

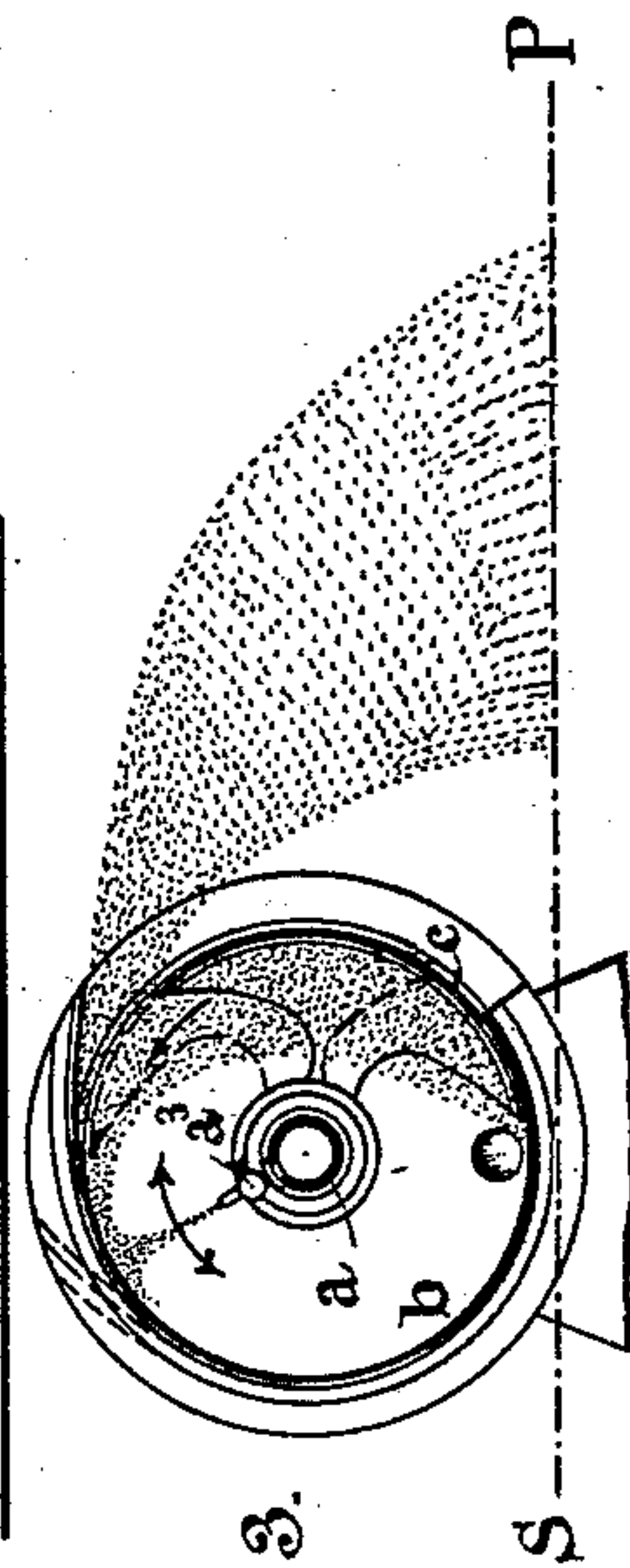
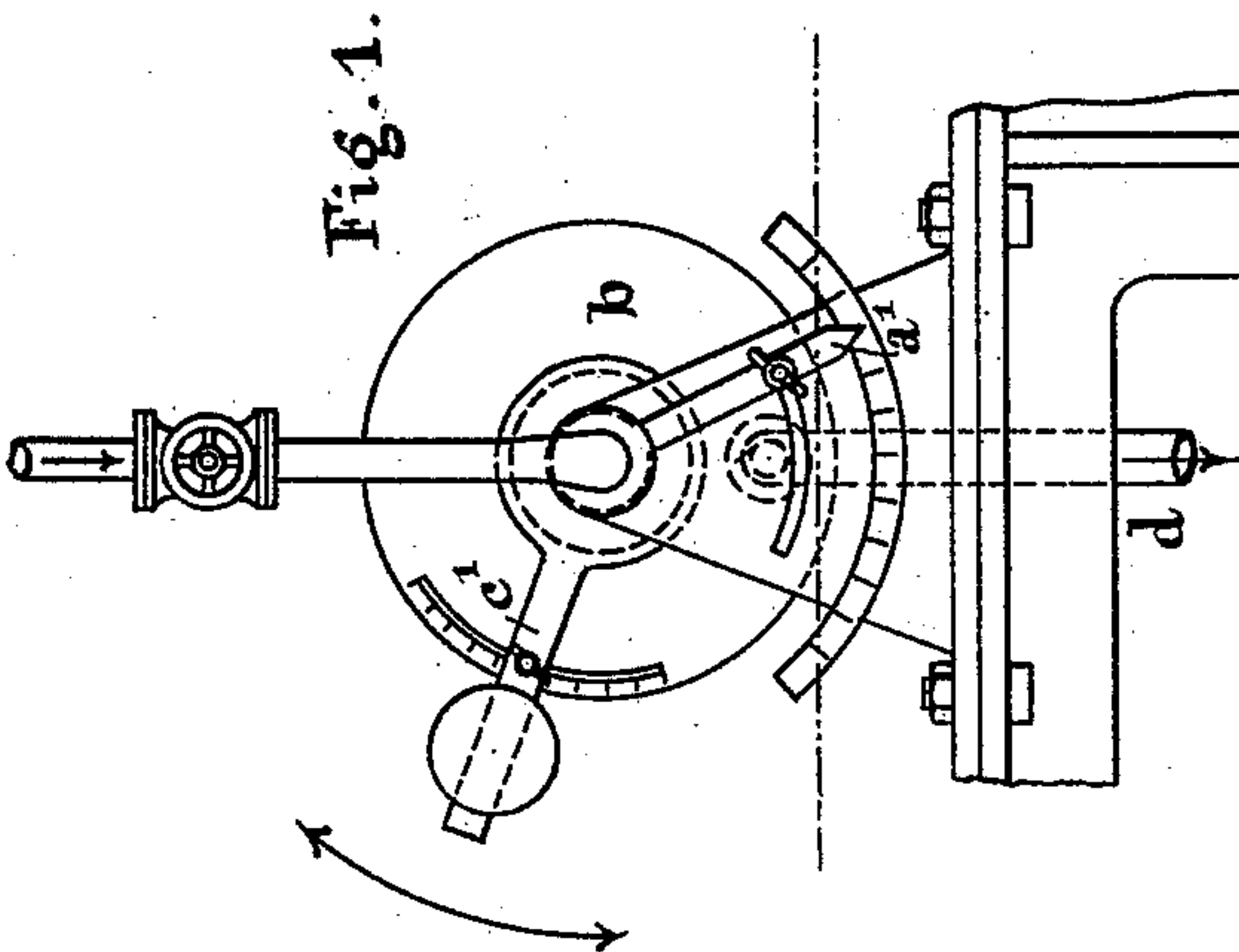
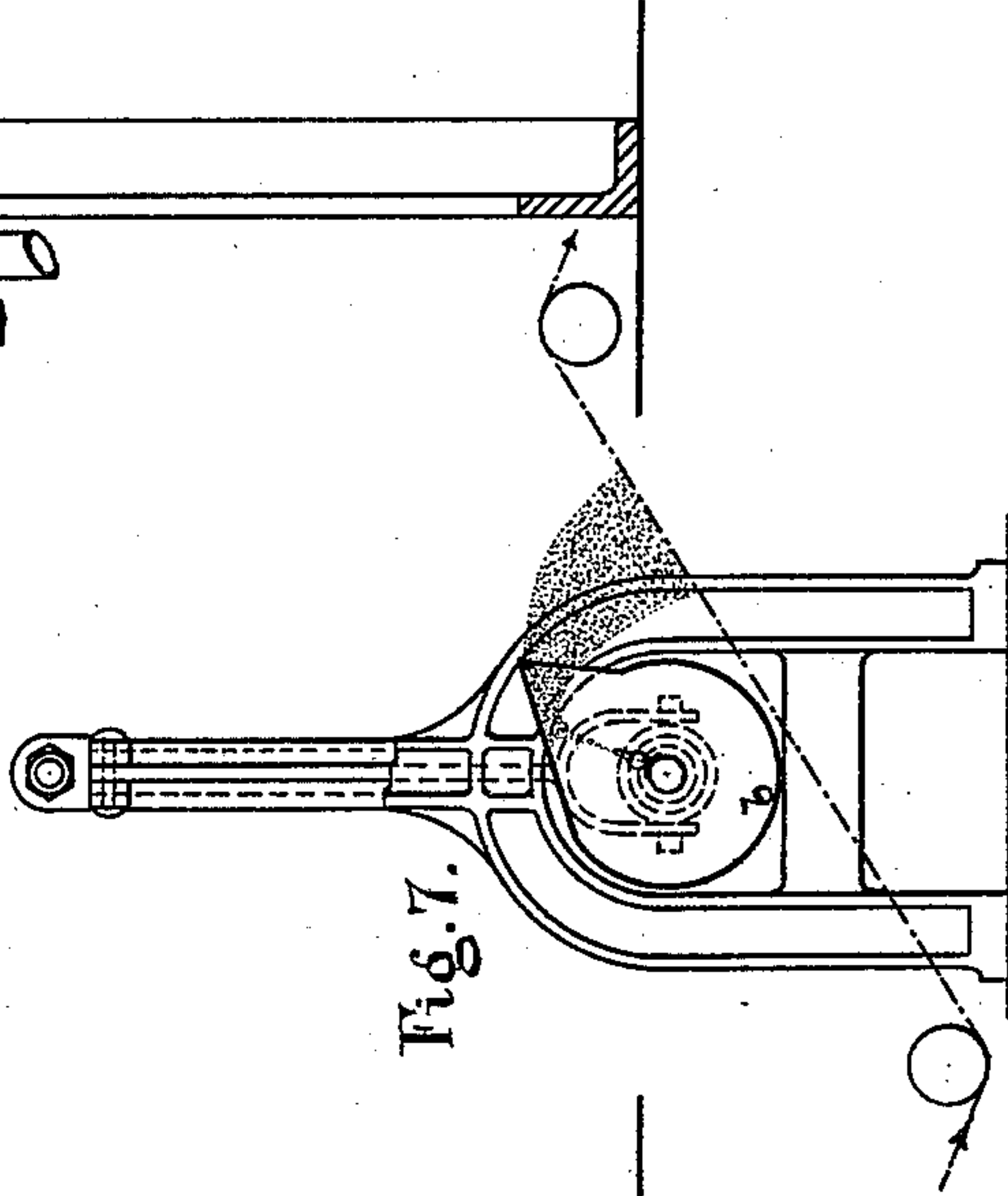
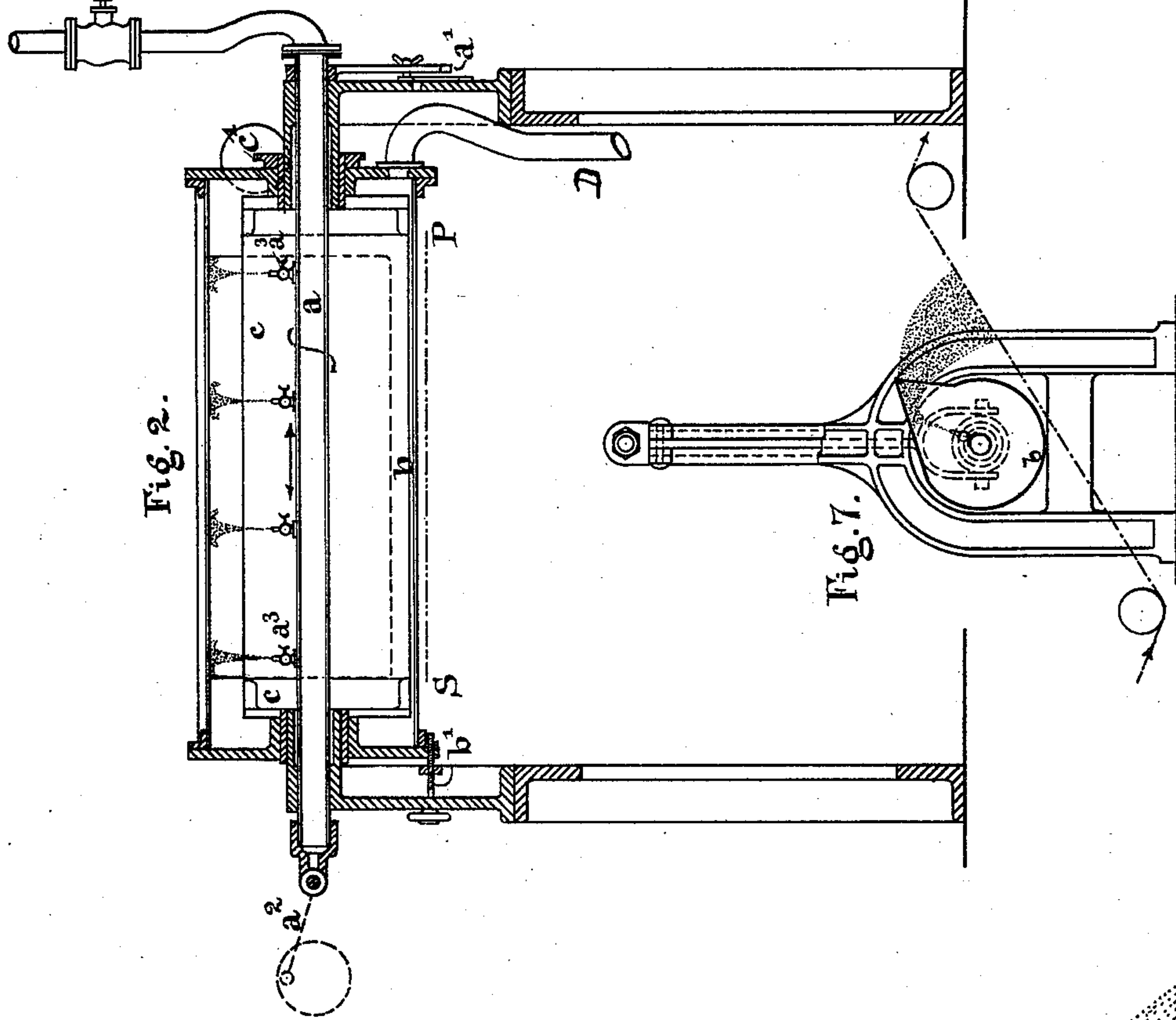
(No Model.)

3 Sheets—Sheet 1.

R. KRON.  
APPARATUS FOR DAMPENING MATERIAL.

No. 420,601.

Patented Feb. 4, 1890.



Witnesses:  
John Bicker  
C. Sundgren

Inventor:  
Rudolf Kron  
by attorneys  
Brown & Griswold

(No Model.)

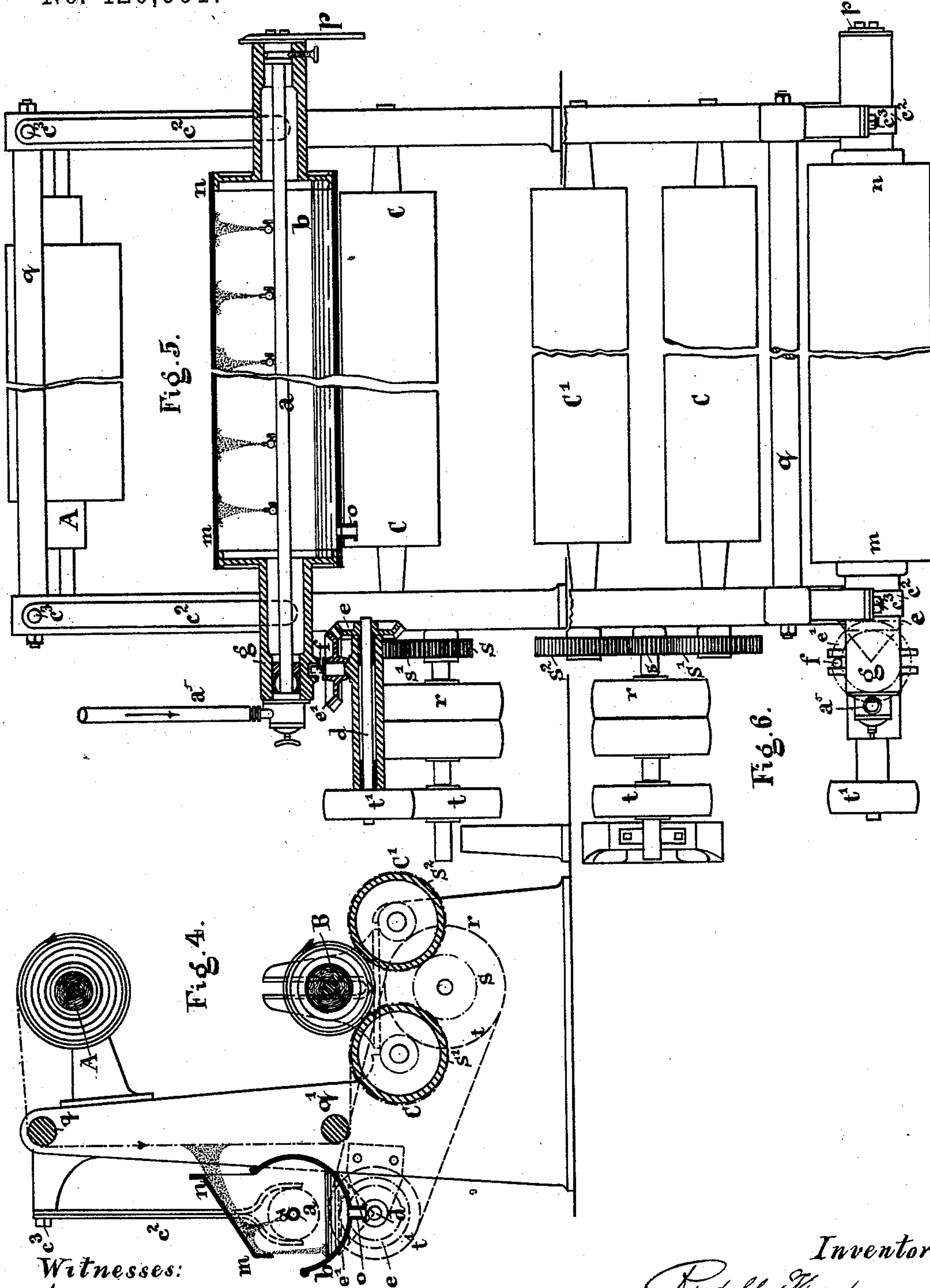
3 Sheets—Sheet 2.

R. KRON.

APPARATUS FOR DAMPENING MATERIAL.

No. 420,601.

Patented Feb. 4, 1890.



*Witnesses:*

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O. Sundgren

*Inventor:*

Rudolf Kron  
by attorneys  
Horn & Spiswold

(No Model.)

3 Sheets—Sheet 3.

R. KRON.  
APPARATUS FOR DAMPENING MATERIAL.

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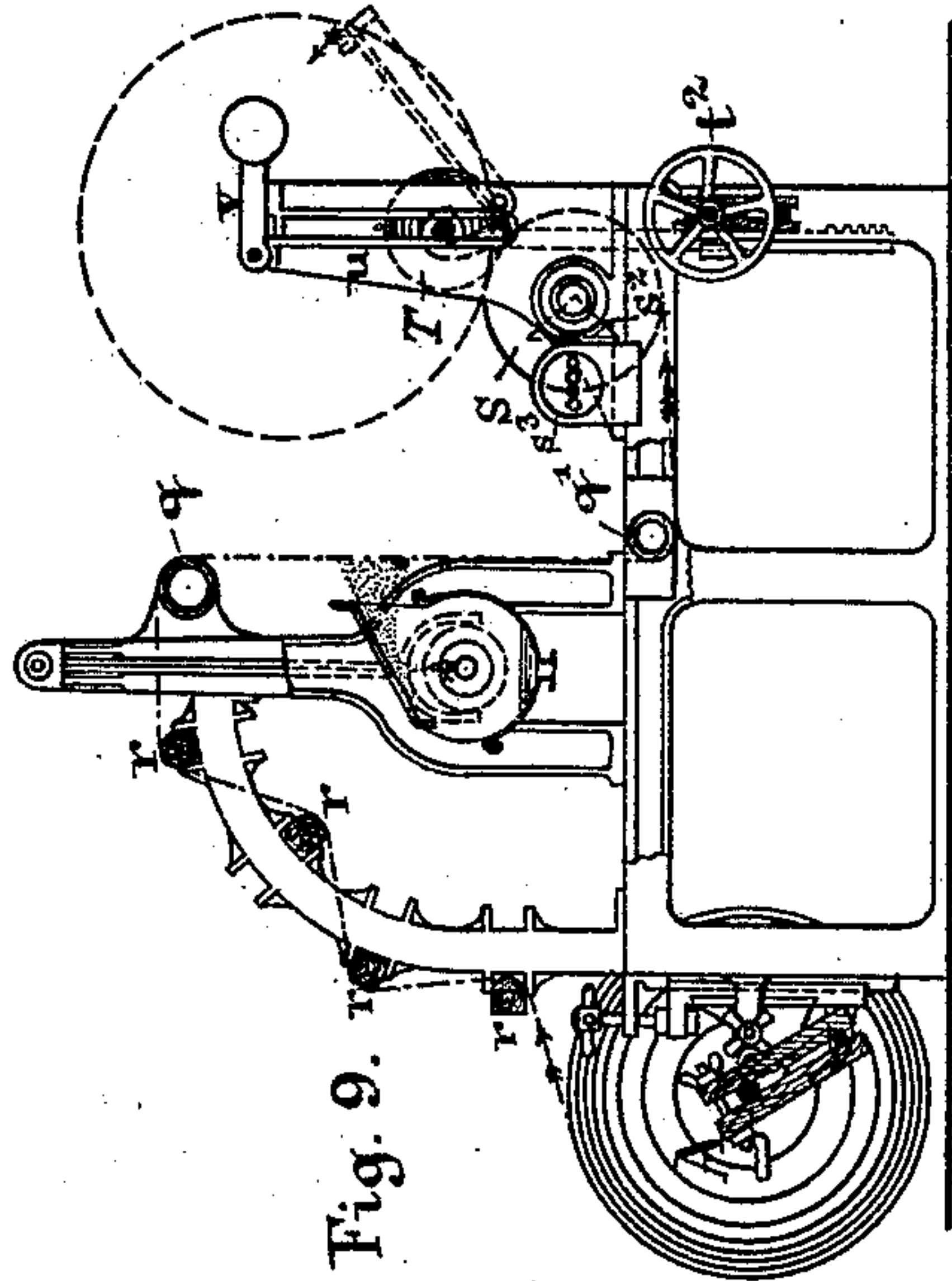


Fig. 9.

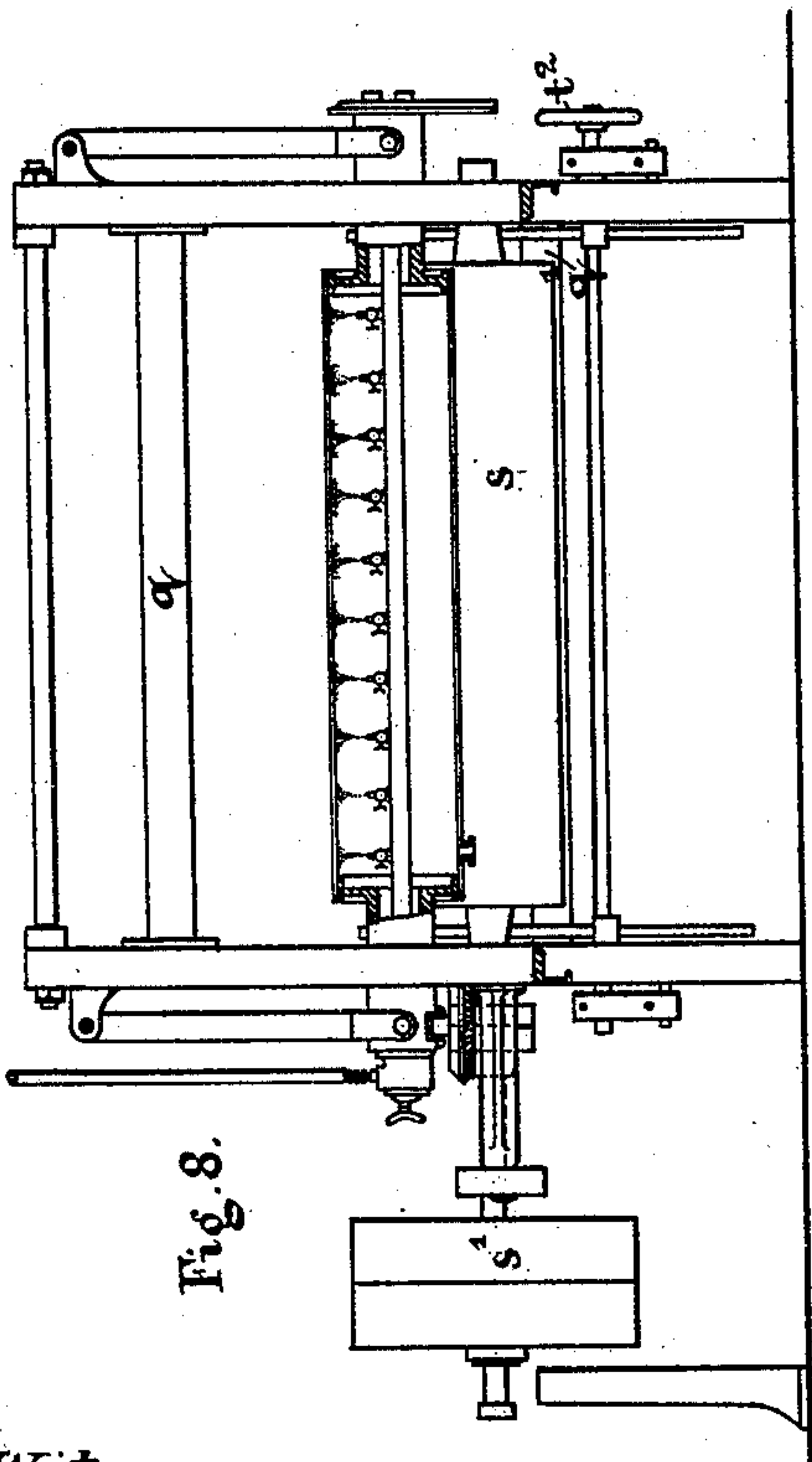


Fig. 8.

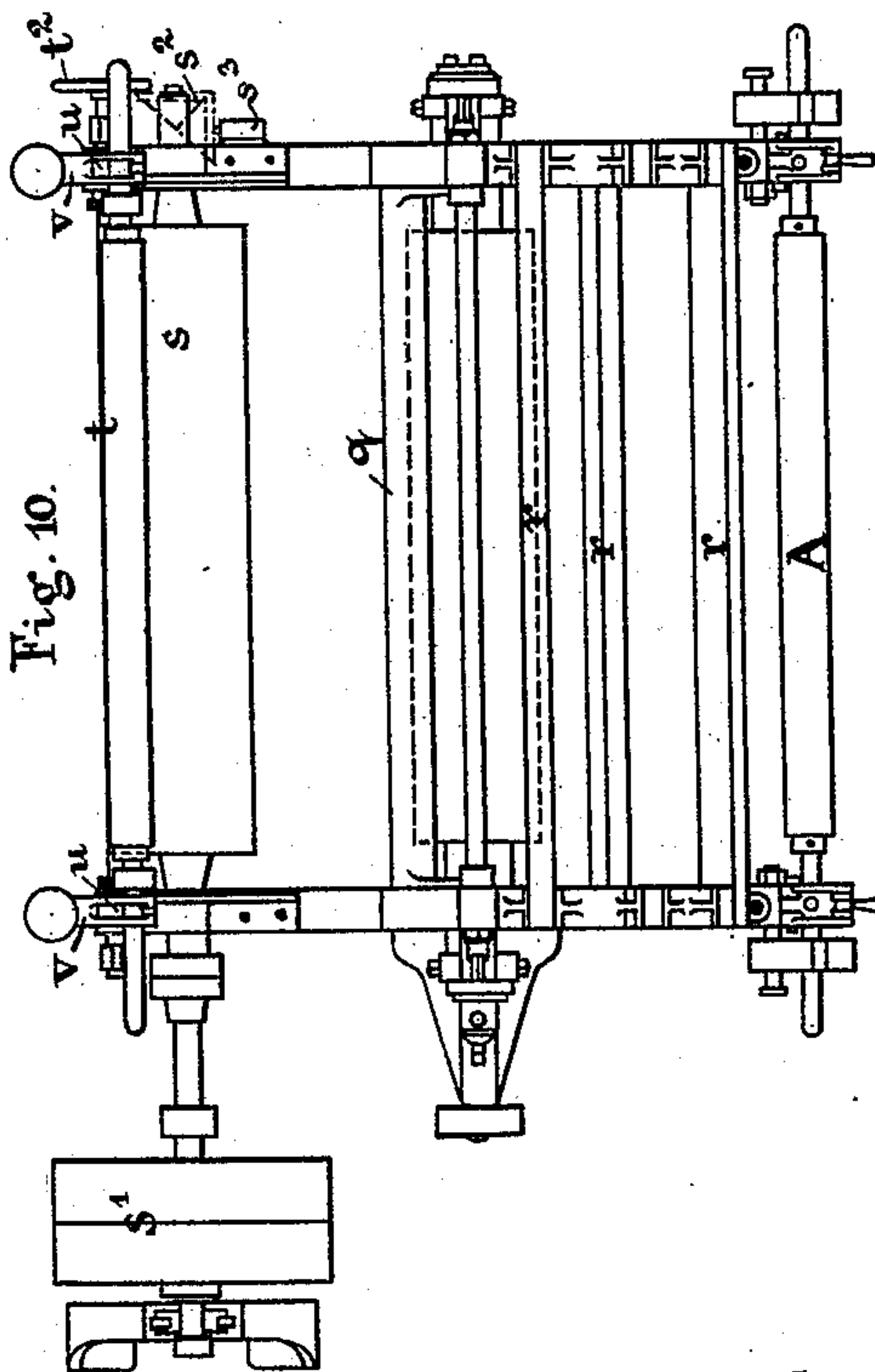


Fig. 10.

Witnesses:

*John Rickett*  
*Chas. Sundgren*

Inventor:

*Rudolf Kron*  
*by attorneys*  
*Forrest & Griswold*



# UNITED STATES PATENT OFFICE.

RUDOLF KRON, OF GOLZERN, SAXONY, GERMANY.

## APPARATUS FOR DAMPENING MATERIAL.

SPECIFICATION forming part of Letters Patent No. 420,601, dated February 4, 1890.

Application filed December 18, 1888. Serial No. 293,976. (No model.) Patented in Germany April 2, 1887, No. 41,401; in France April 9, 1888, No. 189,842; in Belgium April 10, 1888, No. 81,371, and in Italy June 30, 1888, XLVI, 129.

*To all whom it may concern:*

Be it known that I, RUDOLF KRON, engineer, a citizen of the Republic of Switzerland, residing at Golzern, in the Kingdom of Saxony, in the German Empire, have invented certain new and useful Improvements in Apparatus for Dampening Material, (for which I have obtained a patent in Germany, No. 41,401, dated April 2, 1887; a brevet in France, No. 189,842, dated April 9, 1888; a brevet in Belgium, No. 81,371, dated April 10, 1888, and a patent in Italy, dated June 30, 1888, No. 129, Vol. XLVI,) of which the following is a specification, reference being had to the accompanying drawings.

In the manufacture of paper or articles from paper and of fabrics, whether woven or produced in any other way, like felts, &c., it is sometimes desirable to distribute over the surface or surfaces of such paper or fabrics a liquid, or to moisten it with a liquid in a finely-divided state and in a continuous manner. Such liquid may consist of water, glue, size, color, or a finishing material, &c.

I will first describe my invention in detail with reference to the drawings, and afterward point out its novelty in claims.

Figure 1 in the drawings represents an end view, and Fig. 2 a central sectional view at right angles to Fig. 1, of an apparatus illustrating my invention in its simplest form. Fig. 3 is a transverse sectional view parallel with Fig. 1 and at right angles to Fig. 2. Fig. 4 is a side view, partly in section, of another example of my apparatus, showing combined with it means for delivering the material or fabric under treatment to the apparatus and afterward winding up said material or fabric. Fig. 5 represents an elevation, partly in section, taken at right angles to Fig. 4, of the same apparatus. Fig. 6 is a plan view corresponding with Figs. 4 and 5. Fig. 7 is a diagram illustrating an apparatus to which the material or fabric is fed in a different direction to that illustrated by Figs. 4, 5, and 6. Figs. 8 and 9 are vertical sections at right angles to each other, illustrating an atomizing apparatus with means for unwinding and winding the fabric or material different from those shown in Figs. 4, 5, and 6. Fig. 10 is a plan corresponding with Figs. 8 and 9.

The apparatus, as will be seen in all the examples represented, is mainly characterized by a central pipe *a*, communicating with a main pipe under pressure or with any high reservoir filled with the liquid to be distributed, pipe *a* being provided with a series of perforations in one line. The issue of the liquid may be regulated by cocks *a*<sup>3</sup>, provided for each perforation, or by a valve provided in the main pipe. The distributing-pipe *a* is surrounded in the examples shown in Figs. 1, 2, 3, and 7 by a mantle or cylinder *b*, which in its entire length is provided with a slot or aperture. This slot or aperture may be open or closed at will by a slide *c*. All parts are arranged adjustably to suit the purpose in hand. For this purpose the pipe *a*, fitted to the heads or ends of cylinder *b* with stuffing-boxes, may be adjusted or turned according to index *a'* on a dial, in order to alter the direction of the jets of liquid. The pipe *a* may be subject to a movement in lengthwise direction by means of the crank *a*<sup>2</sup>, in order to distribute the descending spray of liquid over the entire width of the surface *S P* of the paper or fabric by allowing the jets to traverse to and fro in said direction. Besides this traversing motion in lengthwise direction a partly-revolving motion may be given to the pipe *a* in any suitable manner.

The cylinder *b* may be made adjustable and secured in its position around its axis by means of a screw-bolt *b'*, arranged in the frame of the apparatus and taking into a circular slot provided in one of the heads of the cylinder. In this manner the points or the line on which the jets of the liquid meet the inner surface of the cylinder may be altered in regard to the distance from the rim or border of the slot or aperture provided in the cylinder, through which slot or aperture the spray issues against the surface of the material under treatment. Furthermore, the slide *c* is made adjustable by means of the arm *c'* and screw and slot, in order to close or open at will the aperture for the issue of the spray. At one of the heads or ends of the cylinder an outlet-pipe *D* is arranged for conducting away all liquid which accumulates in the bottom part of the cylinder.

By means of the arrangements of parts



above specified the liquid may be divided into a fine spray by its dashing against the inner surface of the cylinder, and the opening for the issue of the spray may be thus so regulated that all the spray or part of it uniformly spreads over the surface S P, which travels in front of, over, or underneath the said opening. In this way any drops are avoided upon the surface S P.

The devices above referred to for adjusting the several parts (shown in the drawings at different sides or ends of the apparatus) may also be arranged at one side of the apparatus only, for the convenient handling of such devices.

If it is desirable to use material to be distributed in a molten state—such as wax, paraffine, &c.—the cylinder *b* may be provided with heating-pipes, or may be arranged with double walls, so as to heat the same by introducing steam.

The spray apparatus is composed in the example just described of a cylinder *b* and a central pipe *a*, provided with perforations in one line, and being connected by a flexible hose *a*<sup>5</sup> with the main liquid-pipe or a liquid-reservoir. The cylinder *b* may, as shown in Figs. 4 and 5, be replaced by a trough *b*, supporting a shield *m n*, the latter being arranged over said trough. Against this shield the jets of the liquid meet, the spray created being directed partly in the direction from *m* to *n*, in order to issue against the traveling material, and partly in the direction from *n* to *m*, where it meets a vertical rim of the shield, and is caused to drop down into the trough, from which it is conducted by outlet *o*, by any suitable means, into a reservoir for repeated use. The pipe *a* may, by the handle *p*, be partially turned about its axis, in order to alter the direction of the jets against the shield *m n* and against the aperture for issue. In order, however, to be able to reduce the jets of liquid producing the spray and yet to produce the issue of a spray of a width in proportion to the width of the traveling material to be moistened, the apparatus is carried in the framing by hanging arms *c*<sup>2</sup> *c*<sup>3</sup>, which are pivoted at *c*<sup>3</sup> *c*<sup>3</sup>. On the shaft *d* a bevel-wheel *e* is keyed, taking into bevel-wheel *e'*, turning on a sleeve around the shaft *d*. This bevel-wheel *e'* carries a crank-pin *f*, which takes into a slot provided in the lower part of the sleeve *g*, so as to impart a to-and-fro motion to the entire spray apparatus according to the eccentricity of pin *f*.

The material is rolled upon the roller *A*, whence it is conducted over the guide-rollers *q q'* in the direction of the arrow, receiving on its course the spray from the apparatus. From *q'* the material is wound upon roller *B*, which is carried by the friction-rollers *C C'*, the latter receiving rotary motion from pulley *r* and spur-wheel *SS' S*<sup>2</sup>. The rotary motion is transmitted from pulley *t* to pulley *t'* on shaft *d*, which carries the bevel-wheel *e*.

It is easy to understand that the material

may be conducted in any suitable direction with reference to the spray apparatus—for instance, as indicated in Fig. 7. The atomizing apparatus may also be situated so that the slot or aperture through which the spray issues may be directed upwardly, so that the material under treatment travels horizontally or inclined over the atomizing apparatus.

The atomizing apparatus shown in Figs. 8, 9, and 10, in its combination of the central pipe and of the trough with the upper shield suspended in arms for receiving a lengthwise motion, is the same as in that represented in Figs. 4, 5, and 6; but it is arranged, as indicated, in the middle of a framing, which carries at one side the roller *A*, with the material to be covered, moistened, or impregnated by a spray of liquid. The axle of the roller *A* is provided with a simple brake device for regulating the tendency of the roller to unwind. Between this roller and the atomizing apparatus part of the framing is arc-shaped to receive in proper bearings rods *r*, of suitable cross-section, for guiding the material from roller *A* to the top guiding-roller *q*, from whence the material runs to the lower guiding-roller *q'*, undergoing on its course between the two rollers the action of the atomizing apparatus. The rods *r* are arranged for straightening, unfolding, and regulating the course of the material. From roller *q'* the material runs partly around the roller *s*, which receives rotary movement in any suitable manner on its shaft. This roller *s* causes by friction the rotation of the roller *T*, the trunnions of which are situated within vertical slots of the framing *u*. The roller *T* in its revolution winds up the material. If the roll of material wound on said roller has grown to a certain diameter, the one side of the framing *u*, which is pivoted at its foot, may be turned down by lifting the cover *v* at top of the framing, in order to allow the filled roller *T* to be rolled out of the framing. From the axle of the roller *s* motion is transmitted by bevel-gearing *s*<sup>2</sup> to the apparatus *s*<sup>3</sup> for registering the length of material. *t*<sup>2</sup> is a device of hand-wheel gearing and rack, which takes by a hook around the axle of roller *T*, to regulate the pressure of the latter against roller *s* for the smooth winding of the material upon roller *T*.

It will be observed that in all the examples of my improvement shown there is a deflector, against which the jets of liquid from the pipe *a* will strike, and from which the liquid will be distributed in the form of a spray upon the passing or traveling material.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an atomizing apparatus, the combination of a central pipe perforated for the issuance of liquids in jets, a deflector arranged so that said jets will contact therewith to break up the same into a spray to be distributed on the surface of a passing or traveling sheet of material, and mechanism, sub-



stantially such as described, for imparting a lengthwise movement to said pipe.

2. In an atomizing apparatus, the combination of a central pipe perforated for the issuance of liquid in jets, with a deflector arranged so that said jets will contact therewith to break up the same into a spray to be distributed on the surface of a passing or traveling sheet of material, a trough below said pipe for receiving the surplus liquid, and mechanism, substantially such as described, for rotating said trough, substantially as specified.

3. The combination of a central pipe *a*, perforated for the issuance of liquid in jets, with a deflector arranged so that said jets will contact therewith in order to distribute a spray

on the surface of passing or traveling material, an opening for the passage of the spray being provided at the outer edge of said deflector, and an adjustable slide for varying the size or position of said opening, substantially as specified.

4. The combination of a central pipe *a*, a cylinder *b*, a slide *c*, and a crank for imparting lengthwise movement to the pipe *a*, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

RUDOLF KRON.

Witnesses:

WILHELM WILSENHÜTTER,  
GEORG RICHTER.