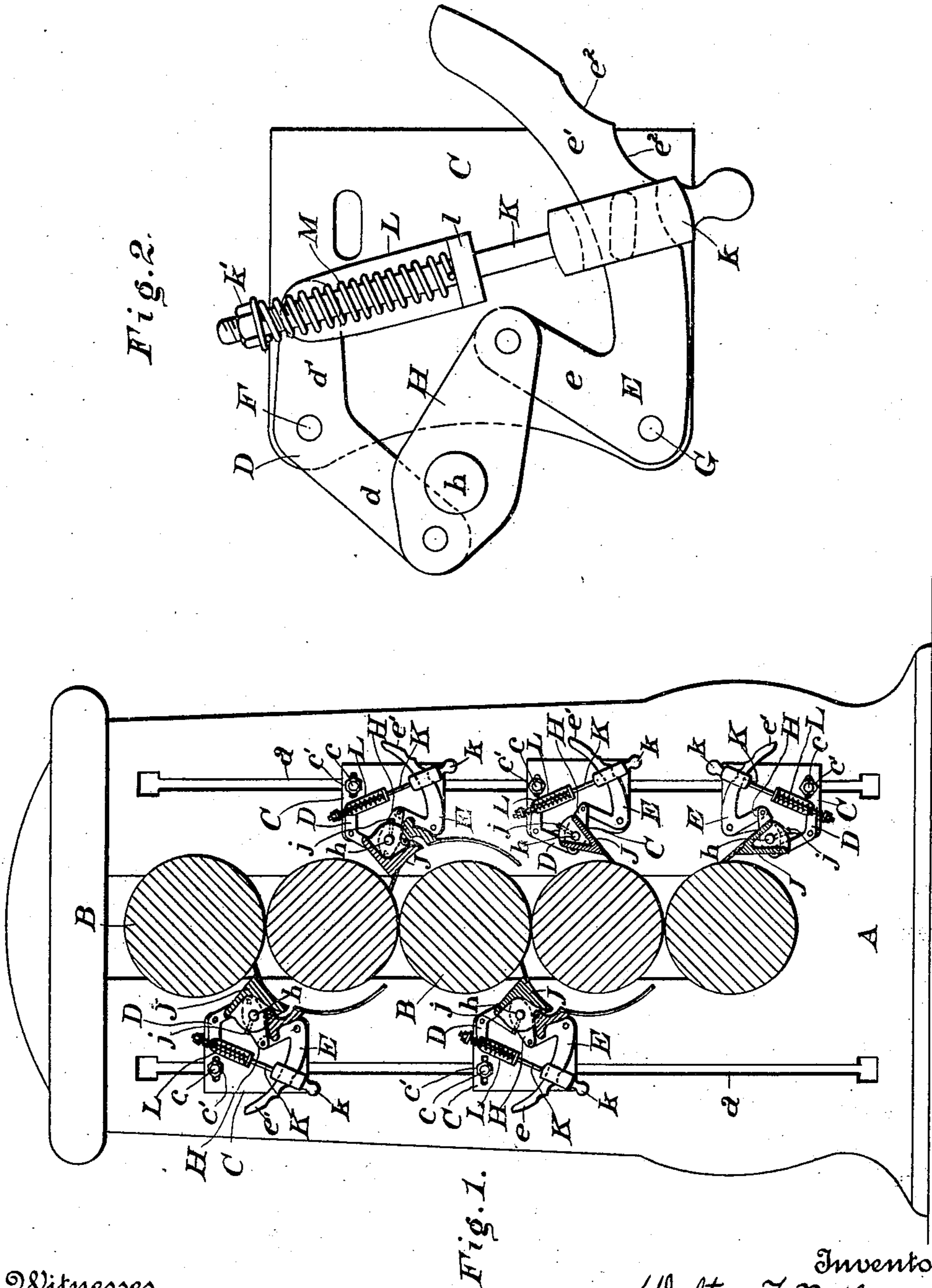


No. 680,495.

Patented Aug. 13, 1901.

W. T. MILES.
CALENDERING MACHINE.
(Application filed Feb. 9, 1901.)

(No Model.)



Witnesses
James S. Smith
S. Oliver Moore

Inventor
Walter T. Miles,
By *Harvey Spalding & Sons.*
Attorneys

UNITED STATES PATENT OFFICE.

WALTER T. MILES, OF LAWRENCE, MASSACHUSETTS.

CALENDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 680,495, dated August 13, 1901.

Application filed February 9, 1901. Serial No. 46,635. (No model.)

To all whom it may concern:

Be it known that I, WALTER T. MILES, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Calendering-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to calendering-machines, more particularly to those devices called "doctors," consisting of elongated metal bodies fashioned in a variety of shapes as to cross-section, but each possessing the common feature of a straight edge brought against the surface of the calendering-roll for the purpose of continuously freeing the paper from that roll and guiding it properly to or between other rolls usually located lower in the same machine. These straight-edged bodies or doctors are ordinarily supported at their ends by means of pivotal connections with cheek-plates adjustable vertically in or upon the end frames, the intention being to enable the edge of the doctor to be advanced to its roll tangentially, or approximately so, and held yieldingly in place in such manner that the edge throughout its extent will always remain in contact with the surface of the roll and adapt itself to any slight change in position thereof.

The object of my invention is to produce improved means for supporting the ends of the doctor which will render the self-adjustment of the edge—that is to say, its constant and complete alinement with the surface of the roll—more prompt and certain and permit the application of the device without modification to rolls of different sizes.

Each constituent element of my invention is described in detail and its individual office, together with the mode of operation of the whole, fully explained hereinbelow.

Of the accompanying drawings, throughout which like letters represent like parts, Figure 1 is an interior side view of an end frame of a calendering-machine, showing my invention, partly in section, in proper position with re-

lation to the rolls; and Fig. 2 represents an enlarged side view of my invention detached.

Considering the drawings, letter A marks one end frame of the pair in which the rolls are journaled, and *a a* the vertical channels, L-shaped, in the inner surface of the end frame. The rolls are designated by letter B. Plates C C, secured at any height upon the end frames in any chosen way—for example, by means of bolts *c c*, having square heads, introduced into channels *a a* and passing through the plates—support the connections whereby the ends of the doctors are pivotally and adjustably upheld. Nuts *c' c'* clamp the plates in place.

The mechanism which I have invented for the purpose stated comprises at each end of the doctor two bent levers D and E. The legs *d* and *d'* of lever D are usually straight and comparatively short, while lever E possesses one short leg *e* and one longer curved leg *e'*, the latter leg being provided with a series of reëntering curves or notches *e²*, which will be again referred to below. The fulcrums of the levers consist of suitable pivot pins or screws F and G, and at these two points alone do the supporting devices connect with the plate C. Another element is the head or end block H, furnished with a trunnion *h*, which enters a hole bored axially in the end of the doctor J. The doctor is therefore directly supported upon the trunnions of the head-blocks, and it is adjustable thereupon rotatively. At each end the doctor carries a set-screw *j* for securing its position on the trunnion. The blocks H H are customarily fashioned as shown, the end portion falling upon one side of the trunnion being much longer than that upon the other side. To the short end of the block the extremity of leg *d* of lever D is pivotally secured, and to the longer end of the block the short leg *e* of lever E is similarly attached. In order that the edge of the doctor may be yieldingly held to its roll, devices of this character include a spring-rod having one end connected to the cheek-plate and an eye or slot at the other end slipped over the curved leg of the long lever and engaging notches therein. I do not attach the spring-rod K to the plate C at any point. The slotted knob *k* engages the retaining-curves *e²* of lever E, and the rod passes

through the projecting foot of an L-shaped plate, (designated by the letter L.) The projection or foot is marked *l*. Plate L is pivotally connected at its upper end with the leg *d'* of lever D. The upper end of the spring-rod K is threaded and provided with a nut *k'*, and encircling the rod is a coil-spring M, confined between the nut and the foot *l* of the plate L. By use of the spring-rod greater or less pressure, as required, during the calendering operation may be exerted against the roll by the doctor. It will be understood that the farther the knob *k* of the spring-rod is removed from the pivot or fulcrum G the greater the leverage gained to force the edge of the doctor against its roll. It is also believed to be clear that the reaction of the spring pulls upon both levers D and E, with the advantage of leverage in favor of the latter, and that the resultant moves the blocks H, and therefore the doctor, forward and upward against the roll. The rotative adjustment of the doctors upon the trunnions of the coupling-blocks enables the attendant to bring the edges into an attitude more or less approaching a tangential position with respect to the surface of the rolls, as the best operation of the machine may require or experience indicate. Within the limits usually set for the sizes of calendering-rolls the adjustment stated may be made for a roll of any diameter. If one end of the stack of rolls drops slightly from wear or other cause, the pivotal devices supporting the ends of the doctors being yieldingly held by springs give a little with the lowering rolls and the edge of each doctor remains in approximately continuous contact with its roll throughout its length. To withdraw the doctor from its roll, the knob *k* of the spring-rod is pulled outwardly, detaching it from the curved leg of lever E, whereupon the doctor by its own weight falls away from the roll.

I am aware that heretofore doctors have been end-supported by pivotal connections, and I do not claim that feature broadly.

What I claim, and seek to secure by Letters Patent of the United States, is—

1. In a calendering-machine, the combination of the end frames, a doctor, head or end blocks provided with trunnions, the doctor being rotatively adjustable upon the trunnions of the said blocks, and pivotal connections supporting the said head or end blocks upon the said frames of the machine, substantially as described.

2. In a calendering-machine, the combination of the end frames, a doctor, head or end blocks provided with trunnions, the doctor being rotatively adjustable upon the said trunnions, the bent levers having fulcrums supported upon the said end frames of the machine, the said levers being pivotally connected with the said head or end blocks, and spring-rods each pivotally connected with one of the levers at the ends of the doctor and possessing a detachable connection with the remaining lever at the same end, substantially as described.

3. In a calendering-machine, the combination of the end frames, a doctor, head or end blocks provided with trunnions, the doctor being rotatively adjustable upon the trunnions of the said blocks, the plates C, means for securing the said plates at different heights upon the said end frames, bent levers pivotally connected with the said head or end blocks and with the said plates C, and adjustable spring-rods each pivotally connected with one of the levers at the ends of the doctor and possessing a detachable and adjustable connection with the remaining lever at the same end of the doctor whereby the effect of the spring upon the levers and doctor may be increased or diminished, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER T. MILES.

Witnesses:

NEWTON P. FRYE,

CHARLES H. LITTLEFIELD.