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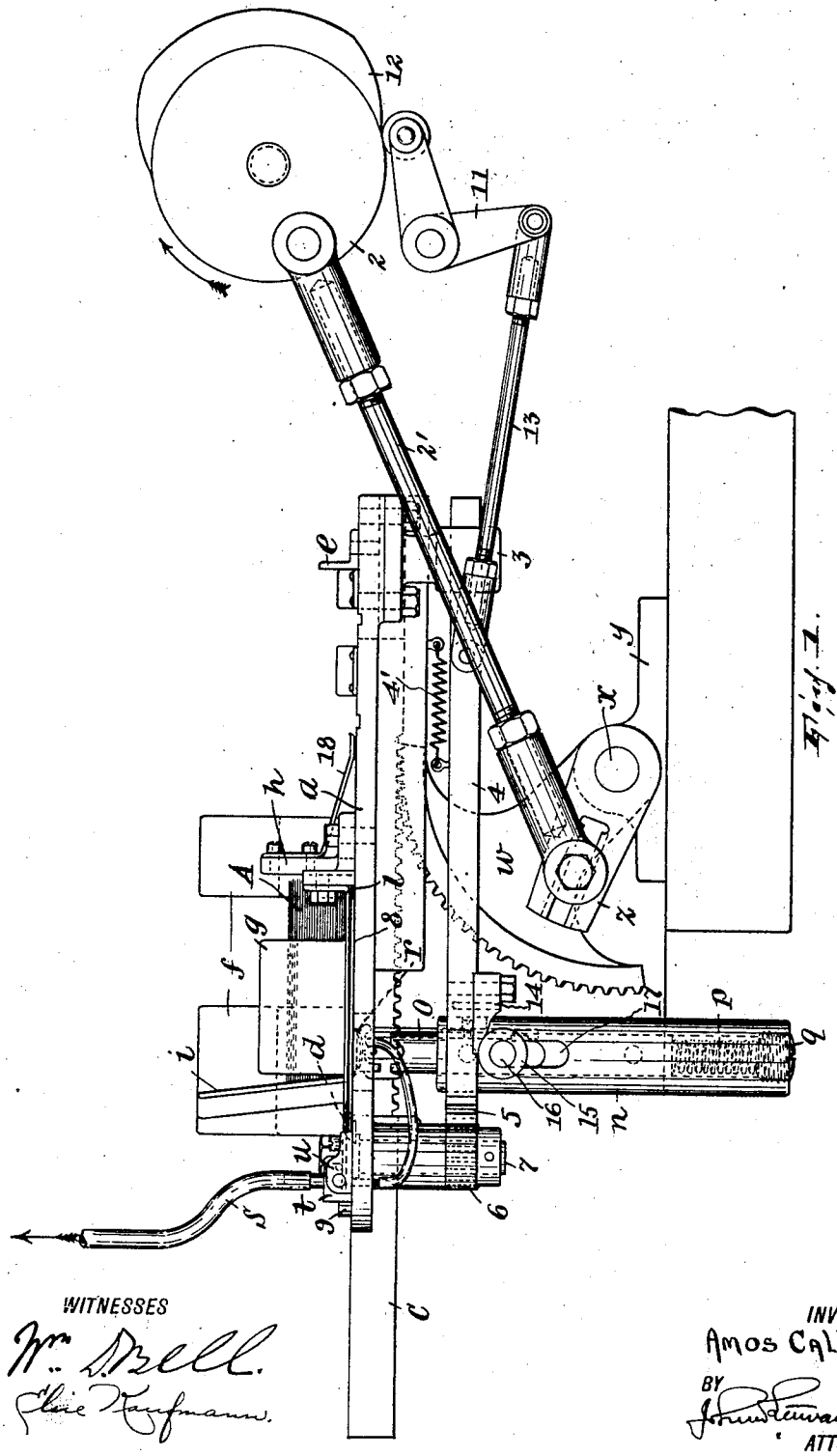
BLANK FEEDING MECHANISM.

APPLICATION FILED SEPT. 27, 1912.

1,186,278.

Patented June 6, 1916.

3 SHEETS—SHEET 1.



WITNESSES

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3 SHEETS—SHEET 2.

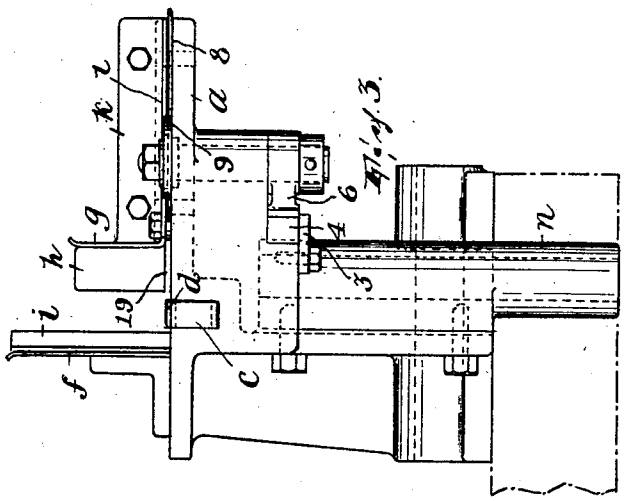


Fig. 3.

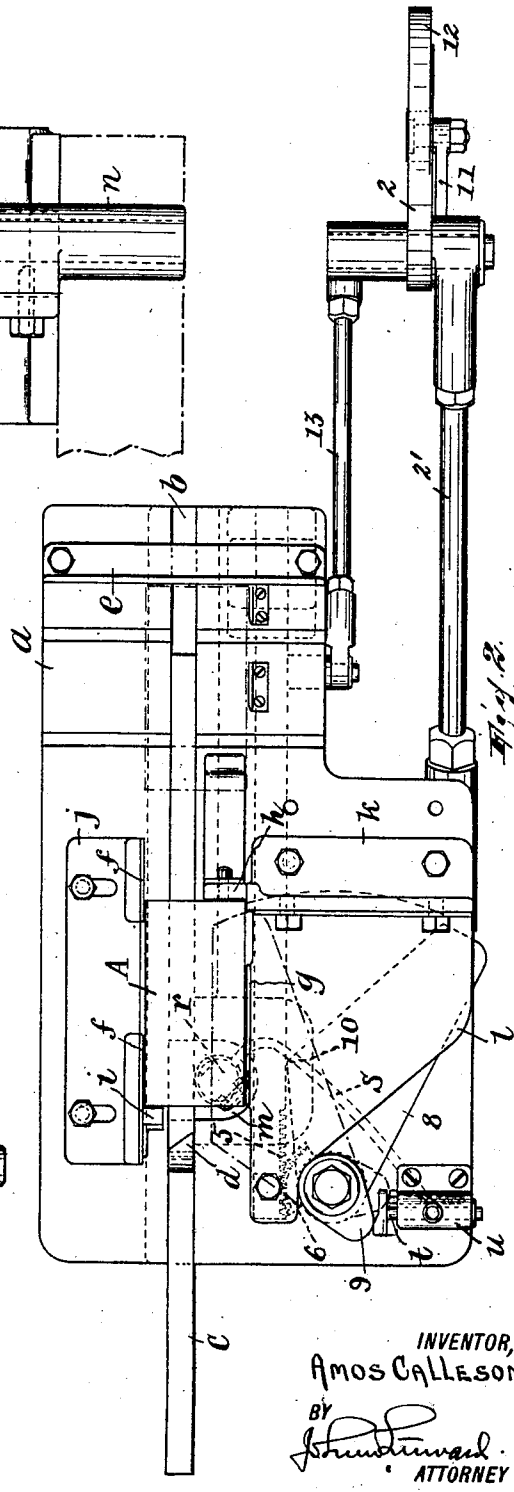


Fig. 2.

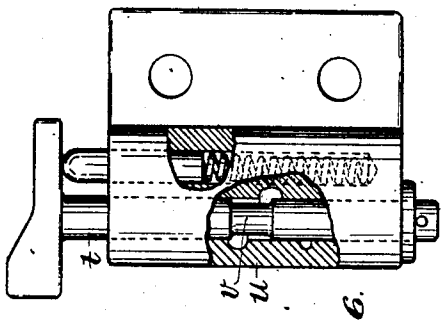


Fig. 6.

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3 SHEETS—SHEET 3.

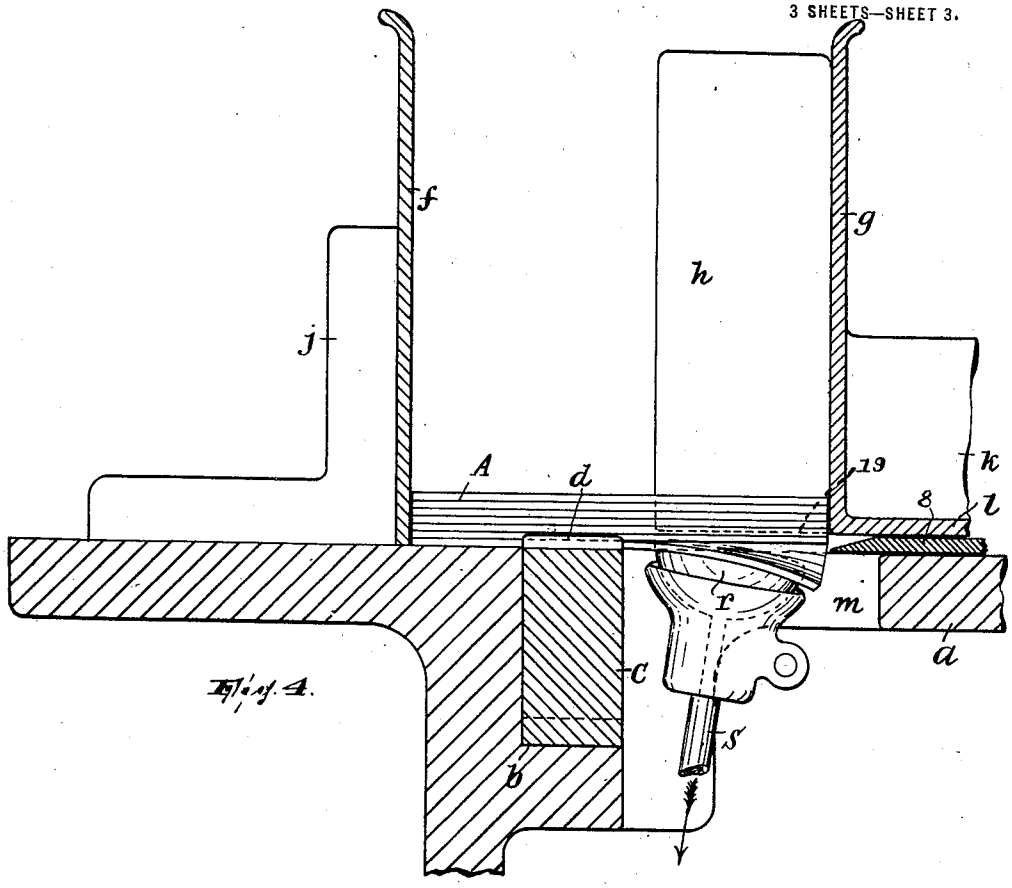


Fig. 4.

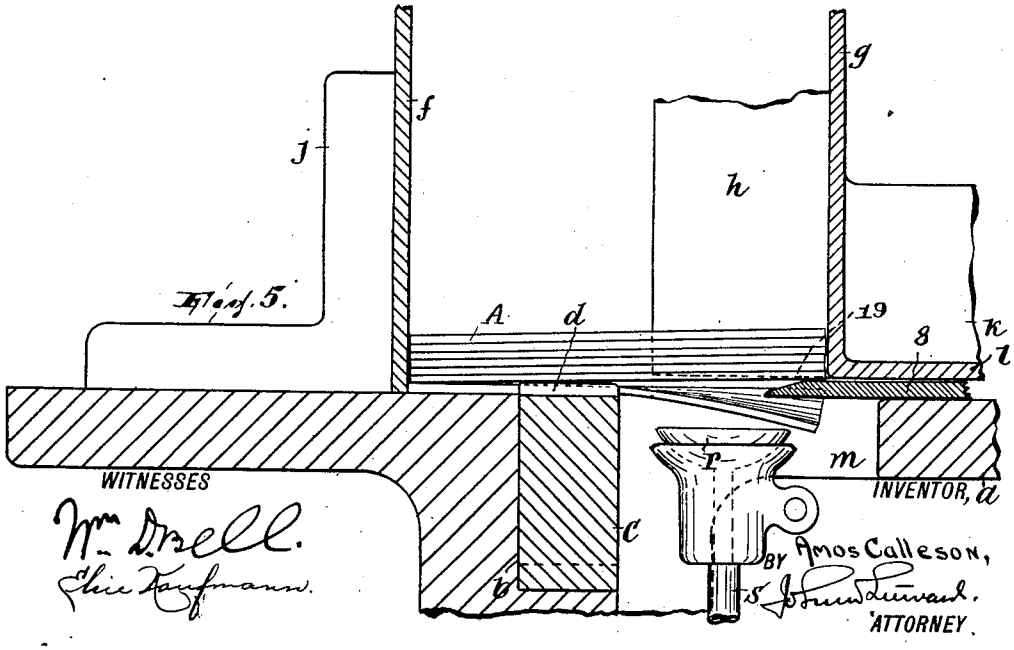


Fig. 5.

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BLANK-FEEDING MECHANISM.

1,186,278. Specification of Letters Patent. **Patented June 6, 1916.**

Application filed September 27, 1912. Serial No. 722,643.

To all whom it may concern:

Be it known that I, AMOS CALLESON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Blank-Feeding Mechanisms, of which the following is a specification.

This invention relates to apparatus for successively removing sheets, plates, and the like from a stack or pile thereof, and it consists in certain novel means whereby the successive removal of the sheets, plates or the like planiform-fashion from the stack may be effected in some selected number (as one, two, three or more) at a time, and no more, notwithstanding adhesion or some other such influence may otherwise be adapted to cause the advance with the sheet or sheets intended at any time to be advanced of a sheet or sheets not so intended to be advanced.

Given a support for a plurality of superposed sheets, one part of my invention consists in a sheet-pushing device movable against an edge of the sheet or sheets next to the support and in a path substantially parallel with and having its sheet-pushing portion above the sheet-supporting plane of the support, together with means to move the corresponding edge of the next sheet away from said support and clear of said path during the pushing movement of said device, whereby the said next sheet will not be affected by said device. Given said support and means for removing from the pile of sheets planiform-fashion and in a given direction the sheet or sheets next adjoining the support, another part of my invention consists in a sheet-abutment arranged close to the side of the pile facing said direction and extending toward the pile-supporting plane of the support but being spaced therefrom a distance exceeding the combined thicknesses of the sheet or sheets being removed and the next sheet, together with means for moving said next sheet into position to be opposed by said abutment, whereby the advance of said next sheet will be positively prevented. By this, the second, part of my invention, the selective advance of the sheets in the precise number at a time as predetermined is possible in either the case where all of the sheets in a run are so thin that two or more at a time might otherwise pass the abutment when a less number (alone positively subjected to the advancing action) are intended to do so, or in the case where the thicknesses of the sheets in a run vary and make this condition possible only occasionally.

In the accompanying drawings, Figure 1 is a side elevation of the improved apparatus; Fig. 2 a plan thereof; Fig. 3 a left-hand-end elevation; Figs. 4 and 5 vertical sectional views illustrating two of the steps occurring in the operation of the improved apparatus; and, Fig. 6 illustrates a certain suction-control valve.

In the said drawings, *a* is a table or other support on which the pile or stack A of sheets is placed, the sheets of the stack lying horizontally. In a groove *b* in the support *a* and extending under the stack reciprocates a bar *c* having a single tooth *d* serving, in the movements of the bar to the right in Fig. 1, to remove the sheets at the bottom of the stack from under the remainder, depositing them at the right of the stack, say against an abutment *e*. In the present adaptation, the sheets are removed from the stack one by one.

A suitable hopper for the pile may be formed by the upright walls *f* and the upright wall *g* situated in opposite relation to each other at the side edges of the pile, and by the walls *h* and *i*, converging downwardly (as by wall *i* being inclined) so that as the sheets descend in the hopper they will be trued to a definite position in the line of travel of the tooth *d*. Walls *f* are a part of a bracket *j* which is adjustable on the support toward and from wall *h;* wall *h* is a part of a bracket *k* secured on the support, and wall *i* a part of the bracket *j;* and wall *g* is a part of a horizontal plate *l* which is bolted to bracket *k* and stands parallel to and slightly spaced from the top surface of support *a*. In Fig. 3 clearance is shown between the bottom of wall *h* and the support, affording an outlet from the hopper for the sheet being removed; as will appear, wall *h* serves as a stop to prevent the rest of the stack partaking in the removing movement.

m is an opening formed in the support *a* under the near left hand corner of the stack in Fig. 1 and in vertical alinement with and

below which is secured to a part of the support a cylinder *n* in which slides a plunger *o* normally pressed upwardly by a spiral spring *p* coiled in the cylinder between the plunger and a screw *q* tapped into the bottom of the cylinder. The upper end of the plunger *o* carries a suction device consisting of a rubber suction cup *r*, adapted to bear against that corner of the lowermost sheet which is unsupported on account of the opening *m*. The air is exhausted from this cup through the means *s* in which is located the suction-control device shown in Fig. 6. In this figure *t* is a spring-pressed valve normally held in its casing *u* by its spring in the position shown in Fig. 2, where its port *v* establishes the communication between the pump of the apparatus and the suction cup, and movable to a position where said port connects the suction cup with the atmosphere.

Meshing with the toothed under side of bar *c* is a toothed segment *w* carried by a shaft *x* arranged to rock in a bearing *y* and carrying a crank *z* which is connected with a suitably rotated disk 2 by a pitman 2′. Thus, when the disk rotates the bar *c* is reciprocated.

In suitable guides 3 slides a bar 4 having rack teeth 5 meshing with a segment 6 on the lower end of a shaft 7 journaled in the support *a*, the upper end of said shaft carrying a knife or blade 8 constituting a positive separator for the sheets. On the upper end of shaft 7 is also fixed a cam 9 adapted to bear against the head of the valve *t* to move the same out of the position in which it is normally held by its spring.

The under side of the blade 8 is flat, and the blade rests flatwise upon the top surface of the table *a*. It is shown in its retracted position in Fig. 2. Its acting edge is obtuse-angular, the apex 10 of the angle being so disposed that when the blade wipes toward the stack of sheets said apex will cross the line representing the near side of the stack in Fig. 2 near its left hand end. From the apex 10 backwardly for a suitable distance the top surface of the blade rises, as by beveling the angular edge of the blade, thus giving it a cam-face. The plate *l* serves as a guard as well as a guide for the blade.

The bar 4 is reciprocated from a bell-crank lever 11 which bears upon the periphery of the disk 2, the same having a hump 12 making it a cam, through the medium of a pitman 13 pivotally connecting the rod and lever, the lever 11 being held against the cam by the spring 4′ shown in Fig. 1.

14 is a cam-piece secured to bar 4 and adapted to impinge against a roller 15 on a stud 16 which projects from the plunger through a slot 17 in the cylinder.

18 is an elastic foot which presses upon the sheet being removed, offering sufficient resistance for insuring its proper placement at or near abutment *e*.

Operation: The working thrust of bar *c* is to the right and of bar 4 to the left. Bar *c*, through its tooth *d*, acts to advance the lowermost sheet from the stack, as already indicated; bar 4 is a part of the mechanism whose function it is, preparatory to the advance of a sheet, to fix that sheet, and that only, as the one which is to be advanced. As the tooth *d* moves toward the right the blade 8 is swung toward the stack, while the suction cup acts to pull down the unsupported front left-hand corner of the lowest sheet. A space (formerly occupied by such corner of the lowermost sheet, Fig. 4) will be thus presented to the apex 10 of the blade, enabling it, as the blade continues its movement, to enter under the second sheet. As the blade wipes under the stack it elevates it, due to the cam-face on its upper side. This elevating serves, primarily, to clear the stack from the path of movement of tooth *d*, which now engages the left-hand edge of the lowermost sheet, pushing it forward to abutment *e*, clear of the stack. In the present instance, the elevating of the stack by the blade also serves in preventing adhesion between the sheet to be advanced and the next sheet from being the cause of the latter sheet advancing with the first, thus: The outlet 19 (under wall *h*) is calculated to let pass the thickest sheet which may be encountered. When the blade 8 elevates the stack, therefore, it does so sufficiently so that the sheet immediately resting thereupon is raised too high to enter the outlet, and wall *h* therefore holds it against advance (Fig. 5).

The suction control is so timed and operated that the suction cup remains active until the blade has overlapped the plate, whereupon the atmosphere is admitted to the cup through port *v*, so that the cup will not exert a drag on the sheet when it is removed from the stack; when the cup rises and impinges against the next sheet the suction is reëstablished. The suction control is of course under the influence of the cam 9, moving with blade 8.

It will be understood, as hereinbefore intimated, that my invention does not exclude the advance of the sheets, if desired, in numbers of more than one at a time, and that the advance of the sheets in such a manner (more than one at a time) depends, first, on whether tooth *d* extends sufficiently high to positively engage the predetermined number of sheets at a time, and, second, on the separating action effected by the suction device and blade 8, the former of which in various ways might accomplish the primary separation from the stack of more than one sheet at a time, as, for instance, if every

other sheet were formed or arranged so as to expose to the suction device the next sheet above.

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

1. In combination, a support for a plurality of superposed sheets, a sheet-pushing device movable in a path substantially parallel with the sheet-supporting plane of said support and having its sheet-pushing portion arranged above said plane and adapted to engage one edge of and push the lowest sheet or sheets planiform fashion clear of the sheet above, means to shift said edge of the lowest sheet or sheets from, and thereby form a marginal space between the same and the sheet above and means, enterable into said space, to move the corresponding edge of the latter sheet away from said support and clear of said path during the pushing movement of said device.

2. In combination, with a support for a pile of sheets, means for removing from the pile planiform-fashion and in a given direction the sheet or sheets next adjoining the support, a sheet-abutment arranged close to the side of the pile facing said direction and extending toward the pile-supporting plane of said support but being spaced from said plane a distance exceeding the combined thicknesses of the sheet or sheets being removed and the next sheet, and means for moving said next sheet into position to be opposed by said abutment.

3. In a feeding device for sheets, pamphlets and the like, the combination of means forming a stationary magazine for the members to be fed, a suction device movable to engage one corner of the lowermost member to be fed, means to move the suction device downward with the lowermost member whereby the corner of the member is separated from the other members in the magazine, and a reciprocable plate for supporting the members to be fed and for discharging the lowermost member by its reciprocation.

4. In a feeding device of the class described, the combination with a longitudinally reciprocable plate upon which the members are supported, of means at the front end of the plate for limiting the number of members to be fed at each reciprocation of the plate, and a finger movable into position between the member or members to be fed at each reciprocation of the plate and the remaining members.

5. In a feeding device of the class described, the combination with means forming a magazine for members to be fed therefrom, of a longitudinally reciprocable plate at the bottom of said magazine for supporting and feeding the lowermost member therefrom, a suction device movable into and out of position to engage one corner of the lowermost member to be fed, and a finger disposed at the same corner and movable into position between the lowermost sheet and the other sheets when the lowermost sheet is drawn by the suction means.

6. In a feeding device for sheets, pamphlets and the like, the combination with means forming a magazine for the members to be fed, of a longitudinally reciprocable supporting and feeding plate at the bottom of the magazine, a suction device movable to engage the lowermost sheet at one corner and to bend the corner of said sheet from the other sheets, a finger movable between the lowermost sheet and the other sheets, and means to operate the finger and the suction means simultaneously.

7. In a feeding device for sheets, pamphlets and the like, the combination with a longitudinally reciprocable plate, of a suction device for engaging and bending one corner of the lowermost sheet downwardly, a finger movable into and out of position between the lowermost member and the other members, and driving mechanism having connection with the said finger, suction means, and the reciprocable plate for moving them simultaneously in their proper relations.

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

AMOS CALLESON.

Witnesses:
F. H. Moses,
Charles C. Burgio.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."