

(No Model.)

2 Sheets—Sheet 1.

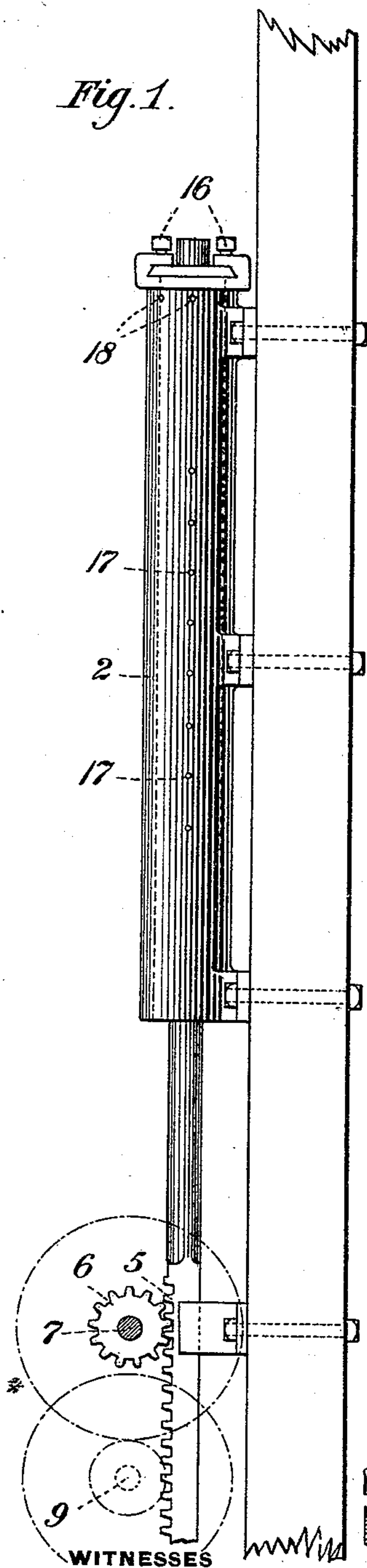
E. METZGER.

MACHINE FOR MAKING TUBES FROM PAPER PULP.

No. 488,149.

Patented Dec. 13, 1892.

Fig. 1.



WITNESSES
H. L. Gill
J. M. Corwin

Fig. 2.

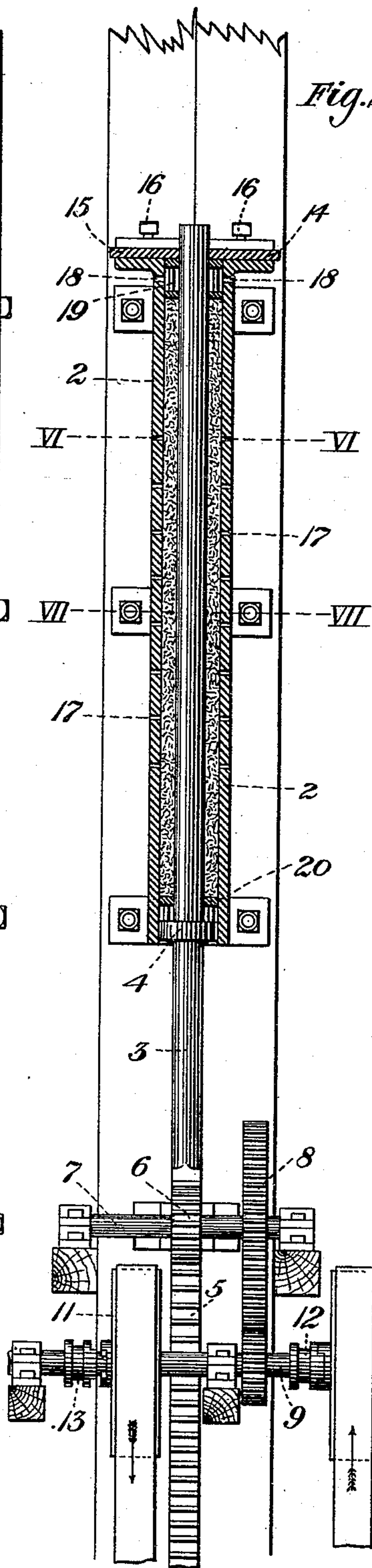
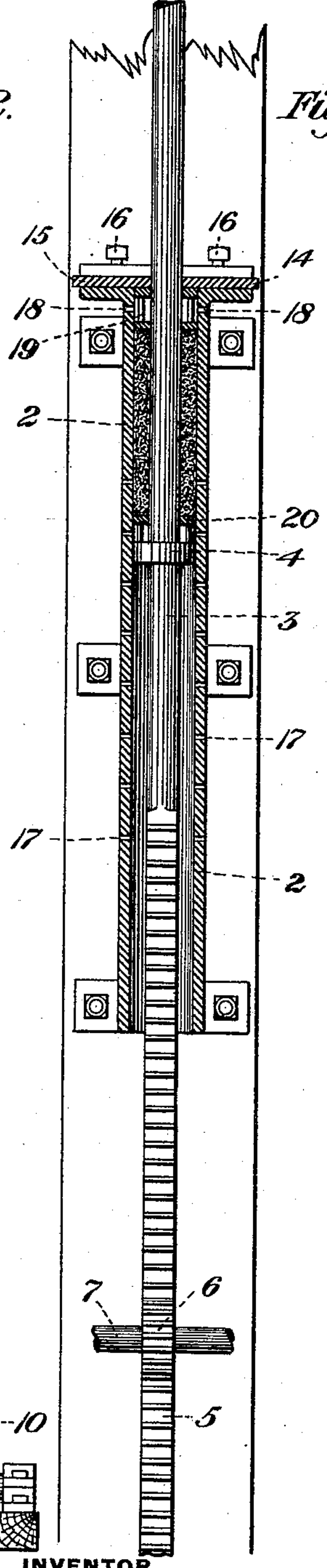


Fig. 3.



INVENTOR
Edward Metzger
by W. R. Russell & Sons
his attorneys.

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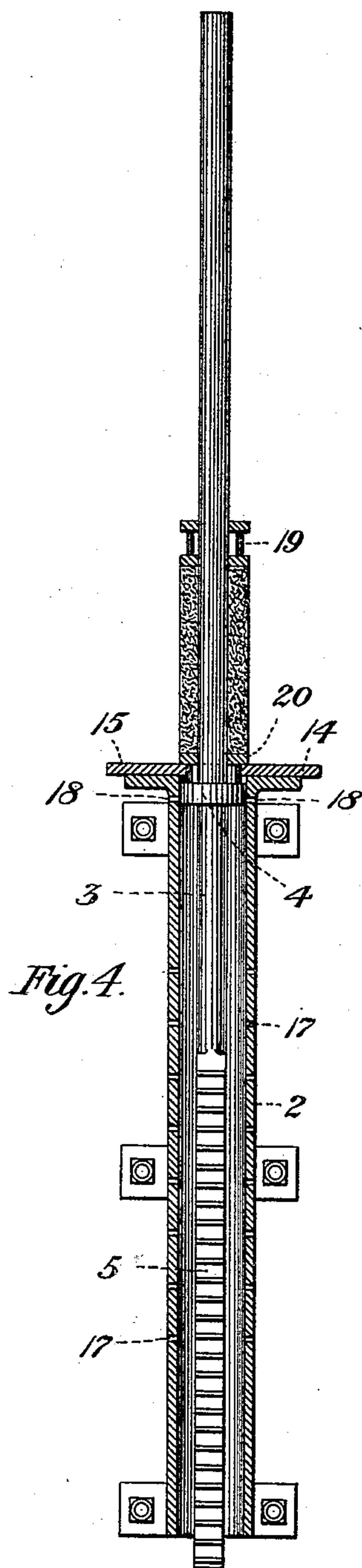


Fig. 4.

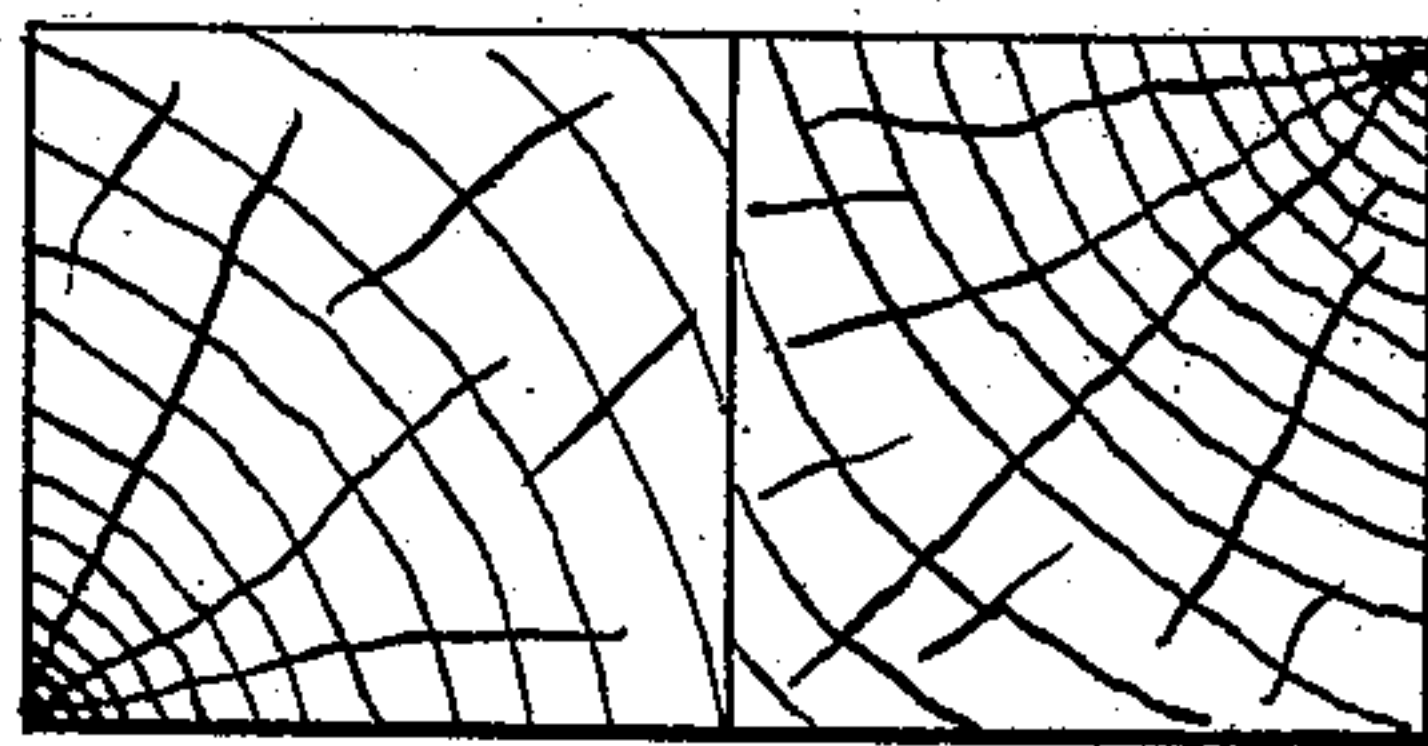


Fig. 5.

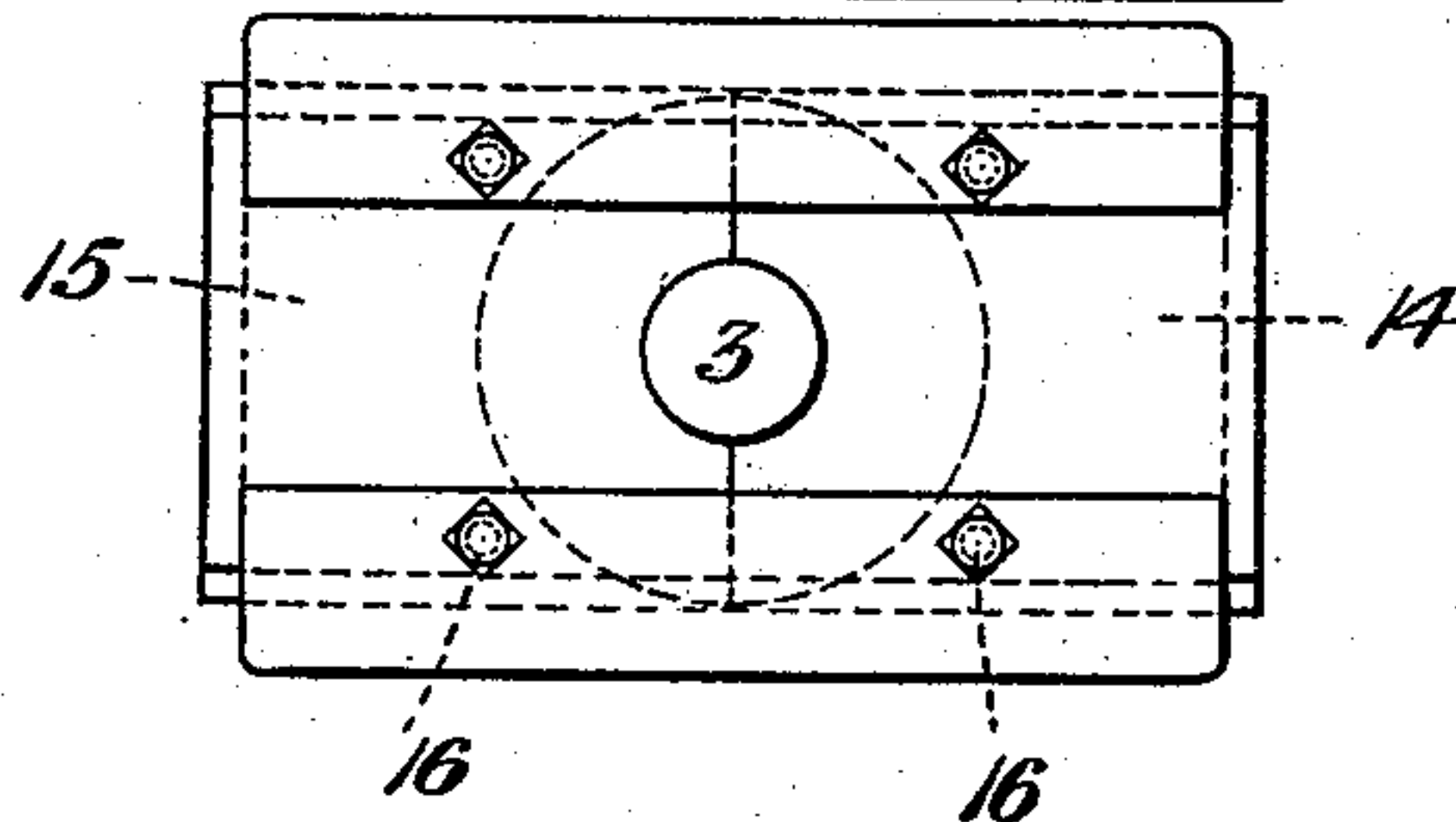


Fig. 6.

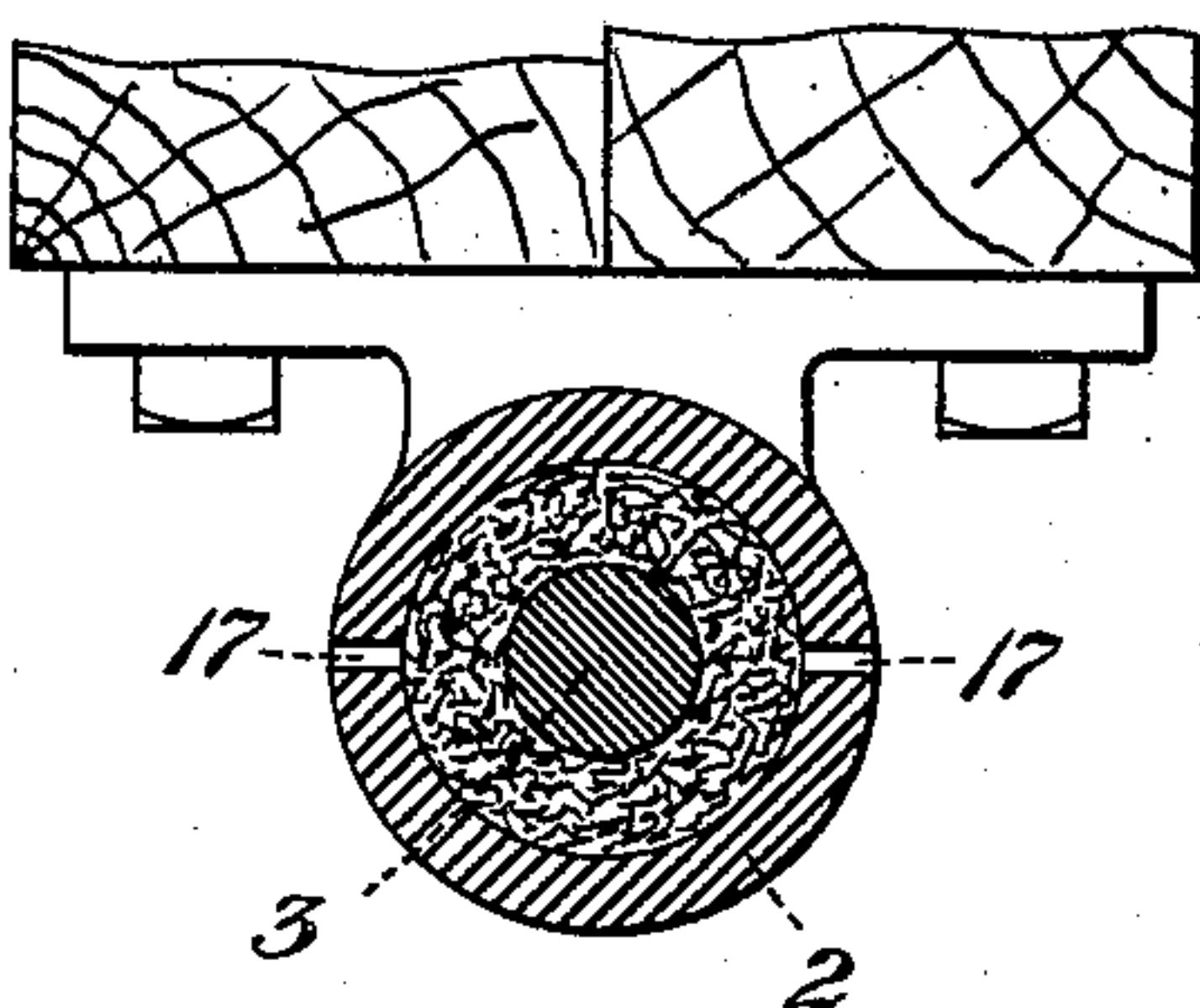


Fig. 7.

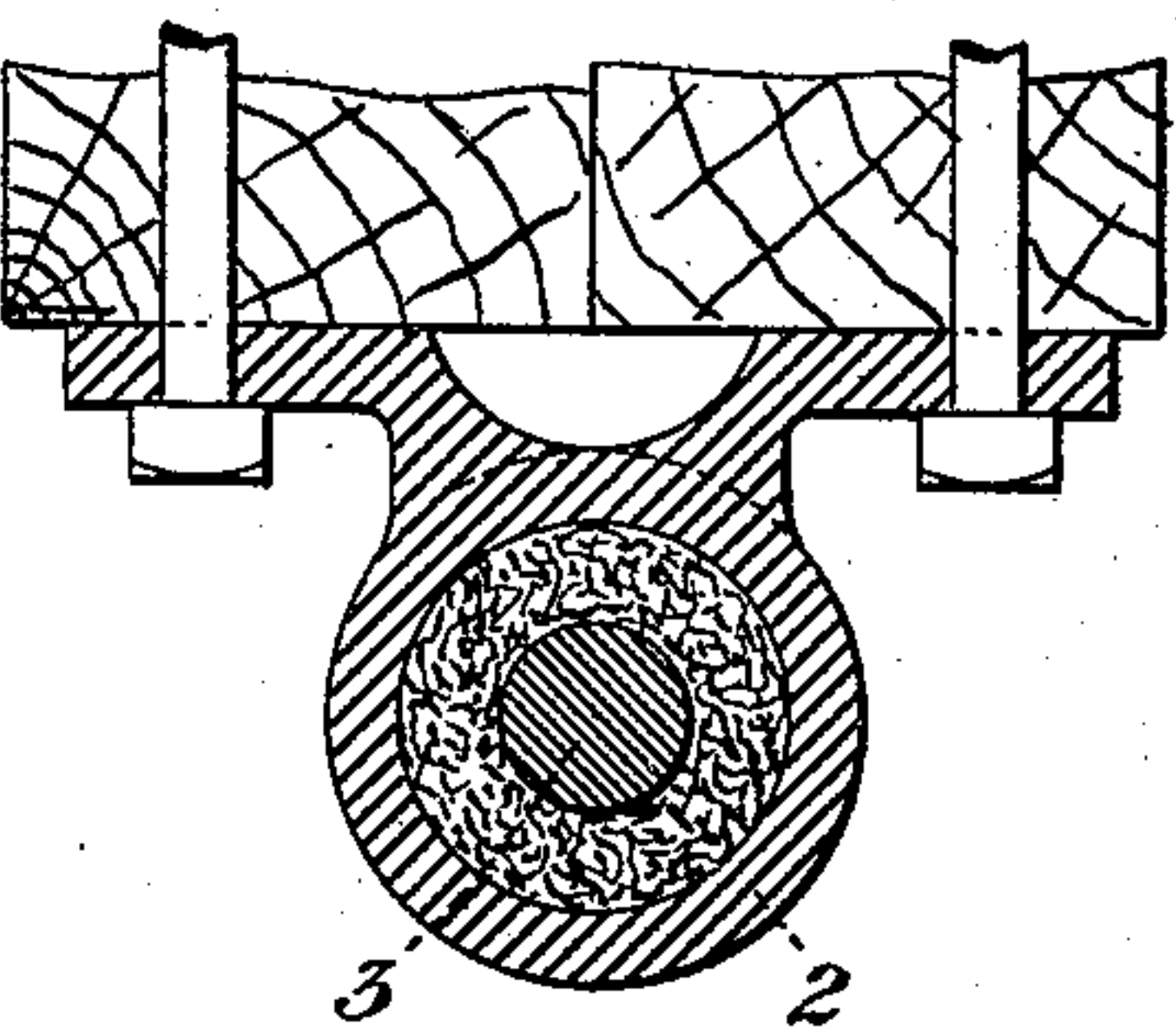


Fig. 8.

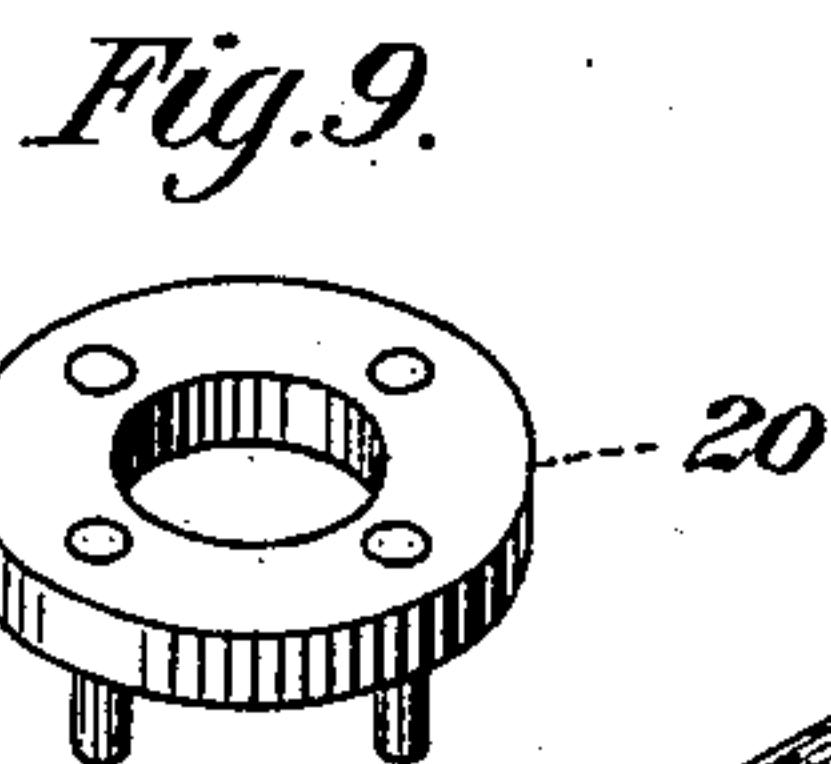


Fig. 9.

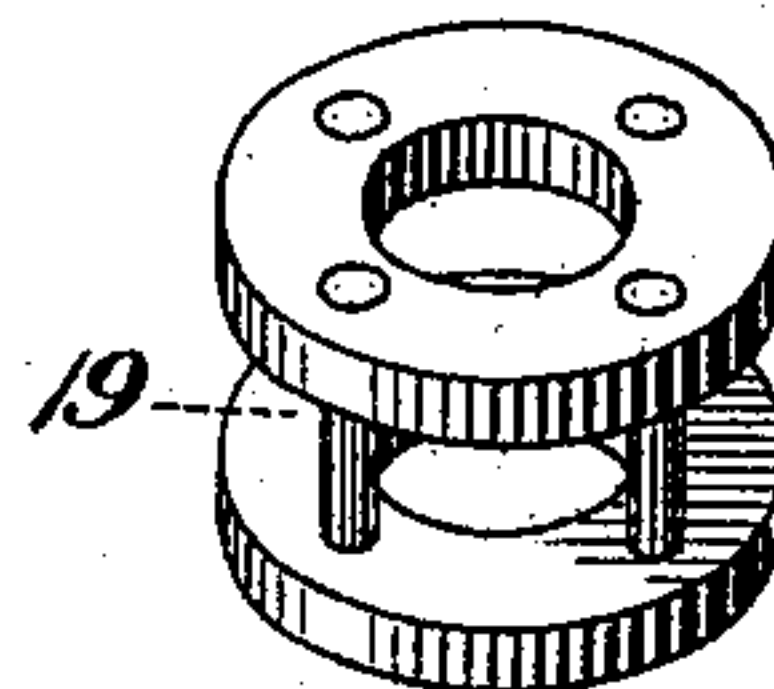


Fig. 10.

WITNESSES
H. L. Gill
H. M. Quinn

INVENTOR

Edward Metzger
by W. B. Baxwell & Sons
his attorneys

UNITED STATES PATENT OFFICE.

EDWARD METZGER, OF PITTSBURG, ASSIGNOR OF ONE-HALF TO JAMES PETERS, OF LATROBE, PENNSYLVANIA.

MACHINE FOR MAKING TUBES FROM PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 488,149, dated December 13, 1892.

Application filed January 18, 1892. Serial No. 418,356. (No model.)

To all whom it may concern:

Be it known that I, EDWARD METZGER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machines for Making Tubes from Paper-Pulp, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved tube-machine. Figs. 2 and 3 are front elevations with the forming-chamber in section, the plunger being shown in two different positions. Fig. 4 is a similar view showing the parts in position for removing the formed tube. Fig. 5 is a top plan view. Figs. 6 and 7 are horizontal cross-sectional views on the lines VI VI and VII VII, respectively, of Fig. 2. Figs. 8 and 9 are perspective views of the top water-chamber and lower supporting-ring, respectively, and Fig. 10 is a similar view of the finished tube.

Like symbols of reference indicate like parts in each of the figures.

My invention relates to those machines which are employed for making tubes from paper-pulp; and it consists in an improved arrangement and combination of the co-operating parts, all as hereinafter more fully described, and set forth in the claims.

In the drawings, 2 represents a forming-cylinder, which is supported in a substantially-vertical position by means of the bolts passing through the integral lugs extending from its sides, as shown. In this cylinder is arranged to reciprocate the compressing-plunger 3, provided near its lower end with the annular flange 4, this plunger terminating beneath in the rack 5, intermeshing with pinion 6 upon the shaft 7. Intermeshing with a gear-wheel 8, also upon the shaft 7, is a second pinion upon a shaft 9, to which a rotation in either direction is communicated by the pulleys 10 and 11 and clutches 12 and 13. By means of this intermediate gearing a slow motion in either direction may be imparted to the plunger. In the upper end of the forming-cylinder are dovetailed two slides 14 and 15, each provided with a registering semicir-

cular recess, the circular hole thus formed when the slides are closed being the same size as the plunger. A suitable holding device, such as set-screws 16, is provided for locking the slides in closed position.

The cylinder is provided with suitable air and water exit holes 17 along its sides, and at its extreme upper end, just below the flanges supporting the slides 14 and 15, is provided a circular series 18 of somewhat larger holes. The water-chamber 19 of Fig. 8, as shown, consists of two rings connected by pins, and this chamber is adapted to fit loosely in the cylinder around the plunger, as shown in Figs. 2 and 3. The lower supporting-ring 20 of Fig. 9 is provided with suitable legs or pins which hold the ring away from the flange 4 upon which the pins rest.

The action is as follows: The plunger being in its lowest position and the slides 14 and 15 opened, the ring 20 is dropped over the upper end of the plunger and pushed downwardly to place against the flange 4. A funnel or other suitable guiding device being placed over the top of the cylinder the stock to form the tube is fed therethrough into the annular space in the cylinder until it is nearly filled. The water-chamber is then slipped over the plunger and pushed down sufficiently to allow the closing of the slides. The said slides are then closed and fastened and a slow upward motion imparted to the plunger. The supporting-ring rising compresses the material beneath the water-chamber and the water and air escape through the side holes and into the water-chamber, passing thence through holes 18. When the material has been sufficiently compressed, the upward motion of the plunger is momentarily arrested and the slides drawn back. The plunger again being lifted raises the formed cylinder upon the ring 20 until said ring is exposed above the top of the cylinder, when the slides are again pushed in and the plunger being lowered the tube with the water-chamber and supporting-ring is stripped therefrom. After the slides are drawn back and before the rising of the formed tube, I preferably place a hinged case about the plunger, into which the tube is pushed by the subsequent rising of the plunger, which

retains the as yet weak and fragile tube in shape and prevents any tearing or breaking of the same. The tube may then be removed in this surrounding case, and a mandrel being passed therethrough the tube is hung up to dry and thoroughly season, by which process it becomes very hard and solid. By forming a battery of these cylinders and extending the shafts 7 and 9 so as to carry all the gears for the various cylinders, I can form a series of tubes simultaneously, thus greatly cheapening and facilitating their manufacture. The plunger may be hollow or solid and the flange 4 either cast integral therewith or fastened thereto, and many other variations in the form and arrangement of the parts and the material employed may be made without departing from my invention.

The advantages of the device are obvious. On account of the vertical position of the forming-cylinder the stock is easily fed in and packs itself somewhat in the act of feeding. The parts are few in number and not liable to get out of order, while the forming and removal of the tube are rendered easy and certain.

I claim as my invention—

1. A machine for making tubes from pulp, comprising a vertical forming-cylinder, a compressing-plunger having an annular water-chamber fitting about the same, and 1 movable plates having recesses to fit about the plunger and close the upper end of the cylinder, substantially as and for the purposes described.

2. A machine for making tubes from paper-pulp, comprising a vertical forming-cylinder, a compressing-plunger movable therein and having an annular flange, and a ring having supporting-pins arranged to rest upon the flange, substantially as and for the purposes described.

3. A machine for making tubes from paper-pulp, comprising a vertical forming-cylinder, a compressing-plunger movable therein and having an annular flange, and an annular water-chamber arranged to fit about the plunger at the upper end of the cylinder, substantially as and for the purposes described.

4. A machine for making tubes from paper-pulp, comprising a vertical forming-cylinder, a compressing-plunger movable therein and having an annular flange, a ring having supporting-pins arranged to rest upon the flange, and an annular water-chamber arranged to fit about the plunger at the upper end of the cylinder, substantially as and for the purposes described.

5. A machine for making tubes from paper-pulp, comprising a forming-cylinder, a compressing-plunger, and a water-chamber arranged to fit about the plunger, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 14th day of January, A. D. 1892.

EDWARD METZGER.

Witnesses:

H. M. CORWIN,

DAVID S. MCCANN.