

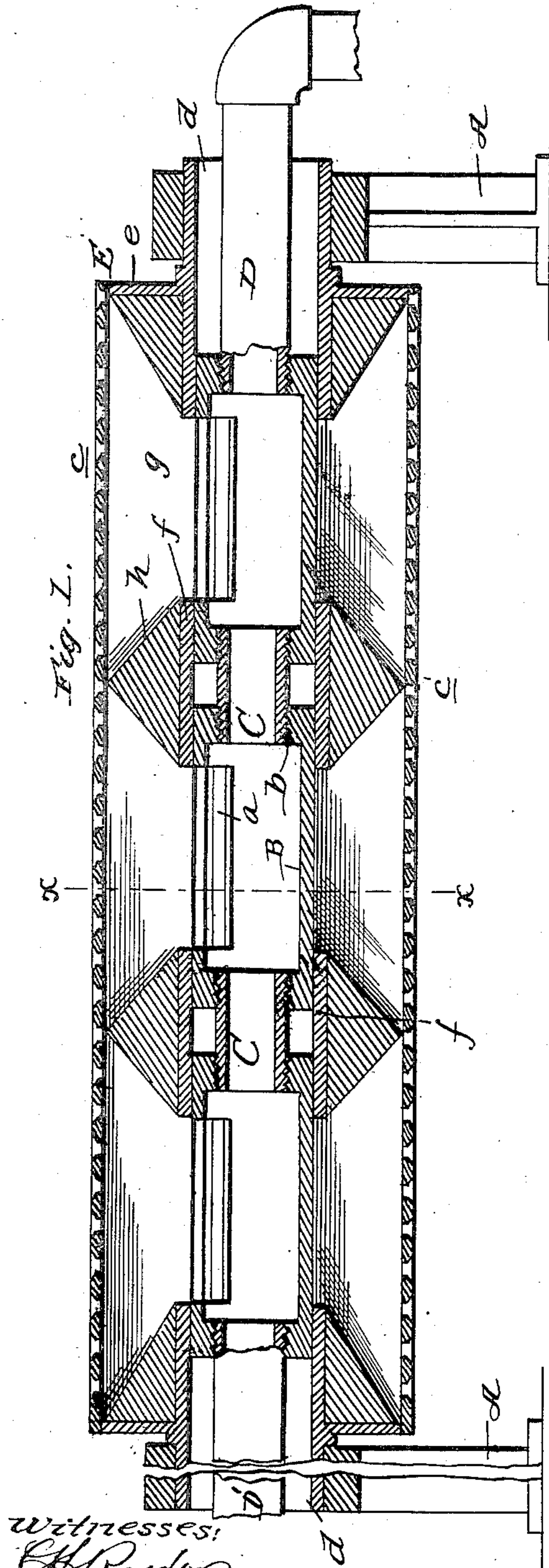
(No Model.)

M. D. KEENEY.

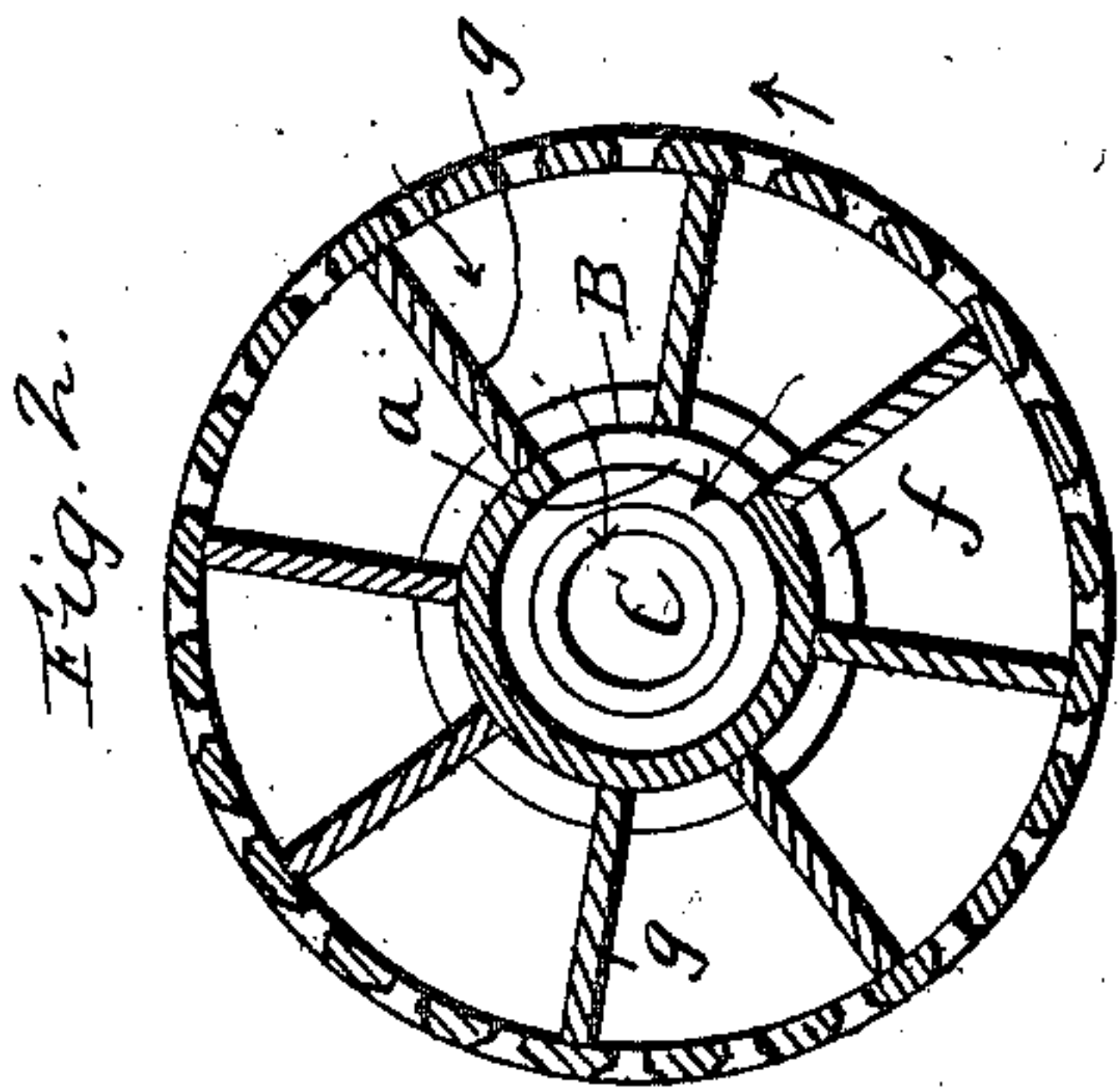
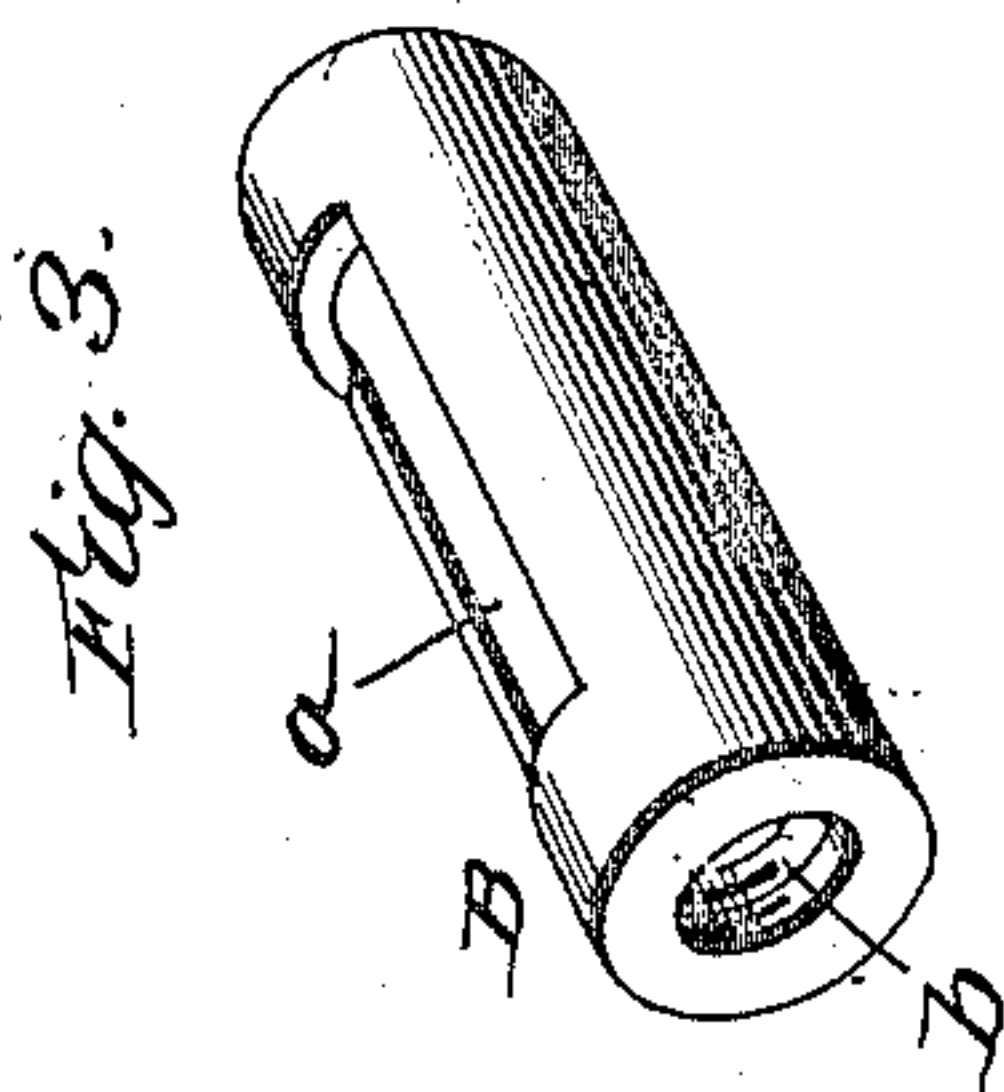
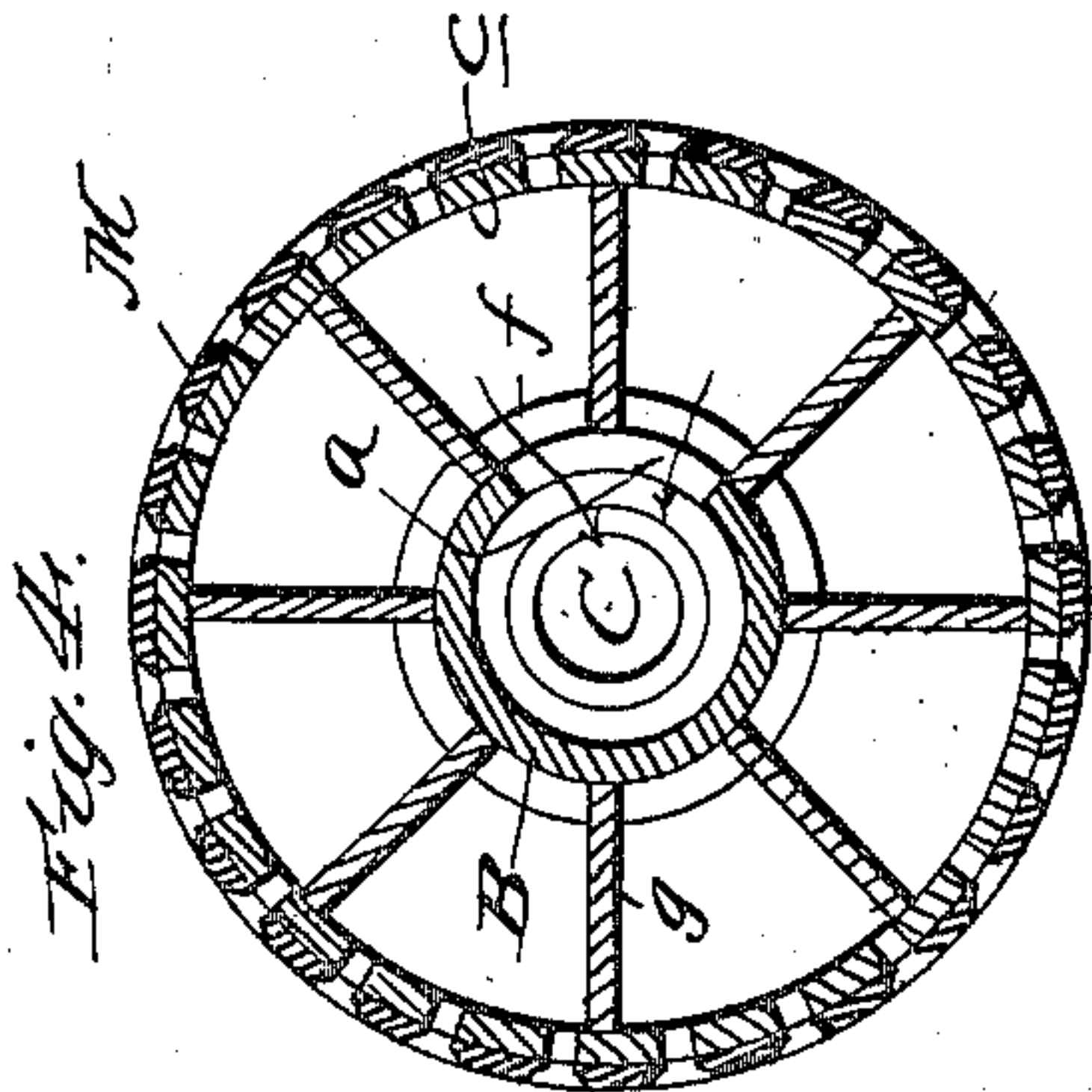
SUCTION BOX FOR PAPER MAKING MACHINES.

No. 581,731.

Patented May 4, 1897.



Witnesses:
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UNITED STATES PATENT OFFICE.

MARBLE D. KEENEY, OF ANTIOCH, CALIFORNIA.

SUCTION-BOX FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 581,731, dated May 4, 1897.

Application filed September 30, 1895. Serial No. 564,202. (No model.)

To all whom it may concern:

Be it known that I, MARBLE D. KEENEY, a citizen of the United States, residing at Antioch, in the county of Contra Costa and State of California, have invented certain new and useful Improvements in Suction-Boxes for Paper-Making Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in revoluble suction-boxes for paper-making machines; and it consists in the peculiar construction, novel combination, and adaptation of parts hereinafter described, and particularly pointed out in the claims appended.

In the accompanying drawings, Figure 1 is a vertical sectional view of my improved suction-box. Fig. 2 is a transverse section taken in the plane indicated by the line $x x$ of Fig. 1. Fig. 3 is a detail perspective view of one of the stationary valves removed, and Fig. 4 is a transverse section of a combined suction-box and coucher embodying my invention.

Referring by letter to said drawings and more particularly to Figs. 1 to 3 thereof, A indicates suitable bearings which may form part of the main frame of a paper-making machine.

B indicates the stationary valves of my improved suction-box, which are preferably of a circular form in cross-section and are provided with an opening a of about the proportional size illustrated and with the inwardly-extending interiorly-threaded flange b at their ends.

C indicates the short sections of pipe, which are exteriorly threaded to engage the threaded flanges b of the valves B and are designed and adapted to connect said valves.

D indicates a pipe which is connected to the outer end of one end valve and is designed to be connected to a suitable suction-pump. (Not illustrated.)

D' indicates a pipe which is connected to the other end valve and may also be connected with the same suction-pump as the pipe D, or with another pump, and which when it is desired to draw water from one end of the suction-box only may be replaced by a plug or the like, and E indicates the revoluble por-

tion of the suction-box. This revoluble portion E may be of any suitable construction that falls within the scope of my invention, but I prefer for the sake of cheapness to construct it as shown in Figs. 1 and 2. As thus constructed, the said revoluble portion E comprises the outer perforated shell c , which is preferably of a circular form in cross-section and is foraminated to admit the water from the felt and pulp into the suction-box; the trunnions d , which are journaled in the bearings A and receive the outer ends of the end valves B and have flanges e , fixedly connected to the shell c ; the tubular portions f , which are arranged and adapted to turn upon the contiguous ends of the stationary valves B; the radially-disposed and longitudinally-extending partitions g , which are fixedly connected with and interposed between the trunnions d and tubular portions f and the outer shell c and are designed to serve a purpose presently described, and the inclined walls h , arranged between the partitions g and connected to the trunnions d , the tubular portions f , and the outer shell c , and pitched toward the openings in the valves B, so as to lead the water which enters the shells c into the openings of said valves, as will be presently described. By reason of the shell c , trunnions d , tubular portions f , partitions g , and inclined walls h being connected together as described or in any other suitable manner, or formed integral, it will be seen that when the revoluble portion is turned by the felt taking around the same all of the mentioned parts will turn as one piece about the stationary valves and the pipes connected to the same.

In the practice of my invention the suction-box is arranged above the pulp-tank of the paper-making machine in advance of the forming-cylinder and the felt usually employed is passed over the suction-box in the ordinary manner, so that when the machine is in operation the traveling felt, contacting with the shell c , will revolve the revoluble portion E of the suction-box at a speed equal to that of the travel of the felt. The openings a in the valves B are preferably disposed as shown in Fig. 2 with respect to the direction in which the box E revolves, and in consequence of this it will be seen that the felt and the pulp thereon will be subjected to suc-

tion as soon as it reaches a point opposite the opening in the valve and the suction will cease before the felt reaches the point at which it leaves the suction-box. By virtue of this the suction employed may be exceedingly strong, so as to quickly suck all the water from the felt and pulp and permit of the felt being moved at a high rate of speed, which is highly desirable, as it materially expedites the process of paper-making. While the suction employed is, as just stated, very strong, it does not tear, weaken, or otherwise damage the felt, as is the case when stationary suction-boxes having a strong suction are employed, because the felt is not subjected to suction as it leaves the suction-box. As the felt is only subjected to suction while it is on the suction-box and before it starts to leave said box, it will be observed that such suction does not tend to retard the rotation of the suction-box or the travel of the felt, as is the case in some rotary suction-boxes where great power is necessary to drive the felt.

The radial partitions *g* of my improved suction-box serve when the box is in operation to prevent the water which is drawn from the felt and pulp from falling, and they also serve to expedite the passage of the water into the openings *a* of the valves *B*, as do also the inclined walls *h*.

In addition to the foregoing it will be observed that my improved rotary suction-box is very simple and that it is durable and embodies no parts which are likely to get out of order.

It will be readily observed from the foregoing that instead of employing a plurality of valve-sections *B*, connected by pipes *C*, a single section *B*, having openings *a* at intermediate points of its length and means at its ends for the connection of the pipes *D* *D'*, may be employed. It will also be observed that the construction of my improved suction-box admits of its being employed as a combined coucher and suction-box, as shown in Fig. 4, it being simply necessary when it is desired to make the device serve the twofold function to cover the shell *c* with perforated rubber or a suitable porous fabric *M*, as shown.

In addition to facilitating the passage of water to the valve-openings *a*, so as to permit of the box being rotated at a high rate of speed without the water drawn from the web being carried past the valve-openings *a*, the inclined walls *h* permit of the said openings *a* being made small, and yet enable them to communicate with a large area of the foraminated shell *c* and receive water from a large portion of the paper web. It is desirable to have the openings *a* comparatively small, inasmuch as the box may then be easily built

in such a manner as to render the connection between the revoluble portion *E* and the stationary valves *B* air-tight, and thereby prevent the air which is drawn into the valves *B* from taking any other course before it enters the openings of said valves except through the web of paper, the foraminated shell, and the space between the walls *g* and *h*.

The peculiar construction and manner described of connecting the valves *B* is highly desirable, inasmuch as it permits of the said valves being readily connected together and to the suction pipe or pipes, and also permits of a valve being readily removed and replaced by a new one when worn or broken.

Having described my invention, what I claim is—

1. In a suction-box for paper-making machines, the combination of a stationary valve having a series of openings *a*, at intervals in its length and adapted to be connected with a suction device, and the revoluble portion surrounding and adapted to revolve around the stationary valve and comprising a foraminated shell, the longitudinally-extending partitions between the valve and the foraminated shell, and the walls *h*, arranged between the longitudinal partitions and pitched or inclined in the direction of the length of the cylinder and toward the openings in the valve so as to facilitate the passage of water thereto, substantially as and for the purpose set forth.

2. In a suction-box for paper-making machines, the combination of the stationary valves *B*, provided with the openings *a*, and having the inwardly-extending, interiorly-threaded flanges *b*, at their ends, threaded pipe-sections connecting the valves *B*, a pipe-section connected to one end valve and adapted to be connected with a suction device, and the revoluble portion comprising the outer perforated shell *c*, the trunnions *d*, having flanges *e*, fixedly connected to the shell *c*, the tubular portions *f*, arranged and adapted to turn upon the contiguous ends of the valve-sections *B*, the radially-disposed and longitudinally-extending partitions *g*, connected with and interposed between the trunnions *d*, and tubular portions *f*, and the outer shell *c*, and the walls *h*, arranged between the partitions *g*, and pitched or inclined in the direction of the length of the cylinder and toward the openings in the valves *B*, all substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

MARBLE D. KEENEY.

Witnesses:

R. H. WOOLLEY,
C. E. WAGENER.