

(No Model.)

3 Sheets—Sheet 1.

A. H. MORRISON.

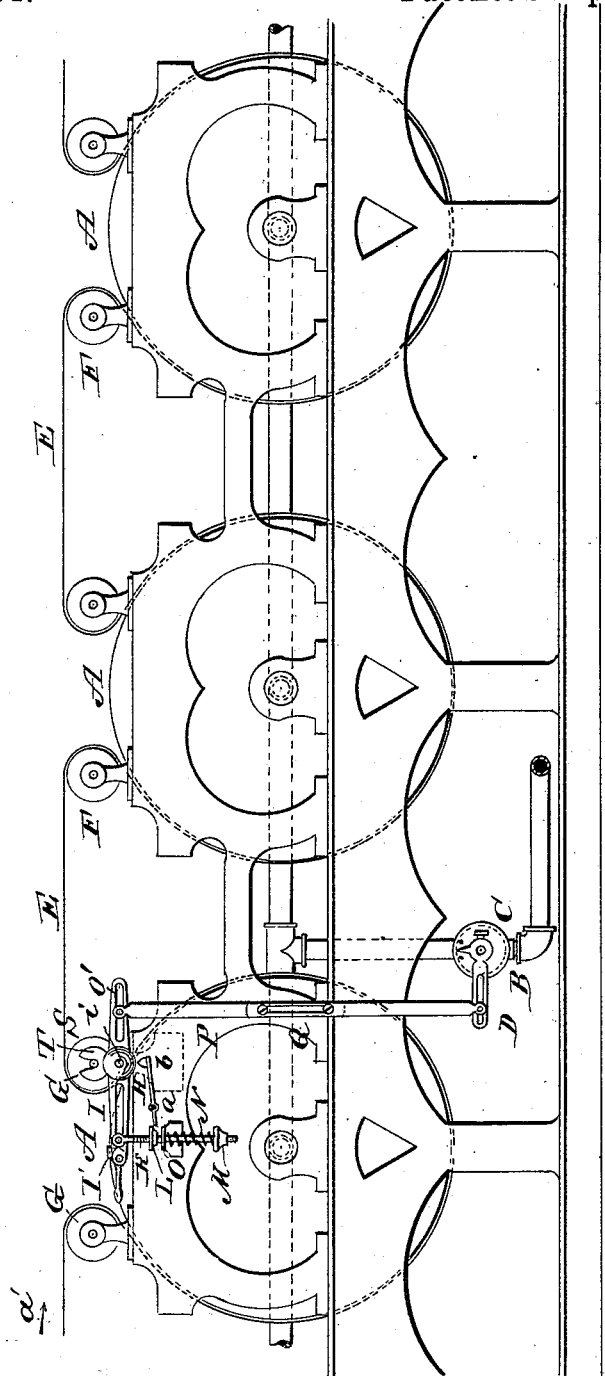
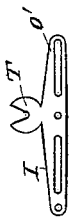
REGULATOR FOR PAPER DRYING MACHINES.

No. 304,444.

Patented Sept. 2, 1884.

Fig. 1.

Fig. 3.



WITNESSES:

Geo. Beyer
C. Bedgwick

INVENTOR:

A. H. Morrison

BY

Munn & Co

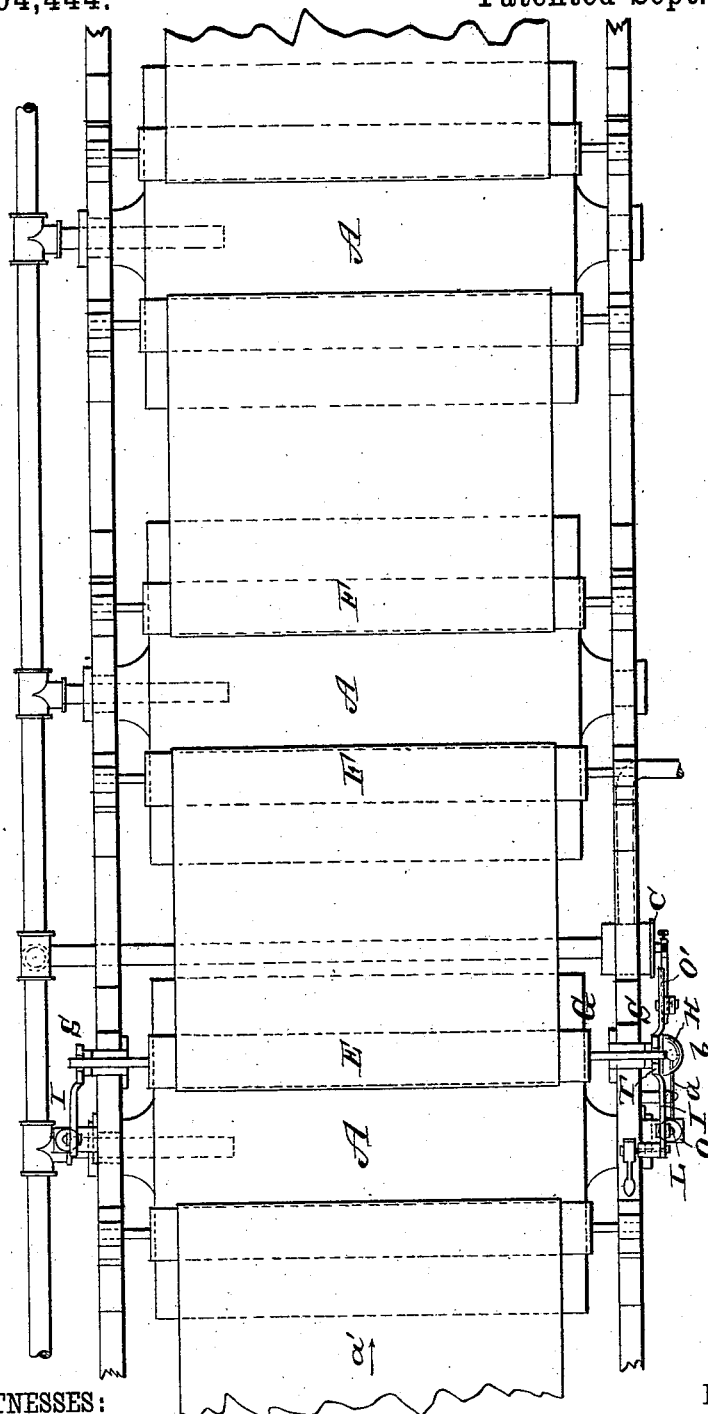
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A. H. MORRISON.
REGULATOR FOR PAPER DRYING MACHINES.
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Fig. 2.



WITNESSES:

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INVENTOR:

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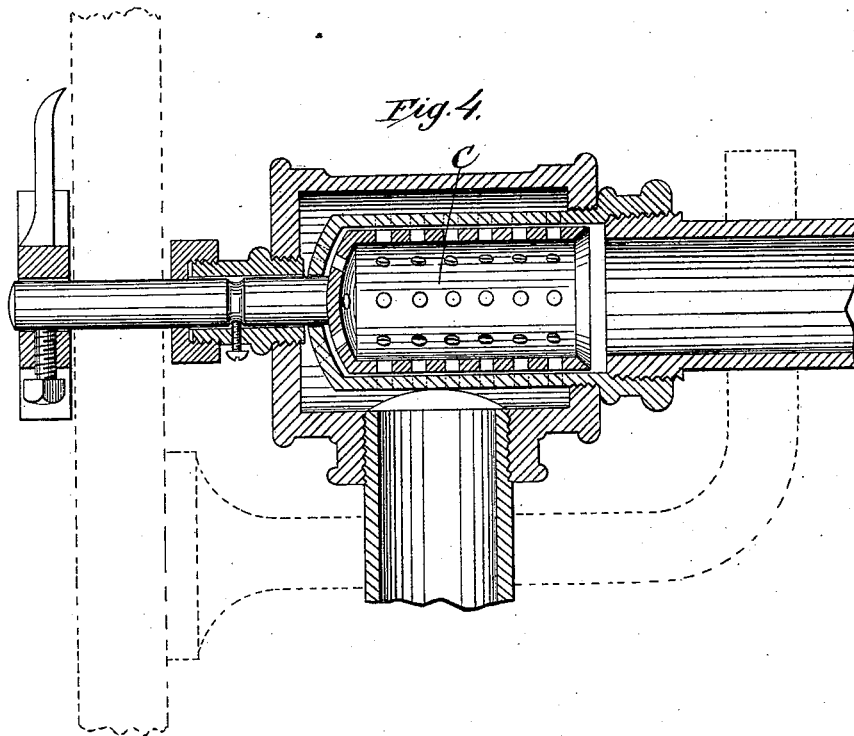
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ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

A. H. MORRISON.
REGULATOR FOR PAPER DRYING MACHINES.
No. 304,444. Patented Sept. 2, 1884.



WITNESSES:
L. Sedgwick
A. H. Davis

INVENTOR:
A. H. Morrison
BY *Munn & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

AUGUSTUS HINKLEY MORRISON, OF MECHANICSVILLE, NEW YORK.

REGULATOR FOR PAPER-DRYING MACHINES.

SPECIFICATION forming part of Letters Patent No. 304,444, dated September 2, 1884.

Application filed December 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS H. MORRISON, of Mechanicsville, in the county of Saratoga and State of New York, have invented a new and Improved Regulator for Paper-Drying Machines, of which the following is a full, clear, and exact description.

The object of my invention is to provide a device whereby the tension on the web of paper can be regulated, and at the same time the quantity of steam passing to the drying-cylinders of a paper-drying machine will be automatically regulated, according to the condition of the paper passing through the drying-machine; and my invention consists in journaling one of the top rollers of the machine in one arm of a three-armed lever, to another arm of which is attached a rod provided with a tension-spring, and to the opposite arm is connected the handle of a steam-valve for regulating the supply of steam to the drying-cylinders; and my invention also consists in providing a bell for giving an alarm in case the web of paper breaks, and in details of construction, all as will be hereinafter shown and fully described.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a paper-drying machine having my regulator applied. Fig. 2 is a plan view of the same. Fig. 3 is a detail view of the three-armed lever of my invention. Fig. 4 is a longitudinal view of the valve and its adjunctive parts.

It is well known that there is great difficulty in regulating the tension and amount of heat required to dry paper in its passage over the cylinders of a drying-machine, and to obviate these difficulties I mount each end of the second guide-roll, G, over the first drying-cylinder, A, of a paper-drying machine in the upper forked arm, T, of a three-armed lever, I, pivoted at *i* on a suitable support attached to the frame of the drier. That arm I' of the lever I toward the front of the machine is slotted, and in said slot is adjustably secured a screw-threaded rod, K, working in a guide, O, attached to the frame of the machine. Above the guide the rod is provided with a hand-nut

L, and at its lower end with a hand-nut M. Upon the rod K, between the guide O and nut M, is a spiral spring, N. The arm O' of the lever I, opposite the arm I', is also slotted, and to it is adjustably attached a rod, P, adjustably connected with the slotted arm D of a regulating-valve, C, in the supply-steam-pipe B of the machine. This valve C may be of any suitable construction; but I prefer to use the valve which is made the subject-matter of another application for Letters Patent of even date herewith. The rod P is made in two parts united by an ordinary sliding connection, Q. A lever, *a*, pivoted on the frame of the machine, has one end extending under the nut L, and its other end provided with a hammer, *b*, located beneath a gong, H, secured in this case on the pivot *i* of the lever I.

In operation the web of paper E, as indicated by the arrow *a'*, passes over the first top roller G, down beneath the first drying-cylinder, A, over the same, and over the second top roller G, and so on through the machine. The tension on the web of paper is regulated for its normal condition of dryness by the tension-spring N and nut M, and the different parts of the connections of the lever I with the valve are arranged to give the requisite amount of steam for paper passing through the machine in its ordinary condition of dryness. Should the paper passing to the machine be more wet or heavy than usual, it will not, in passing over the first cylinder, become as dry as usual, and consequently will not shrink as much, thereby lessening the tension and allowing the spring to draw down the arm I', which raises the arm O' and adjusts the valve C so as to admit a larger volume of steam, increasing the heat of the cylinders. On the contrary, should the paper be drier than usual, or lighter, it will shrink more in passing the first cylinder and increase the tension on the web, and consequently on the spring N, thereby raising the arm I', depressing the arm O', and so adjusting the valve C as to reduce the volume of steam and the heat of the cylinders. When the paper again is in its usual condition as to dryness and weight, the parts return to their normal positions, the valve assuming an intermediate po-

sition between its minimum and maximum limit of opening, said latter limit being centrally of the longitudinal axis of the supply-pipe. It will be seen that the slightest variation in the condition of the paper by the variation in the tension at the roll G automatically regulates the amount of heat required for the proper drying of the paper, and all danger of tearing the web is avoided. Should the web, from any cause, be broken, the spring N throws the rod K down, thereby bringing the nut L against the end of the lever *a* and sounding the gong. The lever and tension-spring are provided for each end of the roller G; but the connections to the valve are made upon one side only.

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

1. A regulator for paper-drying machines, consisting of a three-armed lever, in one arm of which the end of one top roller of the drying-machine is journaled, to another arm of which a tension-spring is attached, and having the opposite arm attached to a regulating-valve, substantially as specified.

2. The combination, in a regulator for paper-drying machines, of the three-armed lever I, carrying the roller G, the rod K, spring N, and a regulating-valve, C, substantially as described.

3. The combination, with the cylinder A, roller G, paper web E, and a regulating-valve, C, of the three-armed lever I, rod K, tension-spring N, and connecting-rod P, substantially as described.

4. In a regulator for paper-drying machines, the combination, with the three-armed lever I, having its opposite arms slotted, and the stop O, of the rod K, spring N, and nuts L M, substantially as described.

5. In a regulator for paper-drying machines, the combination, with the rod K and spring N, of the lever *a*, and the gong H, substantially as described.

AUGUSTUS HINKLEY MORRISON.

Witnesses:

D. S. DOUGLASS,
D. M. CHURCH.