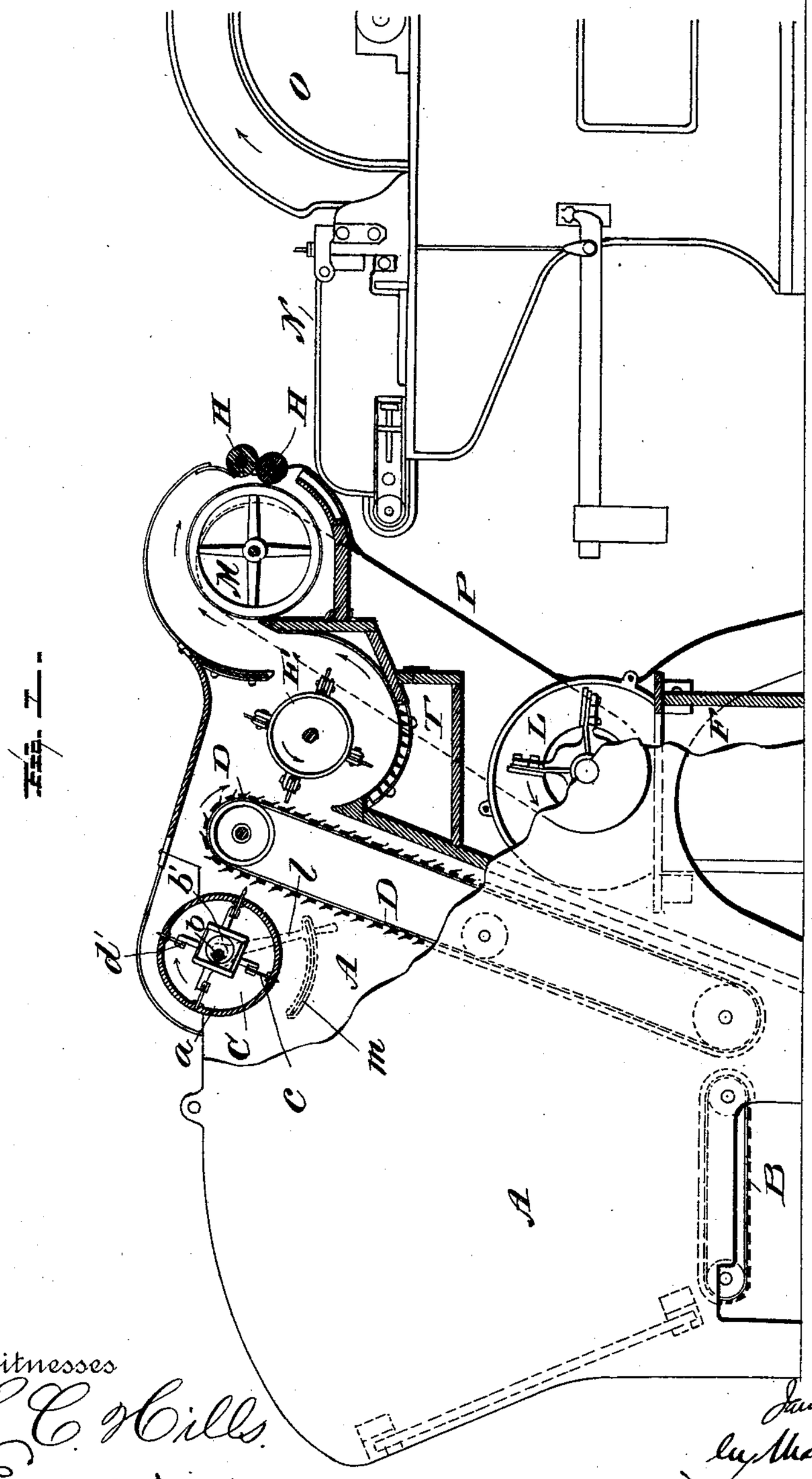
(No Model.) 2 Sheets—Sheet 1.

J. C. POTTER.

FEEDING MECHANISM FOR MACHINERY FOR OPENING, CLEANING, AND PREPARING COTTON.

No. 482,193. Patented Sept. 6, 1892.



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No Model.) 2 Sheets—Sheet 2

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Fig. 4.

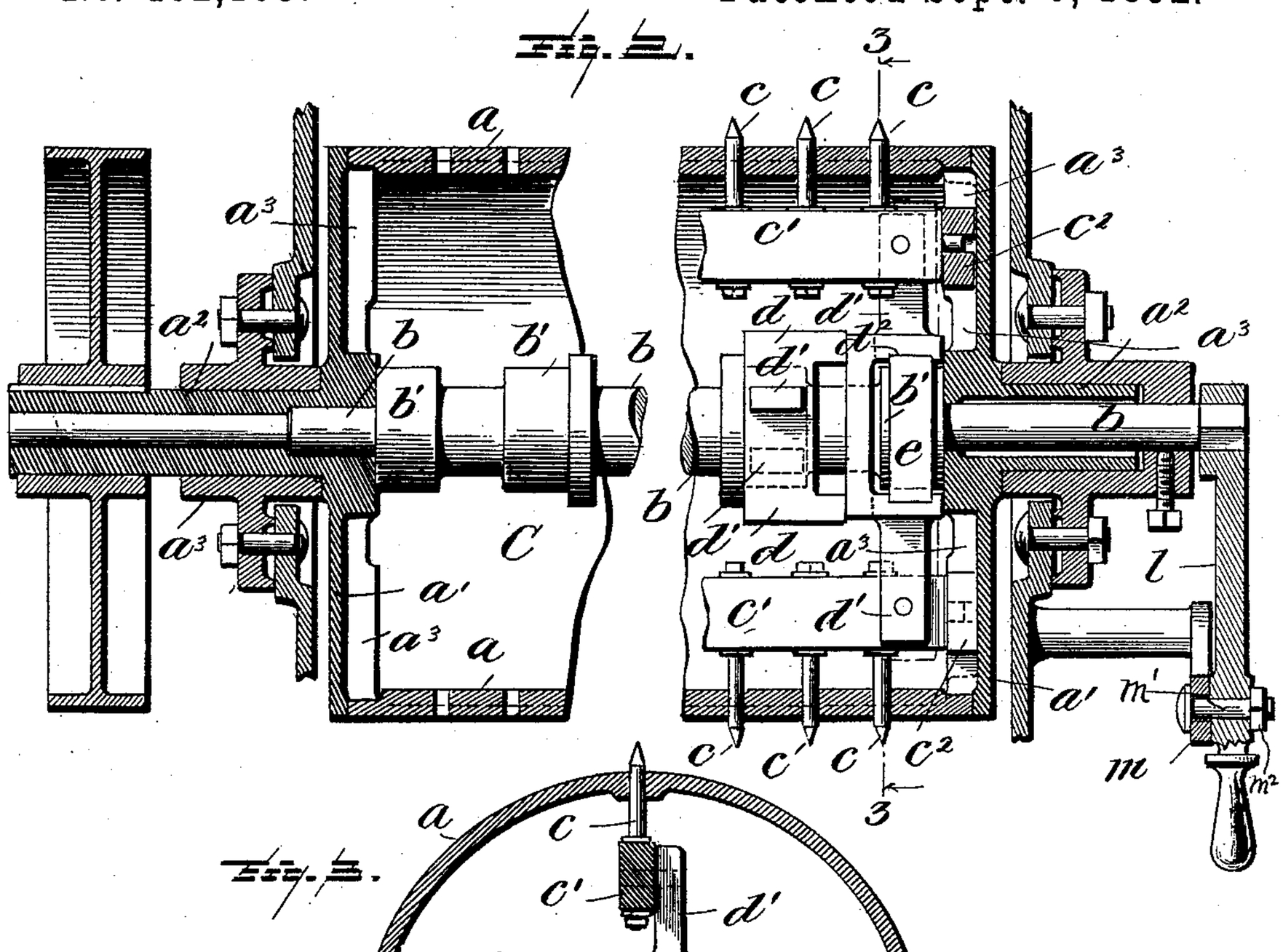


Fig. 3.

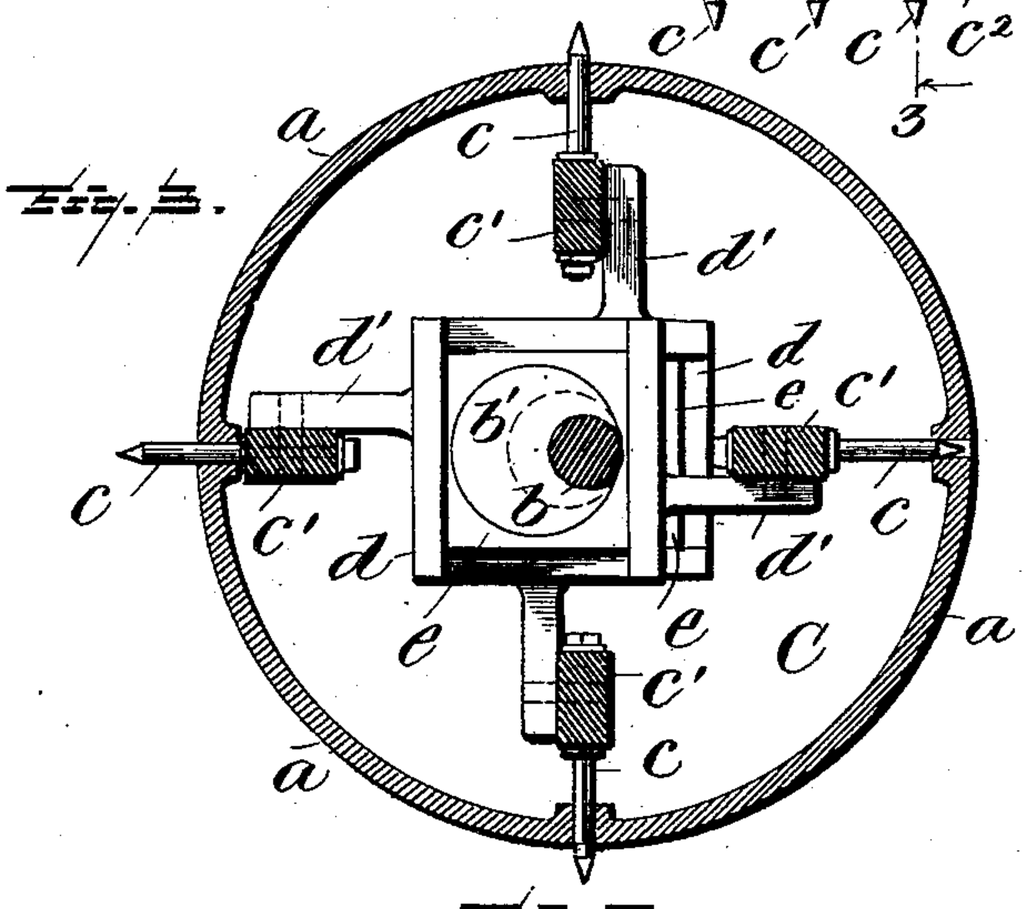


Fig. 2.

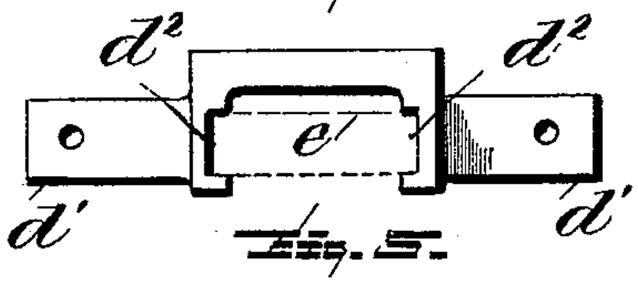
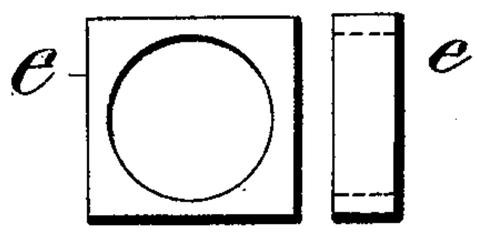


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES C. POTTER, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR TO THE POTTER & ATHERTON MACHINE COMPANY, OF SAME PLACE.

FEEDING MECHANISM FOR MACHINERY FOR OPENING, CLEANING, AND PREPARING COTTON.

SPECIFICATION forming part of Letters Patent No. 482,193, dated September 6, 1892.

Application filed June 29, 1892. Serial No. 438,444. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. POTTER, of Pawtucket, in the State of Rhode Island, have invented certain new and useful Improvements in Feeding Mechanism for Machinery for Opening, Cleaning, and Preparing Cotton or other Fibrous Material, of which the following is a specification.

My invention has been devised with more particular reference to the needs of machinery for opening and cleaning cotton, and it is in that connection that I shall describe it; but it is also adapted to be used in any connection in which a lifting-apron or spiked apron is employed in connection with mechanism for delivering the material carried by such apron to machinery for opening, cleaning, or otherwise treating the same. Much of the material raised or taken by the spiked apron is in the form of bunches and the like, and the apron is liable to take more stock than it is desirable to deliver to the opener or other machine, and to remedy this trouble it has been essayed to use a comb, sometimes reciprocating and sometimes rotary, to remove surplus stock and to insure as far as practicable that the stock shall be delivered in measurably-uniform quantity. The rotary comb, however, soon becomes clogged with the fibers, which catch and gather upon it so as to be practically incapacitated for work, and in the case of the reciprocating comb trouble is also experienced from this cause, (but not to so great a degree as in the other case,) while its action in traveling to and fro against the cotton tends to pack the cotton and to condense the material to an undue extent. It has been essayed to prevent the clogging of the rotary comb by combining with it a clearing-belt perforated to admit the teeth of the comb. This belt passes around and in contact with the face of the comb-cylinder adjoining the lifting-apron and thence runs off from the cylinder, so as to clear the teeth thereon; but this arrangement in practice is not effective for the purpose. The teeth as they recede from the lifting-apron draw back slantwise through the holes or slots in the clearing-apron, and in so doing they carry with them the cotton fibers which gradually gather on the comb-cylinder and are packed thereon until in a short time the diameter of the comb-cylinder is increased to such an extent that the comb-teeth are embedded in the cotton and do not project through as they are intended. Moreover, in practice the holes in the clearing-belt through which the comb-teeth pass must be made somewhat larger than the teeth and of a form approaching that of an elongated slot, and through these openings the cotton fiber will unavoidably pass and catch and gather on the comb-cylinder.

In the device employed by me for the purpose—a device which I term an "equalizing-doffer" in view of the manner in which it operates and the functions which it has—I combine a rotary cylinder or shell and a series of spikes or teeth, which, while they revolve with the shell, are so arranged that during such revolution they alternately protrude from and withdraw within the shell. They protrude from the shell to the greatest extent when they are opposite to the lifting-apron and at the point where they are required to doff the surplus stock therefrom, and after that they gradually withdraw within the shell. Each spike or tooth protrudes from its individual hole or opening in the shell, which hole it exactly fits and fills, so that at no time is there communication through that hole between the outside and inside of the shell. This equalizing-doffer, which is of a length equal to the width of the lifting-apron, is set opposite to that apron at the point where it is required to act upon the stock, and the space between said doffer and the lifting-apron is the throat through which all of the material must pass on its way to the machinery for treating it. By so combining the doffer-teeth with adjusting mechanism that the teeth may be caused to project a greater or less distance from the doffer-cylinder at this point—that is to say, into the throat—I can correspondingly vary the delivery of the cotton through the throat, more cotton being delivered when there is less protrusion of the doffer-teeth, and vice versa. In this way I am enabled to equalize the delivery of the cotton or other stock, and I am also enabled to vary that delivery simply by the adjustment of the doffer-teeth alone and without that adjustment of other

parts of the machinery which heretofore has been required for the purpose. This adjustment of the doffer-teeth for the purpose above intimated can be attained in a variety of ways which will readily suggest themselves to the skilled mechanic when once the idea of such adjustment is suggested.

The preferred means employed by me for the purpose are represented in the accompanying drawings, which I will now proceed to describe, in order that others skilled in the art may fully understand my invention.

In the drawings, Figure 1 is a sectional side elevation of so much of a cotton opening and cleaning machine as is needed for the purposes of explanation. Fig. 2 is a longitudinal vertical section, on enlarged scale, of the equalizing-doffer. Fig. 3 is a cross-section on line 3 3 of Fig. 2. Fig. 4 is a top view of one of the saddles. Fig. 5 is a face and side view of the sliding block to fit that saddle.

A is a hopper for the material.

B is a power-driven horizontal apron which carries the material to the lifting-apron. D is a spiked lifting-apron, also power-driven. Thus far there is nothing new in the mechanism. The cotton in the hopper is taken up by the lifting-apron, and after passing over the top of that apron is delivered by suitable intermediaries to the opener-apron N, whence it passes into the opener O. The intermediaries to which the cotton in this instance is delivered from the lifting-apron to the opener-apron comprise the beater-clearer E, the revolving cage M, and the stripper-rolls H. These devices, together with their accessories T, P, L, and F, while of my invention, are not here claimed, but are made the subject-matter of another application for Letters Patent of even date herewith, bearing Serial No. 438,445.

I now pass to that portion of the machinery in which my present invention more particularly lies.

The equalizing-doffer hereinbefore referred to is shown in Fig. 1 at C. It is located at or near the upper end of the lifting-apron D and is supported in bearings in the hopper, so as to be parallel with that portion of the face of the lifting-apron opposite which it comes, and at such distance therefrom as to leave between the doffer-cylinder or shell and apron a cotton-delivering throat of the dimensions desired. The equalizing-doffer consists of a cylinder a, connected by heads a' to hubs a^2, which are supported and revolve in bearings a^3, Fig. 2, in sides of the hopper A. The hubs receive and are fitted upon a central shaft b, upon which shaft the cylinder as a whole revolves. The doffer teeth or spikes are shown at c. They are cylindrical solid steel pins with pointed outer ends. Each pin passes through and fits closely in a hole formed for it in the shell a. In the present instance I make use of four rows of teeth set at ninety degrees from each other. The teeth of each row are made fast to a steel bar c', as shown in Figs. 2 and 3. To insure the back-and-forth play of the doffer-teeth in the holes in the doffer-cylinder through which they pass, I make use of the following arrangement: Each bar is made fast at each end to a horn d' on a saddle d, which saddle is placed on the shaft b inside the doffer-cylinder. In the saddle d is a sliding block e of rectangular external contour, which fits and can slide in ways or grooves d^2, formed for it in the saddle. The block e is cored out to a true circle, so as to fit upon the eccentric b', fixed on the shaft b. Each saddle has two horns, so as to carry two bars, one on each side, said bars being those which pertain to diametrically-opposite rows of doffer-teeth, as indicated in Fig. 3. The other two rows of doffer-teeth—that is to say, those which are set quartering to the ones just described—are carried by end saddles and eccentrics in precisely the same way, the only difference being that the two saddles which carry the last-named teeth are set quartering to those which carry the first-named teeth. Under this arrangement it will be noted that when the doffer-cylinder is revolved the teeth, their bars, and saddles will revolve with the cylinder; but in so doing the teeth, by reason of the revolution of their saddles upon the eccentrics b', will have a back-and-forth movement of their own independent of the cylinder, the result being that during the revolution of the cylinder the rows of doffer-teeth will successively be projected to the full extent from the doffer-cylinder, and will then be gradually withdrawn until entirely within the outer periphery of the cylinder, and will again be gradually projected or advanced to the position from which they first started, as illustrated plainly in Fig. 3. It will be noted by reference to this figure that under all circumstances, whether projected or withdrawn to its fullest extent, the tooth fills and closes the hole in the cylinder through which it passes. In Fig. 1 the equalizing-doffer is so placed that the doffer-teeth at the time they are most protruded are opposite to the lifting-apron at the point where they are required to do their work in the removal of surplus stock, the revolution of the doffer being in the direction of the arrow thereon. By the time the tooth has traveled forty-five degrees from that position it has very nearly withdrawn into the cylinder, and has completely so withdrawn by the time it has reached ninety degrees. Thus the whole back or rear face of the doffer is smooth, unobstructed, and presents no point where fiber can catch to form any foundation for clogging.

With the parts organized as thus far described the doffer will remove the same amount of stock from the lifting-apron, no matter what the width of the throat may be, because the quantity of stock which can pass is determined by the distance between the projecting teeth of the doffer and lifting-apron, and therefore if it were desired to increase or

lessen the delivery or the amount of stock removed from the doffer it would be necessary to set the apron away from the doffer or to move the doffer as a whole away from the apron, and this might be done, if desired; but I much prefer for this purpose to make use of the simple instrumentality illustrated in the drawings, that instrumentality consisting of the shaft *b*, by the partial rotation of which I find I can so set the eccentric thereon as to vary the protrusion of the teeth from the cylinder at the working-point to any desired extent. To this end I place upon the outer end of the shaft *b* at one side of the apparatus a lever *l*, which works in a slotted sector *m*, made fast to the frame, and has a bolt *m'*, which passes through said slot and is tightened therein by means of a nut m^2, so as to hold the lever in any adjusted position. The shaft *b* can of course turn in the hub of the cylinder when so actuated by the lever. Such being the construction of the parts, then whenever it is desired to increase the delivery all that is needed is to move the lever to the left from the position shown in Fig. 1 to the desired extent and then fasten the same in its adjusted position. By this movement of the lever the shaft *b* is revolved and the eccentrics thereon are moved correspondingly, the result being that there will be only a partial protrusion of the teeth at the time they come opposite the working-point on the lifting-apron. In this way I am enabled to obtain a most delicate adjustment of the feed and delivery and to vary it instantly and without disturbing the relation or interrupting the action of the doffer and apron.

I remark here that in order to insure ease and certainty of action of the reciprocating doffer-teeth and to avoid danger of cramping, I provide each steel bar *c'* at each end with a brass or other suitable bearing-block c^2, which is swiveled to the end of the bar, so that it may have a slight turning movement and fits and is received in a radial guide-groove a^3, formed in the inner face of the cylinder-head.

By the described combination of the doffer-teeth with the saddles, the sliding block therein, and the eccentrics I insure absolute rectilinear reciprocation of the teeth without tendency to torsional action or strain.

What I claim herein as new and of my own invention, and desire to secure by Letters Patent, is as follows:

1. The combination of the doffer-cylinder, the doffer-teeth, the tooth-supporting bars, the saddles, their sliding blocks, and the stationary eccentrics on which said blocks are mounted, substantially as and for the purpose set forth.

2. The combination, with the lifting-apron, of the doffer-cylinder, the doffer-teeth, the tooth-supporting bars, the saddles, the sliding blocks, the eccentrics on which said blocks are mounted, and the eccentric-carrying shaft adjustable in its bearings, as and for the purposes hereinbefore set forth.

3. The combination, with the doffer-cylinder, the doffer-teeth, and the reciprocating tooth-supporting bars, of the bearing-blocks swiveled to the ends of the bars and fitting in radial guide-grooves in the cylinder-heads, substantially as and for the purposes hereinbefore set forth.

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

JAMES C. POTTER.

Witnesses:

EWELL A. DICK,

L. C. HILLS.