

No. 614,714.

Patented Nov. 22, 1898.

J. W. GRANT.

ROTARY SUCTION BOX FOR PAPER MAKING MACHINES.

(Application filed Apr. 9, 1897.)

(No Model.)

Fig. 1.

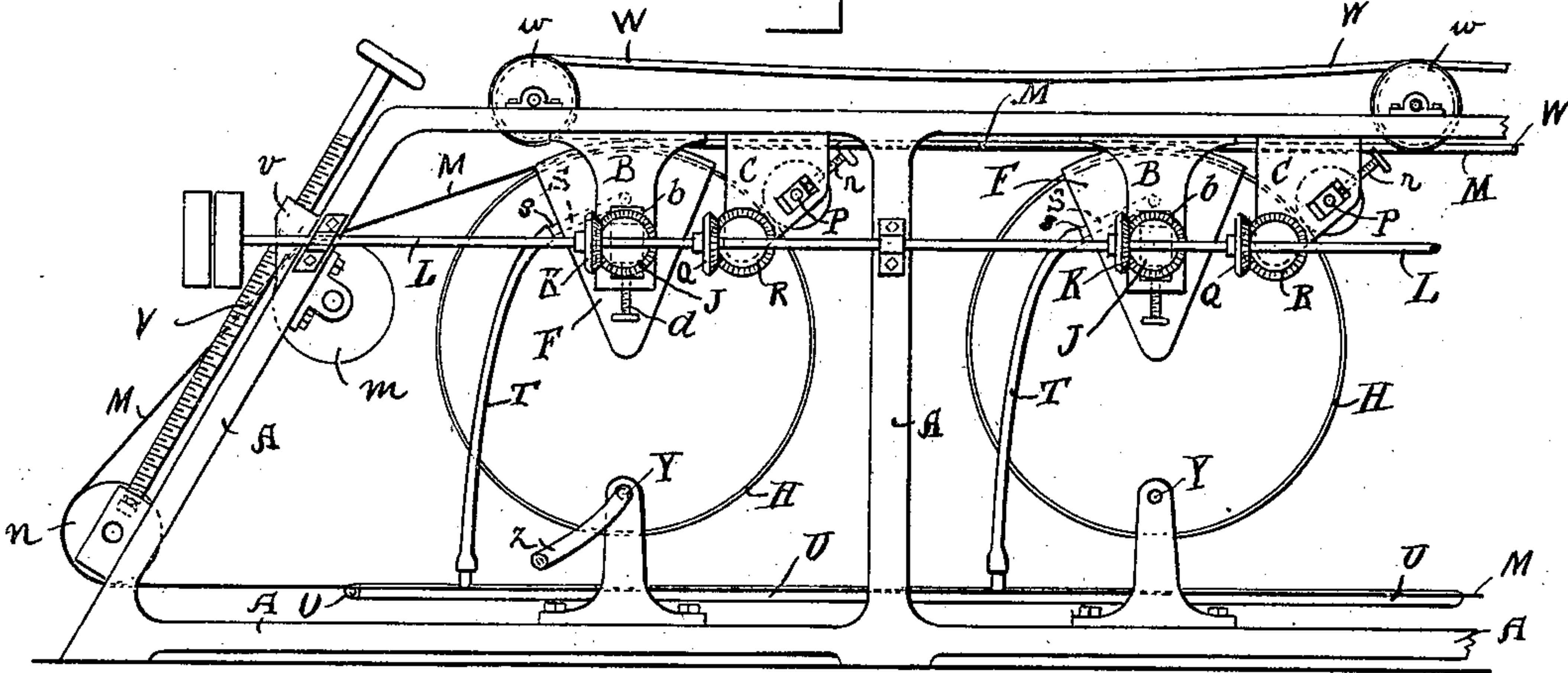


Fig. 2.

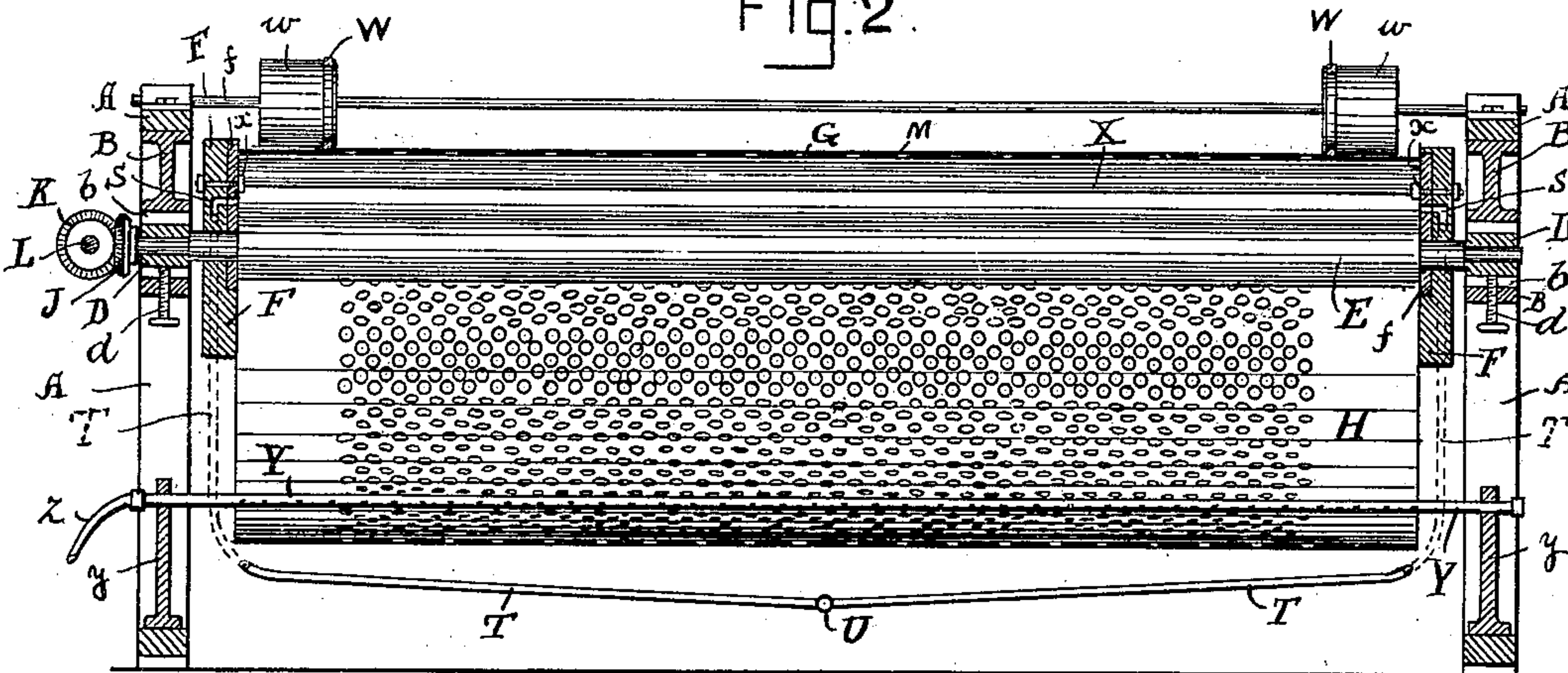
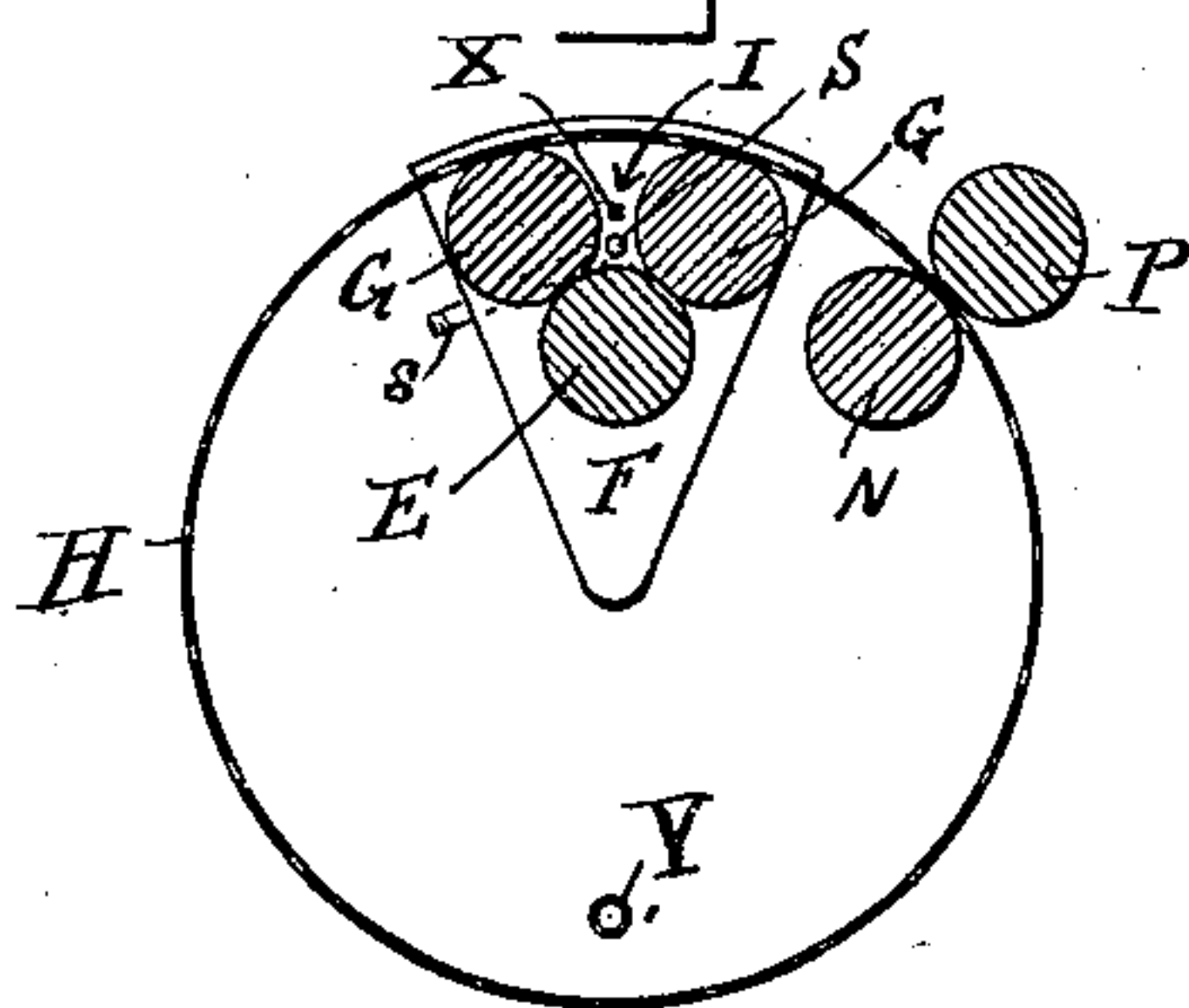


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES W. GRANT, OF BRADFORD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO MILTON CHASE, OF HAVERHILL, MASSACHUSETTS.

ROTARY SUCTION-BOX FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 614,714, dated November 22, 1898.

Application filed April 9, 1897. Serial No. 631,390. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. GRANT, a citizen of the United States, and a resident of Bradford, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Rotary Suction-Boxes for Paper-Making Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to certain improvements in rotary suction-boxes for paper-making machines; and the invention consists in the construction and combination of parts, as hereinafter described and claimed.

Referring to the accompanying drawings, Figure 1 represents a side view of a portion of a paper-machine embodying my invention. Fig. 2 is a transverse section of the same, taken through one of the perforated cylinders. Fig. 3 is a cross-section of one of the perforated cylinders, the rolls forming the vacuum-chamber, and the rolls for driving the perforated cylinder.

A represents the frame of the machine, and B C brackets formed integral with the same or secured thereto. The brackets B are each formed with an opening *b*, in which is mounted a bearing D, the position of which is regulated by a screw *d*, passing through the lower end of the bracket B. In the bearings D are mounted the axes of rollers E, that pass through angular plates F, that are fitted on their inner sides with face-plates *f* of any suitable material, formed with apertures to receive the journals of two rollers G G, the surfaces of which are in contact with the surface of the roller E and their ends with the face-plates *f*.

If desired, the rollers E G G may be covered with rubber or other suitable material to insure a more perfect contact.

H is an open-ended perforated cylinder that is supported and carried by the rollers G G, the edges of said cylinder being in close contact with the face-plates *f*, so as to make practically a tight joint, thus forming a vacuum-chamber I between the inner upper portion of said cylinder H, the two rollers G, and the roller E. (See Fig. 3.)

Upon one of the axes of the roller E is mount-

ed a bevel-wheel J, that is driven by a bevel-wheel K, mounted upon a driving-shaft L, arranged by the side of the machine and to which rotary motion is imparted in any suitable manner. The roller E transmits motion by frictional contact to the rollers G G, which transmit motion by friction to the perforated cylinder H, which is thus caused to rotate and at the same rate of speed as the wire apron M, carried by said cylinder H and upon which the pulp has been deposited; but in order to insure uniformity in the speed of the wire apron M and the cylinder H, I prefer to employ two driving-rollers N P, one, N, working on the inside of the cylinder H, and the other, P, on the outside of the same, the inner one being mounted in stationary bearings and caused to rotate from the shaft L by bevel-gears Q R, the friction of these rollers N P upon the cylinder H being regulated by a screw *r*, connected to the bearings carrying the roller P, which bearings work in a slot formed in the brackets C.

The plates F F are each formed with a small hole or passage-way S, that leads from the edge of the plate to the center between the three rollers E G G. A short piece of pipe is fitted into the edge of the plate F, and to said short piece of pipe *s* is attached a flexible pipe T, that communicates with a main pipe U, from which the air is exhausted by an air-pump or other convenient manner. The air being exhausted from the pipes U T *s* will create a vacuum between the rollers E G G and draw off any water or moisture from the pulp on the wire apron M as it passes over the cylinder H.

I prefer to pass the wire apron M over rollers *m n* at the end of the machine, the upper one, *m*, of which runs in stationary bearings on the frame, the lower one, *n*, being mounted in bearings free to slide upon the frame A, their position being regulated by means of screw-threaded rods V, passing through screw-threaded bosses *v*, secured to the frame A, so that should the wire apron M stretch or otherwise become loose the slack can be taken up by forcing the lower roller *n* down by means of the screw V.

The width of the paper is regulated by deckle-straps W in the usual manner; but the

rollers *w*, carrying said straps, are extended outwardly, as shown, so that when paper of a narrow width is required an elastic or other belt can be arranged thereon to cover the
 5 holes in the ends of the cylinder H, so that the vacuum between the cylinder H and the rollers E G G will not be destroyed.

In order to prevent the plates F being drawn inward by the vacuum, I keep them extended
 10 a proper distance by rods X, having flanges *x* the required distance apart to hold said plates F in place, the ends of said rods passing through the plates and held by nuts.

In order to clean out the holes in the cylinder H, should they become clogged with pulp that may be drawn through the wire apron M, a pipe Y is passed through the cylinder H near its lower end, which pipe is carried in suitable bearings *y*, secured to the frame A, said pipe
 15 being perforated on its lower surface. One end of this pipe is closed by a cap or plug, and to the other end (when required) is attached a hose *z*, that is connected to any suitable water-supply, so that water may be ad-
 20 mitted by the perforated pipe Y into the cylinder H in fine jets or sprays and wash out the holes in said cylinder as it revolves.

Although I have described my invention as applied to a paper-machine, it is obvious that
 30 it could be applied with equal advantage to extracting water or moisture from any other description of material, such as in dyeing or drying cloth, in the manufacture of felt, and the like.

35 What I claim is—

1. In a paper-making machine, a traveling wire apron to receive the pulp, a drive-roller, two rollers in contact with and receiving motion from the same, a perforated cylinder car-
 40 ried by the two driven rollers, a vacuum-chamber formed between the said rollers and

the upper portion of the perforated cylinder, substantially as set forth.

2. In a paper-making machine, a traveling wire apron to receive the pulp, a perforated
 45 rotating cylinder driven at the same speed as the apron, a driven roller and two rollers supporting the cylinder and in frictional contact with the driven roller, end plates against which the ends of said cylinder and rollers
 50 abut to form a vacuum-chamber between the upper portion of the cylinder and roller, and means for creating in said chamber a suction to draw off the moisture from the pulp, substantially as set forth.

3. In a paper-making machine, a traveling wire apron to receive the pulp, a perforated rotating cylinder, three rollers within the same in contact with the cylinder and with each other to form a chamber, and means to cre-
 60 ate a vacuum in said chamber, in combination with two rollers for imparting motion, by frictional contact, to the cylinder at the same speed as the wire apron, substantially as set forth.

4. In a paper-making machine, a traveling wire apron, a perforated rotating cylinder, a suction-chamber within said cylinder, deckle-straps, rollers for carrying said deckle-straps, outward extensions on said rollers, and belts
 70 passing over said extensions to close the openings in the perforated cylinder when paper of a narrow width is being made, substantially as set forth.

In testimony whereof I have signed my
 75 name to this specification, in the presence of two subscribing witnesses, on this 16th day of March, A. D. 1897.

JAMES W. GRANT.

Witnesses:

CHAS. STEERE,
 EDWIN PLANTA.