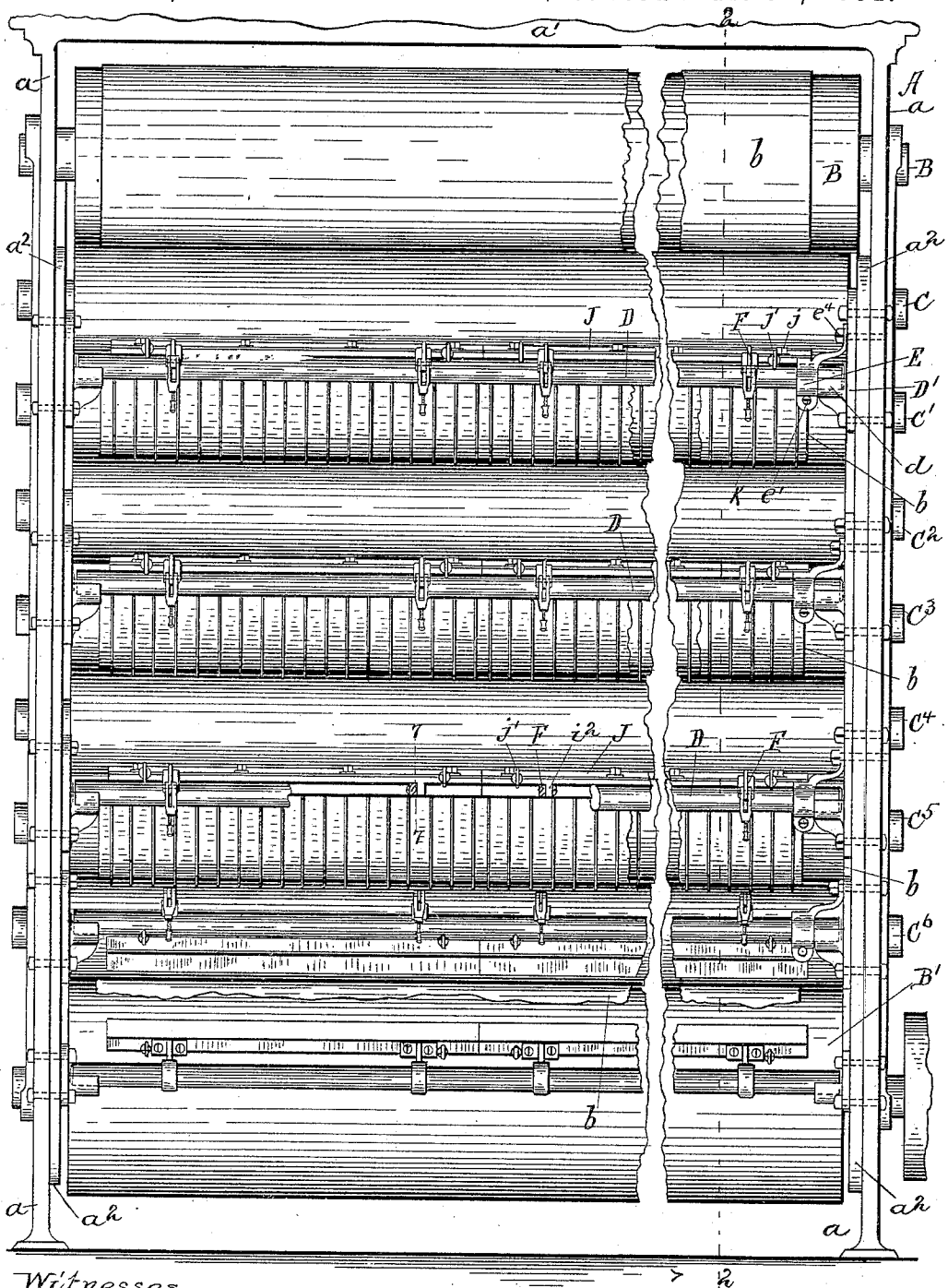
(No Model.) 2 Sheets—Sheet 1.

R. McALPINE.

CALENDER ROLL LEADER.

No. 449,353. Patented Mar. 31, 1891.



Witnesses
W. C. Curlis
A. M. Best

Fig 1

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Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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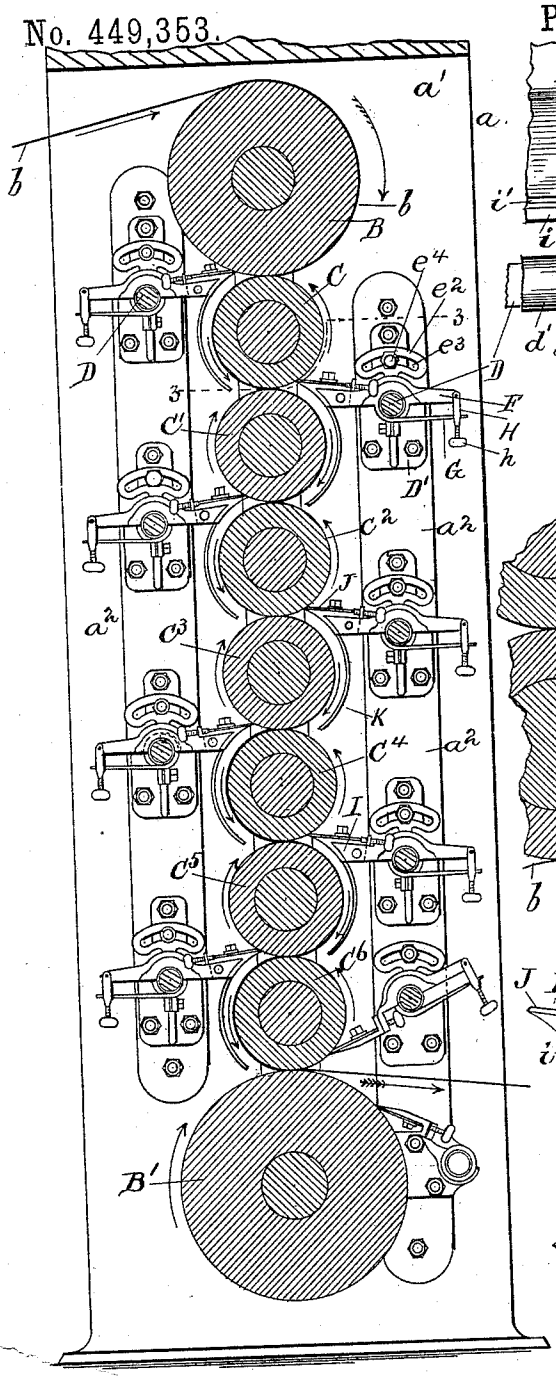


Fig 2

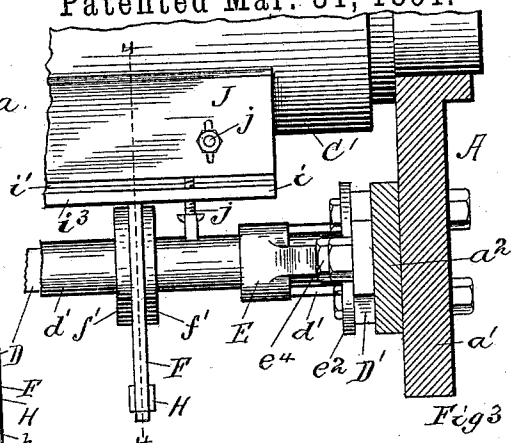


Fig 3

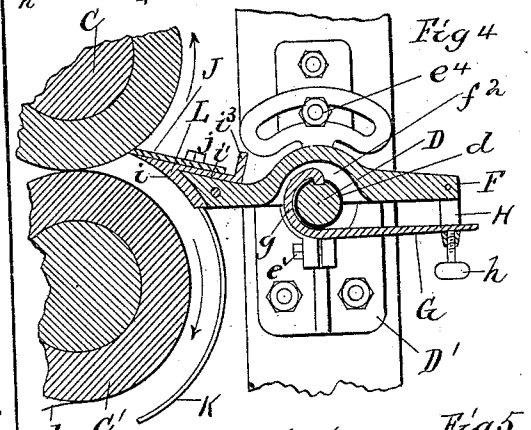


Fig 4

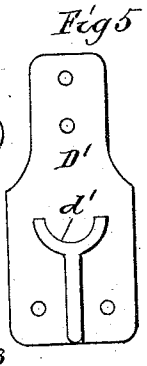


Fig 5

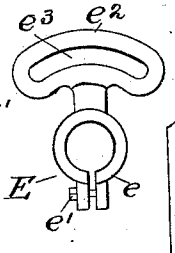


Fig 6

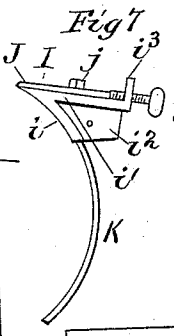


Fig 7

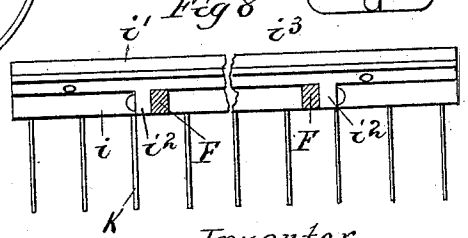


Fig 8

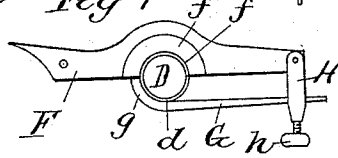


Fig 9

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Robert McAlpine
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT McALPINE, OF MARINETTE, WISCONSIN, ASSIGNOR TO LOUIS A. McALPINE, OF SAME PLACE.

CALENDER-ROLL LEADER.

SPECIFICATION forming part of Letters Patent No. 449,353, dated March 31, 1891.

Application filed June 20, 1890. Serial No. 356,145. (No model.)

To all whom it may concern:

Be it known that I, ROBERT McALPINE, a citizen of the United States, residing at Marinette, in the county of Marinette and State of Wisconsin, have invented certain new and useful Improvements in Calender-Roll Leaders, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of a roll-stack embodying my invention, the central portion partly broken away; Fig. 2, a vertical section of the same, taken on the line 2 2 of Fig. 1, and looking in the direction of the arrow thereon; Fig. 3, a detail plan section taken on the broken line 3 3 of Fig. 2; Fig. 4, a detail vertical section taken on the line 4 4 of Fig. 3; Fig. 5, a front elevation of the bracket-support for the rods carrying the "doctors;" Fig. 6, a similar view of the fastening and adjusting device for said rods; Fig. 7, a detail section of the doctor-bar, taken on the line 7 7 of Fig. 1; Fig. 8, a detail plan of the same, and Fig. 9 a side elevation of a doctor-supporting arm detached.

In the drawings, Figs. 1 and 2 are upon the same scale, but the remaining figures are upon a different and enlarged scale.

My invention relates to a machine for calendering paper as it comes from the drying-machine, this operation being effected by carrying the web of paper through and around a series of calender-rolls. These rolls are usually mounted in an upright frame—one above the other—and constitute what is known as a "stack" of calender-rolls.

The invention relates, especially, to the devices for controlling and directing the web of paper through the stack of rolls, whereby the action of these devices is made certain to avoid the damage occasioned by misdirection of the paper and to secure the ready and proper adjustment of these devices at all times.

I will proceed to describe in detail the construction and operation of a calendering-machine in which I have embodied my invention in practical form, and will then point out more definitely in claims the particular improvements which I believe to be new and wish to secure by Letters Patent.

In the drawings, A represents the upright frame, in which the calender-rolls are mounted, and which consists of the two upright standards *a*, joined by a cross-bar *a'* at their upper ends. At the upper end of this frame is the first roll B of the stack over which the web of paper *b* coming from the drier runs, as seen in Fig. 2. Immediately below this first roll are the regular calender-rolls which are also mounted in the frame and are of any number desired. In the drawings seven are shown, (designated as C C' C^2 C^3 C^4 C^5 C^6,) and immediately below the last of the series is a larger roll B', similar to the upper roll B from which the paper-web is conducted to any place desired, and to such mechanism as may be required for the subsequent manipulation of the paper. These rolls are all mounted in suitable journal-boxes supported in the uprights of the frame and adjustable or not, as may be desired. It will be understood, of course, that the web of paper is carried through this series of calender-rolls in the usual path, passing alternately from one side to the other of the stack, as indicated by the arrows in Fig. 2 of the drawings. Now, it is well known that in the use of these rolls, which of course revolve quite rapidly, the free end of the paper web has a tendency to cling to the surface of the rolls, so that there is some difficulty in leading the end of the web through the rolls at the commencement of operation or in case of a break. A device usually called the "doctor" has been used for the purpose of obviating this difficulty by turning the end of the paper away from the roll and so preventing it from winding around the latter, instead of passing down over the succeeding roll, as is required.

My present invention relates to the construction, mounting, and operation of this device. A series of round rods or bars D are mounted in the frame and arranged alternately on opposite sides of the roll-stack and each one about opposite the line of contact between the pair of rollers to which it is adjacent, though this location is a little below the said line of contact, as seen in Fig. 2. These rods are of any suitable material, either of wood or metal, and are preferably covered by a metal tube *d*, extending their entire

length. They are mounted at each end in brackets D′, which are fastened to the inside of plates a^2, that in turn are fastened, respectively, to each of the frame-standards and are provided with open sockets d', which receive the respective ends of the rods. At one end each rod is also provided with an adjusting-arm E, which is provided at one end with circular fork-arms e, adapted to receive the end of the rod and to be clamped thereto by means of a screw-bolt e', passing through their extremities, thus providing for securing the arm to the respective rods. The upper end of this arm forms a kind of cross-bar or T-head e^2, which is preferably curved and has a curved slot e^3 running its length. This upper portion is also bent outward away from the clamping portion of the arm, so as to stand in a plane outside of the latter, as seen in Figs. 1 and 3. The arm is clamped to the ends of the respective bars at the same side of the stack and at such a point on the bar as will bring the upper slotted end about in contact with the upper portion of its corresponding socket-bracket D′, to which it is secured by a clamping-bolt and nut e^4, as seen in Figs. 2 and 4 of the drawings. It is evident that with this device the rods are firmly fastened in any position desired, and at the same time are adjustable, so that they may be turned either to or from the calender-rolls.

Supporting arms or levers F are mounted on the rods D at suitable points for the purposes hereinafter explained, and at right angles to the said rods. These levers are mounted loosely on the rods in the following way: On the under side of each there is a concave recess or seat f about midway of the length of the lever, and the body of the latter is curved upward over this recess to form a kind of housing, as seen in Fig. 9. These recesses fit around the rods, so that the levers may be seated thereon by simply setting them upon the rods, as seen in Figs. 2 and 4. On each side of the lever narrow flanges f' project outward, which are curved to correspond with the shape of the recess, and in the inside of the latter a shallow groove f^2 is sunk around the seat. These supports are held upon their seats on the rods by means of a long spring G, arranged underneath each support and having its inner end provided with a bend or crook g, which fits around the back side of the round rod and is received within the groove f^2 in the arm, and its extremity is fastened to the rod, as seen in Fig. 4. The outer end of the spring is caught by a swinging loop H, which is pivoted to the outer end of the arm F, and the cross-bar of the loop is provided with a small set-screw h, which may be set up against the end of the spring, as is also seen in Fig. 4. These lever-supports are for the purpose of carrying the doctor, which is mounted upon their inner ends in the following way: Long bars I are fastened to the inner ends of the supporting-levers F. These metal bars are something in the shape of angle-iron; but the inner web i stands at an acute angle to the other web i', and is curved so that its inner face is concave and corresponds in its curvature to the convex curve of the calender-rolls, as seen in Figs. 4 and 7. At intervals along this angular bar, corresponding to the positions of the supporting-levers F, are short lugs i^2, extending backward toward the main supporting-rods. These lugs are perforated, as seen in Fig. 7, and are adapted to fit upon the side of the inner end of the supporting-levers, which are also perforated, as seen in Fig. 9, and bolts, being passed through these respective perforations, fasten the angular bars to the supporting-levers, as seen in Figs. 2 and 4. These angular bars are made in sections of convenient length and in number sufficient to extend the entire length of the calender-rolls, and two supporting-levers are provided for each section, one near each end thereof, as seen in Fig. 1. Of course the number of supporting-levers may be increased, if necessary, for security. The doctor plate or knife J is applied to the web i' of these angular bars, being made in sections to correspond to the sections of the latter. The sections of the doctor-plate are fastened to the immediate supporting-bar by means of small screws j, which pass through short slots in the plates into threaded perforations in the web i'. This provides for securely fastening the doctor plates in position, and at the same time for such adjustment in and out as may be necessary. This adjustment is effected by means of set-screws j', arranged immediately back of the rear edge of the plates and set in threaded apertures in an upright flange i^3, at the rear edge of the web i', as seen in Fig. 7. The front edge of the doctor-plates is beveled in shape to exactly conform to the surface of the calender-rolls, so that when thrown upward into contact with the latter the contact touch will be close and uniform. Curved rods K are fastened at their upper ends to the curved web i of the angular bars I and depend therefrom downward in a curve corresponding to the circumference of the calender-rolls, so that when the parts are in position they will extend downward from each doctor around the roll immediately below and a little distance therefrom, as seen in Figs. 2 and 4, thereby forming a directing shield and guide on alternate sides of the stack. These rods are fastened to the bars by casting them into the latter; or they may be fastened to the plate after casting by screws or in any other suitable way.

Now, it is obvious that when the doctor is mounted in position, as seen in Figs. 2 and 4, the action of the spring G will be to turn the supporting-levers F on their seats in a direction to throw their inner ends upward, and thereby the respective doctor-plates will be held in contact with the respective rolls immediately above them, in which position they act in the well-known way to separate the web from the roll and turn it downward

around the next one below, the curved rods K then serving to guide the end of the web around the latter and in between it and the next lower roll. The supporting-levers, being mounted loosely on the main supporting-rods, are always under the influence of their respective springs, and the latter are independent of each other, so that the position of contact between the doctor-plates and rolls is insured with almost absolute certainty. Then each spring is independently adjustable by means of the set-screw inserted in its respective keeping-loop, which further provides for the proper action of the springs. The supporting-rods D are also adjustable, as already explained, and the individual doctor-plates are also adjustable in and out upon their immediate supporting-bars. With all these provisions for adjustment it is obvious that the required position of the doctor-plates can be obtained with great precision, and at the same time all wear is readily taken up, so that the independent doctor-plates are available for use the greater portion of their width. The peculiar mounting of the main supporting-rods D also provides for the ready detachment of the rods and everything mounted thereon whenever required for any purpose whatever.

The doctors are arranged, of course, alternately on opposite sides of the calender-stack, as seen in Fig. 2, in the proper positions to turn the leading end of the paper web down first on one side and then on the other, thereby providing for automatically leading the end of the web through the calender-rolls and out at the lower pair thereof, where a doctor is arranged in contact with each roll, so as to properly direct the web out from the stack, as is also seen in Fig. 2.

There are modifications which may be made in some of the details of construction which are here shown and described. Hence I do not wish to be understood as limiting myself in all particulars to the specific details which have been described above and are shown in the drawings, but desire to include in my invention such changes as may be merely mechanical.

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

1. In a paper-calendering machine, the calender-rolls, in combination with the main supporting-rods D, the supporting-levers F, set loosely on said rods by circular recesses in the under side of each doctor-plate carried by said supporting-levers, and springs connected to both the rods and the respective levers, and adapted both to hold the said levers upon the rods and to turn the doctor-plates against their respective rolls, substantially as and for the purposes specified.

2. The main supporting-rods D, in combination with the supporting-levers F, provided with concave seats *f* and an interior groove f^2, the springs G, bent at their inner ends and arranged within the said groove and fastened to the main rods, and the swinging loop H, arranged to receive the outer end of said springs and provided with set-screw *h*, substantially as and for the purposes specified.

3. The main supporting-rods D, in combination with the doctors mounted thereon, the open-socket brackets D′, and a spring-arm fastened to the rods at one end and detachably secured at the other end to the said brackets, substantially as and for the purposes specified.

4. The main supporting-rods D, which carry the doctors, in combination with the doctors mounted thereon, the open-socket brackets D′, fastened to the stack-frame, and the fastening-arms E, provided with clamping-arms *e* at one end, and a slotted T-head e^2 at the other end, substantially as and for the purposes specified.

5. The supporting-levers F, free to turn on their supports, in combination with the doctors secured to said levers and the angular bar I, the web *i* of which is curved to correspond to the curvature of the rolls, while the other web *i′* is adapted to receive the doctor-plates, substantially as and for the purposes specified.

6. The freely-vibrating supporting-levers F, in combination with the angular bars I, attached thereto and having the curved web *i* and straight web *i′*, the doctor-plates J, adjustably secured to the web *i′* of the bars, and the adjusting-screws *j′*, substantially as and for the purposes specified.

7. The freely-vibrating supporting-levers F, in combination with the angular bars I, provided with a curved web *i*, the doctor-plates J, mounted on said bars, the curved rods K, fastened to the curved web *i*, and the calender-rolls of the stack, substantially as and for the purposes specified.

ROBERT McALPINE.

Witnesses:
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C. S. REEVE.