

(No Model.)

J. B. CARTER & J. H. BERST.
FIBER DISINTEGRATING MACHINE.

No. 487,913.

Patented Dec. 13, 1892.

Fig. 1.

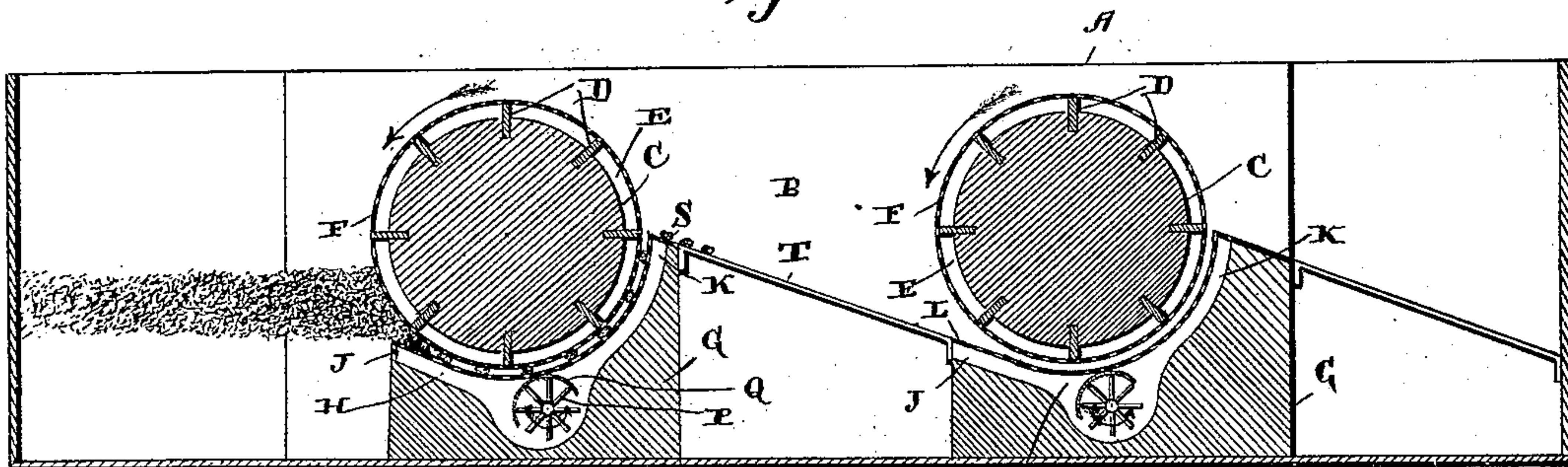


Fig. 2.

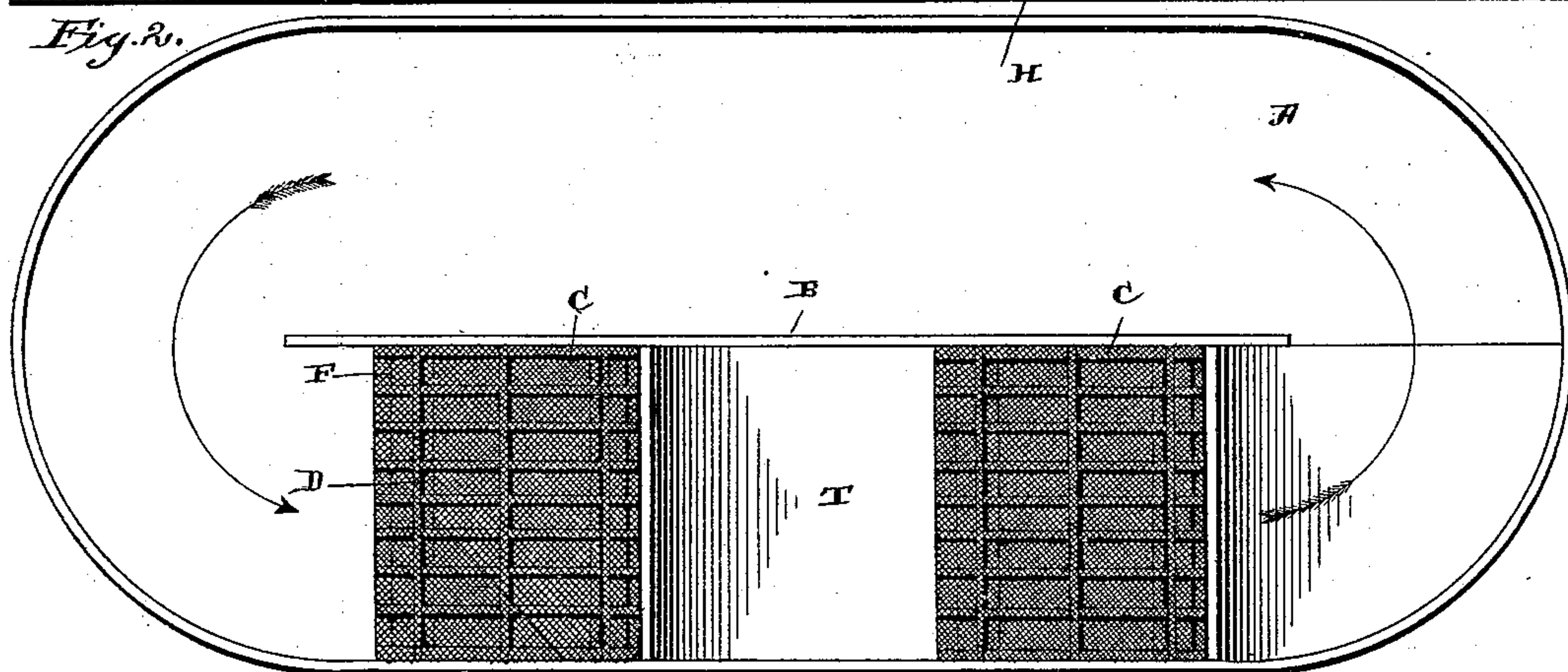


Fig. 3.

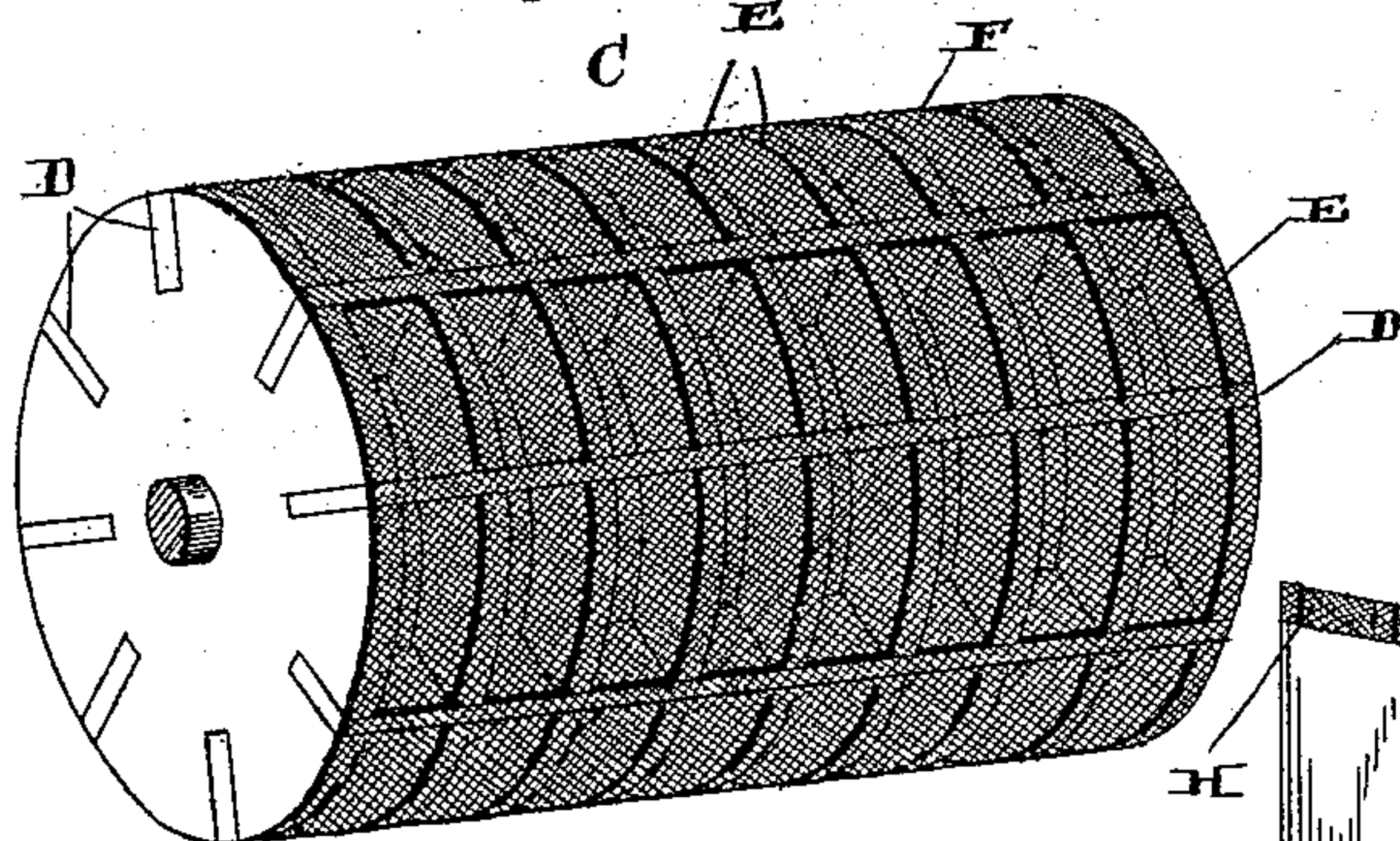
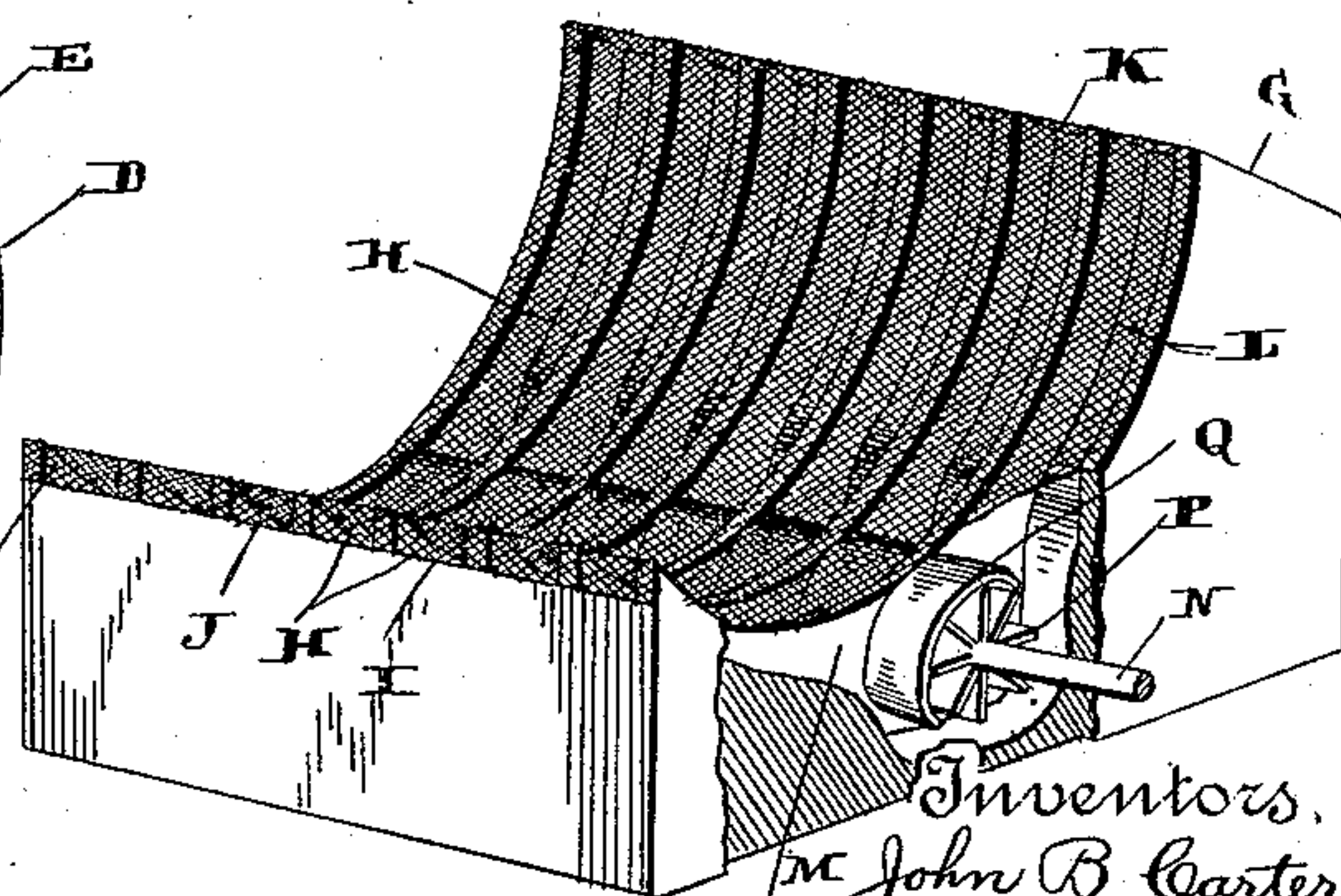


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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FIBER-DISINTEGRATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 487,913, dated December 13, 1892.

Application filed March 22, 1892. Serial No. 425,989. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. CARTER and JESSE H. BERST, of Kokomo, in the county of Howard and State of Indiana, have invented certain new and useful Improvements in Fiber-Disintegrating Machines; and we do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to improvements in fiber-disintegrating machines; and it consists in the novel features of construction and in the arrangement and combination of parts which will be fully described hereinafter, and particularly referred to in the claims.

The object of our invention is to produce a machine for disintegrating and separating the primitive fibers of fibrous substances by collecting and forming the partially-reduced stock or fiber into rolls and then rolling the rolls thus formed upon their own axis, while at the same time the rolls are being subjected to a washing action which tends to break up the rolls and to give to the fibers the necessary felting quality before they can be converted into paper.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of an apparatus which embodies our invention. Fig. 2 is a plan view of the same. Fig. 3 is a detached perspective view of the roll. Fig. 4 is a detached perspective view of the bed-plate or curved rolling-surface, the same being shown broken away in places and also partly in section.

The material to be reduced to primitive fiber is first reduced partially by cutting into shavings or excelsior, which are then placed in the reservoir with the rolling apparatus. While we prefer to partially reduce the fibrous substance by cutting, as just stated into shavings or excelsior, we do not limit ourselves to this method, nor is it the only method which can be employed.

A indicates a tank of suitable size and depth, which is preferably provided with a longitudinal mid-feather B that is shorter than the reservoir to form a space at each end, as shown.

The water and partially-reduced stock placed in the reservoir are caused to circulate around the reservoir, as indicated by arrow, by the mechanism to be now described. Journaled within this reservoir at one side of the said mid-feather B are two or more rollers C, which are constructed as illustrated in Fig. 3—that is, with longitudinal ribs D, annular ribs E, and a wire netting or screen F, which is stretched around and over the said ribs, thus forming water-ways under the said wire netting or screen. The longitudinal ribs D act as paddles or a pump for forcing water in the manner, and for the purpose to be presently described.

Placed in the reservoir is a bed-plate or rolling-surface G for each roll C, and these rolling-surfaces or bed-plates are provided with transverse ribs H, thus forming between these ribs H the water-ways I, which extend entirely across the said bed-plates from their inlet sides J to their outlet sides K. Placed over these ribs H is a wire netting or screen L, which is fitted close to and conforms to the shape of the ribs, which is circular, as seen, and thus forms a curved or circular rolling surface, which coacts with the periphery of the roll C. By reference to Figs. 1 and 4 it will be seen that the screen L extends down and over the inlet ends of the water-ways in the rolling surfaces to prevent the stock passing therein. The water-ways I, which extend across the said bed-plates from side to side, have a chamber or deepened portion M, which extends entirely the whole length of the bed-plate, and journaled in this chamber or deepened portion is a shaft N, which carries the paddles or fans P, which act as pumps, and these fans fit the several water-ways, as shown in Fig. 4. A semicircular plate Q is placed around the inlet side of the centrifugal pump formed by the shaft N and wings or fans P to prevent any reaction of the water or stock, thus keeping by means of this centrifugal pump a continuous suction through the inlet side of the bed-plate and roller and a continuous forcing of the water from the exit side of the pump to the exit side of the bed-plate and roll, as will be understood. The water is also kept moving in the same direction in the water-ways by means of the longitudinal ribs

upon the roll C, which act as paddles, or a centrifugal pump, which creates a current in the reservoir, as indicated by arrow.

The operation of our apparatus is as follows: The partially-reduced stuff or stock being placed in the reservoir A and the rolls C started to revolve in the direction indicated by arrow, the water is caused to flow through the water-ways in the bed-plate from the inlet end J to the outlet end or side K. This flow of water causes the stock to be drawn or settled down constantly upon the curved screen-surface of the bed-plate and to collect and accumulate until sufficient is collected to be caught and formed into a roll by the roll C, as indicated at S, and when formed into a roll the roll thus formed is rolled upon its own axis until it passes out at the exit side K, when it is washed down the incline T to the next roll, which catches the roll or bunch and again rolls it upon its axis. The collection and accumulation of the stock at the inlet side of the roll and bed-plate is increased by the water also passing into the water-ways of the roll, which causes the stock to collect against the moving periphery of the roll by suction, as will be readily understood. While the bunches or rolls are passing between the roll and the curved bed-plate and being rolled upon their own axis for the purpose set forth, the bunches are at the same time subjected to a washing action by reason of the water being forced through the curved screen-surface by the centrifugal pump placed in the water-ways of the bed-plate and also through the screen of the roll by the longitudinal ribs. The water being thus forced around into and on the bunches or rolls has a tendency to tear or wash them apart. As the water is forced down from the roll through the screen placed around it and up through the curved screen-surface, it will be seen that the two currents of water meet at the exit side of the roll and bed-plate, which increases the tendency to separate and tear apart the fibers of the bunches, which action performs, in addition to the separating function, the function of giving to the fibers the desired felting quality. After the bunches have been acted upon by the rolls C they pass around the mid-feather B with the current of water, and, if desired, the bunches are broken up upon the opposite side of partition by any suitable means and the stock is again passed to the rolls to be collected, formed into rolls or bunches, and rolled upon their axis, and this operation is repeated until the fiber is reduced and has been given the felting quality necessary before it can be converted into paper.

While we here show and describe two rolls C, it will be understood that we can use one roll or as many more than two that we may desire without departing from or effecting in any manner our invention. So, also, we do not limit ourselves to the specific construction of the roll, for the roll may be made

smooth—that is, without the water-ways—and still catch and roll the stock which is collected upon the curved screen-surface, in the manner before described. If the rolls are left smooth, we still prefer to cover them with wire nettings or screens to give them the desired or requisite roughness to catch and roll the bunches. It will be noticed that the pump in the bed-plate water-ways is placed at the exit side of the center of the roll for the purpose of preventing the counter-resistance of the water from interfering with a free entrance of the water through the inlet and to the fan-pump.

By means of an apparatus of the above-described construction we are enabled to reduce fibrous substances to their primitive fiber without breaking, grinding, or crushing the fibers in any manner whatever by means of rolling the stock upon its axis, and at the same time to tear and separate the primitive fibers by means of a washing action, which latter, also, together with the rolling, gives to the reduced stock a felting quality.

We do not make any claim to the process herein specified of rolling the stock upon its own axis, nor, broadly, to an apparatus comprising the curved surface and roll having perforated rolling surfaces, for this is the subject-matter of our pending application, Serial No. 420,856.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A disintegrating-machine comprising a roller and a curved bed-plate having transverse water-ways, and a perforated rolling-surface over the water-ways, substantially as specified.

2. A disintegrating-machine comprising a roller, a bed-plate having a water way or ways, a wire screen placed over the water-ways, and a pump for forcing water in the water-ways from the inlet to the exit end of the water-way, substantially as described.

3. A disintegrating-machine comprising a roller, a bed-plate having a series of transverse water-ways, a screen placed over the water-ways and coacting with the roller, and a centrifugal pump placed in each water-way below the said screen, substantially as set forth.

4. A disintegrating-machine comprising a bed-plate having water-ways extending transversely thereof, a roller, a screen placed over the said water-ways, a centrifugal pump placed in the said water-ways, and a shield placed around the inlet side of the said pump, substantially as specified.

5. A disintegrating-machine comprising a bed-plate having water-ways extending transversely thereof, a chamber depending from the said ways and extending longitudinal the said bed-plate, a shaft journaled longitudinally in the said chamber, and fans upon the said shaft in the said water-ways, a screen

placed over the water-ways, and a roller co-
acting with the said screen, substantially as
described.

5 6. In a disintegrating-machine, a bed-plate
having transverse water-ways and a pump for
forcing water from the inlet to the exit side
of the said bed-plate, combined with a roller
having water-ways, longitudinal ribs for car-
rying the water, and a screen placed over the
10 water-ways and ribs, substantially as set forth.

7. In a disintegrating-machine, a curved
bed-plate having transverse water-ways and a

screen placed over the said water-ways, com-
bined with a roller having water-ways, and a
screen placed over the said water-ways for co- 15
acting with the curved bed-plate screen, sub-
stantially as specified.

In testimony whereof we affix our signatures
in presence of two witnesses.

JOHN B. CARTER.
JESSE H. BERST.

Witnesses:

V. D. ELLIS,
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