Serial No. 602,743. (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 Brims of Hats; 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 brims of hats, and has for its object to provide a machine of this description which shall be rapid and efficient in operation and which shall greatly improve the quality of work done thereon.

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 section taken on the line *xx* of Fig. 1; Fig. 3, a vertical longitudinal sectional elevation taken on the line *yy* of Fig. 2; Fig. 4, a detail plan view of the two cams employed in my machine; Fig. 5, a detail perspective view of such cams; Fig. 6, an enlarged detail perspective view of the clutch mechanism carried on the end of the power-shaft, and Fig. 7 a detail perspective view of a plate which supports the base of the hat-body.

Similar numbers of reference denote like parts in the several figures of the drawings.

1 is a bed or table supported by suitable legs 2.

3 is the power-shaft, journaled in bearings 4, bolted to the under side of the table 1.

5 6 are conical-shaped feed-rolls secured, respectively, on the upper ends of inclined shafts 7 8, the latter being journaled in adjustable brackets or supports 9 10. Rigid with the table are ears 11, between which the bracket 9 is pivoted.

12 is a set-screw tapped within the upper end of a post 13 which rises from the table in the immediate rear of the bracket 9. The end of the set-screw 12 bears against the bracket 9, and by manipulating this screw said bracket may be rocked on its pivot and the roll 5 adjusted to a proper plane with respect

to the roll 6, as will be readily understood by reference to Figs. 1 and 3.

14 is a slide working in ways 15, formed on the table, and 16 are ears which rise from the inner end of said slide and between which the bracket 10 is pivoted.

17 is a post formed rigid with the slide 14, and 18 is a set-screw tapped within the upper end of said post. The end of the set-screw 18 bears against the outer portion of the bracket 10, and by manipulating this screw said bracket 8 may be rocked on its pivot, whereby the roll 6 may be adjusted with respect to the roll 5.

19 is a post formed rigidly with the table, and 20 is a coil-spring which is interposed between the post 17 on the slide 14 and said post 19. The spring 20 exerts a tendency to keep the roll 6 pressed tightly against the roll 5.

21 is a lever pivoted to the post 19 at 22, and 23 is a link one end of which is pivoted to said lever, while the other end is pivoted to the post 17 on the slide 14. By depressing the lever 21 the slide 14 will be moved against the resiliency of the spring 20 and the roll 6 will be withdrawn from the roll 5, so that a hat-body may be readily inserted in proper position between the conical-shaped rolls.

Secured to the bracket 10, by a screw-bolt 24, is an arm 25, within the upper portion of which is loosely journaled a conical-shaped roller 26.

27 is an adjustable collar on the spindle of the roller 26, by means of which the vertical adjustment of said roller is effected.

28 is an adjustable plate, also secured to the bracket 10 by a screw-bolt 28^a.

The conical-shaped roller 26 acts as a support for the tip of the hat, while the plate 28 serves to support the base of the hat.

29 30 are two bevel-gears secured on the power-shaft 3, which intermesh with the respective gears 31 32 on the ends of the shafts 7 8, whereby motion is communicated from the power-shaft to the conical-shaped rolls 9 10.

The stiffening compound is contained within a reservoir 33, located somewhat above the horizontal plane of the rolls 5 6, and 34 is a pipe which conducts the stiffening compound from the reservoir to the hat-body.

35 are two nozzles secured to the end of the

pipe 34 in such manner that as the hat is rotated between the rolls 5 6 the stiffening compound will flow from said nozzles both upon the inside and outside surfaces of the hat-body. The extremities of the nozzles 35 are flattened, so that the liquid flowing therefrom upon the hat-body will be evenly spread thereon.

36 is a cock by means of which the quantity of liquid flowing through the pipe 34 may be regulated. The pipe 34 leads from a valve-chamber 37 at the bottom of the reservoir, and 38 is a slide-valve working in said chamber, which controls the flow of liquid therefrom.

When the valve 38 is in its highest position, as shown in Fig. 3, the supply of liquid from the reservoir will be cut off; but when said valve occupies its lowest position the stiffening will be free to flow through the pipe 34 to the hat. This valve 38 is automatic in its operation, and the mechanism for effecting the movements of said valve I will now describe.

39 is a short vertical shaft or spindle secured to the bottom of the table, and 40 is a spur-gear journaled loosely around said shaft.

41 is a vertical slide which works in a way 42, planed in a support 43.

44 is a lever pivoted at 45 to a post 46, rigid with the table, one end of said lever being pivotally connected to the upper end of the vertical slide 41, while the other end is pivoted to the lower end of a link 47. The upper end of the link 47 is pivoted at 48 to the end of the slide-valve 38.

49 is a cam formed upon the face of the gear 40, upon which the lower end of the vertical slide 41 tracks. The weight of the slide 41 is sufficient to keep said slide normally pressed against the cam 49. The contour of the cam 49 is such that when said cam is rotated a vertical reciprocation will be imparted to the slide 41.

Motion is imparted to the gear 40 from a spur-pinion 50, formed on the hub of a bevel-gear 51, which is loosely journaled around a vertical spindle 52, secured to the bottom of the table. The bevel-gear 51 meshes with 50 and is driven by a bevel-gear 53, secured on the power-shaft. The proportions of the gears 40 50 51 53 are such that the power-shaft will make ten revolutions to revolve the gear 40 once.

The clutch mechanism, whereby the machine is started and automatically brought to a standstill, I will now describe.

54 is the power-pulley loosely mounted on the end of the power-shaft, and 55 are teeth formed on the hub of said pulley.

56 is a collar tight on the power-shaft and adjacent to the toothed hub of the power-pulley.

The collar 56 has a groove 57 cut therein, within which works a sliding spring-actuated bolt 58, as clearly shown in Figs. 3 and 6. The bolt 58 has a beveled offset 59 projecting there-

from which is adapted to be engaged by the beveled foot 60 of a vertical slide 61, working in a way 62, planed in the end of the support 43. When the slide 61 is in its elevated position, the bolt 58 will be free to engage the teeth on the hub of the power-pulley, and said pulley will cause the power-shaft to be revolved, but when said slide is depressed so that the beveled foot thereof will engage the bolt 58 said bolt will be withdrawn from the teeth or notches on the hub of said power-pulley and the machine will be brought to a standstill.

63 is a vertical slide working in the way 42 beside the slide 41, and 64 is a bar which connects the slides 61 63 together, so that the movements of said slides will be simultaneous. The lower end of the slide 63 tracks upon a raised annular step or cam 65, formed on the upper face of the gear-wheel 40, immediately adjacent to the cam 49.

66 is a recess or depression made in the surface of the annular step 65, within which the slide 63 rests when said slide is in its lowest position and the machine is at a standstill.

The construction of the cams carried by the gear-wheel 40 is clearly shown in detail in Figs. 4 and 5.

67 is a rock-shaft journaled in bearings 68 on the table, and 69 is a finger which projects beneath the bar 64 and is secured to one end of said rock-shaft. The other end of this rock-shaft is provided with an operating-handle 70, by means of which said shaft may be rocked and the finger 69 caused to raise the slides 61 63 to permit the bolt 58 to engage the toothed hub of the power-pulley, whereby the machine is set in motion.

71 is an adjusting-screw tapped within the outer end of the slide 14, the head of which screw bears against the end of one of the ways 15, as clearly shown in Fig. 2, and by manipulating said screw the inward throw of the slide 14 may be regulated, by means of which the pressure of the rolls on the hat-body is increased or diminished.

The function of the rolls 5 6 is to revolve the hat-body as the stiffening is applied thereon, and by the action of said rolls the stiffening is made to soak thoroughly into the felt.

The relative diameters of the various gears with respect to the cam which controls the stiffening-supply are such that the hat-body will be revolved several times while the stiffening is being applied thereon, and a complete revolution will be given to said hat-body between the rolls 5 6 after the valve 38 has been closed and the stiffening-supply shut off.

As shown in the drawings, the rolls 5 6 will be revolved twenty (20) times while the gear 40, carrying the cams, is revolved once, and such revolution of said rolls will revolve the hat-body approximately four times. The cams 49 65 are so timed with respect to each other that the stiffening-supply will be cut off by the cam 49 sufficiently in advance of the stopping of the machine by the action of the

cam 65 so that the hat-body will be revolved at least one complete revolution by the rolls 5 6 before the machine is brought to a standstill.

5 The effect of rolling the hat-body through the rolls 5 6 after the stiffening-supply has been cut off is to thoroughly and evenly distribute the stiffening and to also remove any surplus, whereby the quality of the hat is
10 greatly improved.

The operation of my machine is as follows: A hat-body having been placed over the hat-supports and between the feed-rolls, as shown in section at Fig. 3, the operator depresses
15 the handle 70, whereby the vertical slides 61 63 are elevated and the bolt 58 thrown into engagement with the toothed hub of the power-pulley, which sets the machine in motion. The cam 49 first operates to raise the
20 slide 41 and open the valve 38, thereby permitting the stiffening compound to flow through the pipe 34 upon the revolving hat-body. The valve 38 remains open until the hat-body has been revolved, approximately,
25 three times through the rolls 5 6. Said valve is then automatically closed by the action of the cam 49, and the revolution of said hat-body by said rolls 5 6 is continued until the slide 63 drops within the recess 66 in the
30 cam 65, whereby the machine is brought to a standstill. The stiffened hat is then removed and another one substituted.

By the use of my machine absolute uniformity is obtained in stiffening hats, for the
35 reason that each hat-body is operated upon precisely the same length of time and the quantity of stiffening supplied to each separate hat-body is in each instance the same.

I do not wish to be limited to the exact construction shown and described, since it is evident that various alterations and changes in detail may be effected without departing from the spirit of my invention.

45 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 instrumentalities for supporting and revolving the hat-body, a supply-pipe for
50 conducting the stiffening compound to the hat-body, a valve within said pipe, and means operating in harmony with the rotation of the hat-body for automatically opening and closing said valve at predetermined times, whereby the supply of stiffening is controlled,
55 substantially as set forth.

2. In a machine for stiffening hats, the combination of instrumentalities for supporting and revolving the hat-body, a reservoir containing the stiffening compound, a pipe leading from said reservoir and conducting the stiffening compound to the hat, a cock in
60 said pipe for regulating the amount of stiffening flowing therethrough, a cam rotated from the power-shaft, and operative connections between said cam and a valve whereby the supply of stiffening to the revolving hat-

body is automatically controlled, substantially as set forth.

3. In a machine of the character described, 70 the combination of instrumentalities for supporting and revolving the hat-body, a reservoir containing the stiffening compound, a pipe leading from said reservoir and conducting the stiffening compound to the hat-body, 75 a cam rotated from the power-shaft, operative connections between said cam and a valve, whereby the supply of stiffening to the revolving hat-body is automatically controlled, and a clutch mechanism also oper- 80 ated from a cam driven from the power-shaft whereby the machine is brought to a standstill at a predetermined time after the supply of stiffening to the hat has been cut off, substantially as set forth. 85

4. The combination of the table, the spring-actuated slide 14 capable of reciprocating in suitable ways thereon, the bracket 10 pivoted between a pair of ears on said slide and having suitably journaled therein a conical- 90 shaped feed-roll, a set-screw whereby said bracket may be adjusted, an operating-lever suitably connected to said slide, the bracket 9 pivoted between a pair of ears on the table and having journaled therein a feed-roll simi- 95 lar to the feed-roll journaled in the bracket 10, a set-screw whereby said bracket 9 may be adjusted, and means for revolving said feed-rolls, substantially as set forth.

5. In a machine of the character described, 100 the combination of a pair of conical-shaped feed-rolls journaled in adjustable brackets, a conical-shaped roller loosely journaled in an arm extending from one of said brackets for the purpose of supporting the tip of the hat- 105 body, and operative connections between said feed-rolls and the power-shaft, substantially as set forth.

6. In a machine of the character described, the combination of a pair of conical-shaped 110 feed-rolls journaled in adjustable brackets, a flat plate or table secured to one of said brackets for the purpose of supporting the base of the hat-body, and operative connections between said feed-rolls and power-shaft, sub- 115 stantially as set forth.

7. In a machine of the character described, the combination of a pair of conical-shaped feed-rolls journaled in adjustable brackets, a conical-shaped roller loosely journaled in an 120 arm extending from one of said brackets for the purpose of supporting the tip of the hat-body, a plate secured to the bracket carrying said tip-supporting roll whereby the base of the hat-body is supported, and operative con- 125 nections between said feed-rolls and power-shaft, substantially as set forth.

8. In a machine of the character described, the combination of instrumentalities for sup- 130 porting and revolving the hat-body, a reservoir containing the stiffening compound, a pipe leading from said reservoir and conducting the stiffening compound to the revolving hat-body, a pivoted lever one end of which is

connected to a valve in said pipe while the other end of said lever is connected to a vertical slide working in ways on the table, a cam driven from the power-shaft and adapted to
5 raise and lower said slide, substantially as and for the purpose set forth.

9. The combination of the table, instrumentalities for supporting and revolving the hat-body mounted thereon and driven from the
10 power-shaft, a reservoir containing the stiffening compound, a pipe leading from said reservoir and conducting the stiffening compound to the revolving hat-body, a gear 40 suitably
15 journaled beneath the table and carrying a cam upon its face adapted to engage a vertical slide 41 working in ways on said table, a pivoted rock-lever one end of which is connected to said slide while the other end of said
20 lever is connected to a valve in the pipe leading from the stiffening-reservoir, and a train of gears driven from the power-shaft and adapted to transmit the motion of the latter to said gear 40, substantially as set forth.

10. In a machine of the character described,
25 the combination of instrumentalities for supporting and revolving the hat-body, instrumentalities for supplying the stiffening compound to said hat-body, the power-pulley loosely mounted on the power-shaft, a collar
30 tight on said shaft and carrying a spring-actuated bolt adapted to engage the toothed hub of said power-pulley, a vertical slide working

in ways on the bed and having a beveled foot adapted to engage said spring-actuated bolt to withdraw the latter from engagement with
35 the toothed hub of said power-pulley, suitable mechanism for elevating said slide and a gear driven from said power-shaft and carrying an annular step or cam whereby said slide is prevented from engaging the said spring-
40 actuated bolt throughout a predetermined period, substantially as set forth.

11. In a machine of the character described, the combination of the conical-shaped feed-rolls driven from the power-shaft, a reservoir
45 containing the stiffening compound, a pipe leading from said reservoir to the revolving hat-body, a gear suitably journaled on the frame and carrying a pair of cams one of said
50 cams being adapted to reciprocate a vertical slide whose movements are transmitted to a valve in the pipe leading from the reservoir to the revolving hat-body, the other cam on
55 said gear being adapted to control the mechanism for disengaging the power-pulley from the power-shaft, and a train of gears between said cam-carrying gear and said power-shaft, substantially as described.

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

LEWIS R. HEIM.

Witnesses:

J. S. FINCH,

THOS. E. AVERY.