J. JORDAN & C. C. MARKLE.

Suction or Vacuum Boxes for Paper-Machines.

No. 225,141. Patented Mar. 2, 1880.

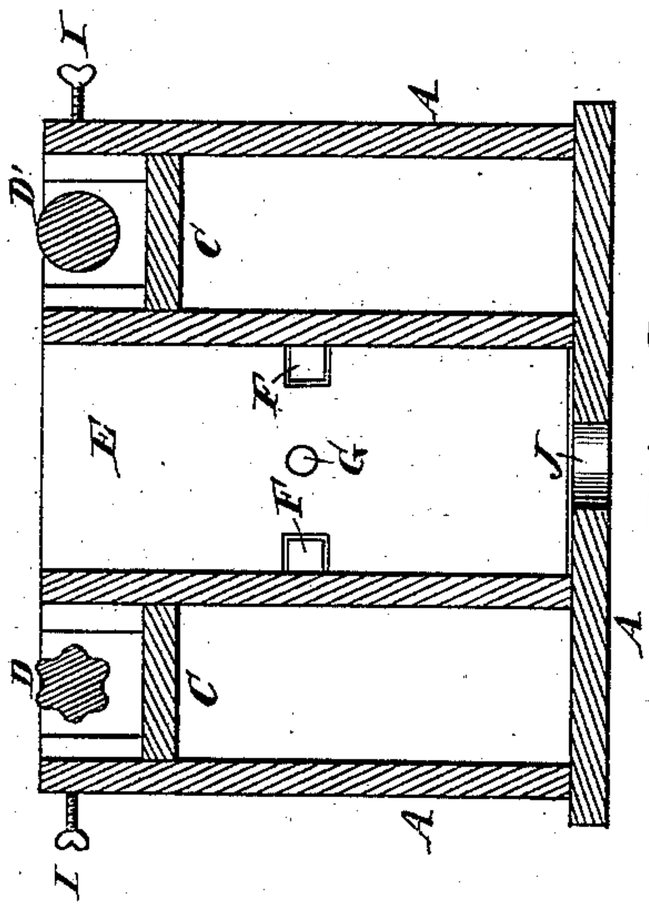

Fig. 2

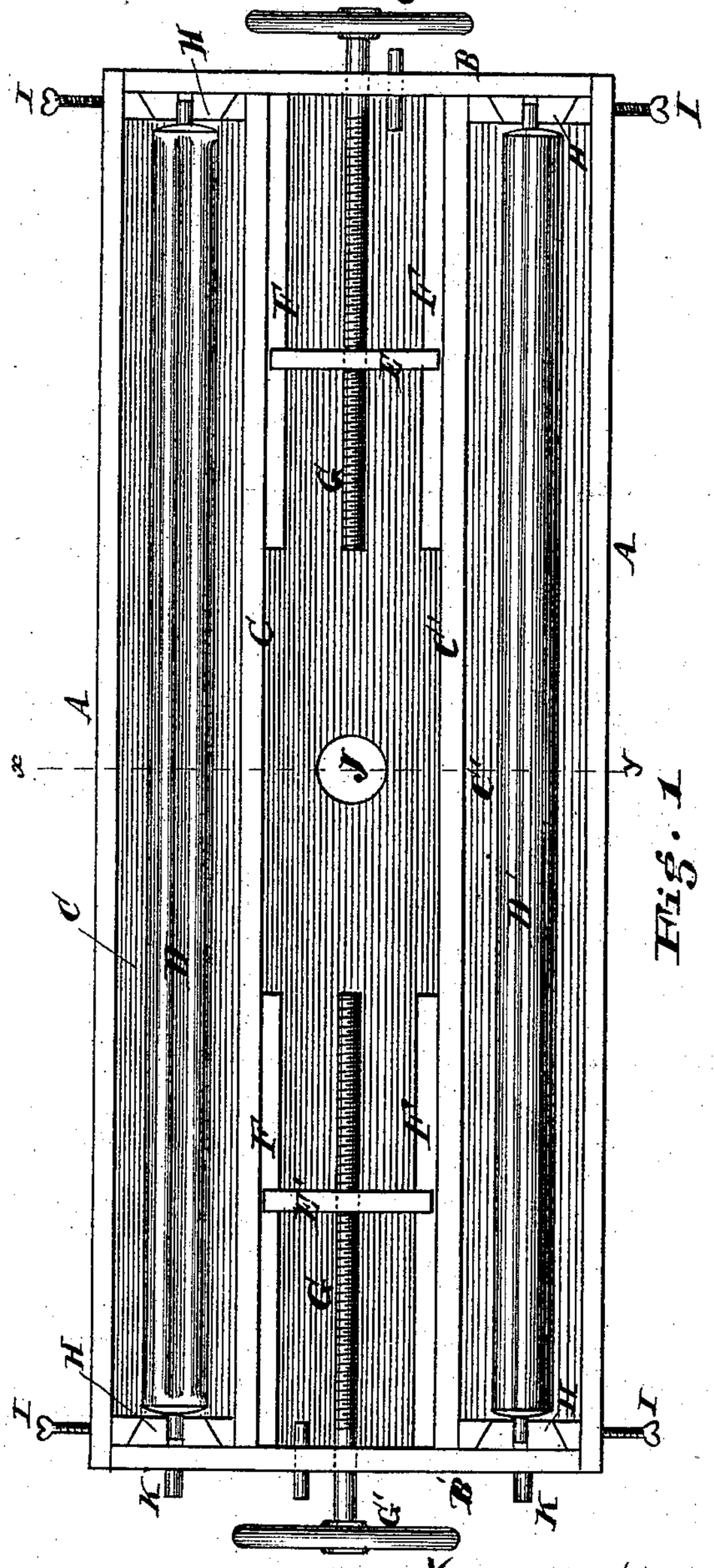

Fig. 1

Attests

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UNITED STATES PATENT OFFICE.

JOSEPH JORDAN AND CASSIUS C. MARKLE, OF PITTSBURG, PENNSYLVANIA.

SUCTION OR VACUUM BOX FOR PAPER-MACHINES.

SPECIFICATION forming part of Letters Patent No. 225,141, dated March 2, 1880.

Application filed January 10, 1880.

To all whom it may concern:

Be it known that we, CASSIUS C. MARKLE and JOSEPH JORDAN, both of Pittsburg, Pennsylvania, have invented certain new and useful Improvements in Suction or Vacuum Boxes for Paper-Machines; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making part hereof.

The nature of our invention will fully appear from the following specification and claims.

In the drawings, Figure 1 is a plan view of our device; Fig. 2, a transverse vertical section on the line X Y of Fig. 1.

A A A are the sides and bottom of the suction-box. B B′ are the two ends of the box. C C′ are the two troughs or water-tight compartments; D, a fluted roller; D′, a smooth round roller. E E′ are adjustable heads for widening and narrowing the suctional space to accommodate different widths of paper. F F F F are guide-bars to the heads E E′. G G are screw-threaded bars fitted into correspondingly screw-threaded holes in heads E E, and are turned by the wheels G′ G′ to move the heads back and forth. H H H H are journal-bearings for the ends of rolls D D′, and are adjustable by sliding up and down, and can be set at any convenient or desired elevation by means of the set-screws I I I I. These set-screws can be placed at the bottom, so as to push these bearings H up and down. J is the suction-hole. K K are pipes to keep the troughs filled with water.

The operation of our device is as follows: The operation of a suction-box is well known to those skilled in the art of paper-manufacture. The rolls D D′ are anti-friction rolls to save the Fourdrinier wire-cloth in its traverse over the suction-box. The troughs or water-tight compartments C C′ are filled with water, and the rolls D D′ are so elevated as to support the wire-cloth or vellum above the point where the greatest amount of friction exists, and under those circumstances the opening created between the frictional points and the wire-cloth is filled by a sheet or column of water thrown above its level in the troughs C C′ by the rolls D D′, and by these means the said opening is filled with water and a perfect vacuum is secured. The rolls D D′ are thus raised just high enough to carry the wire over the balance of the upper edges and parts of the box without touching. As these rolls revolve they will push up this water and throw such a quantity of it against the under side of the wire-cloth as to form a thin film or sheet of water upon the under surface of the wire-cloth, which clings to and follows the latter, and, as described above, is thick enough to form a packing or filling between said under surface and the upper edges of the frictional parts of the box, so that the wire-cloth is apparently running on a thin sheet of water over the place between the two rolls D D′. This sheet of water prevents the air from entering under the sides of the wire-cloth.

We are aware that anti-friction rolls have been used in suction-boxes before in connection with adjustable heads; but while these rolls were raised high enough to save the wire-cloth from friction, they thus raised it above the frictional parts between the rolls sufficiently to destroy the suction to a certain extent.

Our rolls D D′ run from side to side of the box, and each one is as long as or longer than the wire-cloth is wide, and, being outside of the suction-box proper, are longer than any space which can be formed between the heads E E′.

Rolls in other boxes, which were used with heads E E′, were constructed with long journals passing through the heads, so as to permit the heads to be set wide apart and close together, as desired, whereby, when the heads were set apart to a distance greater than the length of the carrying-faces of the rolls for wide paper, the correspondingly wide wire-cloth ridged down on each side over the ends of the rolls. By our arrangement of the rolls they can be made as long as is desired, because they are outside of the suction-box proper, and the heads E E′ are worked irrespective of the rolls.

We have shown two rolls, one fluted and the other plain; but we prefer to use the fluted rolls, as they raise more water by means of their flutes than can be raised by the plain rolls. The journals of the rolls are well packed to prevent the escape of the water.

We are acquainted with the device set forth in United States Letters Patent No. 209,003, of

October 15, 1878; but the object and operation of our invention are different from that. In that invention it is true that the troughs of the rollers contain water for the object therein named; but these troughs are specially constructed so as to prevent this water from passing up on the revolving rollers, and thence on to the under side of the wire-cloth, whereas one of the main objects of our invention is to do this. In that device the only water which reaches the wire-cloth is that which is sucked from the pulp which passes over it. In our device the water is thrown up from the troughs against the wire-cloth, in addition to what passes through the latter as the sucking process goes on.

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

1. In combination with the suction-box of a paper-machine, the troughs or water-tight compartments C C′ and rolls D D′, the said rolls being free from contact with said boxes along their lengths or sides, and the space within said boxes being open and free for the reception of a water-packing in which the rolls are partially immersed throughout their whole lengths, substantially as and for the purposes described.

2. In combination with the suction-box of a paper-machine, the liquid packing boxes or troughs C C′, containing a water packing, and the rollers D D′, partially immersed in said water, the said parts being so arranged with respect to each other as to permit the water to pass up on the rollers from the troughs to the traversing wire-cloth, substantially as described.

3. In combination with the suction-box of a paper-machine, the trough or water-tight compartments C C′ and fluted rolls turning in the same, substantially as described.

4. In a suction-box, a liquid packing between the wire-cloth and the frictional parts of the box, and suitable mechanism to project the same against the under side of the cloth, substantially as and for the purposes described.

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