(No Model.) 2 Sheets—Sheet 1.

T. PUSEY, T. H. LATIMER & T. H. SAVERY.

AUTOMATIC TIGHTENER FOR DRIER FELTS OF PAPER MAKING MACHINES.

No. 569,031. Patented Oct. 6, 1896.

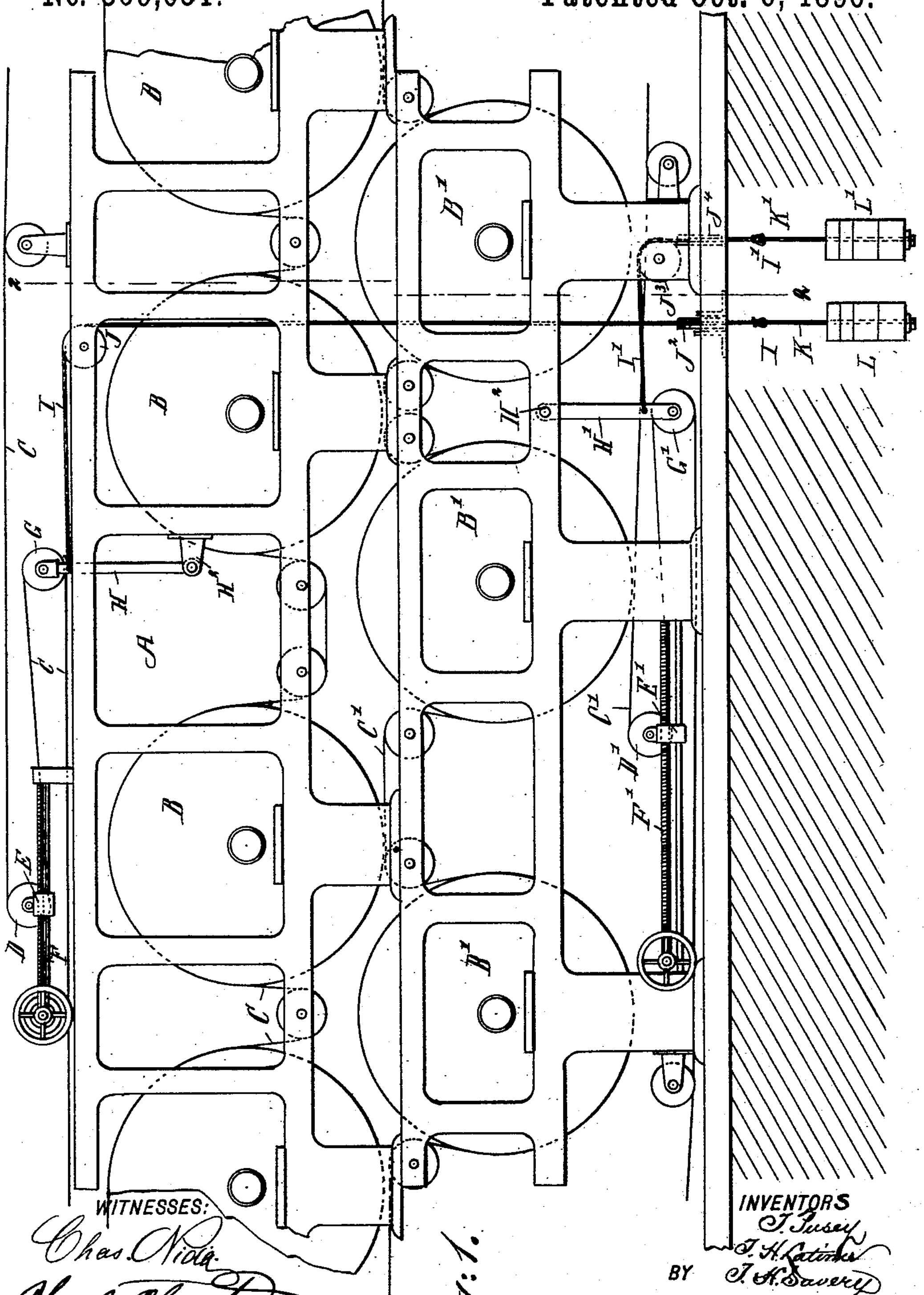

Fig: 1.

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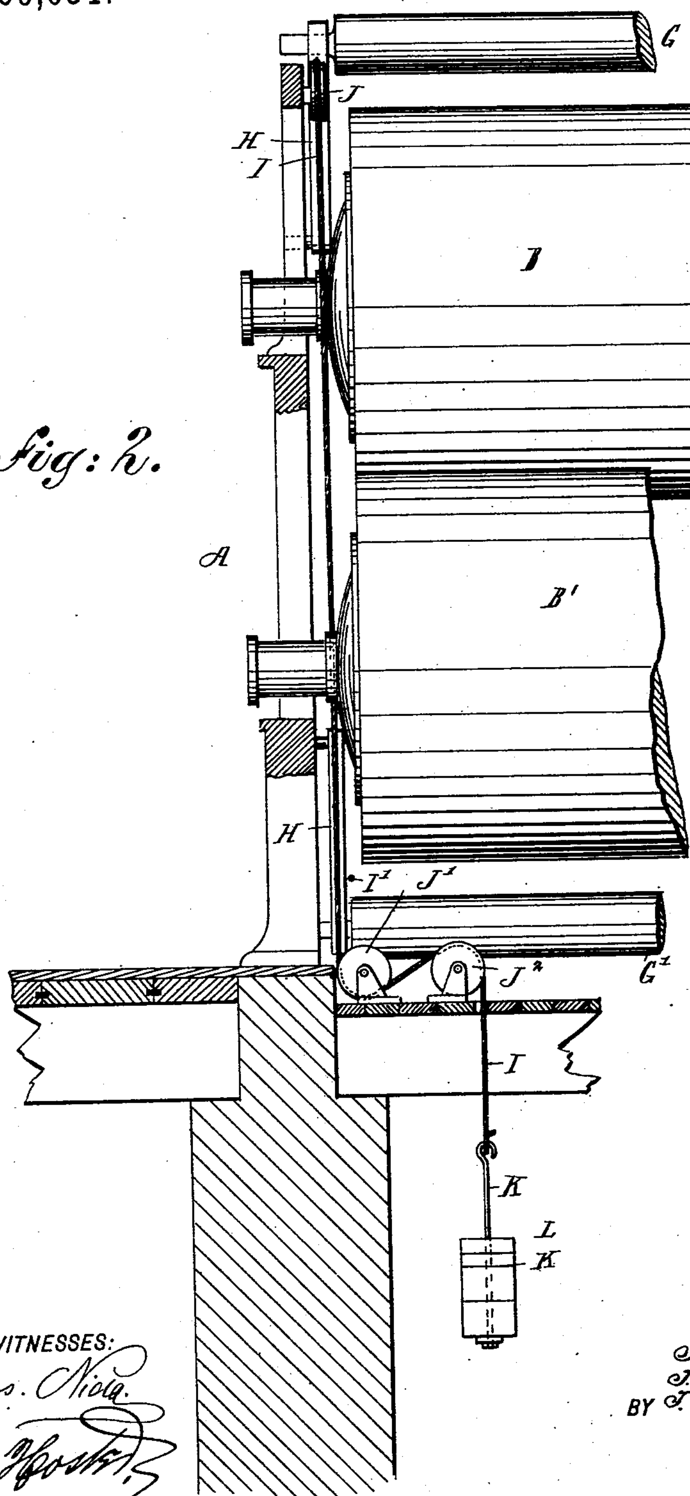
Fig: 2.



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UNITED STATES PATENT OFFICE.

THOMAS PUSEY, OF STOCKTON, CALIFORNIA, AND THOMAS H. LATIMER AND THOMAS H. SAVERY, OF WILMINGTON, DELAWARE.

AUTOMATIC TIGHTENER FOR DRIER-FELTS OF PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 569,031, dated October 6, 1896.

Application filed June 1, 1895. Serial No. 551,408. (No model.)

To all whom it may concern:

Be it known that we, THOMAS PUSEY, of Stockton, in the county of San Joaquin and State of California, and THOMAS H. LATIMER and THOMAS H. SAVERY, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and Improved Automatic Tightener for Drier-Felts of Paper-Making Machines, of which the following is a full, clear, and exact description.

The object of this invention is to provide a new and improved tightener for drier-felts of paper-making machines which will be automatic in its action, and whereby the felt is subjected at all times to such uniform and proper tension as will give the longest life to the felt, produce no undue strain on any of the various rolls, and insure the proper drying of the paper.

The invention consists in certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

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

Figure 1 is a side elevation of part of a paper-drying machine with the improvement applied, and Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1.

In drying-machines for paper-making machines as heretofore constructed the tension to the felt was given by the machine-tender, but it frequently happens that the tender in operating the felt-tightening screws throws an undue strain upon the felt, and consequently upon every roll and roll-journal in the whole system. It also happens that the machine-tender does not tighten the felt sufficiently, so that the paper is not sufficiently clamped against the driers and consequently is not properly dried. Even should the machine-tender succeed in getting the felt properly tightened at one period of time it might not be right continually, as the length of the felt depends on its dryness or dampness, which, as is well known, is a variable quantity. Although these objectionable conditions are noticeable at all times and exist at all times, they are especially evident when the paper breaks while passing over the machine. For a period of time after the paper is broken the surfaces of the driers do not come in contact with the damp paper, but they do come directly in contact with the drier-felt, which becomes dry, and therefore lengthens and slackens away from the driers. Consequently when the paper is again passed over the driers it is not held properly against their surfaces and is not properly dried, and is therefore unfit for use and lost. In due time it will be found that the paper has dampened the felt and thus shortened and restored it to its former state and condition of tightness, so that the paper is held firmly against the driers and is properly dried. By the device presently to be described in detail, however, all of the above-mentioned objections are completely overcome, and no attention is required by the machine-tender for tightening the felts to the proper degree to insure good work.

The drying-machine, of which part is shown in the drawings, is provided with the usual frame A, in which are journaled two sets of drying-rolls B and B′, over which pass the upper and lower felts C and C′, respectively. The felts also pass over the rollers D and D′, respectively, journaled in bearings E and E′, respectively, held longitudinally adjustable on the usual tightening-screws F and F′, respectively. The felts also pass over rollers G and G′, respectively, previous to passing onto the tightening-rolls D and D′, respectively, and these rollers G and G′ are journaled in brackets attached to arms H and H′, respectively, fulcrumed at H^2 on the frame A.

The arms H and H′ are connected near their free ends with ropes or cables I and I′, respectively, of which the rope or cable I extends a short distance in a horizontal direction and then passes over a pulley J, journaled in the frame A, and then the rope passes downward and under a second pulley J′, and then up a third pulley J^2, both journaled on the floor or part of the frame of the machine, as indicated in Fig. 2, the downwardly-extending end of the rope or cable then carrying a rod K, adapted to support a series of weights L. The other rope or cable, I′, likewise extends in a horizontal direction for a short distance to then pass over a pulley J^3

and over a set of pulleys J^4, similar to the pulleys J′ and J^2, after which the downwardly-extending end of the rope or cable I′ carries a rod K′, adapted to support a number of variable weights L′.

The swinging arms with the bearings attached, as herein described, form the construction preferred by us, but it is evident that the bearings may be made movable by being attached to brackets working in slides or guides or any other desirable or preferred way without departing from the principle involved in this invention.

It will be seen that the weights L and L′ exert a pull on their ropes or cables in such a manner that the arms H and H′ have a tendency to swing away from the tightening-rolls D and D′, so that a uniform tension is given to the felts C and C′, passing over the rollers G and G′ previous to passing over the tightening-rolls D and D′.

It is understood that the tightening-rolls D and D′ are adjusted once before starting the machine by the machine-tender, but any subsequent varying in length of the felts, caused by the dryness or dampness thereof, is automatically taken up by the rollers G and G′, carried on the arms H and H′, respectively. Thus no attention whatever is required on the part of the machine-tender for compensating in the varying length of the felts, and at the same time a uniform tension is given to the felts, which tension can be regulated by increasing or diminishing the number of weights L and L′ on the rods K and K′, respectively.

We are aware that a device similar to that herein described has been in use in connection with endless ropes, belts, or cables in the transmission of power, such belts, however, not being subject to any particular longitudinal expansion or contraction; but we believe that we ourselves are the first inventors of the device described in connection with the driers of paper-making machines for the purpose of saving the felts from injury and preventing the undue loss of paper which results from not having the felts kept properly against the drier.

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

1. The combination in a paper-making machine, with the drier-felt and the drying-rolls, of the adjustable tightening-roller around which passes the felt and means for normally holding said roller stationary, another tightening-roller journaled in freely-movable bearings, the felt also passing around said second roller, and a weight connected to the said freely-movable bearing to automatically tighten the felt, substantially as described.

2. The combination, in a paper-making machine, with the drier-felt and the drying-rolls, of the normally-stationary yet adjustable tightening-roller around which passes the felt, tightening-screws engaging the bearings of the said roller to adjust the same, another tightening-roller journaled in freely-movable bearings, the felt also passing around said second roller, and a weight connected to the said freely-movable bearing to automatically tighten the felt, substantially as described.

3. The combination, in a paper-making machine, with the drier-felt and the drying-rolls, of a tightening-roller around which passes the felt, normally-stationary bearings in which said roller is journaled, adjusting-screws for moving said bearings, depending arms pivoted at their upper ends to the frame of the machine, and carrying bearings at their lower ends, so that the said bearings are freely movable at all times, another tightening-roller journaled in said freely-movable bearings, and engaging the felt, and a weight connected to the said arms to automatically tighten the felt, substantially as described.

4. The combination in a paper-making machine, with the drier-felt and the drying-rolls, of the adjustable tightening-roller around which passes the felt and means for normally holding said roller stationary, depending arms pivoted at their upper ends to the frame of the machine, and carrying bearings at their lower ends, so that the said bearings are freely movable at all times, another tightening-roller journaled in said freely-movable bearings, and engaging the felt, and a weight connected to the said arms to automatically tighten the felt, substantially as described.

5. In a paper-making machine, the combination, with the drier-felt and the drying-rolls, of a normally-stationary tightening-roller engaged by the felt at one side, means under the control of the operator, for adjusting said tightening-roller, another tightening-roller journaled in bearings arranged to move freely in substantially the same plane as that in which the first-named roller moves, the felt engaging the second roller on the opposite side to the first-named roller, and a weight connected to the second roller to automatically tighten the felt, substantially as described.

6. The combination, in a paper-making machine, with the longitudinally expansible and contractile drier-felt and the drying-rolls, of the movable roller arranged in contact with said felt, and means for pressing the roller against the felt to keep it under a uniform tension irrespective of its elongation or contraction, substantially as described.

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