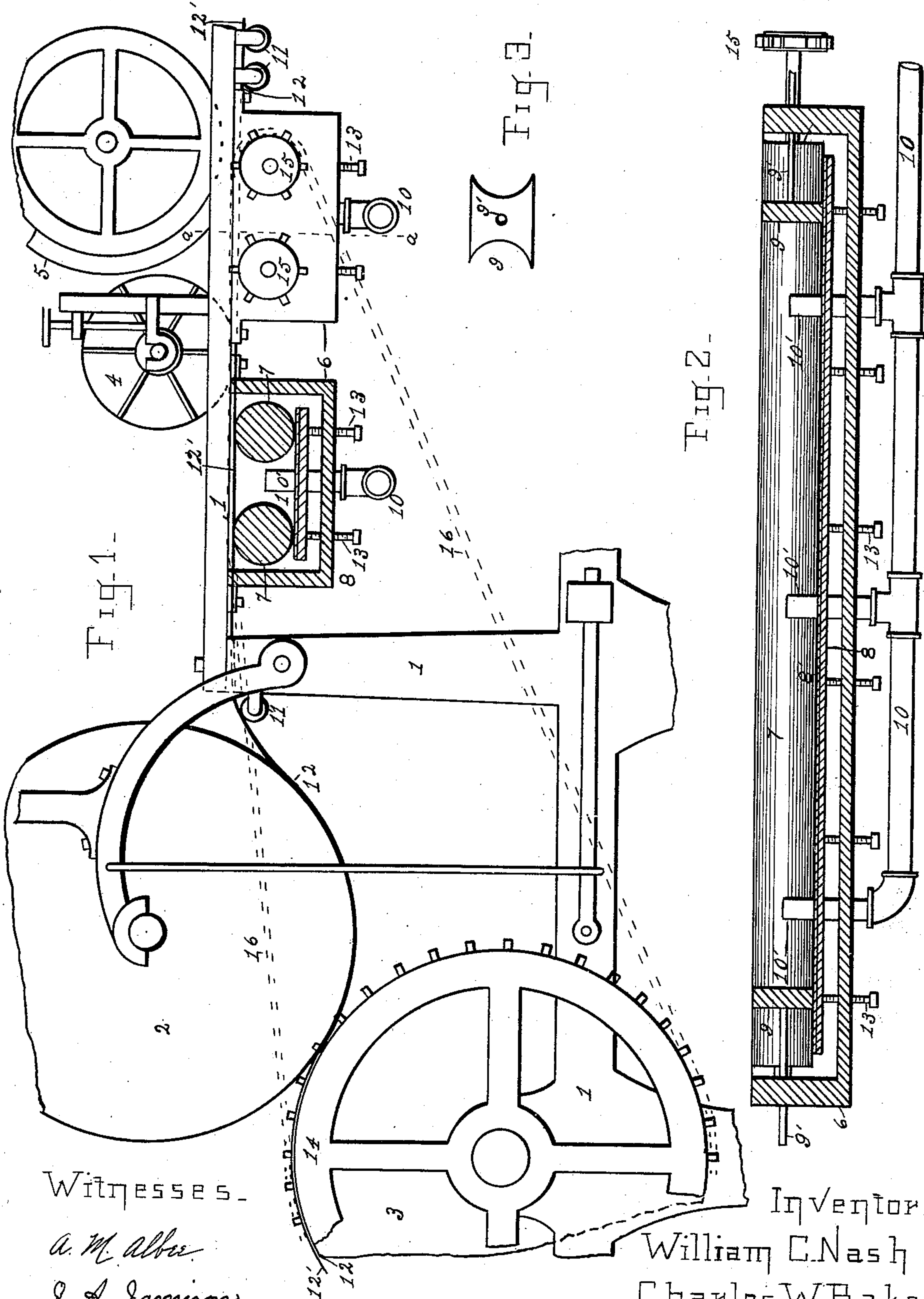


(No Model.)

W. C. NASH & C. W. BAKER.  
SUCTION BOX FOR PAPER MAKING MACHINES.

No. 592,163.

Patented Oct. 19, 1897.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## SUCTION-BOX FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 592,163, dated October 19, 1897.

Application filed August 26, 1896. Serial No. 604,003. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM C. NASH and CHARLES W. BAKER, citizens of the United States, residing at Neenah, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in Suction-Boxes for Paper-Making Machines, of which the following is a specification.

Our invention relates to a suction-box in which the upper longitudinal edges thereof are rollers arranged for revolution along with the wire of the paper-making machine, and the object of the rollers thus arranged is to lessen the wear of the wire in its passage over the edges of the suction-box, and consequently to lengthen the life of said wire. We attain this object by means of the devices shown in the accompanying drawings, in which—

Figure 1 is a side view of a part of a paper-making machine, showing our improvement applied to it, one of the suction-boxes being in section. Fig. 2 is a vertical section upon the line *a a* of Fig. 1 of the suction-box detached from the paper-making machine, and Fig. 3 is a side elevation of one of its followers.

Similar numerals indicate like parts in the several views.

1 indicates the frame of the paper-making machine; 2, the upper couch-roll; 3, the lower couch-roll; 4, the dandy-roll; 5, the deckle-strap; 6, the box containing the suction apparatus; 7 7, two similar rolls; 8, a follower which is arranged under the rolls; 9 9, stops which are arranged between the rolls for adjusting the suction-box to the width of the paper which is being made; 9', rods for operating said stops; 10, a pipe which is connected with the usual suction-pump at its outer end and having numerous branches 10' 10' 10', the open ends of which terminate in the suction-box between the rolls; 11, the wire-supporting rolls; 12, the machine-wire; 12', the web of paper thereon; 13, screws for adjusting the pressure of the follower 8 against the rolls; 14, a sprocket-wheel which is mounted upon the end of the shaft which carries the lower couch-roll; 15, sprocket-wheels upon the end of the roll-shafts; 16, a chain for driving the rolls.

The box 6 may be made of any suitable material and may be secured to the frame 1 by any convenient means.

The suction-pipe 10 is arranged under and lengthwise of the box, or it may be inside of the box and rest upon its bottom, one end being connected to a suitable pump for producing the required degree of suction. Projecting upward from the pipe 10 and through the bottom of the box 6 are a number of short pipes 10', preferably three or more, having their upper ends open and terminating above the center of the box and near the height of the center of the rolls 7 7. Upon opposite sides of the pipes 10' the two rollers 7 7 are journaled for revolution. Fitting tightly around the pipes 10' and extending under the rolls 7 7 far enough to exclude air from passing between it and said rolls is a follower 8 of a stiff material, consisting of a straight even-surfaced rectangular-shaped strip the upper surface 8' of which should be of a slightly-compressible material, leather being one that answers the purpose, and against which surface the rolls are pressed with force sufficient for excluding the passage of water and air. This follower is arranged so as to be raised slightly as the leather is worn by the friction of the rolls thereon, the screws 13 being arranged for the vertical adjustment of said follower. The spaces outside of the rolls and under the follower are to be filled with water from any available supply for preventing the passage of air around the ends of the rolls.

Fitted in between the rollers and between the wire of the machine and the follower 8, near each end of the box, are movable stops 9 9 for adjusting the length of the suction part of the box 6 to the width of the web of paper which is being made. These stops may be made of brass, Babbitt metal, leather, or any suitable material, and should be fitted nicely to its adjoining parts, so as to slide freely while excluding the passage of air.

In order that the friction of the wire in passing over the rolls 7 may be reduced, or substantially all removed, means are provided for revolving said rolls at substantially the same surface speed of the travel of the wire.



This is done in the present case by means of sprocket-wheels of the proper diameter upon both the shaft of the couch-roll 3 and each one of the shafts of the rolls 7, a sprocket-wheel chain being arranged for engaging the teeth of said wheels, and thereby revolving the rolls at a speed corresponding with that of the wire. Gearing or other devices may be arranged for driving the rolls.

10 In driving the rolls by means which are independent of the friction of the wire thereon all wear upon the wire in its passage over the side edges of the suction-box will be avoided, whatever the degree of pressure of the wire upon said edges, as the edges being revolving rolls the surface of said rolls will travel with the wire and at the same rate of speed.

Any desired number of suction-boxes can be arranged upon one paper-making machine or any desired number of rolls in one box for effectually removing the water from the web of paper.

The several parts being arranged in their proper position, the machinery put into operation, a body of paper pulp spread upon the wire, and suction applied to the pipe 10, a strong suction downward from the pulp and through the wire will be produced and the moisture drawn from the pulp, leaving the pulp, if a sufficient number of boxes are arranged in its path, sufficiently dry for the paper web at this point in its travel.

With this improvement the pulp is found to be better closed up than with the usual suction-boxes and a web of paper is produced which is more dense and is of a superior quality.

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

1. In a suction-box for a paper-making machine, the combination with said box arranged transversely of the machine, of a pipe arranged lengthwise of said box and terminating near the height of the center of its rolls in a plurality of open ends, a roll arranged lengthwise of said box upon opposite sides of said pipe ends, stops arranged to slide between said rolls near each end thereof for adapting the working length of said box to the width of paper being made, and a follower

below said rolls and stops consisting of a straight even-surfaced rectangular-shaped strip having a length substantially the same as said rolls, the surface thereof which is in contact with said rolls being composed of a slightly-compressible material, said follower extending from one to the other of said rolls and to distances beyond their centers, and being arranged to bear upon their under sides and support said rolls substantially their entire lengths, but to permit said stops to slide freely thereon and to thereby exclude the passage of air between said rolls and stops, and also between said stops and the follower, substantially as described.

2. In a suction-box for a paper-making machine, the combination with said box arranged transversely of the machine, of a pipe arranged lengthwise of said box and terminating in a plurality of open ends near the height of the center of its rolls, a roll arranged under the wire and lengthwise of said box upon opposite sides of said pipe ends, stops arranged to slide between said rolls near each end thereof for adapting the working length of said box to the width of paper being made, and a follower below said rolls and stops, consisting of a straight even-surfaced rectangular-shaped strip having a length substantially the same as said rolls, the surface thereof which is in contact with said rolls being composed of a slightly-compressible material, said follower extending from one to the other of said rolls and to a distance beyond their center, and being arranged to bear upon their under side and support said rolls substantially their entire length, but to permit said stops to slide freely thereon and to thereby exclude the passage of air between said rolls and stops, and also, between said stops and follower, and means for driving said rolls independently of the friction of the wire of the paper-making machine, and at a circumferential rate of speed corresponding with that of said wire, substantially as set forth.

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Witnesses:

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