J. H. De WITT.

MEANS FOR REDUCING STRAIN AND FRICTION UPON THE FOURDRINIER WIRE OF PAPER-MACHINES.

No. 181,921. Patented Sept. 5, 1876.

Fig. 1.

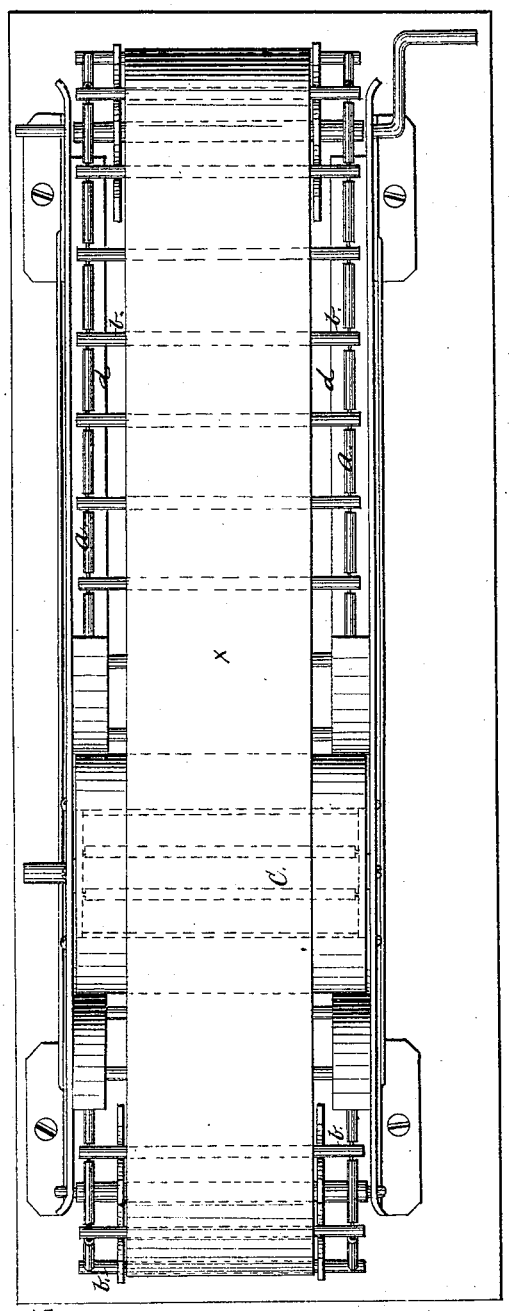
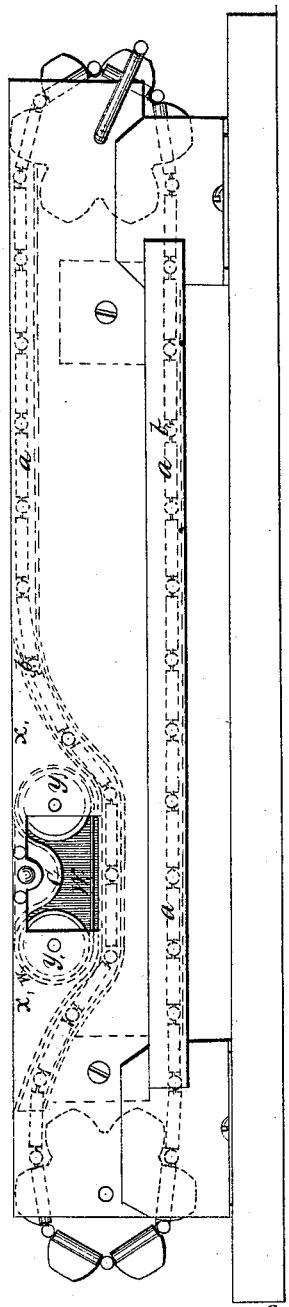


Fig. 2.



Witnesses:
James O. Clark
Wm R. Sands

Inventor:
J. H. De Witt per
Bolen Crane & Co
attys

UNITED STATES PATENT OFFICE.

JOSIAH H. DE WITT, OF ORANGE, NEW JERSEY.

IMPROVEMENT IN MEANS FOR REDUCING STRAIN AND FRICTION UPON THE FOURDRINIER WIRE OF PAPER-MACHINES.

Specification forming part of Letters Patent No. **181,921**, dated September 5, 1876; application filed October 4, 1875.

To all whom it may concern:

Be it known that I, JOSIAH H. DE WITT, of Orange, Essex county, New Jersey, have invented certain Improvements in Paper-Making Machines, of which the following is a description, reference being had to the accompanying drawing, in which—

Figure 1 is a plan of that portion of a paper-machine which carries the wire-cloth, known as a "Fourdrinier net;" and Fig. 2 is a side elevation of the same.

The object of my invention is to reduce the strain and friction to which the Fourdrinier net or the wire is subjected in paper-machines of the ordinary construction. To accomplish this object I have devised certain methods of supporting the wire and driving the same, which are applicable to the machine as ordinarily made, and certain other methods of relieving the friction, which involve more or less change in the present mode of construction.

The chief sources of friction to the wire X as it carries the pulp from the distributer to the dandy-roll are, first, the passage over many small rolls, all of which carry the weight of the wire, the pulp, and a large body of water, and are rotated by the friction of the wire passing over them; second, the movement over the suction-boxes, where the atmosphere presses the wire against the box with sufficient force to wear off the brass facing of the box rapidly, and to wear the under side of the wire greatly. These influences combined suffice to destroy a wire costing one hundred and fifty dollars in a time varying from one week to one year, the difference depending upon the condition of the machine and the skill of the operator in adjusting the wire and its tension.

In Figs. 1 and 2 I have shown two endless chains, *a a a a*, adjusted to carry the Fourdrinier wire through the machine as ordinarily constructed, the two chains being connected at brief intervals by tie-rod or rolls *b b b b*, and carried in the proper course by rollers running in a channel, *d*, provided in the side frames of the machine. This chain, with its continuous succession of slats or rolls *b b*, furnishes a substantial support to the wire in all parts of its movement, and can be so adjusted in respect to its own tension and the tension of the wire that the latter shall travel through the machine very much as the pulp does on the wire, without the severe strains to which it is ordinarily subjected.

As the presence of the chains and rolls *b b* would interfere with the action of the suction-box C upon the wire, I provide rolls to carry the chains and rolls or slats *b b* beneath the suction-boxes, the wire alone being left to travel over the same for the usual purpose, or guide the chains in a curved channel in the frames, so as to pass under the suction box or boxes. This chain-carrier effectually obviates the necessity of straining the Fourdrinier wire, so as to rupture or pull it out of shape in a short time.

It may not be necessary in practice to employ anything stronger as a carrier than a coarse wire-net, which could, if desirable, be carried beneath the suction-boxes, in the manner specified for the chain; or any other porous material suitable for the purpose could be used as a carrier, to bear a greater tension than the wire, for the purpose of relieving it, the wire lying on it, and traveling along just as the pulp or paper does on the wire.

In case any such fabric were used as a carrier, no rolls or guide-channels in the frame would be necessary, the carrier being controlled by the same means as the ordinary wire is, and running either above or below the suction-box, as might be found desirable from the nature of the material employed for the auxiliary carrier.

I have also made an application of my auxiliary carrier for the purpose of diminishing the wear of the suction-box upon the Fourdrinier wire where the wire passes over the same.

This carrier, consisting of an endless belt of suitable texture, is shown at Fig. 2, where C is the suction-box; *y y*, the rolls, adjustable to give the proper tension to the carrier W, and X is the wire resting upon the same. It will be evident that the wire X is carried over the suction-box by this means without any friction whatever, as it rests upon the carrier *w* in its passage; and although the carrier W may be easily worn out, it can be replaced with little

trouble and expense, compared with that required to replace a Fourdrinier wire.

I am aware that carriers of various kinds have been used for drying paper-hangings, and for other purposes; and I do not, therefore, make any claim to such carriers, except in combination with the Fourdrinier net of a machine for making paper from pulp.

Having thus described my invention, I claim, and desire to secure by Letters Patent, the following:

1. The combination of a carrier with the Fourdrinier wire-net of a machine employed in making paper from pulp, said carrier consisting of chains connected by cross-ties, or a wire-net of suitable texture, substantially as described, and subjected to a different tension from the Fourdrinier wire, in the manner described, for the purpose of protecting and preserving the Fourdrinier wire, as herein shown.

2. The auxiliary carrier W, in combination with the rolls *y y*, suction-box C, and Fourdrinier wire X, arranged and operated substantially in the manner described.

J. H. DE WITT.

Witnesses:

THOS. S. CRANE,

J. E. HOWELL.