

(No Model.)

W. F. McCARTHY.

CALENDER PROTECTOR.

No. 362,294.

Patented May 3, 1887.

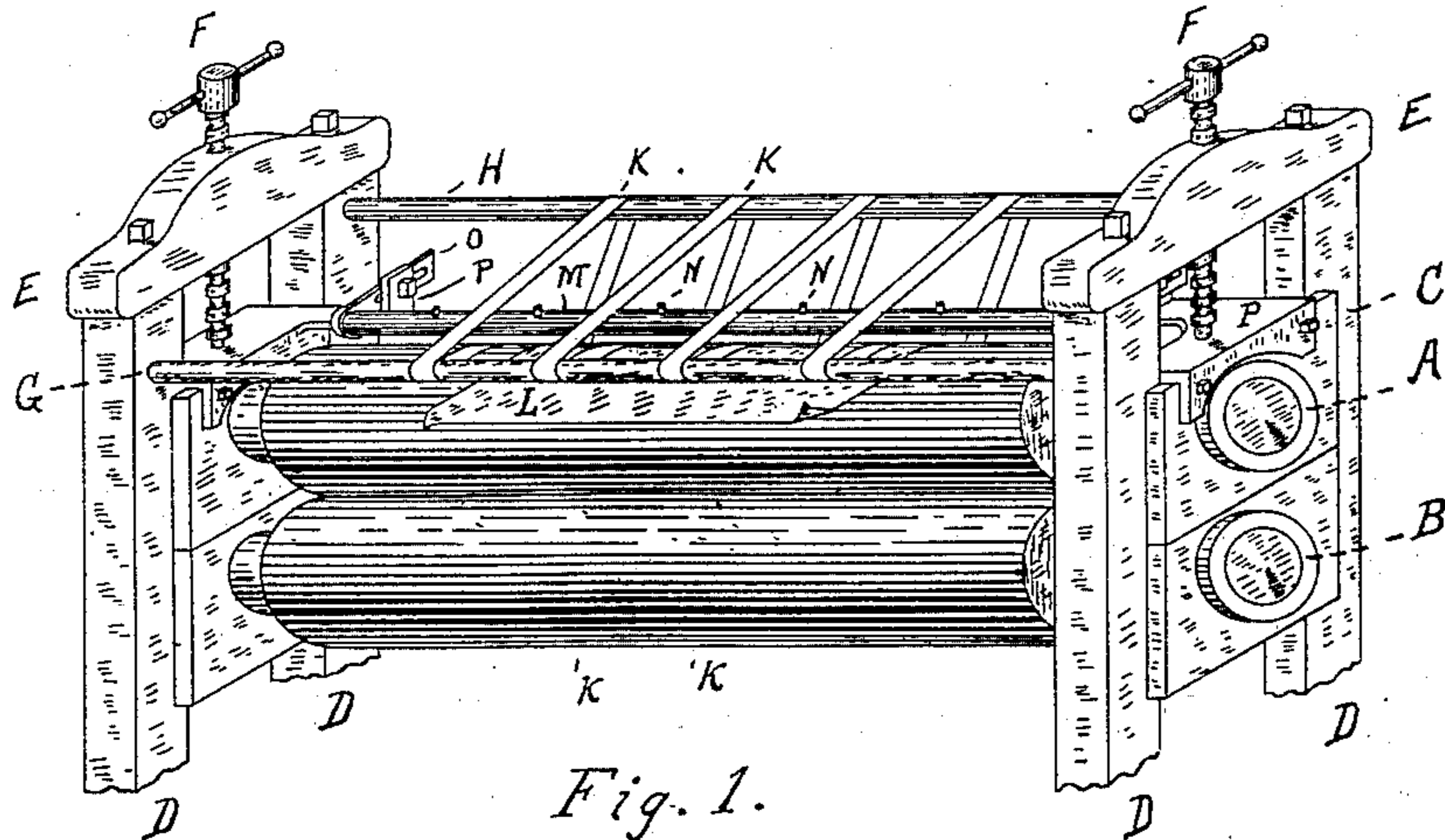


Fig. 1.

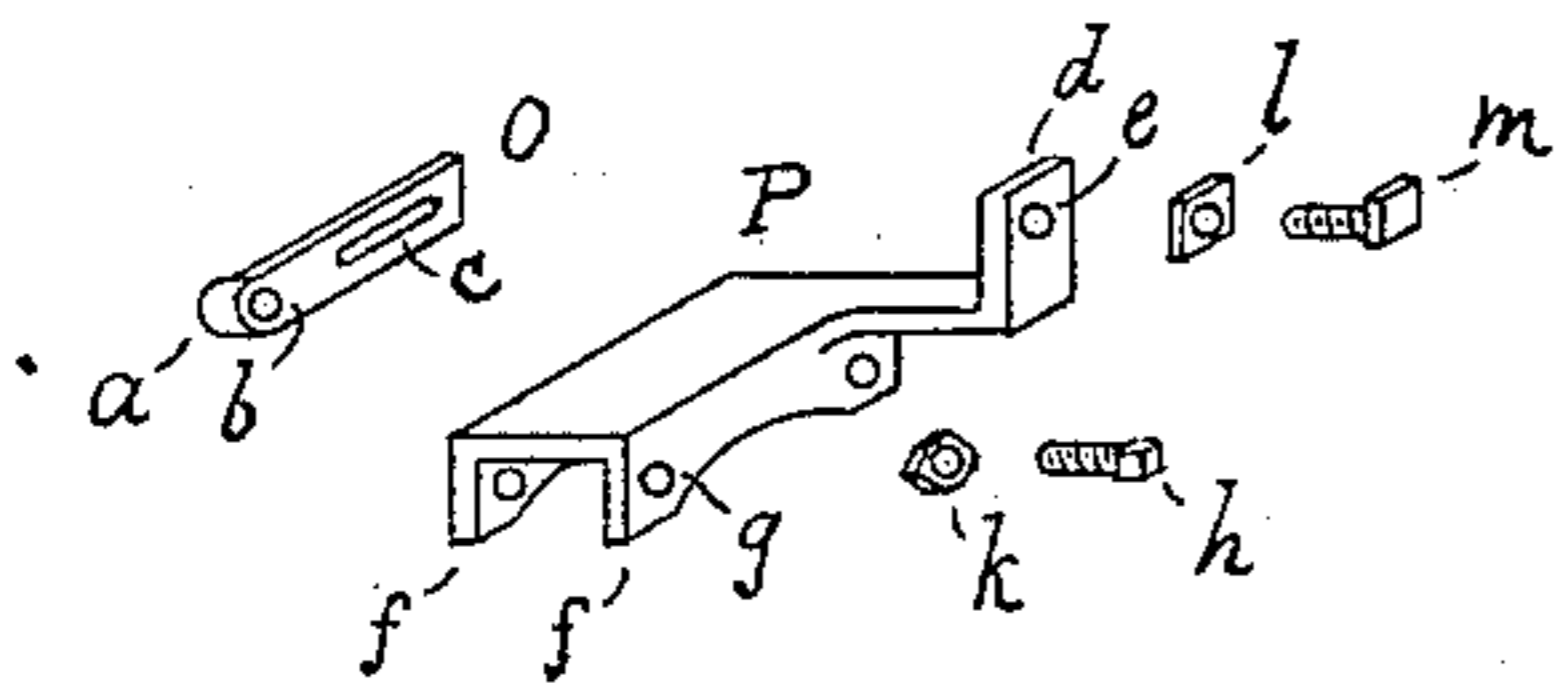


Fig. 2.

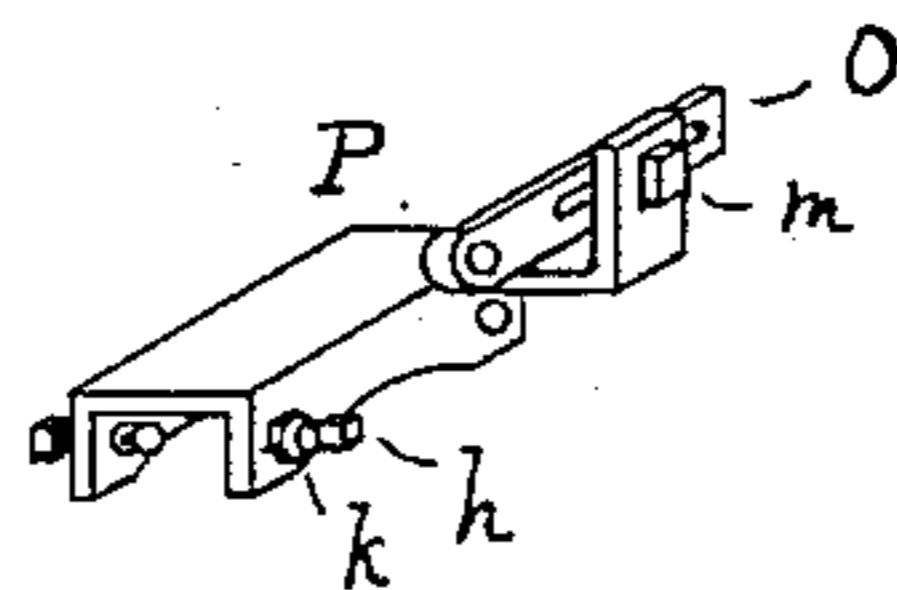


Fig. 3.

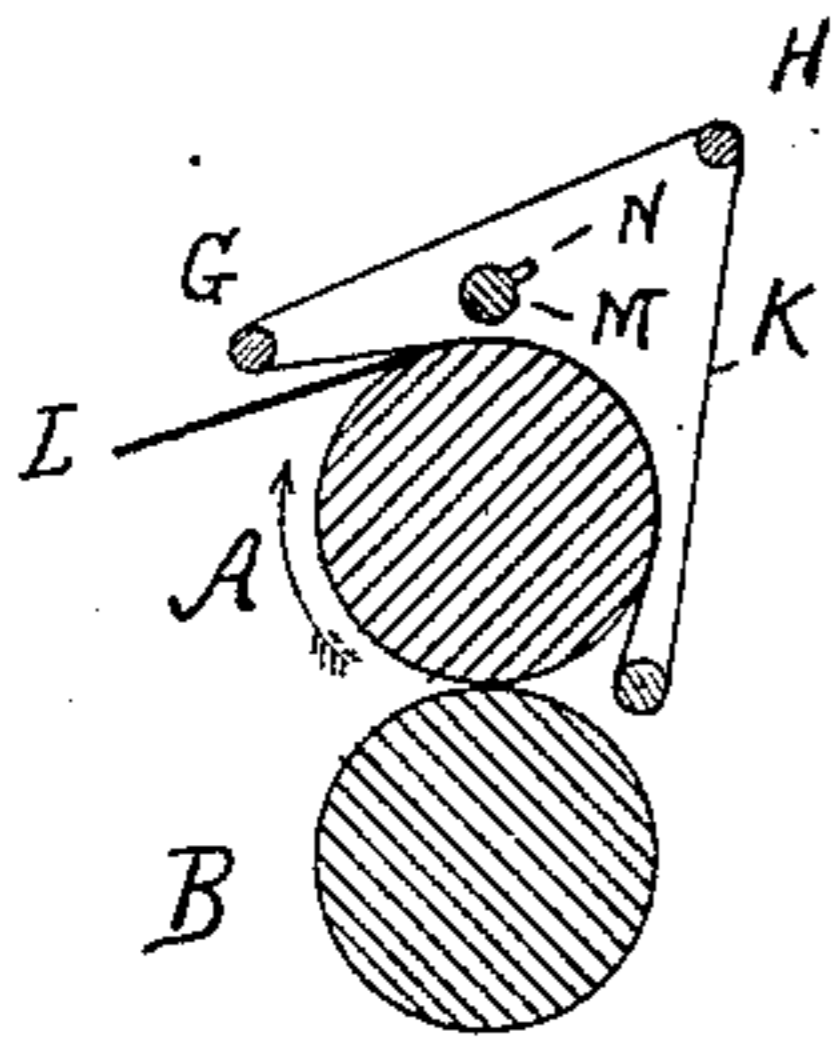


Fig. 4.

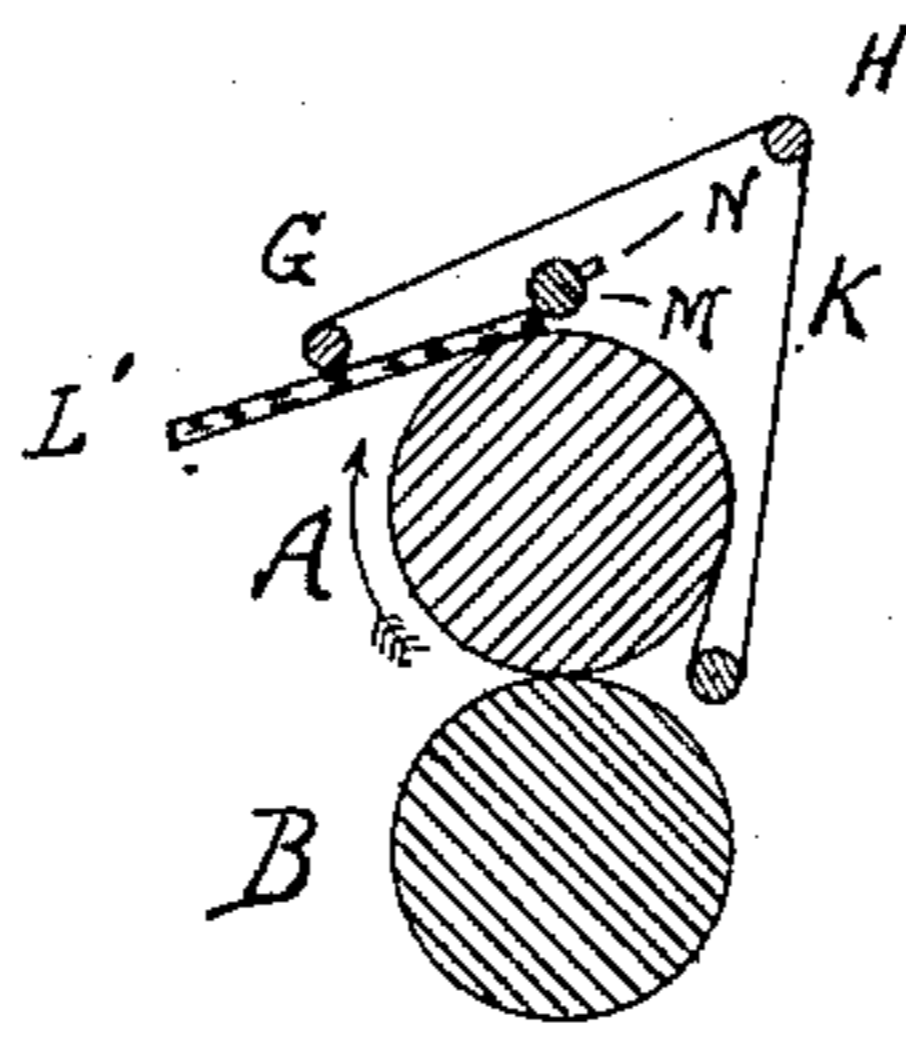


Fig. 5.

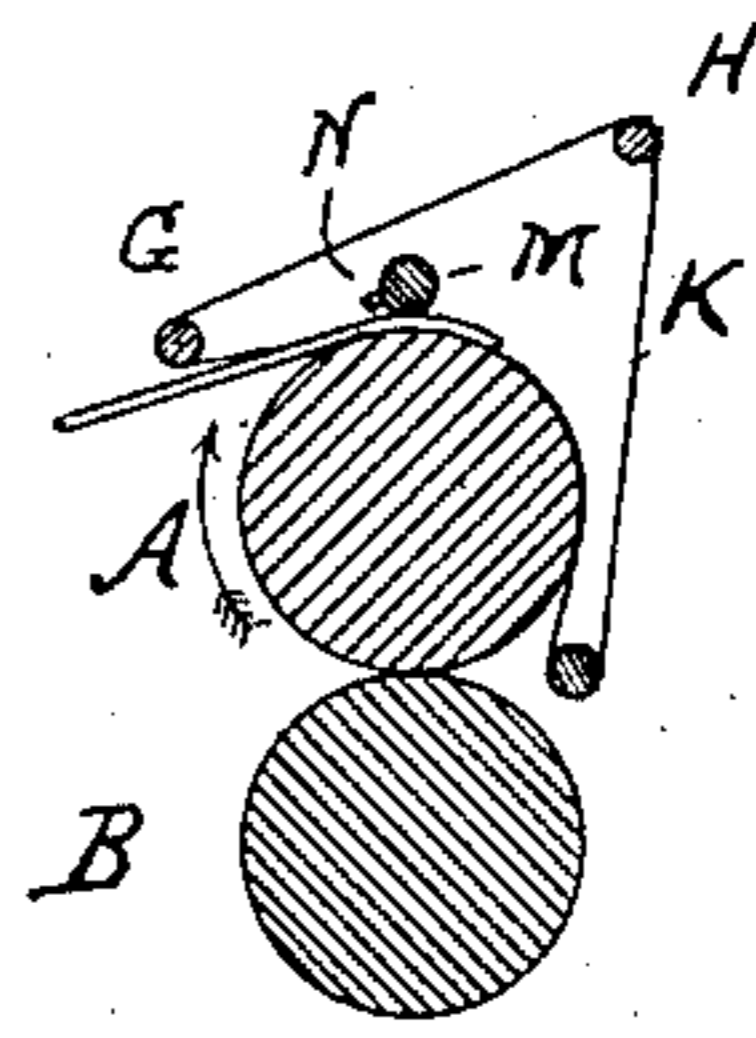


Fig. 6.

Witnesses _____

A. G. Holman
A. H. Chapman

Inventor__

W. F. McLoarchy,
By: James T. Chapman,
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM F. McCARTHY, OF HOLYOKE, MASSACHUSETTS.

CALENDER-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 362,294, dated May 3, 1887.

Application filed December 2, 1886. Serial No. 220,451. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. McCARTHY, of Holyoke, in the county of Hampden and Commonwealth of Massachusetts, have invented a new and useful Improvement in Calender-Protectors, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

My invention relates to devices for protecting or guarding the feed-rolls of sheet-calendering machines, to prevent the accidental feeding to the machine of more than a single sheet of paper at a time, and also to prevent the entrance between the rolls of a sheet of paper of greater thickness than that for which the machine is set. Heretofore such guard or protecting device has consisted of a bar secured to the frame of the machine and extending the full length thereof above the feed-roll, said bar having rigid arms adjustably connected therewith and extending downwardly toward the feed-roll, the distance between the ends of said arms and the periphery of the roll being slightly greater than the thickness of the paper to be calendered. When a change is to be made to thicker or thinner paper, each arm is adjusted to a higher or lower position to correspond therewith. This device, besides necessitating the loss of much time in the independent adjustment of each arm, is open to the further objections that the arms being rigid are liable to be broken off when a thick sheet of paper or card-board is carried against them by the feed-roll, and that, since the arms necessarily extend downwardly between the bands which guide the paper to and around the rolls, they interfere with the lateral adjustment of said bands to suit different widths of paper.

The object of my invention is to produce a protecting device which will obviate the objections above noted, and at the same time constitute a more efficient guard to prevent the entrance to the rolls of sheets of improper thickness.

To this end my invention consists in a protector composed of a bar, preferably in the form of a roll, adjustably supported above the feed-roll in such manner as to lie wholly within the line of travel of the guiding-bands.

My invention consists, further, in a pro-

jector composed of a roll adjustably mounted upon the journal-boxes of the feed-roll above the latter, said roll being provided with a series of detents for arresting the progress of sheets of improper thickness between said roll and the feed-roll, in the manner hereinafter described.

My invention, furthermore, comprises certain details of construction connected with the mounting of said roll, hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like letters designate like parts in the several views, Figure 1 is a view in perspective of so much of a sheet-calendering machine with my invention applied thereto as is necessary to show the operation thereof. Fig. 2 is a perspective view showing in detail the parts which constitute one of the brackets for supporting the detent-roll. Fig. 3 is a similar view showing said parts assembled to form the bracket. Figs. 4, 5, and 6 are sectional views illustrating the operation of my invention, as hereinafter described.

The letters A and B designate, respectively, the feed-roll and the first paper-roll of a sheet-calendering machine, the remaining rolls being omitted from the drawings. It will be understood, however, by those skilled in the art that usually five of these rolls, arranged in a substantially-vertical plane, are employed, the steel rolls alternating with the paper-rolls, and that the rolls being properly adjusted relatively to each other to receive paper of a certain thickness, the paper is fed to the feed-roll one sheet at a time, and is so guided by bands that it passes between each two rolls and issues from the last with a calendered surface.

The letter C designates one of the journal-boxes in which the feed-roll is supported at each end, the journal-boxes of each roll being grooved at the ends to receive and have vertical movement upon the uprights D of the frame of the machine, said uprights being connected at each end by the cross-beams E, as shown. By thus supporting said journal-boxes provision is made for a vertical yielding of the rolls to admit paper of various degrees of thickness, the amount of such yielding movement,

however, being regulated and controlled by the screws F, mounted in the cross-beams E.

The letters G and H designate the band-rolls, around which pass the bands or tapes K, which guide the paper in its passage through the rolls. These bands are increased or decreased in number and placed at various distances apart, to correspond with the width of the paper to be calendered.

L, in Figs. 1 and 4, designates a sheet of paper at the instant of being grasped between the bands and the feed-roll as it is fed to the machine.

The construction as thus far described constitutes the ordinary sheet-calendering machine, and when proper care is taken by the operator to feed no more than a single sheet at a time, and when the paper is of uniform thickness throughout, nothing further is required to enable such machine to successfully accomplish its function; but when, as is always liable to occur, the operator feeds in two sheets instead of one, or when, owing to defects in its manufacture or to the accidental mixing of different grades, the paper is made up of sheets of different degrees of thickness, more or less serious damage is sure to result to the machine, for the rolls, being set to receive a single sheet of a specified thickness, cannot yield sufficiently to receive two sheets, or even a single sheet of greater thickness, and consequently when the thicker substance is drawn between them they are either forced from their bearings or are fractured at some point between their bearings, in either case wrecking the machine. This danger has led, as hereinbefore stated, to the use of a protector or guard to intercept such double or thicker sheets and prevent their entrance between the rolls.

To overcome the objections to which the device heretofore used is open, as above specified, I have devised the means which I will now proceed to describe.

The letter M designates a bar, preferably made in the form of a roll, as shown, having projecting therefrom at intervals the detents N, which may be pointed or provided with angular corners, for a purpose presently described. The roll M is adjustably supported at each end by a bracket, P, said brackets having downwardly-projecting flanges *f*, whereby they are adapted to be secured to the upper sides of the journal-boxes C of the feed-roll, as shown in Fig. 1, by means of the set-screws *h*, passing through holes *g* therein, and the set-nuts *k*. (See Figs. 2 and 3.) The letter O designates an adjusting-bar having slot *c* therein and having at one end a journal-bearing, *a b*, for the end of roll M. One of these bars O is secured to each of the brackets P by a bolt, *m*, passing through a hole, *e*, in an up-turned arm, *d*, on the bracket and through slot *c* in the bar, and by a nut, *l*, turned upon the bolt, which locks said parts together.

When the roll M is mounted in the bearings *a b*, it is obvious that by loosening the nuts *l* the said roll can be adjusted both vertically

and horizontally, and that, being supported at the ends only, it lies wholly within the line of travel of the bands K, which bands can therefore be adjusted laterally or removed from and replaced on the machine without regard to said roll. The roll is supported in the bearings *a b* so as to revolve freely, and the normal position of the detents N thereon should be substantially that shown in Figs. 4 and 5.

The operation is as follows: Supposing the thickness of the paper to be calendered to be one-sixteenth of an inch, the screws F will be set to allow the feed and other rolls a yielding capacity to correspond therewith, and the roll M will be so adjusted with reference to the feed-roll, by means of the bars O, bolts *m*, and nuts *l*, that paper of that thickness will pass freely beneath said roll without touching it, as shown in Fig. 4, the feed-roll revolving in the direction indicated by the arrow in said figure. So long as this limit in thickness is not exceeded the roll M remains idle; but should the operator inadvertently present two or more sheets to the machine at once, as indicated at L' in Fig. 5, said sheets will contact with said roll and be arrested in their progress, as shown in said figure, whereupon the operator is advised of and can rectify his error, either by stopping the machine and removing the sheets, or, when the paper is of sufficiently strong texture, by quickly withdrawing them from between the guiding-bands and the periphery of the feed-roll.

If the carelessness of the operator were the only contingency to be provided against, the roll M would accomplish its function, as just described, without the detents N, and need not be cylindrical in form; but it often happens that, through defective manufacture, or in the accidental commingling of different grades of paper, occasional sheets will be of greater thickness than the others, but still less than the combined thickness of two sheets, so that instead of contacting with the body of the roll, as in the former case, such a sheet would be carried beneath the roll, rotating it about its axis, and pass on around the feed-roll. It is to provide for this further contingency, therefore, that I have placed the detents N upon the roll, the result being that when the roll is thus rotated by the friction of the passing sheet the detents will be brought into contact with the sheet and clamp it so tightly against the feed-roll that it can proceed no farther, such operation being indicated in Fig. 6. When the sheet is removed, the roll can be manually returned to the position shown in Figs. 4 and 5, or a light spring or other similar means may be employed for that purpose.

It will be observed that by mounting the brackets P upon the journal-boxes of the feed-roll the roll M is always in exact horizontal alignment with said feed-roll, or, in other words, is always parallel therewith, even if one end of the feed-roll should be permitted by its screw F to yield vertically more than

the other end, as often happens in these machines—a result which cannot be obtained with a bar secured to the cross-beams E, as in the device heretofore used.

5 By the lateral adjustment, by means of slot *c*, I am enabled to locate the roll M directly over the center of the feed-roll, as shown, or to move it to the front or rear of that point, as may be desired; but I regard the position
10 shown as the one in which the best results can be secured.

The number and particular character of the detents N may be varied at will, and, so far as the broader features of my invention are con-
15 cerned, means for supporting the roll M other than the brackets P could be utilized without departing from the spirit thereof.

I claim—

1. A protector for sheet-calendering machines, consisting of a bar adjustably mounted
20 above the feed-roll and parallel therewith and lying wholly within the line of travel of the guiding-bands, substantially as set forth.

2. A protector for sheet-calendering machines, consisting of a roll adjustably mounted
25 above the feed-roll and parallel therewith and lying within the line of travel of the guiding-bands, said roll being provided with a series of detents, substantially as and for the purpose
30 set forth.

3. The combination, with the feed-roll of a paper-calendering machine, of a protector consisting of a roll adjustably mounted upon the journal-boxes of said feed-roll, whereby the

alignment of said rolls is assured, substantially 35 as described.

4. The combination, with the feed-roll of a sheet-paper-calendering machine, of a protector consisting of a roll having a series of de-
40 tents projecting therefrom and supported at each end, so as to revolve freely, by brackets secured to the upper side of the journal-boxes of said feed-roll, said brackets comprising means whereby the protector can be adjusted
45 both vertically and horizontally, substantially in the manner set forth.

5. In a sheet-calendering machine, the combination, with the feed-roll mounted in journal-
boxes at each end, of brackets having down-
wardly-extending flanges, whereby they are 50 adapted to be secured to the upper side of said journal-boxes, adjusting-bars secured to said brackets by a bolt and locking-nut, and a protector-roll supported in journal-bearings at the
ends of said bars, substantially as and for the 55 purpose set forth.

6. In a sheet-calendering machine, the bracket P, having the flanges *f* and the lateral and vertical extension *d*, the bar O, having
therein the slot *c*, and having the journal-bear- 60 ing *a b* at the end, the bolt *m*, and the nut *l*, combined and operating substantially as set forth.

WILLIAM F. McCARTHY.

Witnesses:

W. H. CHAPMAN,
T. M. BROWN.