

W. H. DECKER.
 APPARATUS FOR FORMING BILGED BARREL BODIES OF PAPER PULP.
 APPLICATION FILED JULY 9, 1908.

928,249.

Patented July 20, 1909.
 3 SHEETS—SHEET 1.

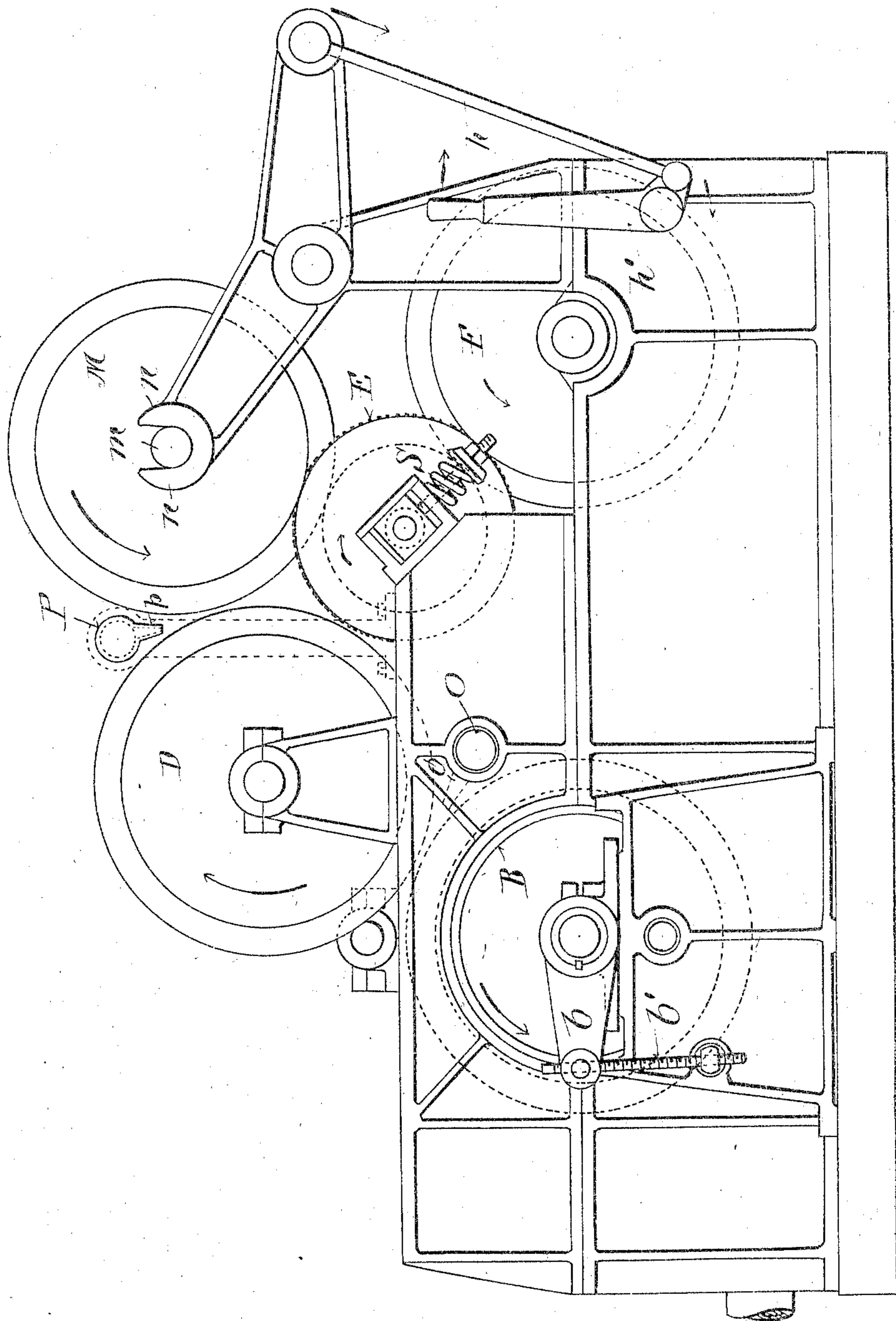


Fig. 1.

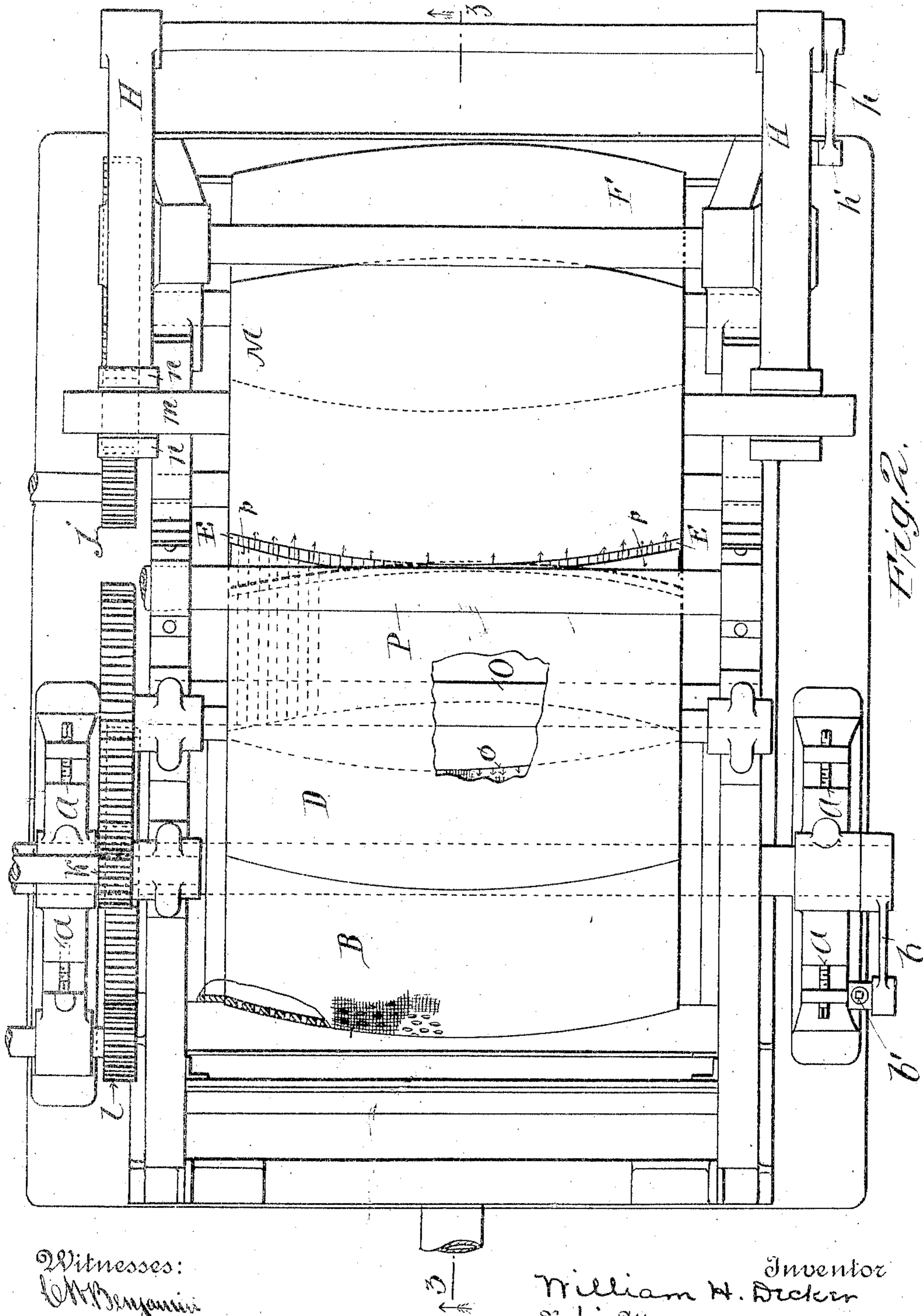
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Inventor
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 By his Attorney
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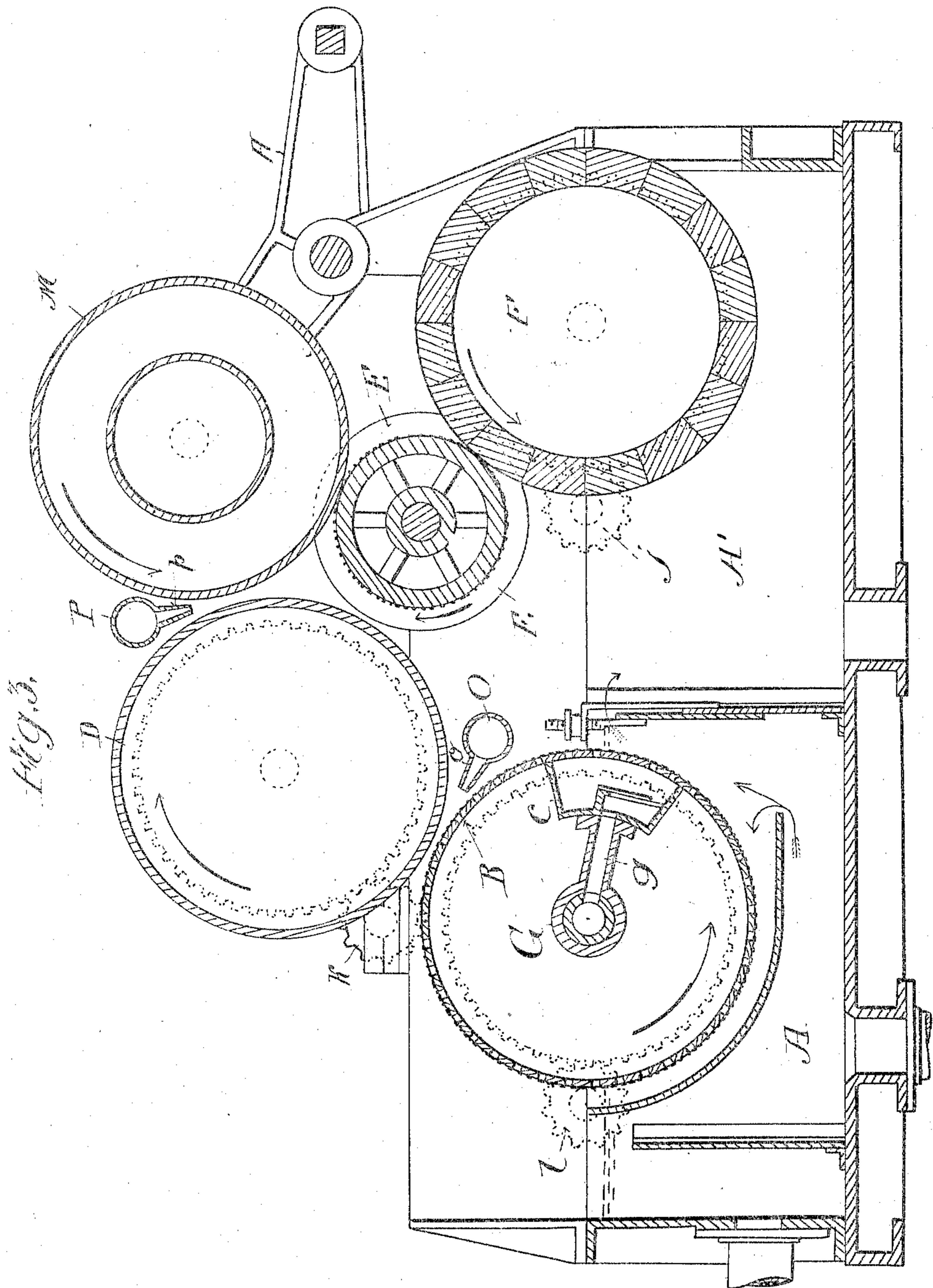
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UNITED STATES PATENT OFFICE

WILLIAM H. DECKER, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE SOLVAY PROCESS COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

APPARATUS FOR FORMING BILGED BARREL-BODIES OF PAPER-PULP.

No. 928,249.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed July 9, 1908. Serial No. 442,669.

To all whom it may concern:

Be it known that I, WILLIAM H. DECKER, a citizen of the United States, residing in the city of Syracuse, county of Onondaga, and State of New York, have invented certain new and useful Improvements in Apparatus for Forming Bilged Barrel-Bodies of Paper-Pulp, of which the following is a description.

My invention relates to the form of apparatus for this purpose described in an application for Letters Patent heretofore filed by me, Serial No. 355,844, and its object is, while retaining the general principles of construction and operation of said apparatus, to effect certain improvements in details of construction, and obtain increased efficiency. To this end, in my present construction, I interpose between the bilged forming roll and the transfer roll an auxiliary, or carrying roll, of the same size and shape as the forming roll, and located above the forming roll, and also above, or partly above, the sectional transfer roll. With this arrangement the web of pulp (having been sufficiently strengthened for the purpose by the application of a suitable degree of suction thereto), is lifted by hand from the forming cylinder, when it reaches the proper point thereon, and placed upon the auxiliary roll, around which it is carried until, when it reaches the horizontal diameter of this roll on the side opposite to its point of application, it separates from the roll and is delivered by gravity to the sectional transfer roll, by which it is carried to and deposited upon the mandrel.

In order to take up the slack of the web as it passes from the forming roll to the auxiliary roll and avoid the formation of folds or ridges in the web, I interpose between these rolls a graduated air blast having a bow-shaped aperture conforming to the bilge of the web, so that the web is held in its bilged shape as it passes to the auxiliary roll and is laid smoothly thereon. A similar air blast may be interposed between the auxiliary roll and the transfer roll to take up any excess of slack at this point and enable the web to be laid smoothly upon the transfer roll. By these means the web of pulp is carried through the apparatus and laid upon the mandrel and wound thereon, without straining or wrinkling in any part thereof.

The invention will be best understood by reference to the accompanying drawings, of which—

Figure 1 is an end view, Fig. 2 is a plan view, and Fig. 3 is a transverse sectional view of the apparatus.

Referring to the drawings, A, indicates a pulp containing tank, adjoining which is a waste tank or "save all", A'.

B is the bilge shaped forming roll arranged to revolve within the tank A, and having a perforated, wire covered shell; C, is a suction box located within the roll, B, and mounted by means of hollow arms, g, upon a hollow shaft, G, which is connected with an air exhaust apparatus of any usual or suitable construction, not shown in the drawings. In operation the suction box, C, is set so as to be partly below and partly above the surface of the pulp in the tank, A. It may be adjusted circumferentially of the roll, B, by rotating the shaft, G, by means of the arm, b, and threaded rod, b', and its pressure against the interior of the roll, B, may be adjusted by means of set-screws, a, a.

D, is the metal, smooth-surfaced auxiliary roll rotatably mounted above the forming roll, B. If desired, this auxiliary roll may be heated by steam pipes, or otherwise, so as to partially dry the moist web of pulp in its passage over the roll.

E, is the concave surfaced transfer roll made up of independent, wire covered sections, rotatably mounted on a fixed shaft, and located below and partially underneath the auxiliary roll, D, so that as the web of pulp descends from the roll, D, it will strike upon and be taken up by the transfer roll. The sections of the transfer roll are driven by a bilge-shaped drive-roll, F, which has the same size and shape as the forming roll.

M is a collapsible mandrel of any usual or suitable construction, mounted on a shaft, m, which lies in the open bearings, n, n. The mandrel, M, lies in contact with the sectional transfer roll, and is driven thereby, and the barrel in process of formation is compressed between the mandrel, and the transfer roll, by the weight of the mandrel thereon. The forming roll, B, auxiliary roll, D, and drive roll, F, are driven, at the same speed, respectively by the gear wheels, i, k, l.

The operation of the apparatus is as follows. The tank, A, having been filled with

pulp to the required depth, and the machinery set in motion, a bilge shaped film or web of pulp is lifted upon the surface of the roll, B. As the web passes in front of the suction box, C, it is deprived of a portion of its watery content, and is sufficiently compacted so that it can be handled to a certain extent without breaking. When the end of the web reaches the proper point, it is lifted from the forming roll, B, by hand, and laid upon the auxiliary roll, D, to which it adheres and is carried forward thereon. As the web passes from the forming roll, B, to the roll, D, the blast of air from the graduated air blast, O, strikes it and holds it in the bilged form, so that it is laid smoothly upon the roll, D. When the end of the web reaches the side of the roll, D, opposite to its point of application thereto, it separates from the roll, D, by gravity, and descends until it strikes the concave surfaced transfer roll, E, revolving in the same direction as the roll, D, and adheres thereto and is carried along thereon until it reaches the collapsible mandrel, M, to which it is transferred, and on which it continues to be wound until a barrel body of the desired thickness is formed. While the presence of the graduated air blast, P, between the roll, D, and the transfer roll, E, is not essential to the successful working of the apparatus, I prefer to employ it, as it prevents the possibility of any wrinkling of the web at this point as it is being laid upon the transfer roll.

The sections of the transfer roll, E, and consequently the web resting thereon, move at the same rate of speed as the parts of the mandrel with which they are in contact; hence there is no straining or disruption of the web by reason of any change in the rate of speed of the different parts thereof, as it passes from the transfer roll to the mandrel. By reason also of the fact that the transfer roll, E, moves in the same direction as the roll, D, from which it receives the web, some slack is given the central portion of the web so that the central portion of the web is laid upon the transfer roll shortly after the sides thereof on the same transverse section; thus, as the central portion of the web has a shorter distance to travel on the transfer roll, than the sides, all parts of the web on any given transverse section thereof reach the mandrel at substantially the same time. In this way any pull of the web from the sides toward the center is prevented. By these means I cause the delivery of the web to the mandrel to be even and regular, without any weakening or distortion thereof. When a barrel body of the desired thickness has been deposited upon the mandrel, the web is cut across in any convenient way between the roll, D, and the transfer roll, E. The drive roll, F, and with it the transfer roll, E, and mandrel, M, is moved away from the trans-

fer roll by means of the rocking bar H, and is stopped. The mandrel, M, is lifted out of its bearings, and another is substituted in its place. The movement of the forming roll, B, and auxiliary roll, D, is not stopped with that of the other parts of the apparatus, but continues to feed forward the web, the free end of which falls down into the save-all, A'. When an empty mandrel has been put in place and the transfer roll is about to be set in motion, the web is again cut above the transfer roll, and its free end, as it descends, is taken up by the moving transfer roll, and proceeds as before. In this way the operation is rapid and practically continuous, the only interruption being the time required to remove the filled mandrel and substitute an empty one in its place.

What I claim as new and desire to secure by Letters Patent is:

1. In an apparatus for forming bilged barrel bodies of paper pulp the combination of a bilged forming roll, a bilged auxiliary roll, and a bilged mandrel, all arranged to be revolved at the same rate of speed, and a concave-surfaced, sectional transfer roll located between said auxiliary roll and said mandrel, and arranged to receive a web of pulp from the former and deliver it to the latter, substantially as set forth.
2. In an apparatus for forming bilged barrel bodies of paper pulp the combination of a bilged forming roll, a bilged auxiliary roll, a bilged mandrel, and a concave-surfaced, sectional transfer roll arranged to receive a web of pulp from said auxiliary roll and deliver it to said mandrel, substantially as set forth.
3. In an apparatus for forming bilged barrel bodies of paper pulp the combination with a bilged mandrel and a concave-surfaced transfer roll of a bilged roll arranged to deliver a web of pulp by gravity to said transfer roll, substantially as set forth.
4. In an apparatus for forming bilged barrel bodies of pulp the combination of a bilged forming roll, a bilged mandrel, a concave-surfaced transfer roll located between said forming roll and said mandrel, and means for effecting the delivery by gravity to said transfer roll of a web of pulp formed on said forming roll, substantially as set forth.
5. In an apparatus for forming bilged barrel bodies of paper pulp the combination with a bilged forming roll and a bilged auxiliary roll out of contact therewith and adapted to receive a web of pulp therefrom, of a graduated air blast arranged to act upon the web of pulp and hold it in the bilged shape as it passes from one to the other of said rolls, substantially as set forth.
6. In an apparatus for forming bilged barrel bodies of paper pulp the combination with a bilged forming roll and a bilged auxiliary roll out of contact therewith and adapted to receive a web of pulp therefrom, of an

air blast arranged to act upon the web of pulp and hold it in the bilged shape as it passes from one to the other of said rolls, substantially as set forth.

5 7. In an apparatus for forming bilged barrel bodies of paper pulp the combination with a bilged forming roll and a bilged auxiliary roll, arranged to receive a web of pulp therefrom, of means whereby the web of pulp
10 is caused to retain its bilged shape as it passes

from the forming roll to the auxiliary roll, substantially as set forth.

In testimony whereof, I have hereunto subscribed my name, this 30th day of June, A. D., 1908.

WILLIAM H. DECKER.

Witnesses:

JOHN R. WICKES,

FRED H. BISHOP.