

D. S. ZIMMERMAN.

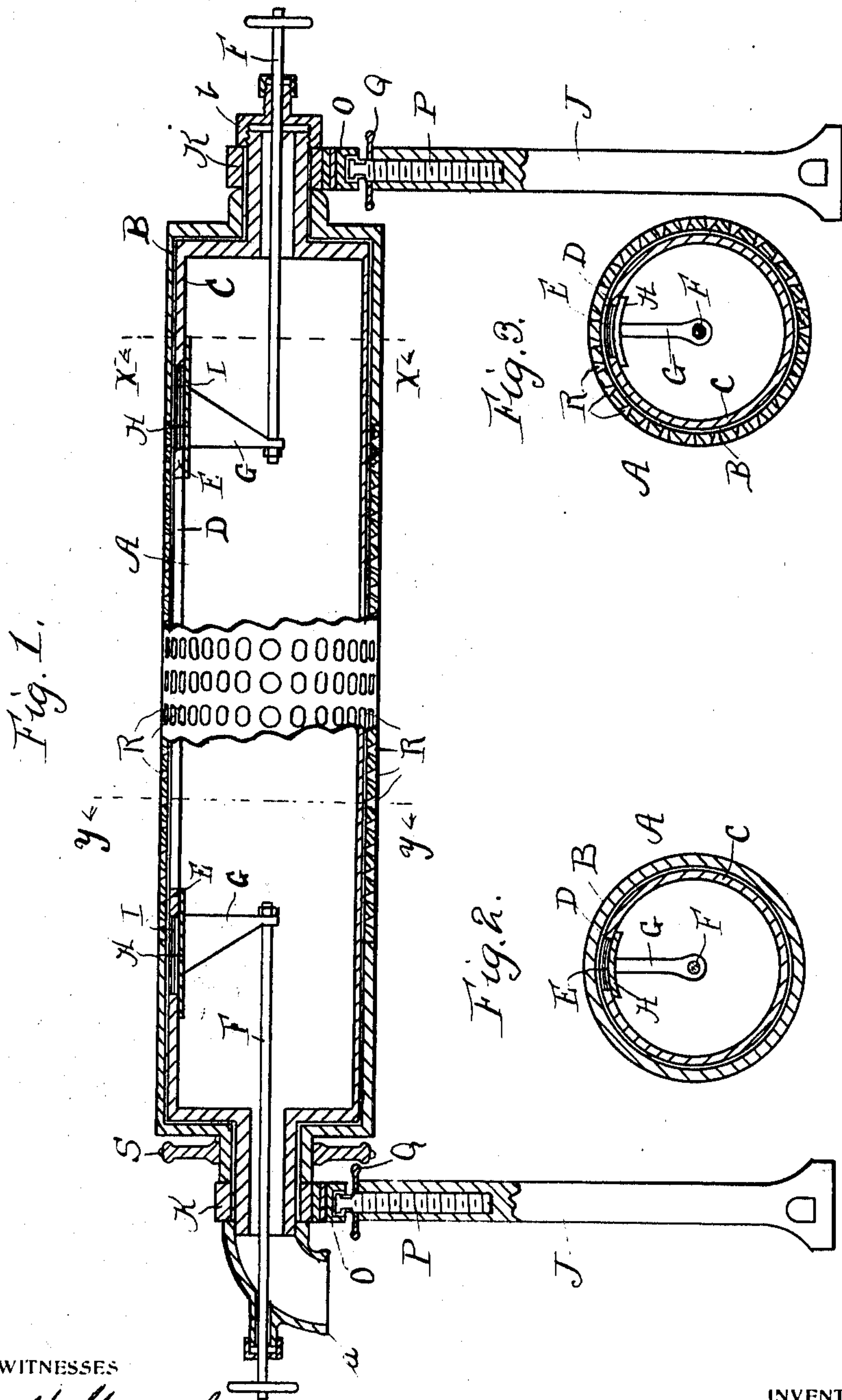
SUCTION BOX.

APPLICATION FILED JUNE 24, 1909.

970,776.

Patented Sept. 20, 1910.

3 SHEETS-SHEET 1.



WITNESSES

J. M. Gallagher
H. W. Burton

INVENTOR

Daniel S. Zimmerman

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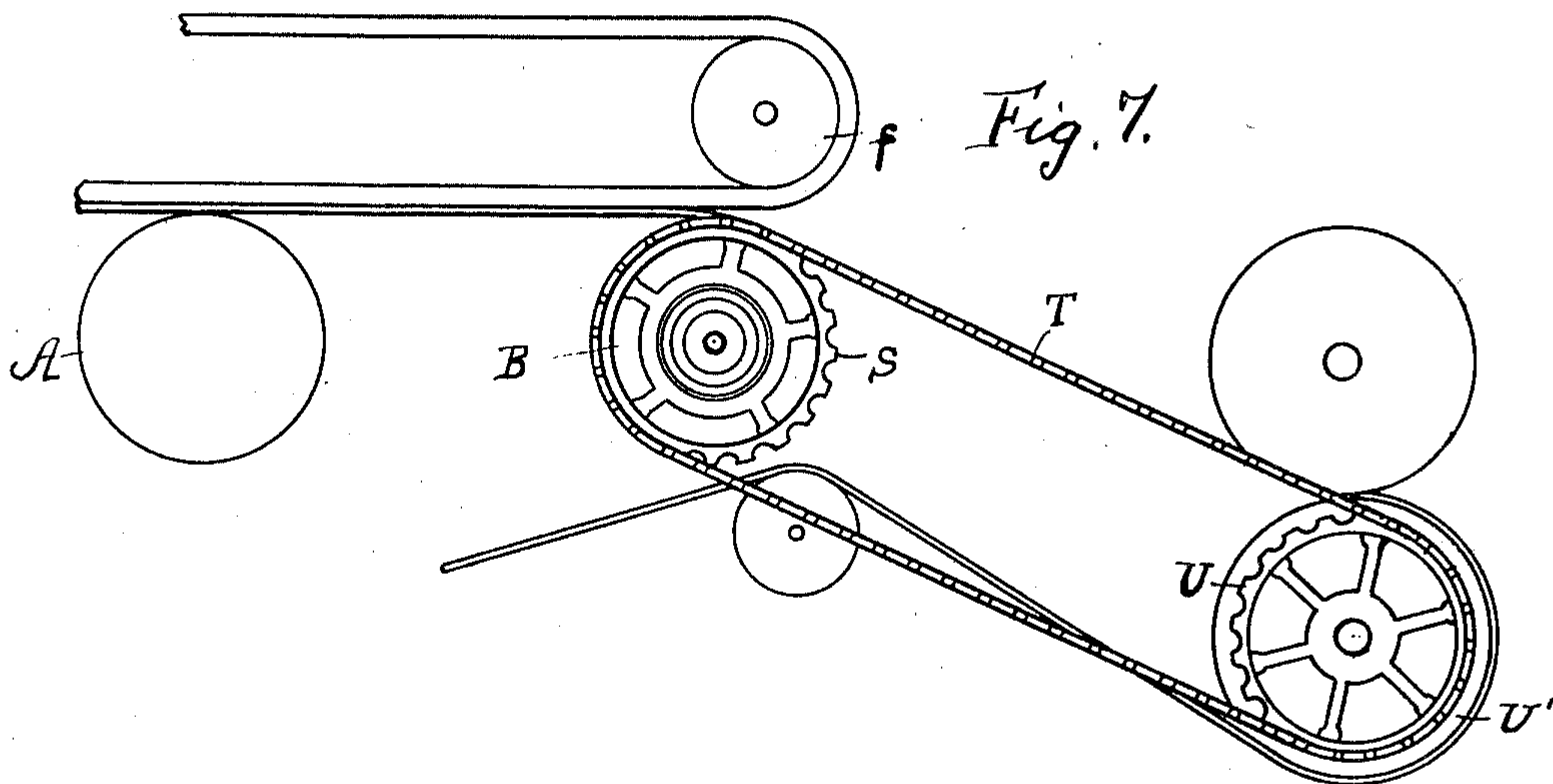
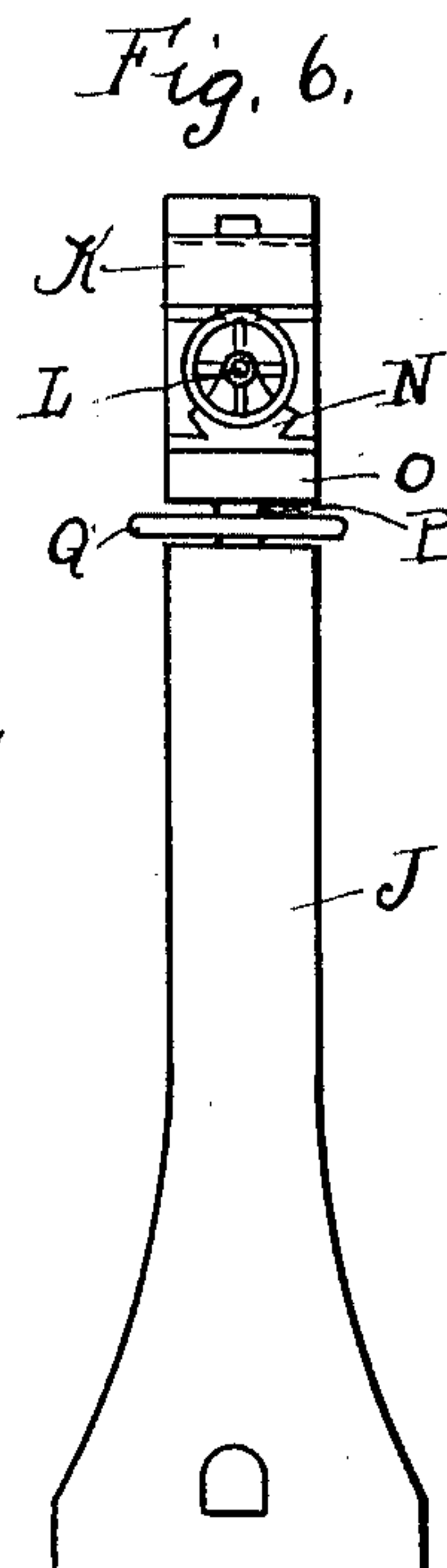
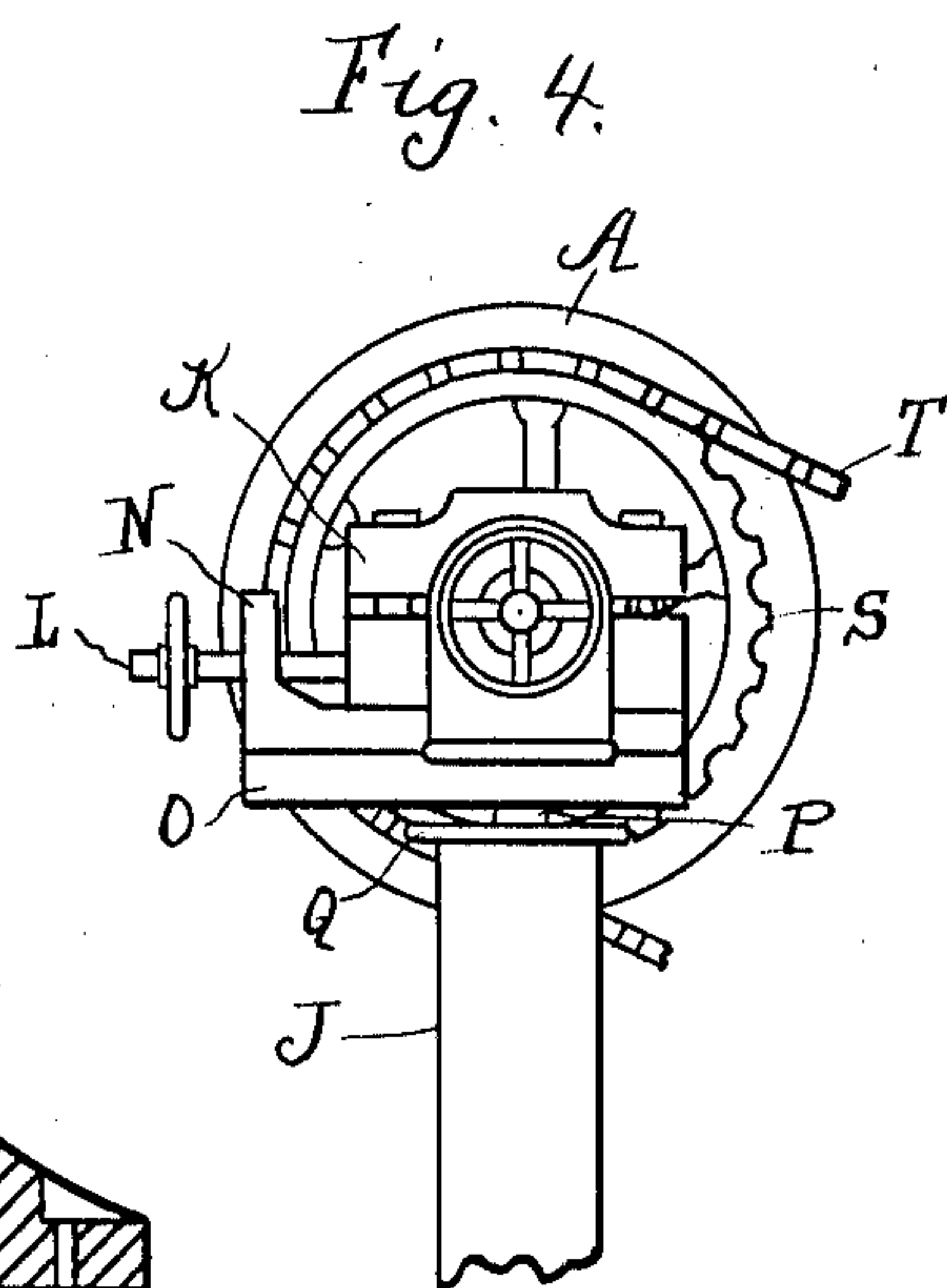
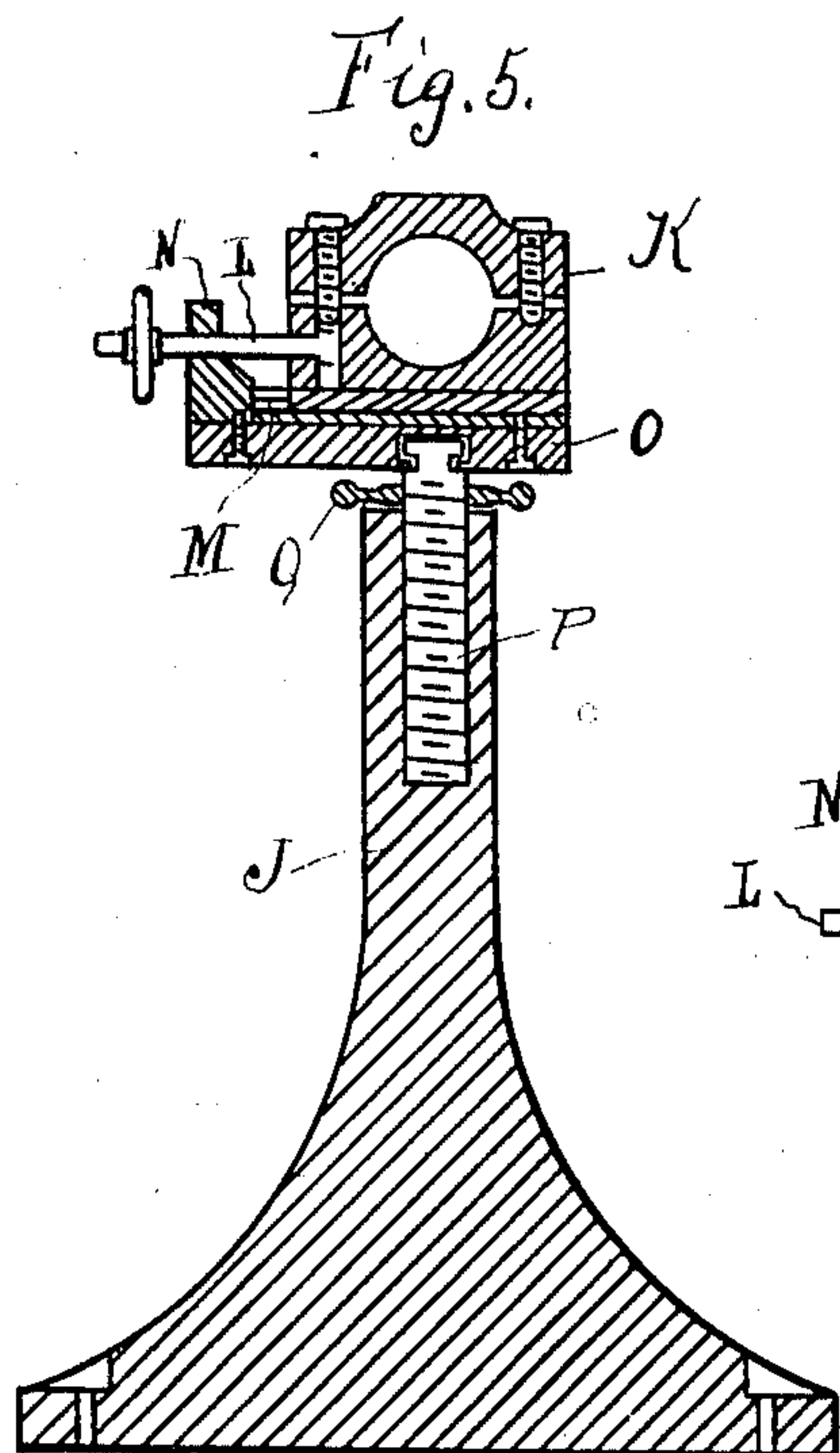
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3 SHEETS—SHEET 2.



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3 SHEETS--SHEET 3.

Fig. 8.

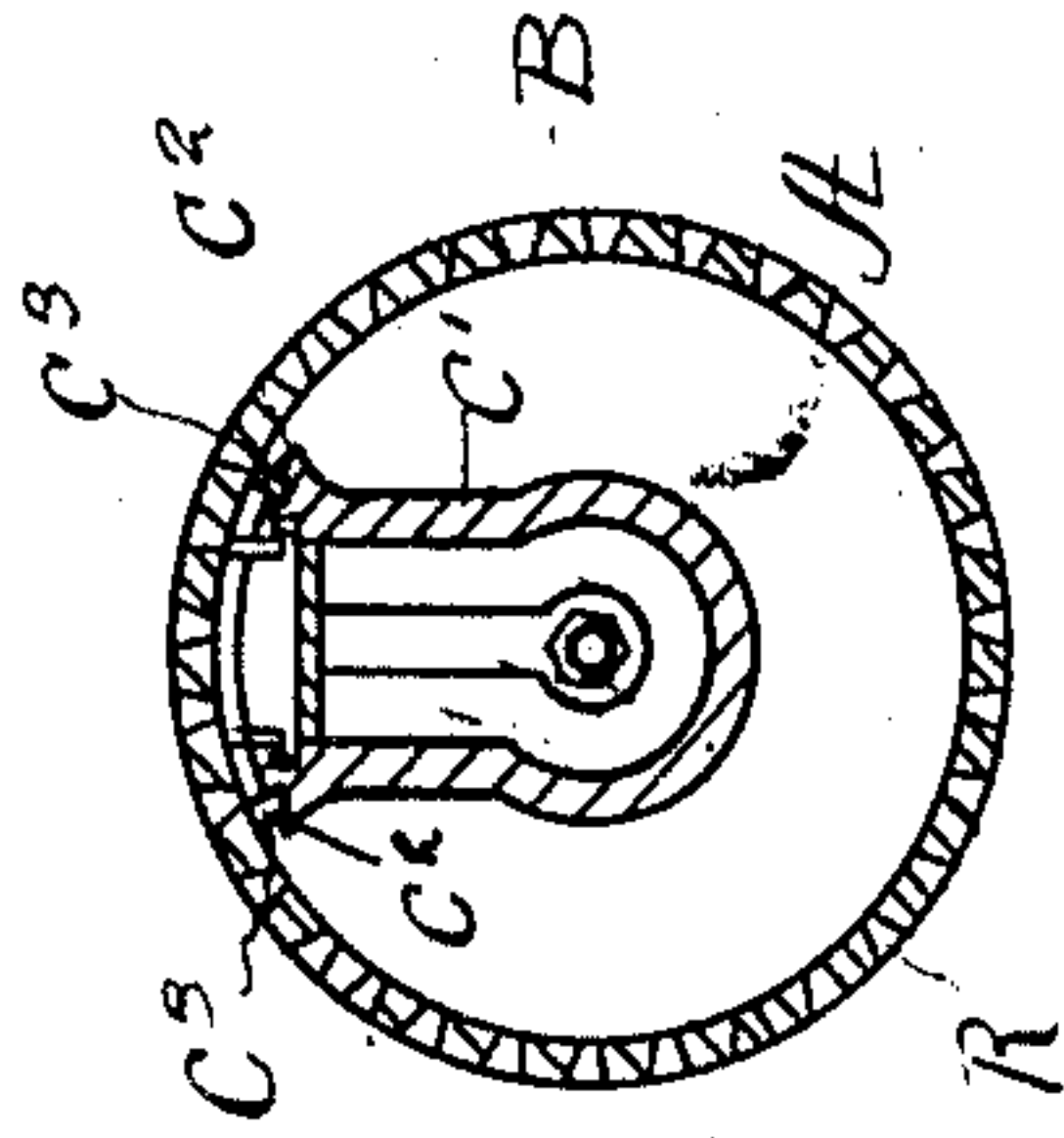
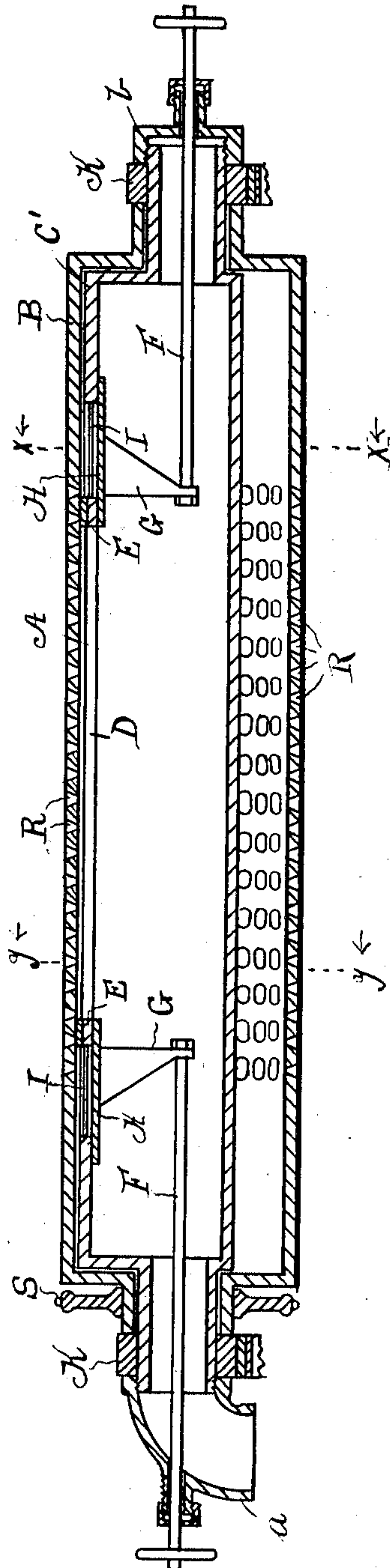


Fig. 10.

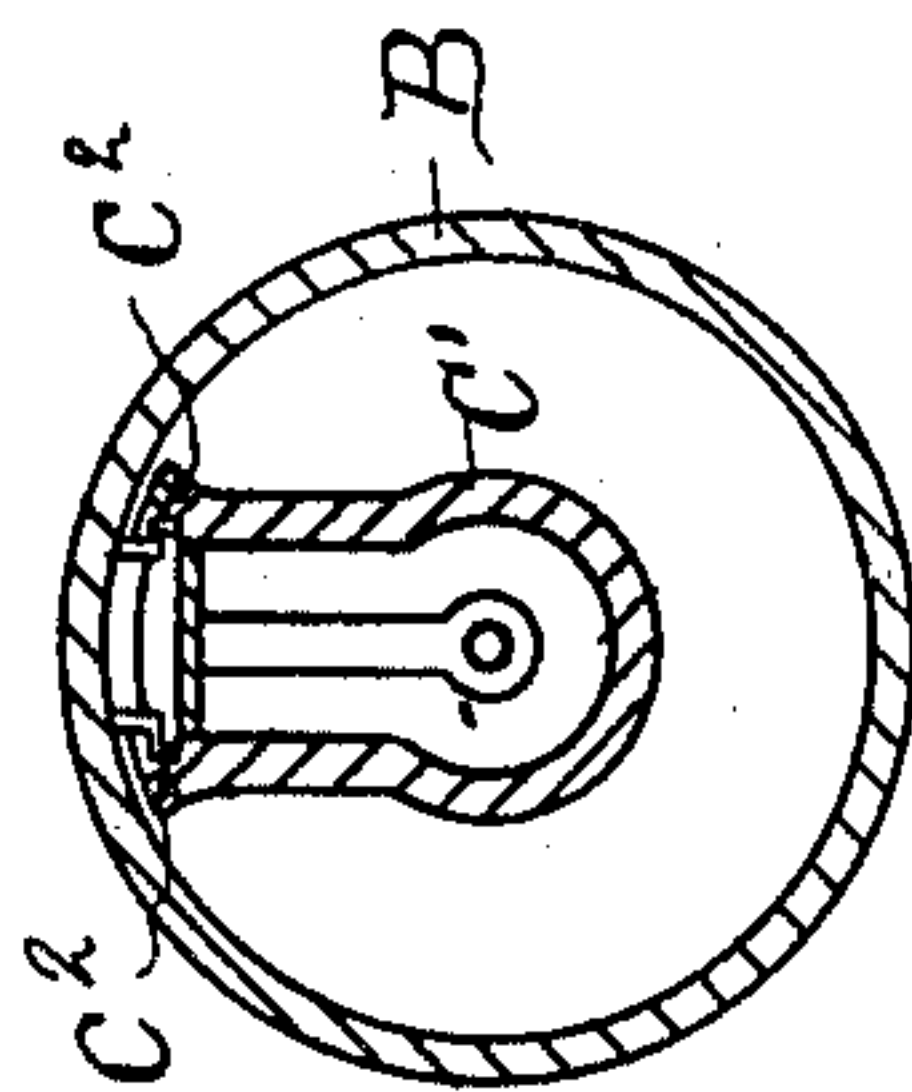


Fig. 4.

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SUCTION-BOX.

970,776.

Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed June 24, 1909. Serial No. 504,180.

To all whom it may concern:

Be it known that I, DANIEL S. ZIMMERMAN, a citizen of the United States, residing at North Water Gap, in the county of Monroe and State of Pennsylvania, have invented a certain new and useful Improvement in Suction-Boxes, of which the following is a specification.

My invention relates to a new and useful improvement in suction boxes, of that class which are used with paper making machines or systems, and has for its object to provide an exceedingly simple and effective device of this description by means of which the Fourdrinier wire is passed over revolving suction boxes instead of in the old manner where a Fourdrinier wire is drawn over stationary boxes which may be adjusted up or down to either side or to different widths of paper as the case may be.

With these ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction in detail, referring by letter to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a detail section of my improved suction box. Fig. 2, is a section at the line $x-x$ of Fig. 1 looking in the direction of the arrow. Fig. 3, a section at the line $y-y$ of Fig. 1 looking in the direction of the arrow. Fig. 4, an end view thereof, a part of the stand being broken away. Fig. 5, is a vertical section of one of the stands. Fig. 6, a side elevation thereof. Fig. 7, is a diagrammatical view showing how the Fourdrinier wire passes over the suction boxes. Fig. 8, a sectional view of my modified form of suction box. Fig. 9, a section at the line $x-x$ of Fig. 8 looking in the direction of the arrow. Fig. 10, a section at the line $y-y$ of Fig. 8 looking in the direction of the arrow.

In carrying out my invention as here embodied, A represents a suction box composed of two cylinders B and C, one within the other.

The cylinder C has a slot D cut in one side thereof for the reception of water, pulp or other particles which may be drawn from

the material being made into paper while passing over the Fourdrinier wire. This slot D may be made smaller or larger by means of the plug E, which is adapted to be moved backward or forward as the case may be, by means of the shaft F which is connected therewith by means of the brace G, and when this plug is at its inward extremity, as shown in Fig. 1, that part of the slot D which this plug does not fill will be covered by the plate H. To hold the plug even with the cylinder I provide a track I along a portion of the side of the slot, into which fit projections formed on the plug E. This cylinder is held stationary in the stands J by means of the adjustable clamp K, through which bolts are threaded for holding the upper part to the lower portion of said clamp. One of the bolt holes in the lower portion of the clamp K is extended a considerable length through said portion and another hole extended from said bolt hole outward to one side of said clamp through which passes the adjusting screw L, by means of which the clamp is drawn backward or forward in its track M, thus the cylinder would be moved backward or forward as the case may be. This adjusting screw is held in position by means of the brace N, and this brace and also the clamp are fastened to a plate O by means of small bolts. In the plate O is placed a swivel screw P which is threaded in the stand J. To operate this screw I provide a threaded wheel Q which rests on the upper part of the stand J, and when it is turned the swivel screw turns, gradually threading upward or downward, thus raising or lowering the suction box A.

The cylinder B which revolves about the cylinder C is provided with perforations R extending all the way around the central portion thereof, and through these perforations pass the water, pulp and other particles. To revolve the cylinder I provide a sprocket wheel S secured to one side thereof, over which passes a chain T, and this chain passes over a second sprocket wheel U, which is secured to the bottom couch roll U', to which power is transmitted by means of a motor or engine.

The width of the paper is regulated by means of the rubber deckle straps V, which rest on top of the Fourdrinier wire and pass over suitable wheels f placed at both ends of that portion of the Fourdrinier wire on

which the pulp runs, one of said wheels being shown in Fig. 7.

In my modified form as shown in Figs. 8, 9 and 10, in place of the inside round cylinder C, I use a U-shaped cylinder C' so that the water, pulp and other particles entering this cylinder may be more easily withdrawn, as the bottom of the cylinder will be more on a level with the outlet. In the top of the sides of the U shaped cylinder C' I form the groove C², in which I place the wood strips C³, and this will rub against the inside surface of the outer cylinder B, and this will prevent the surfaces of the two cylinders rubbing, which will prevent the wear of the same, and as these wooden strips wear away, they may be readily and easily replaced with very little expense.

a represents the joint which connects the inside cylinder with the pipe passing to the suction pump. This pump sucks the water, pulp and other particles from the inside of the cylinder C through its outlet at one end, and then expels it into a sewer or a pipe for returning it to a tank at the head of the paper making circuit. To prevent any of the water or pulp passing out of the opposite end I provide a cap b which threads upon the inside cylinder, thus closing that end except the hole through which the shaft F passes, which may be packed to prevent any of the material passing out this way.

In practice, the pulp for making paper which is very wet is carried over the suction box by the Fourdrinier wire, said suction box drawing the water from the pulp. In the old style suction boxes which have been stationary, the wire was drawn over them and constantly had to be removed because they wore out by the constant friction caused by said Fourdrinier wire being drawn over said suction boxes, but by my improved suction box this will be overcome, as the Fourdrinier wire and the suction box traveling at the same speed will cause little or no friction.

Having thus fully described my invention, what I claim as new and useful is—

1. The combination of a stationary cylinder having a slot cut in the upper portion

thereof, a plug fitted in said slot, a plate fastened thereto, a bracket secured to said plate, a shaft, one end of which is attached to the bracket, the opposite end passing to the outside of the cylinder for adjusting said plug, a revolving perforated outside cylinder, a sprocket wheel secured thereto, means for revolving the same, wheels placed above the Fourdrinier wire at either end of that portion on which the pulp is adapted to run, rubber deckle straps, adapted to pass over said wheels and rest upon the top of the Fourdrinier wire, stands, adjustable clamps, swivel screws threaded into said stands and fastened to said clamps by means of a plate, a wheel placed about said swivel screws for adjusting the clamp up or down, a shaft movably attached to the clamp, a bracket for holding said shaft in position, attached to the plate, a cap, an opening therein, through which passes one of the adjusting shafts, said cap closing one end of the cylinder, and a joint threaded on the opposite end of the said cylinder, adapted to receive a pipe leading to a suction pump.

2. In a suction box of the character described, an inside cylinder having a slot cut therein, means for holding said cylinder in position whereby the slot will always be at the top, a plug placed in said slot, means for moving the plug backward or forward making the slot longer or shorter, a revolving perforated cylinder placed about the first named cylinder means for revolving the same, deckle straps resting upon the upper surface of the Fourdrinier wire, a cap for closing one end of the cylinder, a joint connecting the inside cylinder with a suction pump for withdrawing the water, pulp and other particles from the inside cylinder and means for adjusting the suction boxes up and down or backward and forward.

In testimony whereof, I have hereunto affixed my signature in the presence of two subscribing witnesses.

DANIEL S. ZIMMERMAN.

Witnesses:

GEO. DRAKE,

DANIEL STEMPLER.