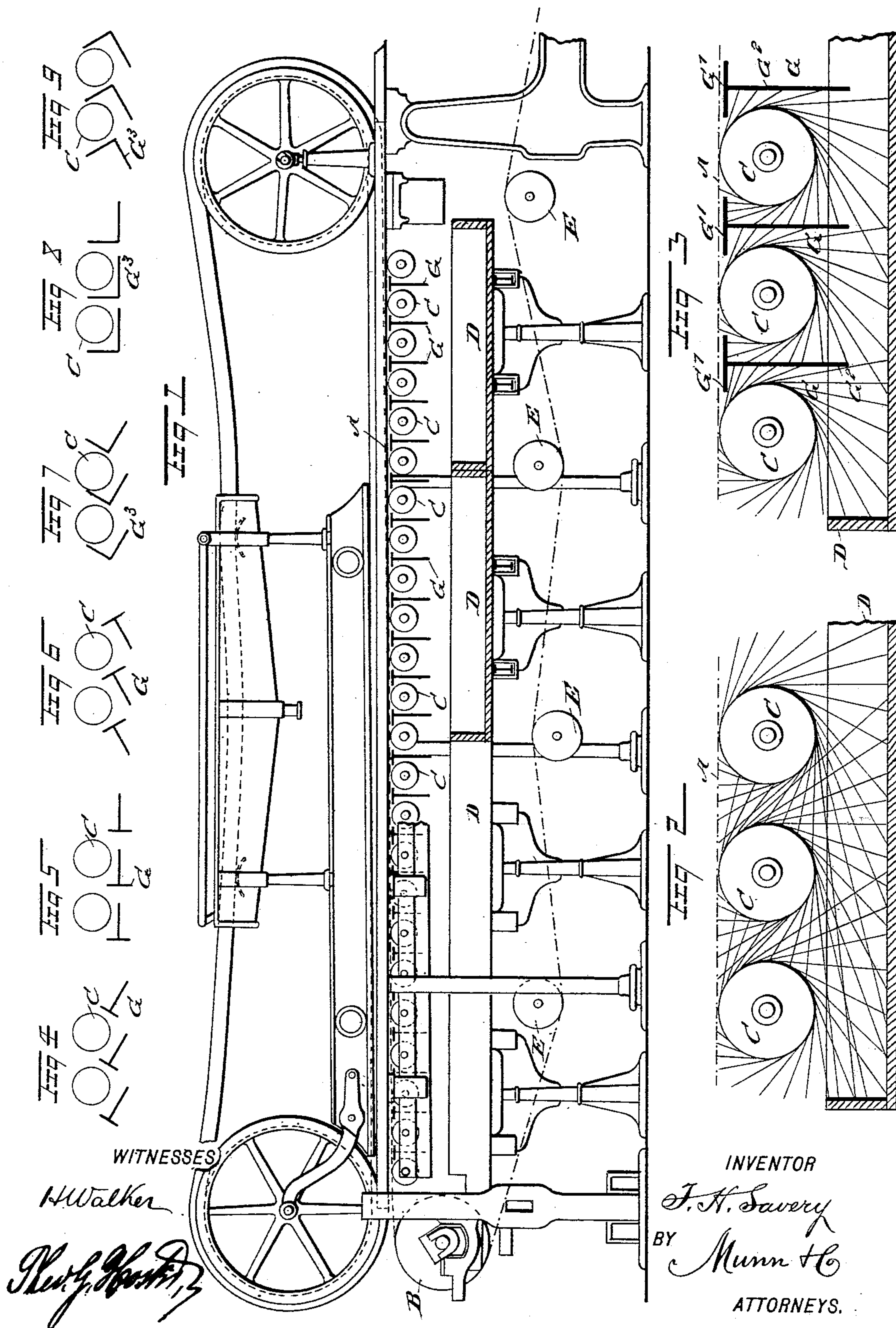


**T. H. SAVERY.**  
**PAPER MAKING MACHINE.**

Patented June 18, 1895.





# UNITED STATES PATENT OFFICE.

THOMAS H. SAVERY, OF WILMINGTON, DELAWARE.

## PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,336, dated June 18, 1895.

Application filed January 25, 1895. Serial No. 536,248. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS H. SAVERY, of Wilmington, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a full, clear, and exact description.

The invention relates to the Fourdrinier or wire part of paper making machines; and its object is to provide certain new and useful improvements for high speed Fourdrinier machines, whereby the water from the pulp resting upon and being carried by the wire, over a series of table rolls, is properly directed and caused to flow into the save-all boxes placed below to receive it.

The invention consists in the novel construction and combination of parts hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is an enlarged sectional side elevation of the table-rolls and save-all box with the dashboard omitted and showing the water leaving the rolls. Fig. 3 is a similar view of the same with the dashboard in position; and Figs. 4 to 9, inclusive, are side elevations showing the deflectors arranged in different positions relative to the table-rolls.

In high speed Fourdrinier machines in which the paper travels rapidly, that is, two hundred feet or more per minute, great difficulty has been experienced relative to the removal of the water from the endless wire, as the supporting or table rolls, owing to the rapidity with which they revolve, throw a great part of the water upward upon the under side of the wire and outward toward the adjoining table rolls, as illustrated in Fig. 2. The water that is thrown in this manner against the wire besides injuring the paper, must be taken down again by the same or another roll farther on in the system, and the water thrown by one roll against another gives an added duty in a place already insufficient for the required duty at high speeds. Therefore the rolls really interfere with their own action in removing the water from the wire.

As a consequence of the decreased efficiency of the table rolls in performing their duty in high speed machines, namely: the duty of taking the water out gradually and at the same time with sufficient rapidity to effect the proper formation of the paper before it reaches the suction boxes, it has been found necessary to increase the number of table rolls and consequently the length of the wire. When running at high speeds it has been found necessary to increase the number of the suction boxes, as the table rolls failed to extract the proper amount of water from the paper. The use of suction boxes, however, except for their legitimate purpose of removing the water from the sheet of paper has been formed, and to render it as firm as possible before couching, is in a degree detrimental to the quality of the sheet of paper. Furthermore, the friction occasioned by the wire against the suction box, lessens the life of the wire and makes the wire drag hard so that it takes more power to drive this part of the paper machine. Now in order to insure the rolls performing the duty of removing water from the wire and to cause the water to flow to the save-all box instead of back upon the wire, or toward or upon the adjoining rolls, I provide the improvement presently to be described in detail.

The endless wire A passes over the usual breast roller B, then over the small table rolls C located over the save-all box D, then over the suction boxes and outward to the lower couch roll, to then return under and over the small bottom rolls E to the breast roll B. In the rear or in front of each of the table rolls C is arranged one or more transverse deflectors G, preferably made T-shaped and having the horizontal member G' extending directly under the wire A between adjacent rolls C, but without necessarily touching either roll or wire. The depending member or arm G<sup>2</sup>, extends about midway between the adjacent rolls C and downward to a point preferably below the said rolls, or at least substantially flush with the lower surface of the rolls. The deflectors may also be differently located relative to the rolls as shown in Figs. 4 to 9 inclusive, and the form or shape of the deflectors may be varied, and a flexible ma-



terial substituted and arranged to come in contact with the surface of the rolls, without deviating from my improvement.

In Figs. 4, 5 and 6 the deflectors G are of the same shape as in Figs. 1 and 3, but instead of having the stem  $G^2$  vertical as in the said two views, they are so arranged that the stem will be inclined to either side (Figs. 4 and 6) or horizontal (Fig. 5). In Figs. 7, 8 and 9 I have illustrated deflectors  $G^3$  which are L-shaped in cross section and are arranged in the same manner relatively to the rolls C, as the T-shaped deflectors G illustrated by Figs. 4, 5 and 6 respectively.

Now, by reference to Fig. 3 it will be seen that the water, fibers and other substances passing through the wire upon the table rolls, which are revolved at a high rate of speed by the movement of the wire, are thrown off the rolls on tangential lines, and consequently, a considerable portion of the water thus thrown off strikes the deflectors G at both members  $G^2$  and  $G'$ , so that the water is prevented from passing to the under side of the wire or anywhere where it could interfere with the water controlled by the adjoining rolls, or in any manner disturb the fibers resting upon the upper surface of the wire, and is caused to flow downward by its own gravity into the save-all box of the machine.

By the use of the deflectors or dash-boards, above described, the water which has been removed from the pulp through the wire as it passes over the table rolls, is prevented from coming into contact with the wire again, and is diverted downward directly into the save-all box, and consequently it is not necessary to unduly lengthen the wire or increase the number of table rolls in order to get a sufficient amount of water from the pulp before it reaches the first suction box. Consequently also, with each of the table rolls taking its quota of water from the wire, it is not necessary to have as many suction boxes as would be required if the dash-boards were not assisting the table rolls in the performance of

their duty. By dispensing with a suction box the length of the life of the wire is increased, the cost of up-keep of the suction box is dispensed with, the suction pump has less duty to perform, and the power required to drive the wire part is lessened.

Without the use of deflectors or dash-boards, as described, it is impossible to make as good paper at high speeds as at slow speeds, because the water is thrown by the table rolls so forcibly against the lower side of the wire upon which the pulp rests, as to positively and greatly disturb the pulp and injure the paper. These deflectors, therefore, become a necessary and essential part of high speed paper machines.

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

1. A paper machine, provided with table rolls adapted to support the wire, and deflectors interposed between the rolls and extending downward to the plane or level of the lower surfaces of the said rolls, to prevent the water being thrown from one roll to the adjacent roll, substantially as described.

2. A paper machine, provided with table rolls adapted to support the wire, deflectors interposed between the rolls and extending downward to the plane or level of the lower surfaces of the said rolls, to prevent the water being thrown from one roll to the adjacent roll, and a save-all box located below said deflectors to receive the water therefrom, substantially as described.

3. A paper machine, provided with table rolls adapted to support the wire, and deflectors interposed between the rolls and having their upper surfaces below the plane or level of the tops of the rollers, so that the said deflectors will not touch the wire, substantially as described.

THOS. H. SAVERY.

Witnesses:

THEO. G. HOSTER,  
C. SEDGWICK.