

(No Model.)

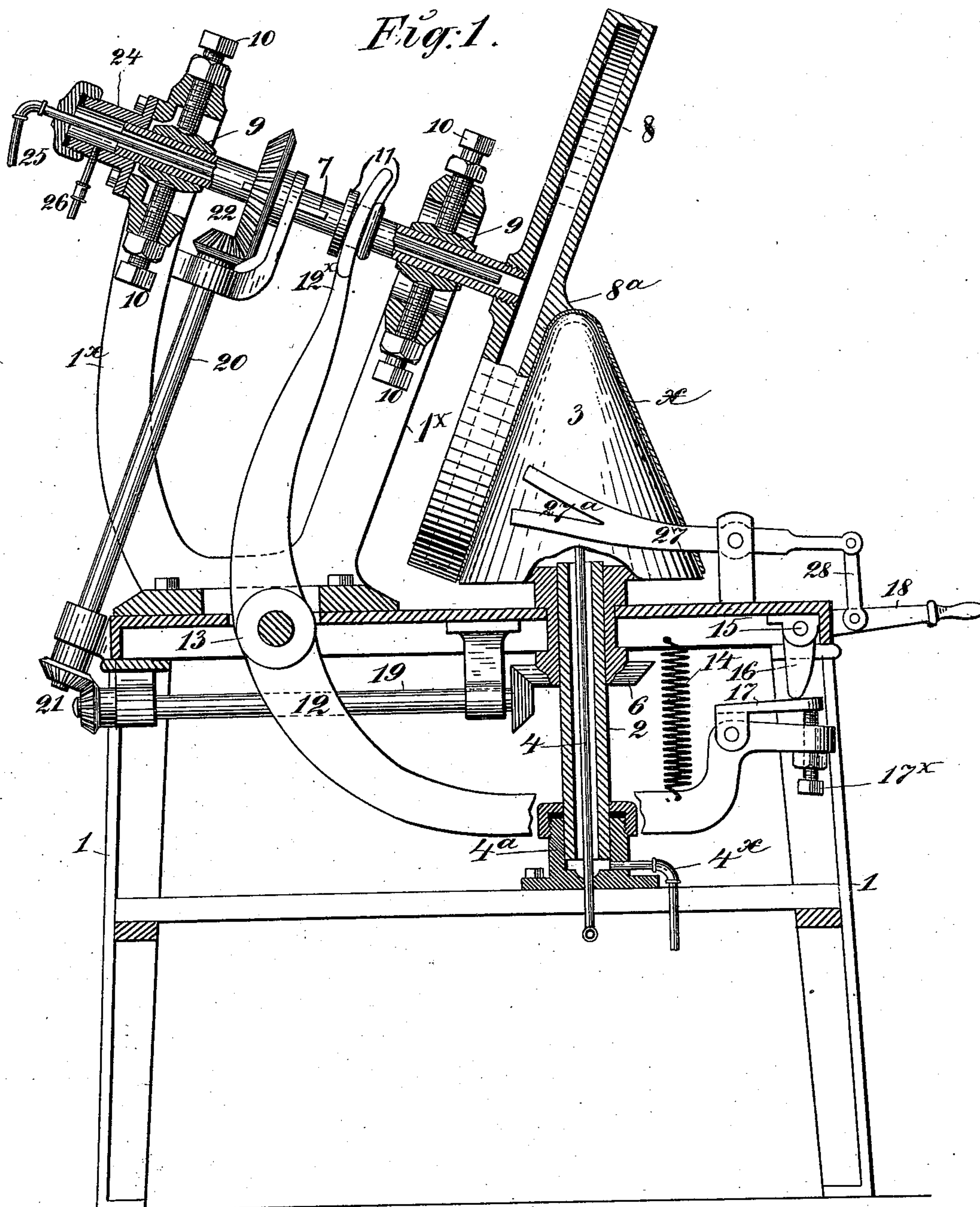
2 Sheets—Sheet 1.

W. H. KNOWLES.

MACHINE FOR SIZING, FELTING, AND PINNING OUT HATS.

No. 546,453.

Patented Sept. 17, 1895.



WITNESSES:

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Fig. 2.

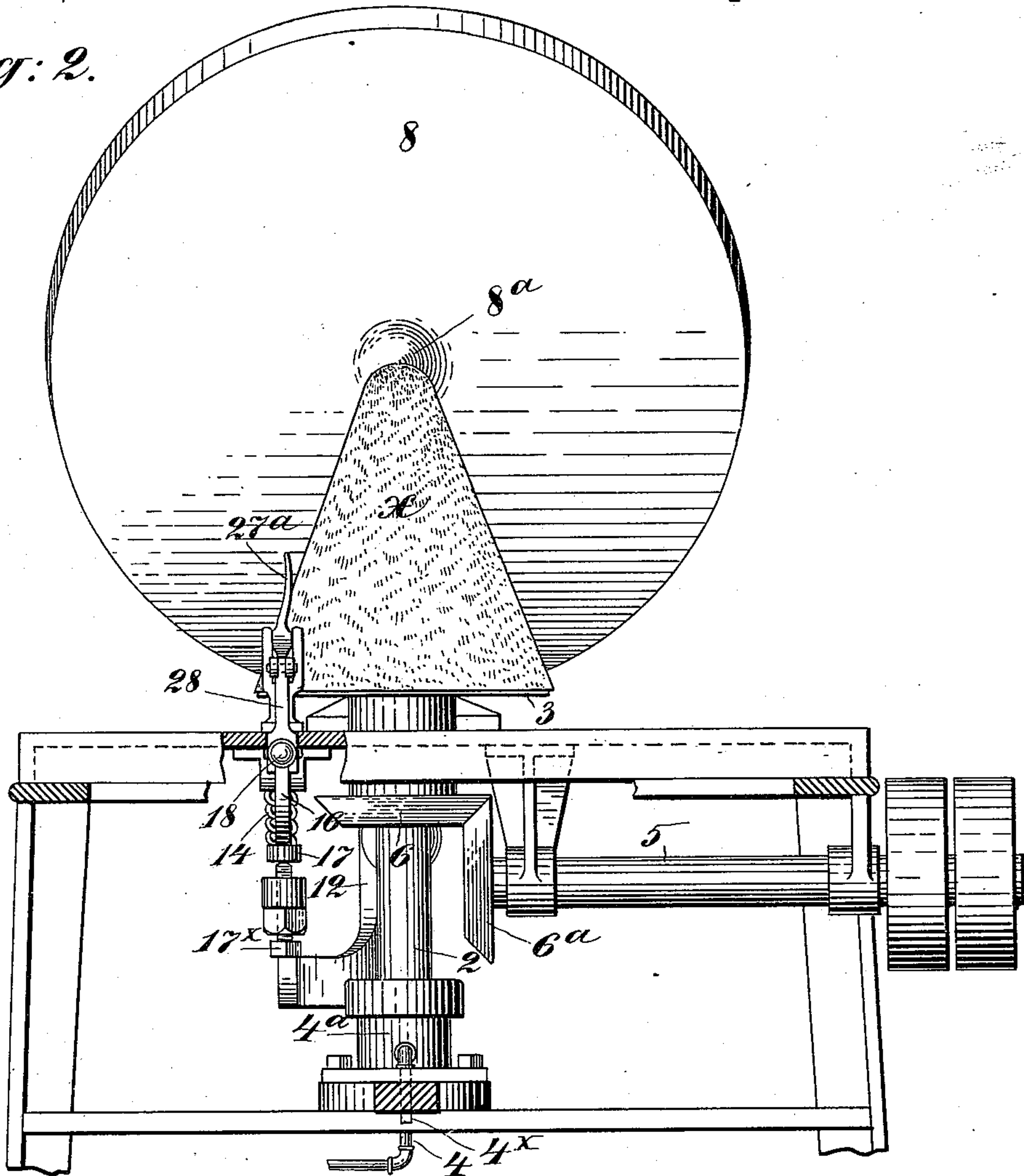
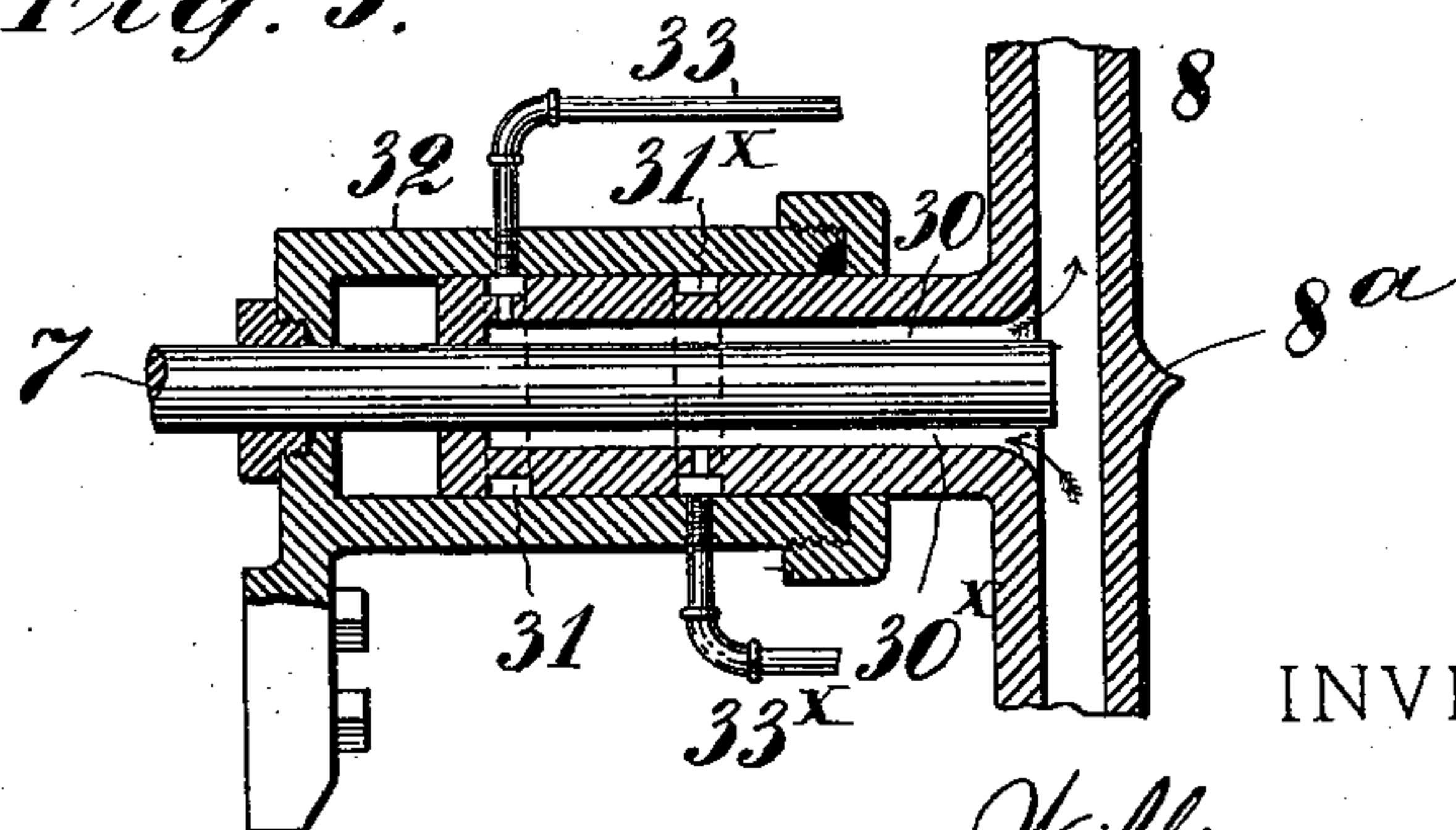


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. KNOWLES, OF DANBURY, CONNECTICUT.

MACHINE FOR SIZING, FELTING, AND PINNING OUT HATS.

SPECIFICATION forming part of Letters Patent No. 546,453, dated September 17, 1895.

Application filed February 13, 1893. Serial No. 462,200. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KNOWLES, 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 Sizing, Felting, and Pinning Out Hats, of which the following is a specification.

My invention relates to a class of machines employed in the manufacture of felt hats for sizing, felting, and pinning out the hat. The machines that have usually been employed for this purpose comprise an upright rotatable cone to support the hat and conical rollers arranged to bear on the hat as it is carried around on its rotating support.

The object of my invention is to improve this class of machines and produce a simple machine of inexpensive construction which will accomplish better results than those in common use.

The invention will be fully described hereinafter and its novel features carefully defined in the claims.

In the accompanying drawings I have shown an embodiment of my invention.

In the drawings, Figure 1 is a side elevation of the machine, partly in mid-section. Fig. 2 is a front view of the machine. Fig. 3 illustrates a means of admitting steam to the disk which differs in some respects from that illustrated in Fig. 1.

1 is a suitable frame to support the mechanism. In this frame is mounted in suitable bearings a shaft 2, on which is fixed the cone 3, which supports the hat under treatment. The shaft 2 is preferably arranged with its axis upright, and it and the cone are made hollow for admitting steam for heating the cone. The steam is led to the cone through a pipe 4, which extends up through a step 4^a, and the hollow of the shaft. The returning steam and water of condensation escape at pipe 4^x.

5 is the driving-shaft, which also has bearings in the frame and drives the cone-shaft 2 through beveled friction-gears 6 and 6^a.

On the frame 1 is mounted a supplementary frame 1^x, in which is mounted a shaft 7, on which is secured a smoothing and pressing disk 8. The face of this disk is parallel with the inclined face of the supporting cone

3, and means are employed for moving the face of the disk up against the hat *x* on the cone 3 by shifting the shaft 7 longitudinally in its bearings. The shaft 7 and disk 8 are so arranged relatively to the cone 3 that the prolonged axis of the shaft and disk cuts the axis of the cone substantially at the apex of the latter. Means are also provided for varying the angle of the face of the disk. The shaft 7 is mounted in bearing-blocks 9, which are mounted in the frame 1^x, and these bearing-blocks are supported by adjusting-screws 10, set in the frame. On the shaft 7 is secured a grooved collar 11, or two collars with a space between them, and the groove in this collar is engaged by a fork 12^x on a bent lever 12, fulcrumed at 13 in the frame. The lower arm of this lever 12 extends forward, and a spring 14 connects it to the frame in a manner to draw up the lever-arm and, by the engagement of the fork 12^x with the collar on shaft 7, to draw the disk 8 away from the cone 3. In an operative machine this movement of the disk may be about two inches. To force the disk up to and into contact with the hat on the cone 3, I employ a cam-like device for depressing and holding down the arm of the lever 12. As here shown, this depressing device comprises a rock-shaft 15, mounted transversely in the frame over the lever-arm, and having on it a cam 16, which is adapted to bear on an adjustable shoe 17, hinged to the lever-arm and adapted to be raised and lowered at will by means of a screw 17^x in the lever undersaid shoe. The shaft 15 is rocked by means of an operating-arm 18. The object in employing the adjustable shoe 17 on the lever-arm is to regulate the pressure of the disk on the hat, as the cam 16 will or should be brought to the vertical position seen in Fig. 1, in order that it may be "on centers" and stand firm when set.

The disk is driven through the medium of counter-shafts 19 and 20 and gears 21 and 22, as clearly shown in Fig. 1. The gear-wheel on the disk-shaft 7 is splined on the shaft, so that the latter may play through the wheel in its longitudinal movements. The disk 8 will be made hollow, by preference, and be provided with means for admitting steam to its interior for heating it. This is desirable in some of the operations on hats. The steam

may be admitted in any convenient manner. I have shown two modes of effecting it, one of which is illustrated in Fig. 1 and the other in Fig. 3. In the construction illustrated in Fig. 1 the shaft 7 is hollow or tubular, and its outer end is housed in a box 24, secured to the frame 1^x. The steam is admitted by a pipe 25, which may extend into or through the shaft 7, and it passes back to the box 24 and out at a pipe 26. The disk 8 will have a somewhat conical central point 8^a to take over the rounded top of the hat on the cone, and the operative face of the disk, which is tangent to the cone, will move in the same direction as the convex face of the latter. The impingement of the disk on the hat will press out the water from the latter, remove croze-marks and color-streaks, and leave the hat with a smooth and nearly dry surface.

On the frame 1 is pivotally mounted a flat spring-blade 27, the forked end 27^a of which moves up and down in a substantially vertical plane, and when depressed bears on the lower inclined side of the hat at its larger part. This blade is coupled at 28 to the operating-arm 18, whereby its working end will be depressed into operating position when the disk is brought into play. The hat or "body" *x* always fits loosely on the cone 3 about its lower and larger part, and as the cone rotates at about two hundred revolutions per minute slight folds are apt to form in the wet flexible material and pass under the disk, thus forming marks, the blade being adapted to press elastically and lightly on the hat, like the spread fingers of the workman's hand, and at the point where the folds are apt to form, smooth out the latter automatically. This blade 27 is very useful on hats of certain shapes, which would otherwise require to be manipulated by hand, and its use renders the machine in a great measure automatic in its treatment of the hat.

Fig. 3 illustrates a means of introducing steam to the disk 8 when the shaft 7 is not tubular. In this construction the hub of the disk has two longitudinal bores or passages 30 and 30^x, which lead, respectively, from the hollow in the disk to circumferential grooves or channels 31 and 31^x in the hub. The latter is embraced by a cylindrical box 32, fixed to the frame 1^x, and is adapted to play longitudinally to a sufficient extent in the box. When the disk is operating on the hat, the groove 31 is in communication with the steam-inlet 33 and the groove 31^x is in communication with the steam-outlet 33^x, so that steam may be caused to circulate through the hollow of the disk. When the disk is moved back from the cone, the respective grooves are moved out of register with the steam inlet and outlet and the steam is thereby cut off.

I do not limit myself to heating the disk by steam, as in some operations on the hat this may neither be necessary nor desirable.

I have shown the disk driven positively,

as well as the cone; but in some cases the contact of the disk with the hat on the cone may be relied on to rotate the disk.

The advantages of the disk over the conical roller as ordinarily mounted will be readily understood by those skilled in the operation of these machines. The conical roller, even when most carefully adjusted, is almost certain to spring away from the hat near the tip, or rather to press firmly on the hat at the lower part only of the cone. This causes the roller to drive the hat upward on the cone, crumpling and injuring the tip of the hat. The disk being moved up to the cone in the line of its axis, the path being substantially at right-angles to the surface of the cone, no skill is required in regulating and operating the machine, and the difficulties above stated are wholly avoided. Moreover, the disk presents to the hat on the cone a broad flat surface at each side of the line of contact and prevents in a great degree the formation of wrinkles or folds in the rapidly-moving hat adjacent to the line of contact, which are apt not only to form, but to be instantly drawn in between the two surfaces when a coned roller is employed.

Having thus described my invention, I claim—

1. In a machine for the purpose specified, the combination with a rotatable, conical support for the hat, of a rotatable disk with its face adapted to be put in contact with the hat on the support by the movement of the disk in the direction of its axis, the shafts of the said support and disk, and a supporting frame therefor.

2. In a machine for the purpose specified, the combination with an upright, conical, rotatable support for the hat, and its shaft, of a rotatable disk and its shaft, the disk being movable toward and from the cone in the direction of its axis, and the conical support and disk being so arranged, relatively, that the prolonged axis of the disk cuts the axis of the conical support substantially at the apex of the latter.

3. In a machine for the purpose specified, the combination with the upright, conical, rotatable support for the hat, and the shaft of said support, of the pressing disk and its shaft, said disk having a central projection, 8^a, on its operative face to take over the apex of the hat on the cone, and the shaft of the disk being movable endwise in its bearings, as set forth.

4. In a machine for the purpose specified, the combination with an upright, conical, rotatable support for the hat, and the shaft of said support, of the pressing disk and its shaft, and means for shifting the disk axially into and out of contact with the hat on the support, the axes of the respective shafts of the hat-support and disk being in the same vertical plane, substantially as shown.

5. In a machine for the purpose specified, the combination with the conical, rotatable

support for the hat, of the rotatable hollow pressing disk, 8, arranged with its operative face substantially parallel with the inclined face of the conical support, the shafts of the conical support and disk, and means for heating the hollow disk.

6. In a machine for the purpose specified, the combination with the rotatable, conical support for the hat, of the pivotally mounted spring blade, 27, adapted to be brought into contact with the hat on the rotating support by rocking on its pivot, substantially as set forth.

7. In a machine for the purpose specified, the combination with the frame, of the shafts 2 and 7, mounted therein, the latter capable of longitudinal movement in its bearings, the conical support on the shaft 2, the pressing disk on the shaft 7, adapted to be brought into contact with the hat on the support as described, the lever 12, fulcrumed in the frame and having a fork which engages a collar on the shaft 7, the spring 14, to retract the parts, the cam 16, for depressing the arm of the lever 12, and an operating arm 18, for operating said cam, substantially as set forth.

8. In a machine for the purpose specified, the combination with the frame, the rotatable, hollow cone, 3, its shaft, mounted in the frame, means for introducing steam to the

cone for heating it, the rotatable disk 8, arranged with its operative face substantially parallel with the inclined side of the cone and adjacent thereto, the shaft of said disk, movable longitudinally in its bearings, and means for moving said shaft longitudinally in order to shift the disk toward or from the cone, substantially as set forth.

9. In a machine for the purpose specified, the combination with the supporting cone, 3, and its rotatable shaft, of the rotatable disk 8, its shaft 7, means for moving the shaft 7 longitudinally in its bearings, mechanism for driving said supporting cone, and gearing, intermediate the shafts 2 and 7, whereby the former drives the latter, as set forth.

10. In a machine for the purpose specified, the combination with the hollow supporting cone, 3, and its hollow shaft, of the step 4^a, at the base of said shaft, and the pipe 4, extending up through said step and through the hollow shaft to the cone, the step having an outlet 4^x, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WM. H. KNOWLES.

Witnesses:

HENRY CONNELL,
HENRY QUIEN.