

No. 897,133.

PATENTED AUG. 25, 1908.

I. E. PALMER.
FLUID CIRCULATING ROLL.
APPLICATION FILED JUNE 26, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

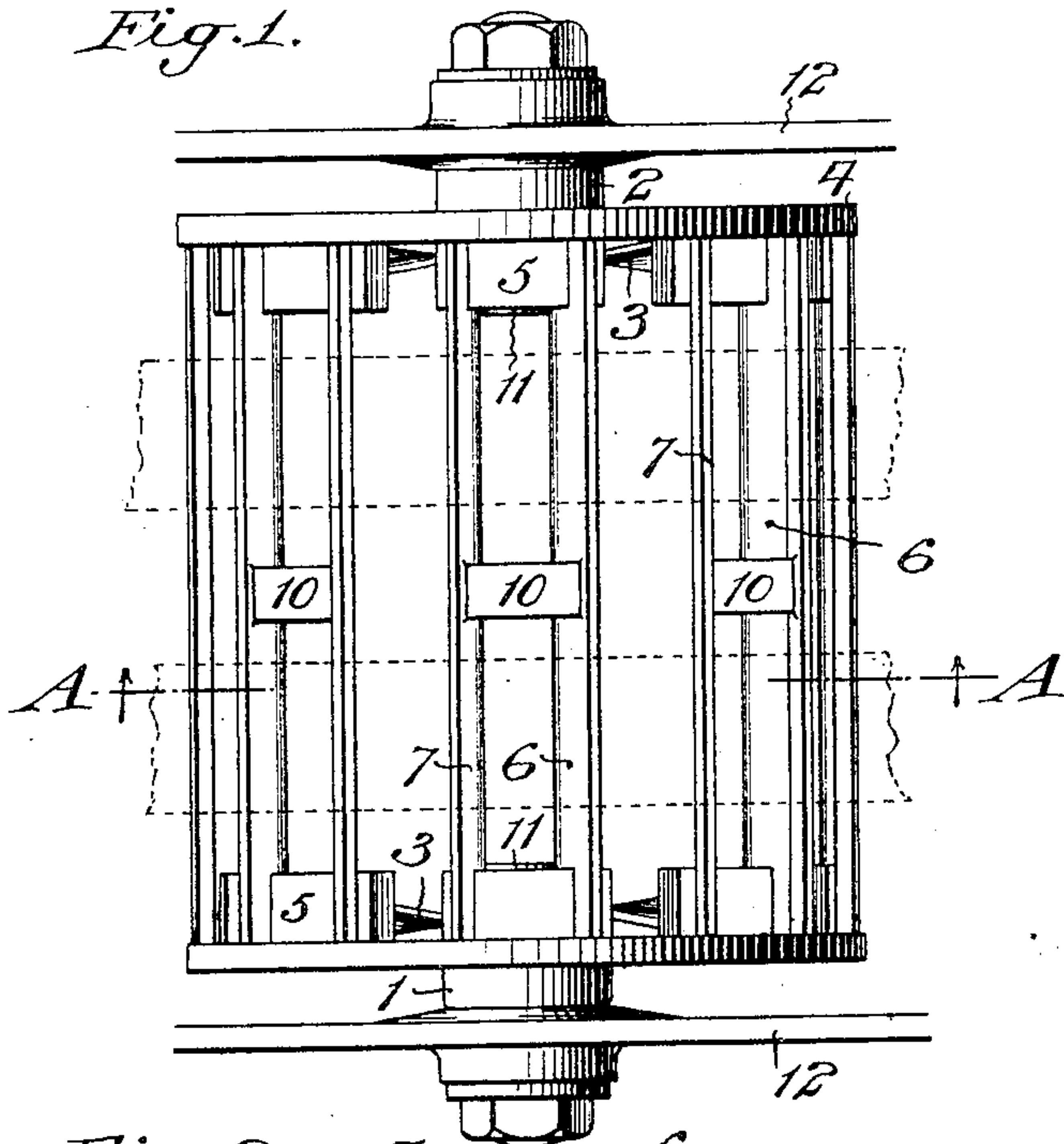


Fig. 2.

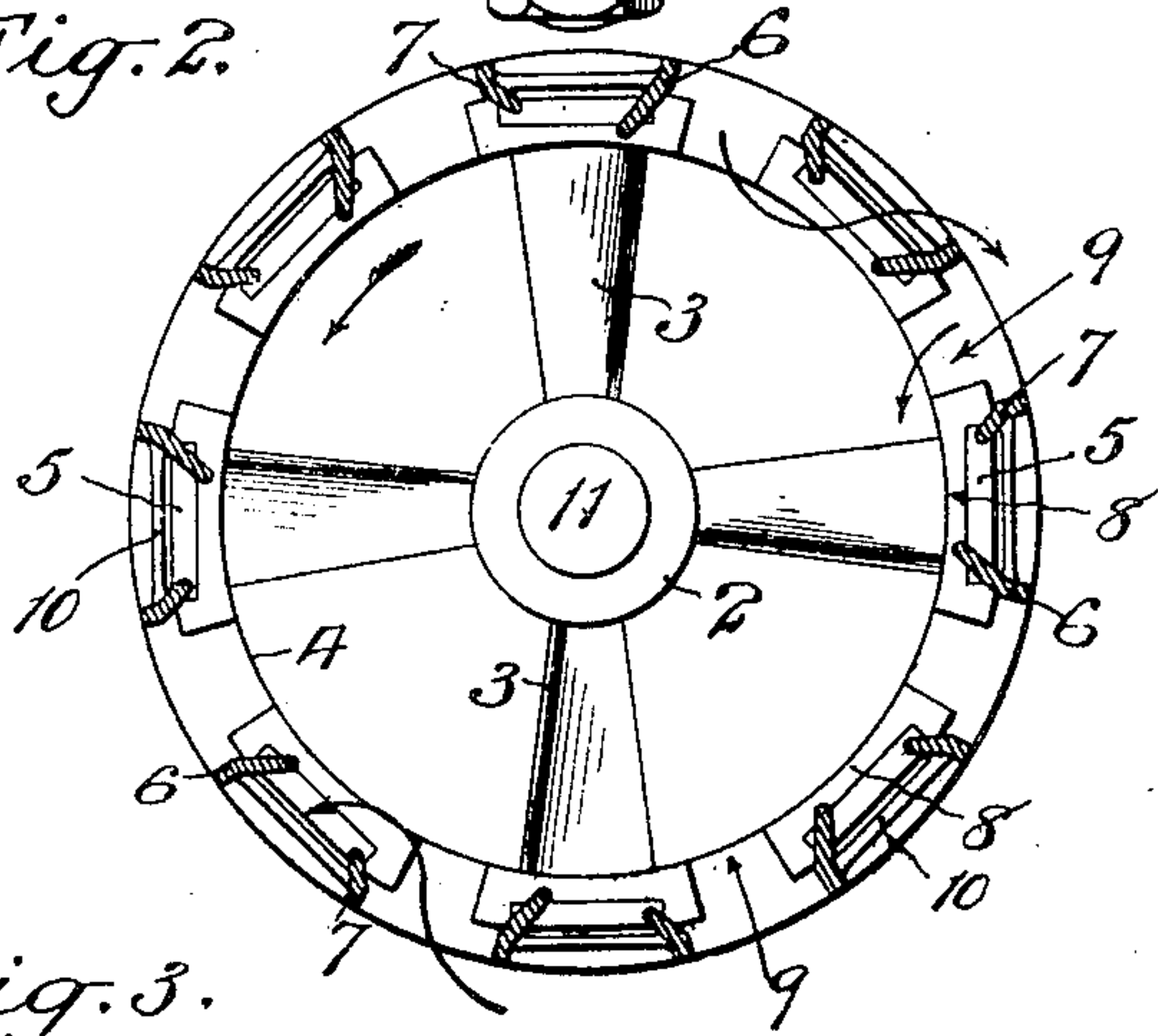
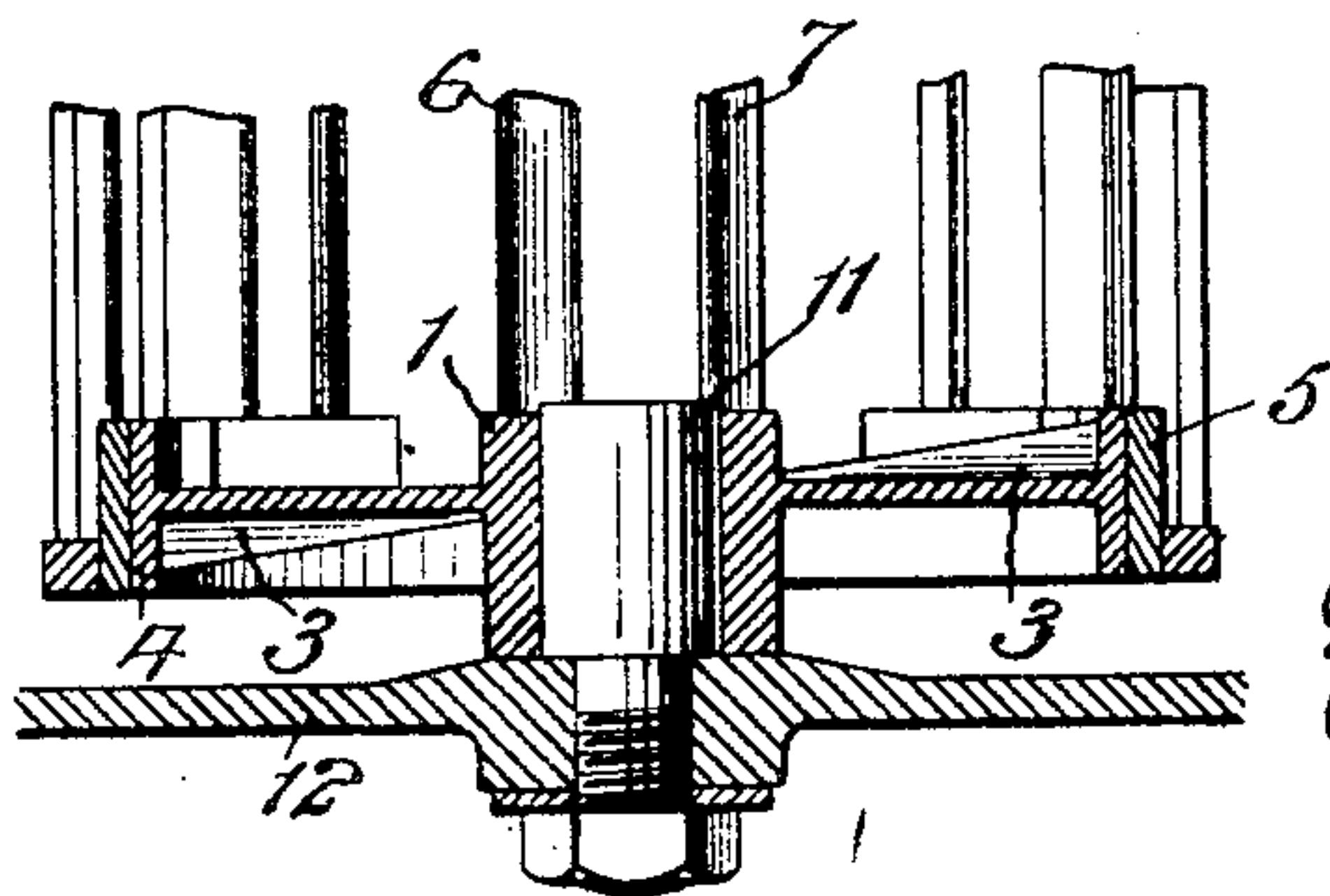


Fig. 3.



Witnesses:
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2 SHEETS—SHEET 2.

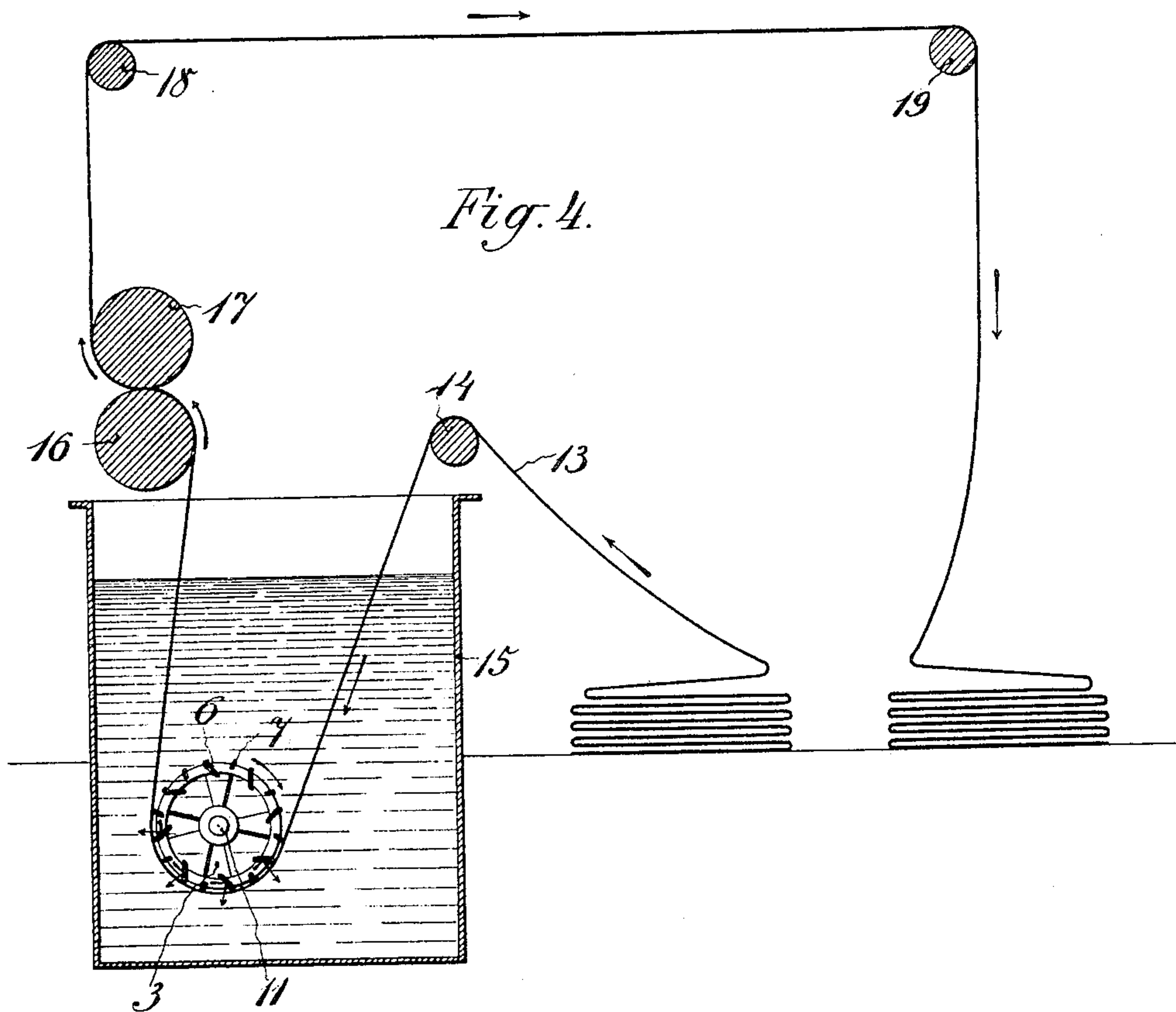
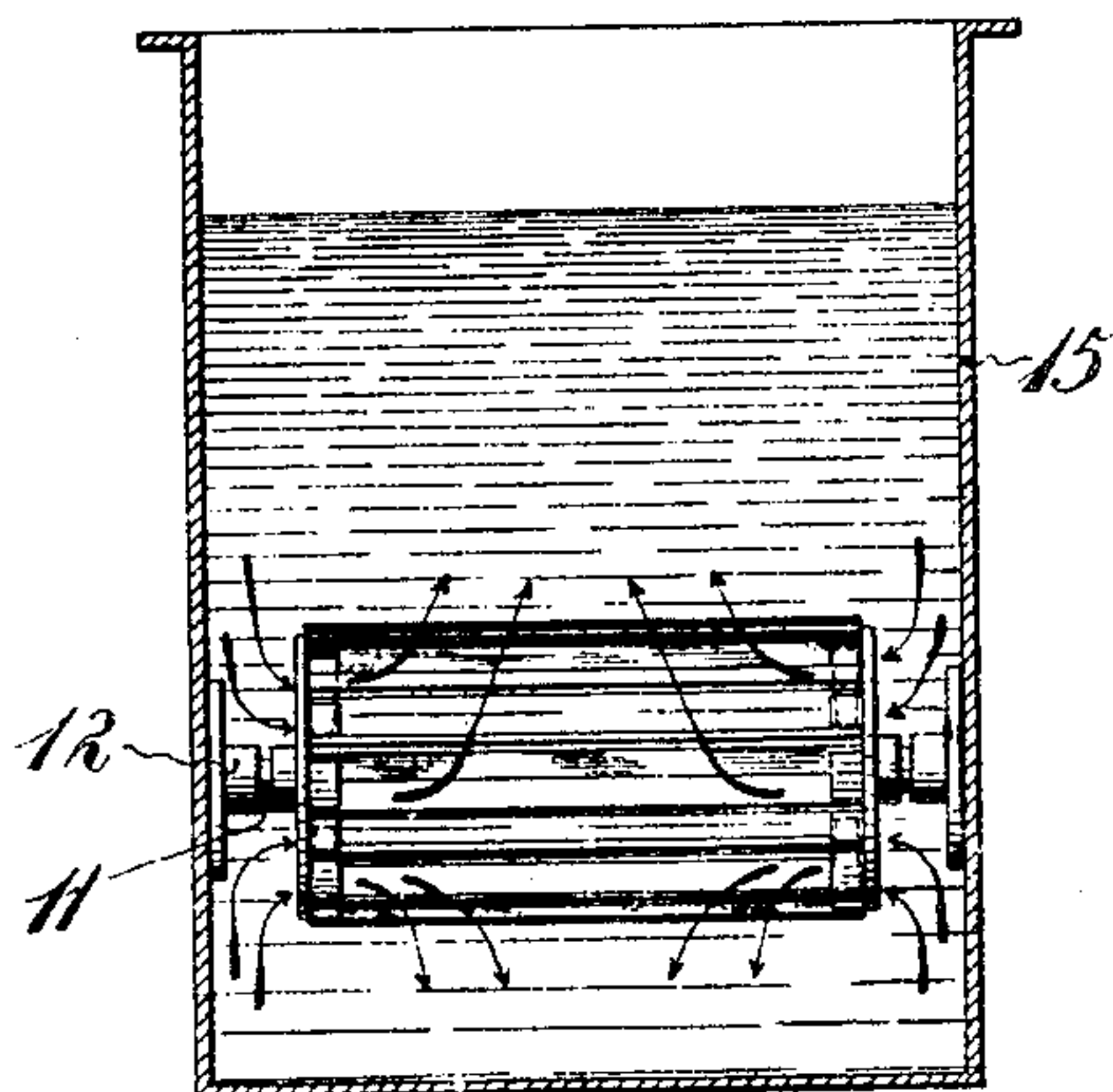


Fig. 4.



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UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

FLUID-CIRCULATING ROLL

No. 897,133.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed June 26, 1907. Serial No. 380,874.

To all whom it may concern:

Be it known that I, ISAAC E. PALMER, a citizen of the United States, and resident of Middletown, in the county of Middlesex and State of Connecticut, have invented a new and useful Fluid-Circulating Roll, of which the following is a specification.

My invention relates to a fluid circulating roll and more particularly to a roll intended for immersion in a liquid for circulating the liquid in contact with the interior of a rope, chain or strip of material carried by the periphery of the roll.

It is well adapted to use in dyeing and washing machines and wherever it becomes desirable to keep up a circulation of the liquid on the inner as well as the outer face of the material passing around the roll.

In the accompanying drawings, Figure 1 is a view of the roll in side elevation, Fig. 2 is a transverse section in the plane of the line A—A of Fig. 1, Fig. 3 is a partial longitudinal section, the section passing centrally through the end and part of the body of the roll. Fig. 4 is a view showing how the roll is arranged in use, the roll being shown in transverse section in the tank, and Fig. 5 is a view showing the roll in side elevation in the tank.

As herein illustrated, the roll comprises end hubs 1 and 2 provided with spokes 3 radiating therefrom and connected with rims 4 on which are applied retaining plates 5 for the reception of the ends of the circulating blades 6, 7. The blades 6, 7, are arranged in pairs as clearly shown in Figs. 1 and 2, the blade 6 extending inwardly a greater distance from the periphery of the roll than the blade 7 and the inner ends of the two blades being inclined toward each other as they extend inwardly. The blades 6 and 7 extend longitudinally of the roll and are spaced from each other leaving a passageway 8 for the liquid to pass between them and the succeeding pairs of blades are also spaced from one another leaving passageways 9 for the entrance of the liquid from the exterior of the roll to the space within its periphery. The spokes 3 which connect the hub with the periphery are flat and inclined in a lateral direction after the manner of the blades of a screw propeller for the purpose of inducing a current of liquid from without through the end of the roll to the space within its periphery. The spokes at one end are inclined in an opposite

direction from the spokes at the opposite end, thereby tending to force the liquid in at the opposite ends while the several pairs of blades 6 and 7 tend to direct a current outwardly through the periphery. The inner end of the blade 7 of each pair of blades 6, 7, tends to scoop the liquid within the periphery of the roll as the roll advances from right to left in the direction shown by the arrow, Fig. 2, thereby inducing a current of liquid outwardly through the space between the blades 6 and 7 and hence into contact with the inner surface of the rope, chain or strip of material which may be carried on the periphery of the roll. The position of two such chains is indicated in dotted lines in Fig. 1. The blades 6 and 7 may be steadied in their positions by spacing pieces 10 intermediate of their lengths.

The construction is such that the liquid will readily flow in through the spaces 9 and will pass the blade 7 and be interrupted by the inner end of the blade 6 and be caused to pass outwardly between the blades thereby being forced into intimate contact with the inner face of the goods and passing around the chain or rope of fabric will again be drawn inwardly and so will alternately pass outwardly and inwardly through the periphery of the roll as the latter is rotated within the liquid in which it is immersed.

The roll may be mounted in any well known or approved manner, the means of mounting which I at present prefer being stub axles 11 carried by a supporting frame 12 and entering within the hubs 1 and 2 of the roll.

The roll is simple in its structure and very effective for the purposes for which it is intended.

The rope or chain of fabric will rest on the outer edges of the several blades thereby leaving the greater portion of its interior surface exposed to the liquid and thus materially expediting the scouring or washing of the fabric when it is used for washing purposes and insuring a very homogeneous shade of color when the roll is used for dyeing purposes.

The position of the roll when in use is illustrated in Figs. 4 and 5, the chain or rope of fabric 13 passing as indicated by the arrow over a guide roll 14, thence down into the liquid in the tank 15 and around the roll therein, and thence up and between squeezing rolls 16, 17, and thence over guide rolls 18, 19, and

down to a suitable support for receiving it. Certain of the rolls, as, for instance, the rolls 16, to 19, inclusive, may be positively driven in any well known or approved manner, the roll mounted within the liquid in the tank and which forms the subject of my present invention being rotated by the rope or chain of fabric which passes around it.

What I claim is:—

10 1. A roll for circulating liquid in which it is immersed, said roll comprising longitudinal blades arranged along its periphery, one blade being inclined toward and extended inwardly within the roll to a greater extent
15 than a neighboring blade for the purpose of inducing a current of liquid between the blades when the roll is rotated.

2. A liquid circulating roll adapted to be immersed in the liquid and comprising blades
20 arranged longitudinally and extending inwardly along its periphery in pairs, the said members of a pair being of different depths and inclined toward one another for inducing a current of liquid between them as the roll is
25 rotated.

3. A liquid circulating roll adapted to be immersed in the liquid and comprising blades

extending longitudinally along its periphery and inwardly therefrom and forming a support for the material to be carried by the roll, 30 the said blades being of different depths and inclined toward each other for inducing a current of liquid between the blades as the roll is rotated.

4. A liquid circulating roll adapted to be 35 immersed in the liquid and comprising a skeleton periphery formed of longitudinal blades arranged in pairs, the members of a pair being of different depths, rims for supporting the blades and hubs connected by 40 spokes with the rims, the said spokes being set laterally at an angle to form in effect a screw propeller for inducing a current of liquid through the end into the interior of the roll. 45

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 24th day of June 1907.

ISAAC E. PALMER.

Witnesses:

CHAS. M. SAUER,
PAUL S. CARRIER.