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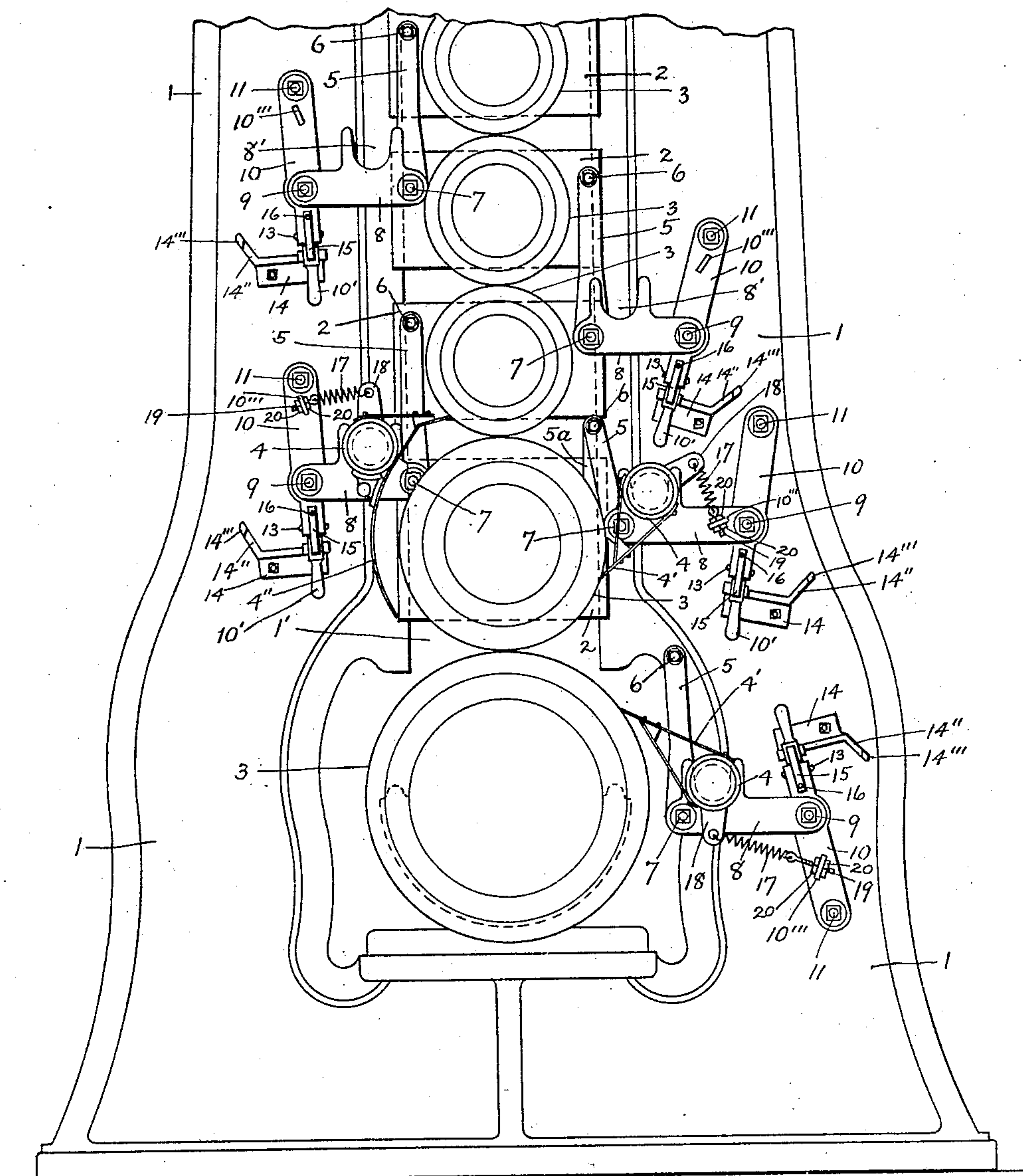
R. SMITH.

CALENDER FEED FOR ROLLS OF PAPER MAKING MACHINES.

APPLICATION FILED JULY 27, 1907.

2 SHEETS—SHEET 1.

Fig. 1



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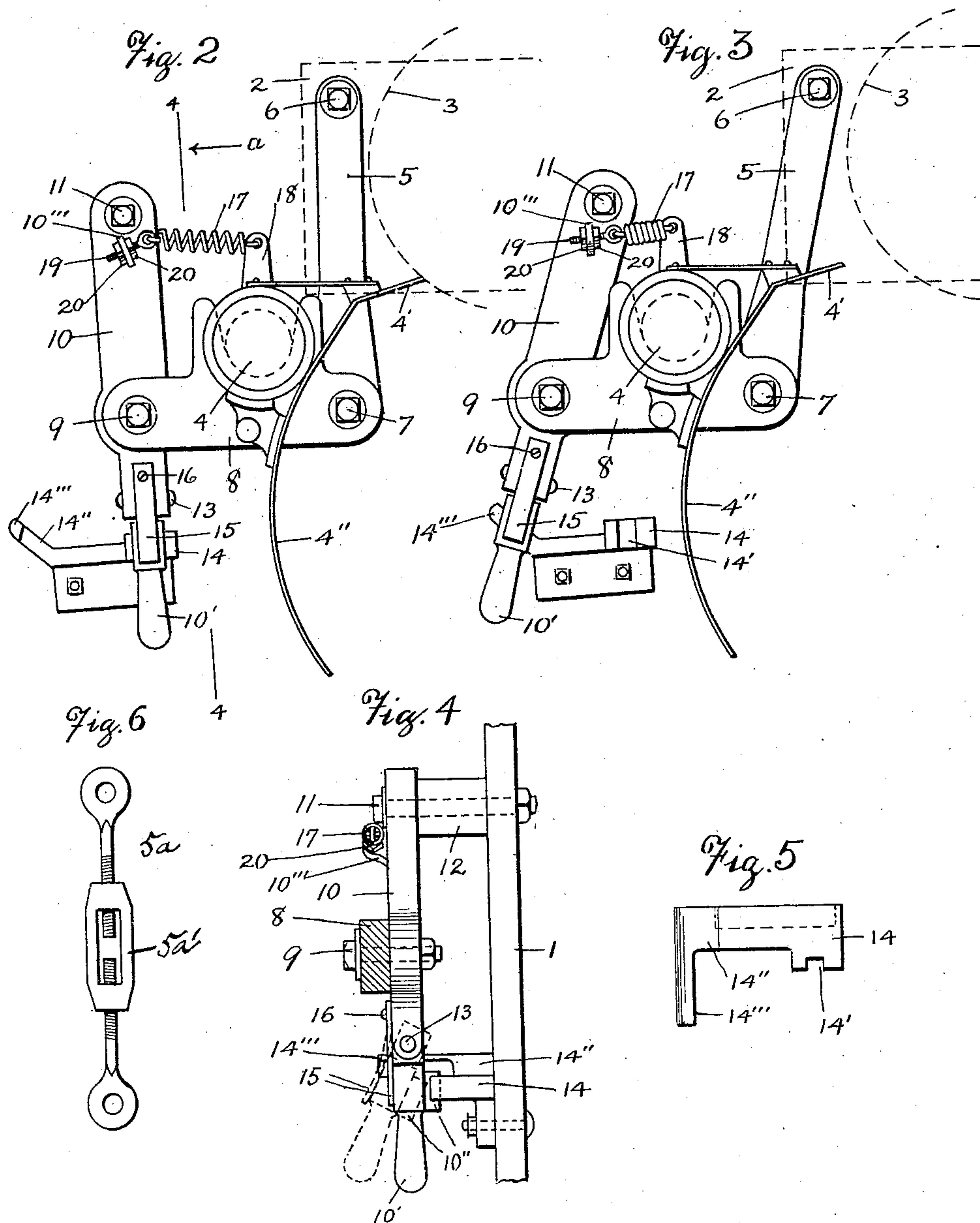
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UNITED STATES PATENT OFFICE.

RICHARD SMITH, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO SMITH PAPER MACHINERY COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

CALENDER-FEED FOR ROLLS OF PAPER-MAKING MACHINES.

No. 875,386.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed July 27, 1907. Serial No. 385,775.

To all whom it may concern:

Be it known that I, RICHARD SMITH, a citizen of the Dominion of Canada, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Calender-Feeds for Rolls of Paper-Making Machines, of which the following is a specification.

My invention relates to the calender feed for rolls of paper making machines, and particularly to mechanism for supporting and moving the doctors.

The object of my invention is to provide improved mechanism for supporting and moving the doctors, which is of simple construction and operation.

In my improvements, the mechanism for supporting a doctor at each end, is connected to the box or bearing of the roll that the doctor comes in contact with, thus insuring the positive vertical movement of the doctor with the vertical movement of the roll. The mechanism for supporting the doctors at each end, is so constructed, that the doctors can be readily removed without the removal of any bolts or screws, and when the doctors are replaced, each doctor will occupy its exact former position, and consequently fit the roll the same as it did before its removal. If it is desired to remove one or more of the rolls from the stack, it can be done without taking down the reed. The mechanism for supporting the doctors at each end, and for moving the doctors, is alike for all of the rolls, and consequently is interchangeable in case of repairs or breakage.

The mechanism that supports a doctor at each end, is so constructed, that by means of a single handle, held in position by a spring attachment, the whole doctor can be swung free from its roll instantly, so that its edge may be readily cleaned, and then be instantly moved back into contact with the roll. A fixed stop limits the outward movement of a doctor. The edge of a doctor is kept in constant contact with the roll by a spring, which is adjustable, so that any required tension may be placed on the doctor, and the movement of the doctor up and down, to suit the position of the roll when the paper is passing through, is entirely independent of said spring, and it is not necessary to exert a heavy pressure upon the doctor to keep it in

constant contact with the roll, so that the heating and scratching ordinarily resulting is prevented.

My invention consists in certain novel features of construction of my improvements as will be hereinafter fully described.

Referring to the drawings:—Figure 1 is an inside view of one end of a calender stack, broken away at the top, and shows my improved mechanism for supporting and moving the doctors. Fig. 2 shows, on an enlarged scale, my mechanism for supporting one end of a doctor; a portion of a roll, and its box or bearing at one end is shown by broken lines. Fig. 3 corresponds to Fig. 2, but shows the doctor moved away from the roll, and the supporting mechanism in its opposite position. Fig. 4 is a section, on line 4, 4, Fig. 2, looking in the direction of arrow *a*, same figure; the broken lines show the handle in its unlocked position. Fig. 5 is a plan view of the locking plate, detached, and, Fig. 6 shows a modified construction of the link or lever of the doctor supporting mechanism, detached.

In the accompanying drawings, 1 is the end frame of a calender stack. It will be understood that there are two end frames, only one is shown in the drawings, and each end frame has a central vertical opening 1' therethrough to receive and hold the boxes or bearings 2 for the calender rolls 3, of which five are shown in the drawings. The doctors 4, one for each roll 3, are arranged upon opposite sides of the rolls, and alternately, as is customary, except the doctor for the lower roll is on the same side as the doctor for the second roll. Each doctor 4 is provided with a scraper 4', as is customary, and some of the doctors are also provided with an inclined or curved plate 4'', as is customary, to direct the paper sheet between the rolls. All of the above mentioned parts may be of the usual and well known construction, and as shown and described in my patents, No. 743,403, and No. 839,966.

I will now describe my improvements in the mechanism for supporting the doctors 4 at each end, and for moving them into, and locking them in operative position, with the scraper on each doctor yieldingly held in contact with its roll by a spring, and for moving them out of contact with the rolls.

Referring to Fig. 2, the mechanism for

supporting and moving the doctor shown in said figure, corresponds to the lower mechanism shown at the left in Fig. 1. In said mechanism, 5 is a vertically extending lever or link, having its upper end pivotally attached, in this instance by a bolt 6, to the upper left hand corner of the box or bearing 2 for the third roll 3. The lower end of the link 5 is pivotally connected, by a bolt 7, with one end of a casting or bar 8, which has on its upper edge an open end slotted portion 8', to form a bearing for the end of the doctor, which end is preferably of reduced diameter. The other end of the casting or bar 8 is pivotally attached, by a bolt 9, to a swinging hand operated lever 10, preferably near the central portion of said lever. The lever 10 extends in a vertical direction, and is pivotally attached at one end, in this instance its upper end, by a bolt 11 to the end frame 1. A bushing or collar 12 on the bolt 11, acts to hold the lever 10 out from the end frame 1, as shown in Fig. 4. The other end of the lever 10 is provided with a movable handle 10', one end of which is pivotally secured, by a pin or stud 13, in the fork or yoke-shaped end on the lever 10. The handle 10' has upon its inner side a projection 10'', which is adapted to extend into a notch or recess 14' in a plate or stand 14, bolted to the end frame 1. A flat leaf spring 15 is attached at one end, in this instance by a screw 16, to the lever 10, and bears at its free end against the handle 10', and acts to hold the handle in locked position with the projection 10'' in the notch 14' in the plate 14. On the plate 14 is preferably a projection 14'' which has a side extension 14''' thereon, which acts as a stop to engage the handle 10', as shown in Fig. 3, and limit the outward movement of said handle, and with it the bar or support 8 for the doctor 4. A helically coiled contraction spring 17 is attached at one end to a lug or ear 18 on the doctor 4, and at its other end to a threaded pin 19 moving loosely in a hole in a lug 10''' on the lever 10, and having two nuts 20 thereon, by means of which the position of the pin 19 is adjusted to regulate the tension of the spring 17. The spring 17 acts to yieldingly hold the edge of the scraper 4' on the doctor 4, in contact with the roll 3.

In the case of the support for the lowest doctor 4, shown in Fig. 1, the vertically extending pivoted lever or link 5 is pivoted directly to the frame 1, and the operating handle lever 10 is pivoted at its lower end, instead of at its upper end, and the position of the locking plate 14 is reversed, and it is located above the doctor. In the case of the second doctor, on the right hand side in Fig. 1, the vertically extending pivoted lever or link 5, instead of being pivoted directly to the box or bearing 2 of the roll 3, is pivoted to the upper end of a bar or stand 5^a, secured

at its lower end to the box or bearing 2 of the roll 3, and extending above said box or bearing. In the case of the other doctors 4, all of the vertically extending levers or links 5 are pivoted directly on the boxes or bearings 2 of the rolls 3, and the supports for the doctors at each end are connected, through the levers or links 5, directly with the box or bearing at each end of the roll with which each doctor acts, so that any vertical movement of the box or bearing of a roll causes the positive movement of its doctor.

When it is desired to move a doctor away from its roll, the lock handle 10' is moved outwardly, as shown by broken lines in Fig. 4, against the action of the spring 15, to release the extension 10'' on said handle from the notch 14' in the plate 14; the lever 10 is then moved outwardly until it engages the notch 14', and the outward movement of the lever 10, moves outwardly the bar or support 8 of a doctor 4, at each end, through the swinging movement of the levers or links 5. The edge of the scraper 4 is then free to be cleaned, if desired, and the doctor may be removed, or its roll may readily be removed. When it is desired to move the doctor into operative position relative to its roll, the handle 10' of the lever 10 is moved inwardly, and the projection 10'' thereon engages the notch 14' in the plate 14, to lock the handle in position, and positively hold the bar or support 8 in its inward position, with the doctor 4 and its blade 4' in operative position relative to its roll.

In Fig. 6 I have shown a modified construction of the link or lever 5. In said figure, the lever or link 5^a is shown as adjustable, comprising two threaded eye-bolts, one with a right hand thread, and the other with a left hand thread, and a turn buckle 5^a.

The advantages of my improvement will be readily appreciated by those skilled in the art.

It will be understood that each doctor is supported, and movable at each end, by the mechanism shown in the drawings at one end of the doctors.

It will be understood that the details of construction of my improvements may be varied if desired.

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

1. In a calender feed, the combination with the box or bearing at the end of a calender roll, of mechanism for supporting the end of a doctor, said mechanism pivotally connected with said box or bearing, and having a vertical movement therewith.

2. In a calender feed, the combination with the box or bearing at the end of a calender roll, of mechanism for supporting the end of a doctor, said mechanism pivotally connected with said box or bearing, to move

therewith, and means for moving said mechanism toward and away from said roll.

3. In a calender feed, the combination with the box or bearing at the end of a calender roll, of mechanism for supporting the end of a doctor, said mechanism pivotally connected with said box or bearing, to move therewith, and means for moving said mechanism toward and away from said roll, and means for locking said mechanism in its inward position.

4. In a calender feed, the combination with the box or bearing at the end of a calender roll, of mechanism for supporting the end of a doctor, said mechanism pivotally connected with said box or bearing, to move therewith, and means for moving said mechanism toward and away from said roll, and means for locking said mechanism in its inward position, and a stop for limiting the outward movement of said mechanism.

5. In a calender feed, the combination with the box or bearing at the end of a calender roll, of a lever or link pivotally attached, and connected with said box or bearing at one end, and pivotally connected at its other end to a bar or support for one end of a doctor, and said bar or support, pivotally connected at its other end with a lever, pivotally supported on the frame, and said lever, having a movable handle attached thereto, and adapted to engage a plate or locking device, to hold and lock said lever, and to be moved out of engagement with said plate or locking device, and into engagement with a stop, to limit the movement of said lever in one direction.

6. In a calender feed, the combination with the box or bearing at the end of a calender roll, of a lever or link pivotally attached to said box or bearing at one end, and pivotally connected at its other end to a bar or support for one end of a doctor, and said bar or support, pivotally connected at its other end with a lever, pivotally supported on the frame, and said lever, having a movable handle attached thereto, and adapted to engage a plate or locking device, to hold and lock said lever, and to be moved out of engagement with said plate or locking device, and into engagement with a stop, to limit the movement of said lever in one direction.

7. In a calender feed, the combination with the box or bearing at the end of a calender roll, of a lever or link, pivotally attached, and connected with said box or bearing at one end, and pivotally connected at its other end to a bar or support for one end of a doctor, and said bar or support, pivotally connected at its other end with a lever, pivotally supported on the frame, and said lever, having a handle pivotally attached thereto, and adapted to engage a plate or locking device, to hold and lock said lever, and to be moved out of engagement with

said plate or locking device, and into engagement with a stop, to limit the movement of said lever in one direction, and a spring connected with said pivoted lever or bar, and with the doctor, to hold the doctor in yielding engagement with its roll.

8. In a calender feed, the combination with the box or bearing at the end of a calender roll, of a lever or link, pivotally attached, and connected with said box or bearing at one end, and pivotally connected at its other end to a bar or support for one end of a doctor, and said bar or support, pivotally connected at its other end with a lever, pivotally supported on the frame, and said lever, having a handle pivotally attached thereto, and adapted to engage a plate or locking device, to hold and lock said lever, and to be moved out of engagement with said plate or locking device, and into engagement with a stop, to limit the movement of said lever in one direction, and an adjustable spring connected with said pivoted lever or bar, and with the doctor, to hold the doctor in yielding engagement with its roll.

9. In a calender feed, the combination with the box or bearing at the end of a calender roll, of a lever or link, pivotally attached, and connected with said box or bearing at one end, and pivotally connected at its other end to a bar or support for one end of a doctor, and said bar or support, pivotally connected at its other end with a lever, pivotally supported on the frame, and said lever, having a handle pivotally attached thereto, and a spring for holding said handle in locked position, and means for locking said handle and the lever carrying said handle, and means for engaging said handle or lever, to limit the swinging movement thereof.

10. In a calender feed, the combination with the box or bearing at the end of a calender roll, of mechanism for supporting the end of a doctor, said mechanism comprising a pivoted lever or link, attached to said box or bearing, to move therewith, a pivoted lever attached to the frame, and an intermediate connection between said levers, said connection adapted to have a movement in a vertical plane with said box or bearing, and also a movement in a horizontal plane.

11. In a calender feed, the combination with the box or bearing at the end of a calender roll, of mechanism for supporting the end of a doctor, said mechanism comprising a pivoted lever or link, attached to said box or bearing, to move therewith, a pivoted lever attached to the frame, and an intermediate connection between said levers, said connection adapted to have a movement in a vertical plane with said box or bearing, and also a movement in a horizontal plane, and means for moving said connection toward and away from a roll, and for locking it in its inward position, and a spring connected

with said supporting mechanism, and with the doctor, to hold it in yielding engagement with its roll.

12. In a calender feed, the combination
5 with a box or bearing at the end of the calender roll, of mechanism for supporting the end of a doctor, said mechanism comprising an adjustable lever or link attached to said
10 box or bearing to move therewith, a pivoted lever attached to the frame, and an intermediate connection between said levers, said connection adapted to have a movement in a vertical plane with said box or bearing, and also a movement in a horizontal plane.

13. In a calender feed, a doctor, a tension
15 device normally operative to yieldingly hold the edge of the scraper on the doctor in con-

tact with the roll, and means for supporting said doctor at each end and for moving the doctor toward and away from its roll, said 20 means comprising a lever or link pivotally attached at one end, and pivotally connected at its other end to one end of a bar or support, and said bar or support pivotally connected at its other end to a lever, and said 25 lever pivotally supported, and means for moving said last mentioned lever, and means for locking said lever in its inward position, and means for limiting the outward movement of said lever.

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