

No. 698,304.

Patented Apr. 22, 1902.

P. MICKLE.  
FIBER CROSSER.

(Application filed Sept. 28, 1901.)

(No Model.)

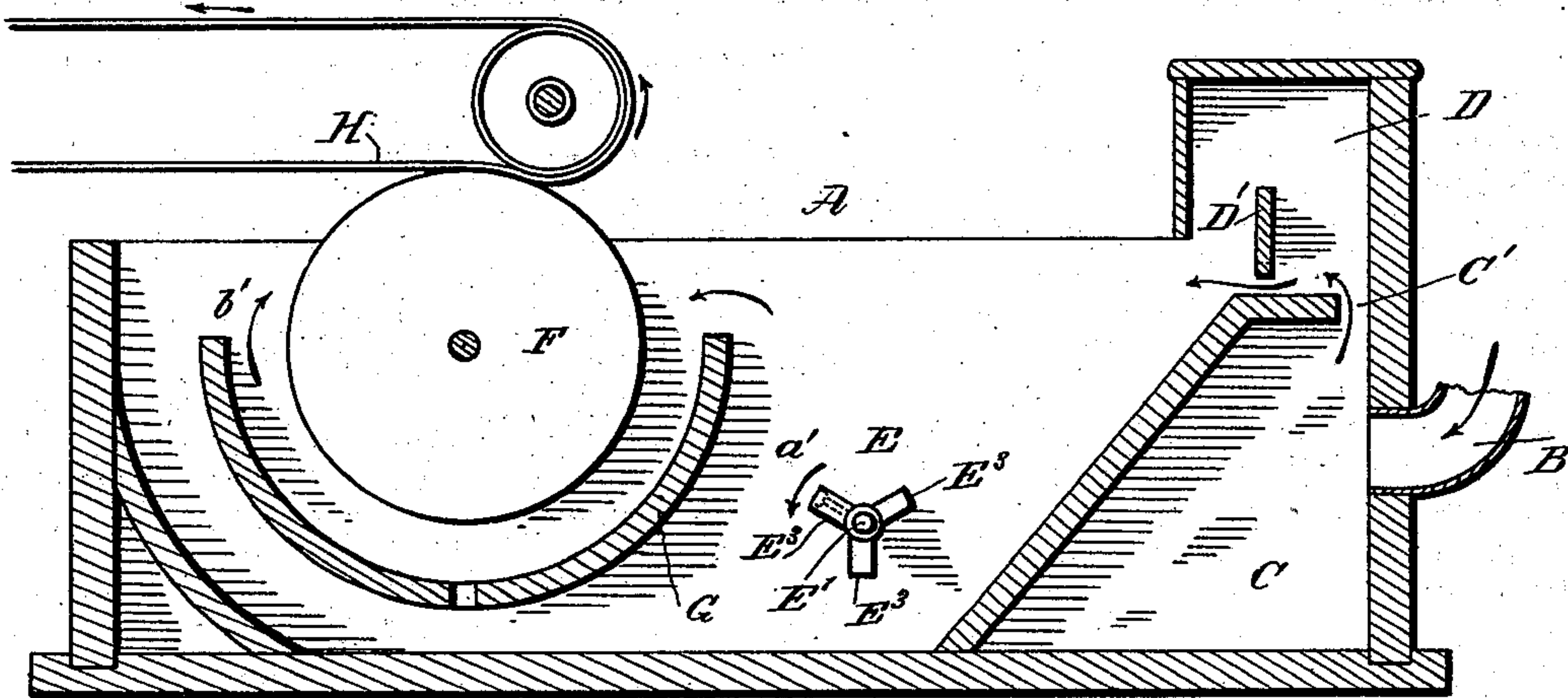


Fig. 1.

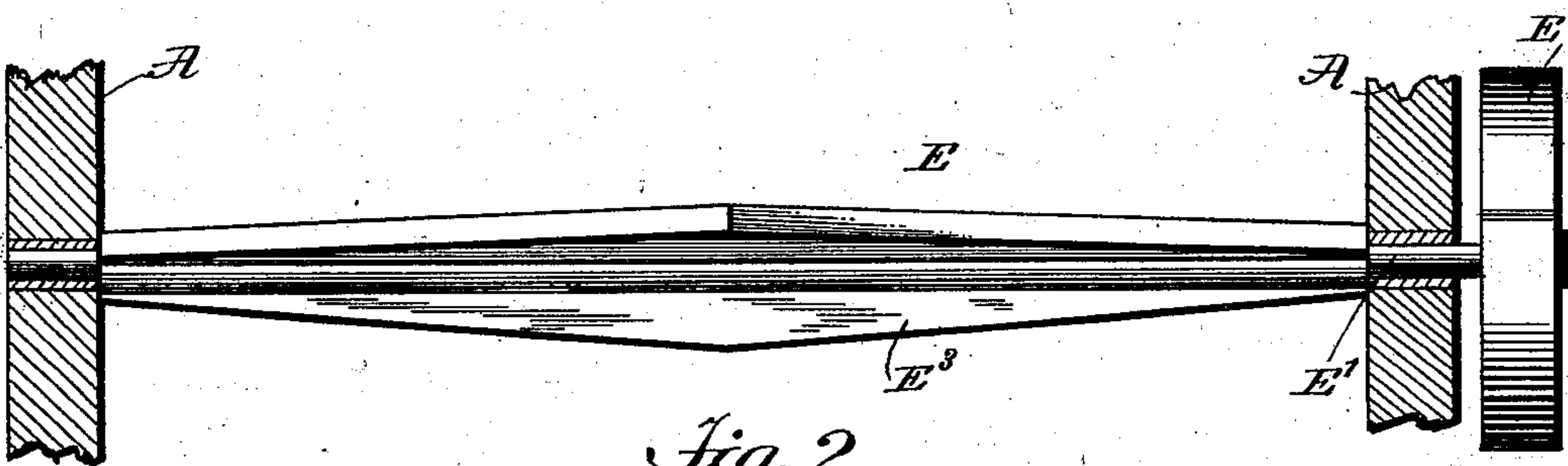


Fig. 2.

WITNESSES:

*A. Appleman Jr.*  
*Rev. J. H. Hester*

INVENTOR

*Philip Mickle*

BY

*Munroe*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

PHILIP MICKLE, OF TROY, NEW YORK.

## FIBER-CROSSER.

SPECIFICATION forming part of Letters Patent No. 698,304, dated April 22, 1902.

Application filed September 26, 1901. Serial No. 76,656. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP MICKLE, a citizen of the United States, and a resident of Troy, in the county of Rensselaer and State of New York, have invented a new and Improved Fiber-Crosser, of which the following is a full, clear, and exact description.

The invention relates to machines for making paper from all kinds of fiber, especially rope and wood; and its object is to provide a new and improved fiber-crosser for use in the cylinder-vat and arranged to insure a perfect crossing of the fibers in the pulp to cross the fibers in all directions, and thereby insure the formation of a very strong and durable paper.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the views.

Figure 1 is a sectional side elevation of the improvement; and Fig. 2 is an enlarged cross-section of the vat, showing the fiber-crossing wheel in elevation.

In order to produce a very strong and durable paper, it is essential that the pulp fibers be crossed and interlocked with each other as much as possible. With the device presently to be described in detail the stock is thoroughly agitated in such a manner that the fibers are crossed immediately previous to passing onto the cylinder and to the vat, so as to hold the fiber in the crossed and interlocked position during the formation of the stock into paper.

A vat A of usual construction is provided at one end with an inlet-pipe B for discharging the stock into the receiving-chamber C, arranged in the vat and having at its top an outlet C', leading to the feed-chamber D, containing the cross-bar D', having its lower end scalloped for gaging the stock passing from the chamber D into the vat A proper. The stock thus passing into the vat comes in contact with the wheel E, mounted to rotate in the direction of the arrow  $a'$  in front of the cylinder F, spaced from the apron G, ex-

tending transversely in the vat A, so that the stock passing onto the cylinder F is finally delivered in a thin sheet to the web H. The wheel E has its shaft E' journaled in suitable bearings in the sides of the vat A, and on the outer end of the said shaft is secured a pulley E<sup>2</sup>, driven by suitable means so as to rotate the wheel E in the direction of the arrow  $a'$  and at a speed considerably exceeding that of the cylinder F, which rotates in the direction of the arrow  $b'$ . The wheel E is provided with radial wings E<sup>3</sup>, preferably three in number and diminishing in height from the middle of the wings to the ends thereof, as plainly indicated in Fig. 2, so that when the wheel E rotates the wings E<sup>3</sup> agitate the stock to throw the same from the middle of the vat toward the end thereof, whereby the fibers are caused to cross each other and interlock previous to passing to the cylinder F. It is understood that when the pulp passes under the peripheral surface of the cylinder F and the fibers are well crossed and interlocked they remain in this position during the rest of the process in paper-making—that is, while on the web H and while passing through the various rolls. Thus by the arrangement described the fibers are thoroughly crossed and interlocked to insure the formation of very durable and strong paper.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A paper-making machine, having a wheel mounted to turn in the cylinder-vat and arranged to cross the fibers in the pulp previous to the latter passing to the cylinder; the said wheel having wings gradually decreasing in height from the middle of the wings to the ends thereof, as set forth.

2. In a paper-making machine, the combination of a vat having a feed-inlet, a cylinder, and a fiber-crossing wheel revolvably mounted in said vat between the cylinder and the feed-inlet, said wheel provided with longitudinally-tapering blades which are arranged to throw pulp fibers in crossing paths within the vat.

3. A paper-making machine, provided with a cylinder-vat and a wheel extending transversely in the vat and mounted to rotate at a higher rate of speed than the cylinder, the

wheel being located between the cylinder and the inlet, and the wheel having radial wings diminishing in height from the middle of the wings toward the ends thereof, as set forth.

- 5 4. In a paper-making machine, the combination with a vat, and a cylinder, of a fiber-crossing wheel mounted within said vat and revoluble in an opposite direction to, and at greater peripheral speed than said cylinder,

said wheel having longitudinally-tapered blades arranged to direct pulp fibers in crossing paths in the vat.

In testimony whereof I have signed my name in the presence of two witnesses.

PHILIP MICKLE.

Witnesses:

JOHN W. FINCH,

OLIN B. SYLVESTER.