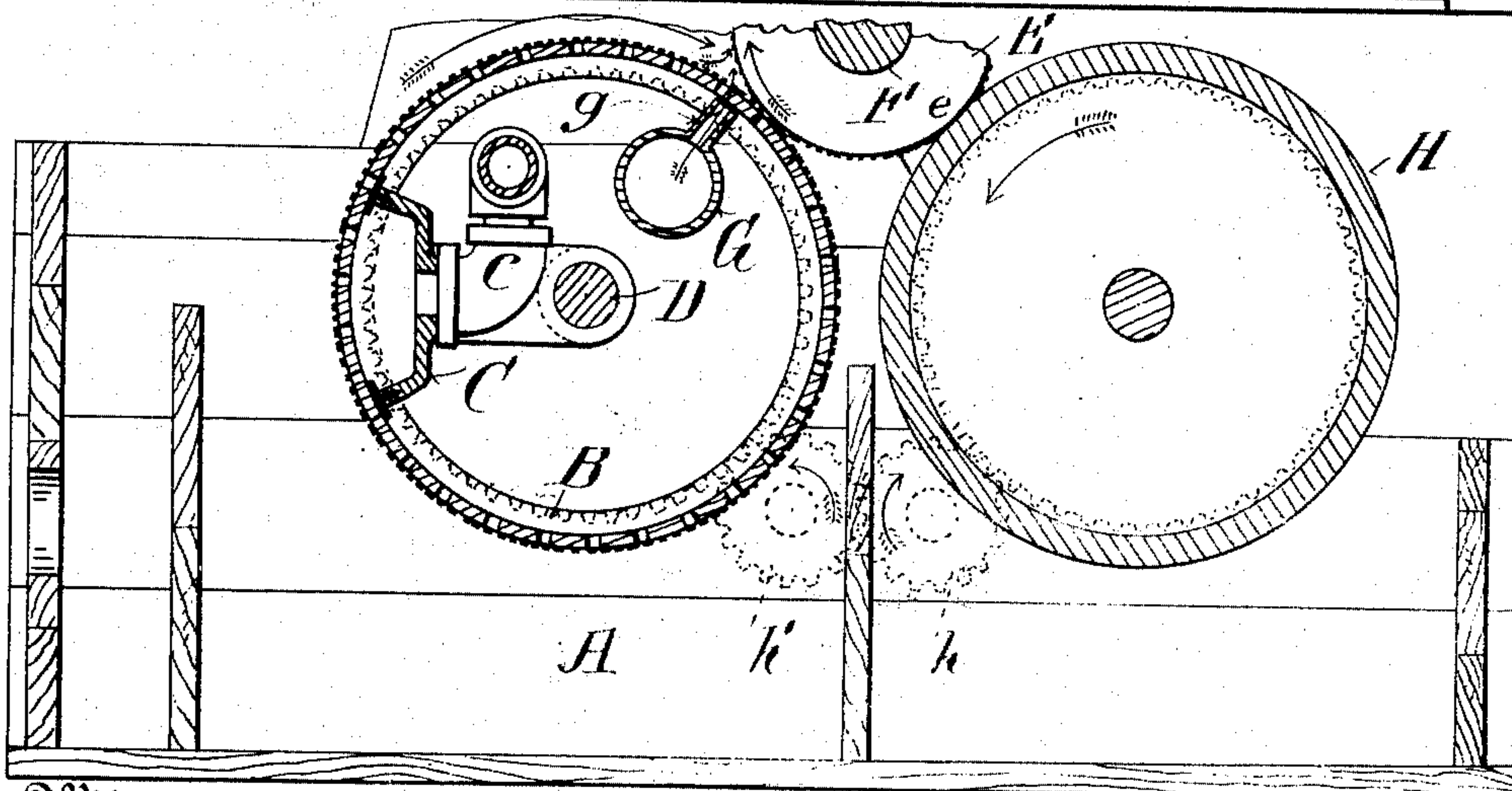
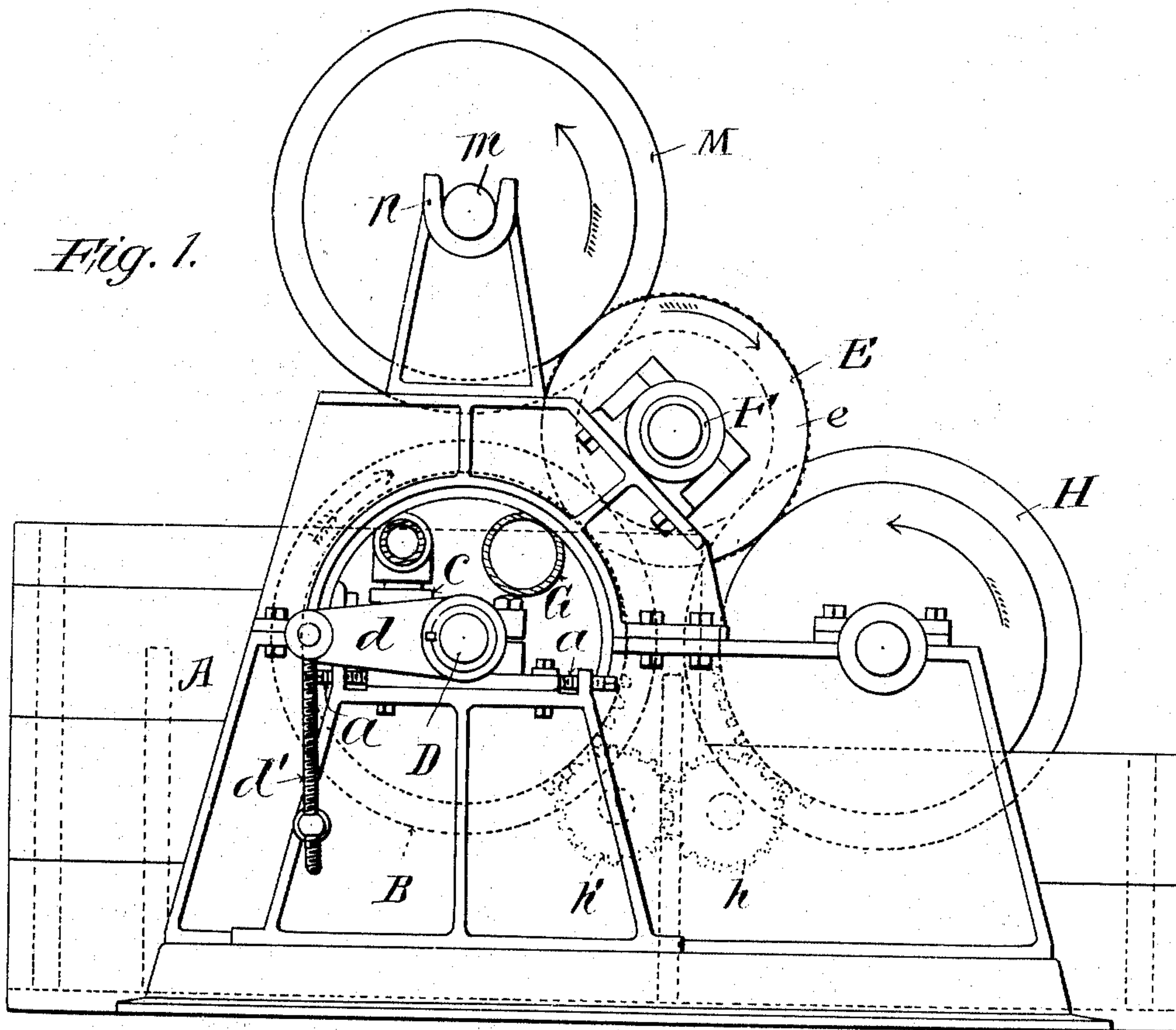


928,248.

3 SHEETS—SHEET 1.



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Fig. 4.

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928,248.

Patented July 20, 1909.

3 SHEETS—SHEET 2.

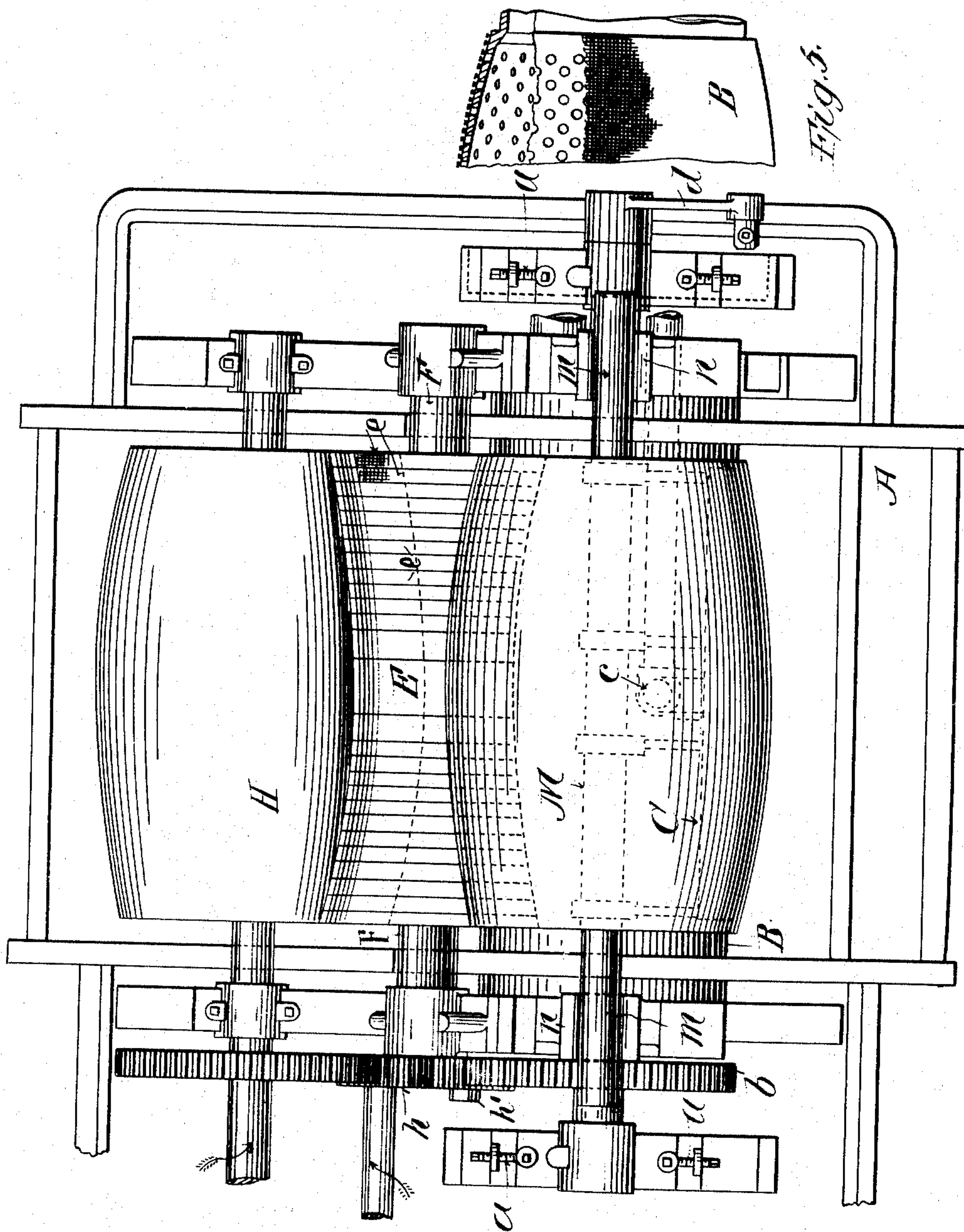


Fig. 5.

Fig. 2.

2 Witnesses:
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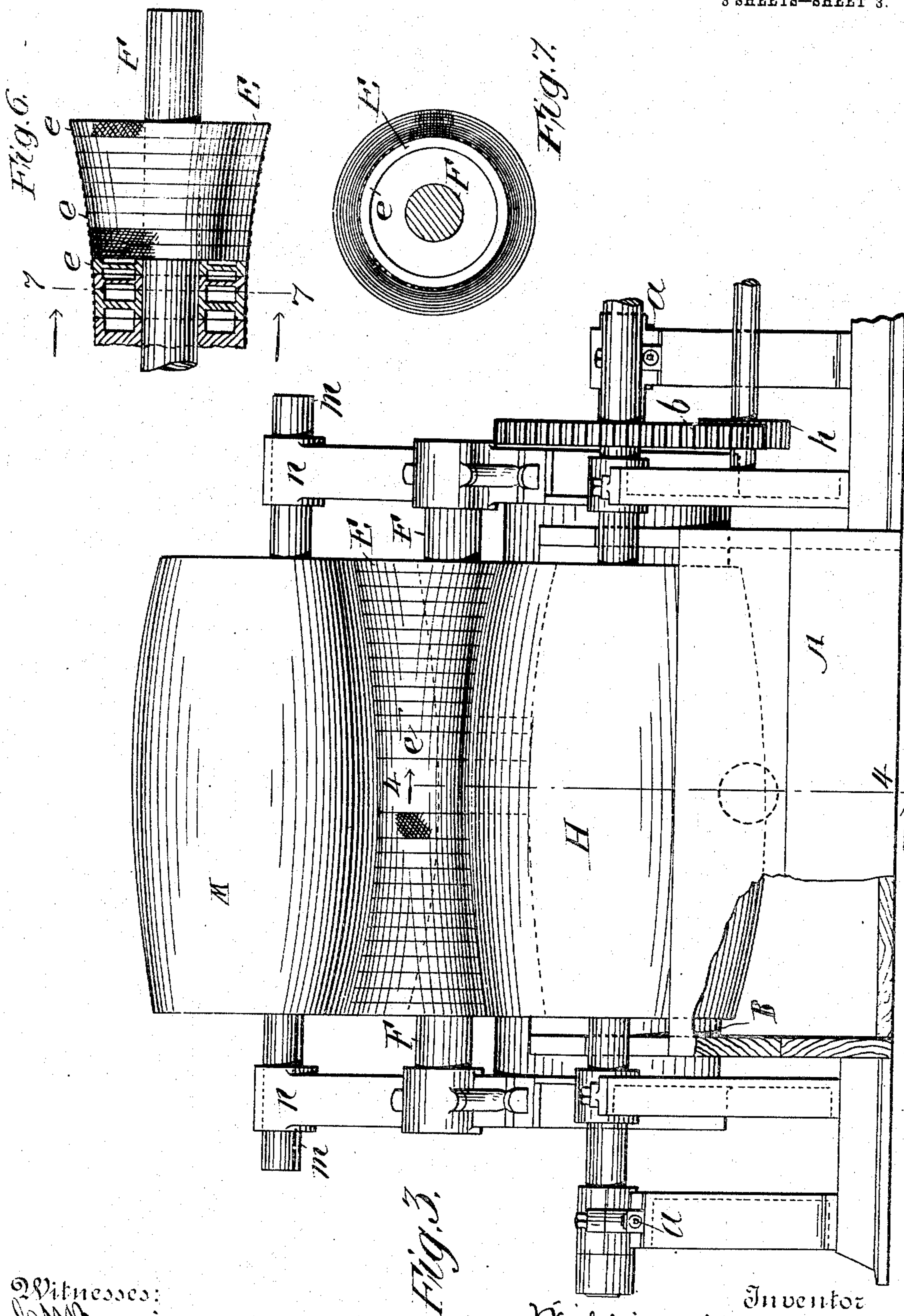
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W. H. DECKER.
 APPARATUS FOR MAKING BARREL BODIES OF PAPER PULP.
 APPLICATION FILED JULY 9, 1908.

928,248.

Patented July 20, 1909.

3 SHEETS—SHEET 3.



Witnesses:
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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 MAKING BARREL-BODIES OF PAPER-PULP.

No. 928,248.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed July 9, 1908. Serial No. 442,668.

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 Making Barrel-Bodies of Paper-Pulp, of which the following is a specification.

In an application for Letters Patent heretofore filed by me, Serial No. 355,844, I have described a form of apparatus for this purpose, in which the film of pulp of which the barrel is formed is transferred from a bilge shaped forming roll to a concave surfaced transfer roll, and thence to the bilge shaped mandrel upon which the barrel body is wound. In the operation of this apparatus the sheet of pulp of which the barrel is formed is transferred from the forming roll to the concave surfaced transfer roll at all points of its transverse section at the same time. This results, though the device is practically operative and produces a commercially desirable barrel body, in a narrowing of the web as it passes onto the mandrel, for the reason that the center of the web, having the shorest distance to travel upon the concave surfaced transfer roll, and also moving most rapidly at this point, reaches the mandrel on any given line of its transverse section, before the sides of the web on the same line.

The object of my present invention is to improve the apparatus described in my former application in this respect, and obviate all strain upon the web as it passes onto the mandrel. This I accomplished by so constructing the apparatus that the bilge shaped forming roll and the concave surfaced transfer roll revolve in the same direction, instead of in opposite directions, as shown in my former application, whereby the center of the web is given a small amount of slack between the forming roll and the transfer roll and, on any given line of its transverse section, is laid upon the transfer roll shortly after the sides thereof on the same line, and hence all points of the web on such line reach the mandrel at substantially the same moment. I have also modified my former apparatus in that, instead of driving the transfer roll by friction from the mandrel, as shown in my former application, I cause the transfer roll to rotate by contact

with a separate driving roll, and rotate the mandrel by friction from the transfer roll, whereby variation in the speed of the transfer roll, due to the change in the efficient size of the mandrel as the barrel is wound thereon, is avoided.

My invention will be best understood by reference to the accompanying drawings, in which—

Figure 1 shows an end view, Fig. 2 a plan view, and Fig. 3 a rear elevation, of the apparatus; Fig. 4 shows a vertical section of the forming roll, and the driving roll; Fig. 5 shows the perforated shell and wire covering of the forming roll; and Fig. 6 is a side view, partially in section; and Fig. 7 an end view of the concave surfaced transfer roll.

Referring to the drawings, A indicates the pulp tank, within which is arranged to rotate the barrel shaped, or bilged, forming roll, B, consisting of a perforated metal shell covered with wire netting of fine mesh. Within the forming roll, B, is a suction box, C, connected by a pipe, *c*, with an air exhaust device of any usual or suitable construction, not shown in the drawings. The suction box, C, is mounted upon a shaft, D, which may be rotated by means of arm *d* and threaded rod *d'*, so as to adjust the suction box to different positions in reference to the circumference of the cylinder. The suction box, C, is so set that when in operation it is partly below and partly above the level of the pulp in the tank A. The shaft D may also be adjusted horizontally by means of set screws, *a, a*, to regulate the pressure of the suction box C against the interior of the forming roll B.

G is a pipe connected with a source of air pressure (not shown), and provided with a row of tubes, *g, g*, whereby a blast of air may be directed against the inner surface of the forming roll B. In close proximity to, but out of contact with, the forming roll B, is the transfer roll, E, made up of independently rotatable, wire covered, sections, *e, e*, mounted upon a fixed shaft F. Each of the sections forming the transfer roll E is so shaped that the transfer roll presents a concave exterior surface, which is the converse of the bilged or convex exterior surfaces of the forming roll, B, and the mandrel, M.

M is a collapsible mandrel of any usual or

suitable construction, arranged to be rotated by contact with the transfer roll E. The surface of the mandrel is of metal, so as to take off the film from the transfer roll E, and has the shape of the bilged barrel to be formed thereon. The sections of the transfer roll E are rotated by frictional contact with the bilge shaped drive roll, H, from which in turn power is applied through the gear wheels, h, h' , to drive the forming roll, B. The driving power may evidently be applied to the shaft of the driving roll, H, or to the shaft of one of the gear wheels, h, h' . If desired, the forming cylinder, B, may be driven by means of an independent gear meshing with the gear, b , of the forming roll. In any case, however, the gears must be so arranged, and the power applied in such a direction, that the forming roll, B, and transfer roll, E, shall revolve in the same direction as indicated by the arrows. The transfer roll, E, must also rotate in such a direction that the sheet or film of pulp shall pass to the mandrel without going between the transfer roll and the drive roll.

In the operation of the apparatus, the film of pulp formed upon the surface of the forming roll, B, by its rotation in the mass of pulp in the tank, A, passes in front of the suction box, C, whereby it is compacted and strengthened sufficiently to enable it to be carried across to the transfer roll without breaking. When the film, in the rotation of the cylinder, comes opposite the pipes g, g , it is, by the air blast therefrom, blown across to the transfer roll, E, and attached thereto, and then continues on in the same direction upon the surface of the transfer roll until it reaches the mandrel, M, to which it is transferred, and continues to be wound thereon until a barrel body of the desired thickness is formed, when the mandrel is removed, another substituted in its place, and the operation repeated. When the film or web of pulp has once become attached to the transfer roll, E, it will be drawn up at the sides thereof from the forming cylinder so that, at its sides, it will be tangential, or nearly tangential, to the ends of the forming roll and transfer roll. In this way some slack is given to the central portion of the web and, on any given transverse section of the web, the central portion thereof will be laid upon the transfer roll and begin its travel thereon shortly after the sides, and hence all points of the web on such transverse section of the web will reach the mandrel at the same time. In this way any strain upon the web is prevented.

By providing an additional driving roll, instead of driving the transfer roll from the mandrel as heretofore, I prevent the variation in speed of the transfer roll due to the increase in the size of the mandrel by the ad-

dition of the barrel, and provide a more convenient mechanical arrangement.

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 for withdrawing a web of pulp from the tank, a bilged mandrel and a concave surfaced transfer roll, composed of independently rotatable sections, lying between said forming roll and said mandrel and in contact with the latter, and a bilged shaped driving roll in contact with the transfer roll, substantially as set forth.

2. In an apparatus for forming bilged barrel bodies of paper pulp, the combination of a bilged forming roll for withdrawing a web of pulp from the tank, a bilged mandrel, a concave surfaced transfer roll lying between said forming roll and said mandrel and in contact with the latter, and a bilge-shaped driving roll in contact with the transfer roll, substantially as set forth.

3. In an apparatus for forming bilged barrel bodies of paper pulp, the combination of a bilged forming roll for withdrawing a web of pulp from the tank, a concave surfaced transfer roll composed of independently rotatable sections, a bilge-shaped mandrel in contact with the transfer roll and arranged to be driven thereby, and means independent of the mandrel for driving the transfer roll, substantially as set forth.

4. In an apparatus for forming bilged barrel bodies of paper pulp, the combination of a bilged forming roll for withdrawing a web of pulp from the tank, a concave surfaced transfer roll, a bilge-shaped mandrel in contact with the transfer roll, and arranged to be driven thereby, and means independent of the mandrel for driving the transfer roll, substantially as set forth.

5. In an apparatus for forming bilged barrel bodies of paper pulp, the combination of a bilged forming roll for withdrawing a web of pulp from the tank, a bilged mandrel, a concave surfaced transfer roll composed of independently rotatable sections lying between said forming roll and said mandrel and in contact with the latter, and means for rotating the forming roll and the transfer roll in the same direction, substantially as set forth.

6. In an apparatus for forming bilged barrel bodies of paper pulp, the combination of a bilged forming roll for withdrawing a web of pulp from the tank, a bilged mandrel, a concave surfaced transfer roll lying between said forming roll and said mandrel and in contact with the latter, and means for rotating the forming roll and the transfer roll in the same direction, substantially as set forth.

7. In an apparatus for forming bilged barrel bodies of paper pulp the combination

of a bilged forming roll for withdrawing a web of pulp from the tank, a bilged mandrel and a transfer roll adapted to carry the web of pulp from the forming roll to the mandrel, and arranged to rotate in the same direction as the forming roll, substantially as set forth.

8. In an apparatus for forming bilged barrel bodies of paper pulp the combination
10 of a bilged forming roll for withdrawing a web of pulp from the tank, a bilged mandrel and means for transferring the web of pulp

from the forming roll to the mandrel whereby all points on any transverse section of the web are brought to the mandrel at practically the same time, substantially as set forth. 15

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.