

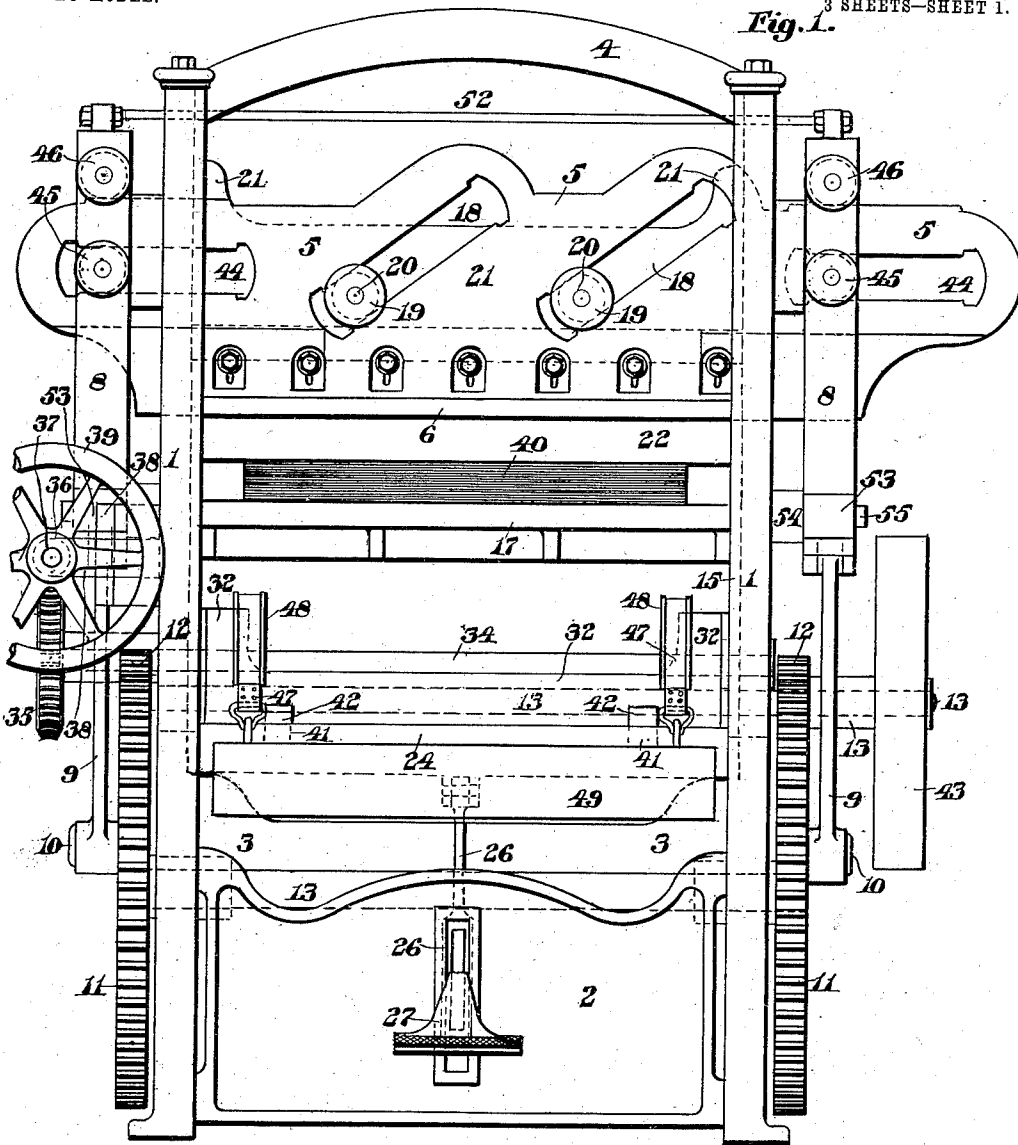
B. F. DE COSTA.  
CLAMPING APPARATUS FOR PAPER CUTTING MACHINES.

APPLICATION FILED DEC. 3, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

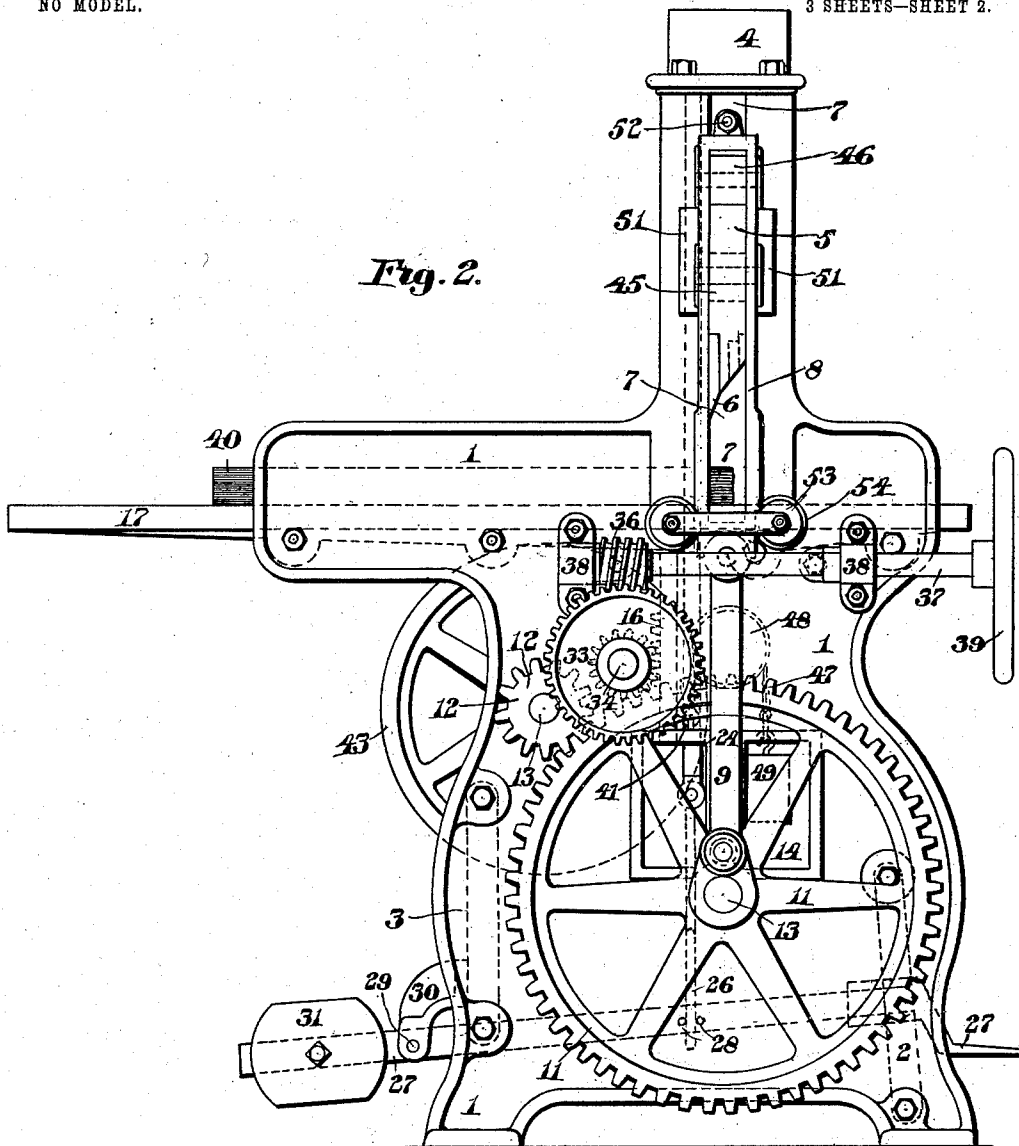


Fig. 2.

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3 SHEETS-SHEET 3.

Fig. 3

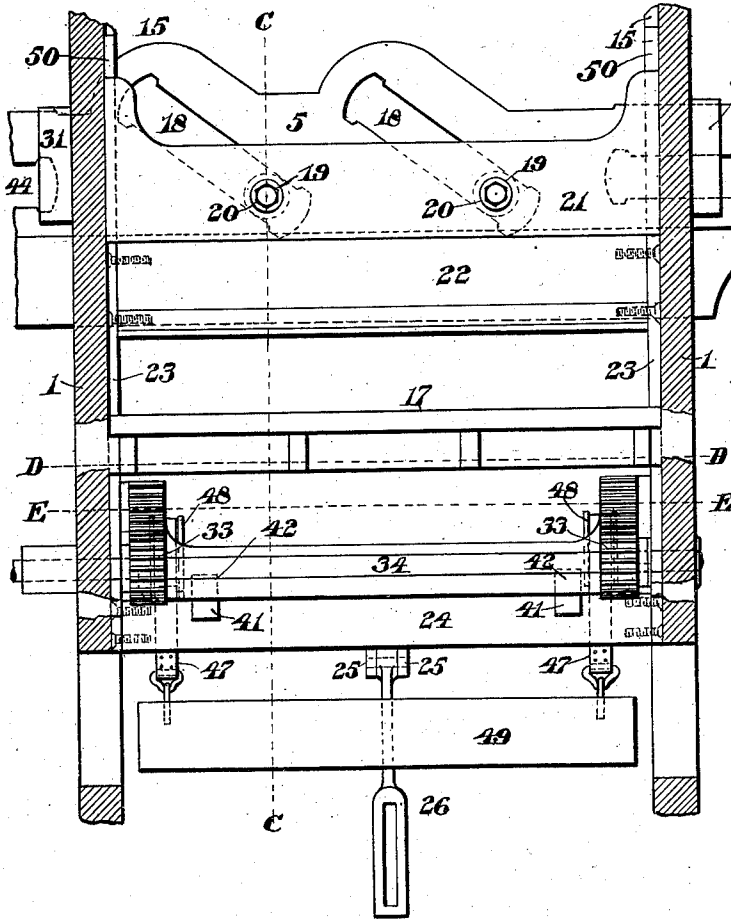


Fig. 4

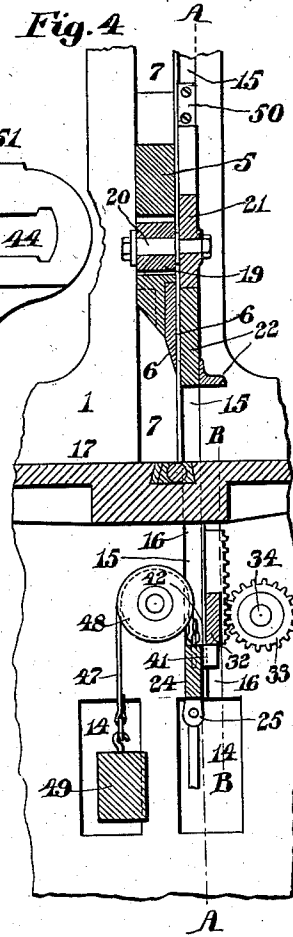


Fig. 5

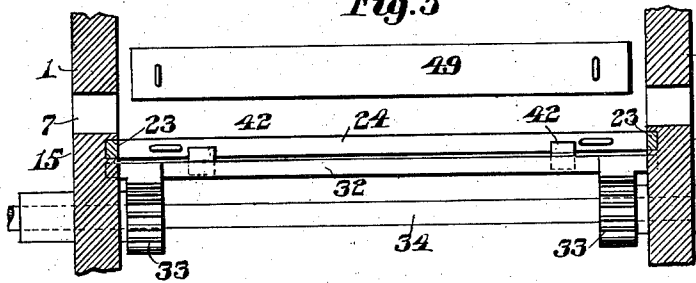
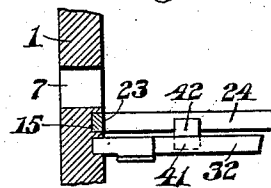


Fig. 6



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# UNITED STATES PATENT OFFICE.

BENJAMIN F. DE COSTA, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE  
HIGHLAND MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A FIRM.

## CLAMPING APPARATUS FOR PAPER-CUTTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 742,974, dated November 3, 1903.

Application filed December 3, 1902. Serial No. 133,690. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN F. DE COSTA, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Clamping Apparatus for Paper-Cutting Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to clamping apparatus for paper-cutting machines; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

The object of my invention is the production in a paper-cutting machine of a clamping apparatus for securing a pile of paper in a fixed position while it is being cut that may be operated by foot, by hand, or automatically at the will of the operator, and to this end I construct the machine as illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a paper-cutting machine embodying my invention. Fig. 2 is a side elevation of the same looking at the left side of Fig. 1. Fig. 3 is a partial rear elevation with the two side frames cut in section in two different planes, the upper and lower portions on the line A A and the central portion from the under side of the table or bed downward to the upper edge of the bar 24 on line B B on Fig. 4. Fig. 4 is a vertical section on line C C on Fig. 3. Fig. 5 is a horizontal section on line D D on Fig. 3, and Fig. 6 is a horizontal section through a small portion of the left-hand side frame on line E E on Fig. 3.

In the drawings, 1 1 represent the two side frames, which are connected together by the tie-girths 2 and 3 and the cap or cross-head 4. The knife-bar 5, having secured thereto the knife 6, is fitted to and movable vertically and horizontally in vertical slots 7, cut through said side frames, in which it is guided in its vertical and horizontal movements, which movements are imparted thereto through the medium of the slotted yokes or bars 8, the

connecting-rods 9, the crank-pins 10, the gear-wheels 11 11, the pinions 12, and the driving-shaft 13 in a well-known manner.

The side frames 1 1 have two rectangular openings 14 14 formed therein, and each frame has formed in its inner face a rectangular groove 15, extending from one of said openings to the top of said frame in near proximity to and parallel with the slot 7, in which the knife-bar 5 is guided, and a second rectangular groove 16, which extends upward from the same opening 14 to a point a short distance below the top of the bed or table 17 in near proximity and parallel to the groove 15, as shown in Figs. 3, 4, 5, and 6.

The knife-bar 5 has formed therein two obliquely-arranged slots 18 18, which receive and act upon the rolls 19, mounted upon studs 20, set in the automatically-operated clamping-bar 21, which is fitted to and movable vertically in the groove 15, as shown. Just below the bar 21 is the clamping-bar 22, also fitted to and movable vertically in the groove 15 and is the clamp-bar that actually comes in contact with the pile of paper to hold it in a fixed position on the table or bed while it is being cut. The bar 22 has secured to each end thereof the upper end of a rectangular rod or strap 23 of a size and shape to just fill the groove 15, the lower ends of which rods or straps are secured to opposite ends of the treadle-yoke bar 24, provided with a pair of ears 25, to which is pivoted the upper end of the slotted link 26, the slotted lower portion of which embraces the treadle-lever 27 between the pins 28, set in said lever, all so arranged that the bar 24 and the link 26 may be moved downward without moving the treadle-lever. The treadle-lever 27 is pivoted at 29 to the stand 30, which is secured to and projects from the rear of the rear tie-girth 3, said treadle-lever projecting toward the rear from said pivotal connection and has mounted thereon the counterweight 31, as shown.

In the groove 16 is fitted, so as to be movable vertically therein, the bar 32, having formed on its rear side two series of rack-teeth, one series near each end, with each of which a pinion 33, secured upon the shaft

34, engages and by the rotation of which said clamp-bar 32 may be moved up or down in said groove.

On the left-hand end of the shaft 34 is secured a worm-wheel 35, which is engaged by the worm 36, mounted on the shaft 37, which is fitted to and revoluble in bearings in the stands 38 and has secured to its front end the hand-wheel 39, by which said shaft, worm, worm-wheel, and the pinions 33 may be revolved to raise or depress said bar 32.

The treadle-yoke bar 24 has formed upon its rear side two rearwardly-projecting lugs 41, the upper faces of which are on a level with the upper edge of said bar, and the bar 32 has formed on its front side two lugs 42, with their lower faces on a level with the lower edge of said bar and so arranged as to project over and engage the lugs 41 on the bar 24, as shown.

The shaft 13 has loosely mounted thereon the driving-pulley 43, which may be intermittently connected to said shaft by any suitable clutch. (Not shown.)

In Figs. 1 and 2 the knife-bar is shown in its uppermost position, and the clamping-bar 22 and the bars 24 and 32 are shown as moved downward into a position to clamp the pile of paper 40, which has a thickness about equal to one-half the capacity of the machine, and in Figs. 3 and 4 the bars 22, 24, and 32, as well as the knife-bar and knife, are all at the extreme of their upward movements.

The knife-bar 5 has formed therein two horizontal slots 44, each of which receives and is acted upon by a roll 45, journaled on a pin set in the slotted yoke or bar 8. Each of said yokes is provided with a second roll 46, which engages the upper edge of said knife-bar, all in a well-known manner.

The treadle-yoke bar 24 has connected to its upper edge two flexible straps 47, which pass over pulleys 48, mounted on studs set in the inner faces of the frames 1, the opposite ends of said straps being connected to the weight-bar 49, as shown.

The operation of my invention is as follows: If a pile of paper of considerable area is to be trimmed or cut in two parts, the pile is first properly located on the bed beneath the knife when if the driving-shaft 13 is set in motion by coupling the pulley 43 thereto by means of a suitable clutch the knife-bar 5 will be moved bodily downward, carrying therewith the bars 21 and 22 until the bar 22 comes into contact with and firmly clamps the pile of paper, when the downward movement of said bars will be arrested, and the action of the trucks 19 upon the slots 18 in the knife-bar will cause the further downward movement of the knife-bar to be in an oblique direction, thereby imparting to the knife a drawing cut. So far the machine is operated in a well-known manner.

It often happens that a pile of paper of small area and considerable height is to be cut, in which case if the automatically-oper-

ated clamping-bar is suddenly brought into contact with the pile of paper it is liable to disarrange the pile and prevent its being properly trimmed and possibly destroy the whole pile. My invention obviates this difficulty and provides the paper-cutting machine with means whereby the paper to be cut may be clamped automatically by foot or by hand at the will of the operator. In some cases when it is not desirable to do the clamping entirely automatically it is preferable to operate the clamp by the foot and in other cases it is desirable to operate the clamp by hand. In cases where the entire clamping cannot be done automatically with safety and can be done with the foot the operator depresses the treadle 27, thereby moving the bars 24 and 22 until said bar 22 comes in contact with and clamps the pile of paper, when the knife-bar is moved downward, carrying with it the bar 21 until said bar comes in contact with the bar 22, when the downward movement of said bar 21 is arrested and the knife-bar and knife continue to move in an obliquely downward direction until the pile of paper is cut entirely through without disturbing in any way the bar 32, which forms a part of the hand-clamping apparatus. In cases where more careful manipulation of the clamping of the paper is necessary the operator by rotating the shaft 37 and worm 36 to revolve the worm-wheel 35, shaft 34, and pinions 33 depresses the bar 32, which by contact of the lugs 42 with the upper edge of the bar 24 carries therewith said bar 24, and by virtue of the connection of said bar 24 with the clamping-bar 22 through the medium of the straps or rods 23 said bar 22 is moved downward into contact with the pile of paper and firmly clamps the same in the desired position, said hand-clamping being accomplished without moving the treadle, as the slot in the link 26 permits a downward movement of the bar 24 and said link without disturbing said treadle. When the bar 24 is moved downward, the weight-bar 49 is correspondingly raised, and when the cut is completed and the knife-bar is moved upward the force of gravity acting upon said weight will cause it to descend and acting through the straps 47 will move the bars 24 and 22 to the extreme of their upward movement, except when the clamping has been done by hand, when said weight will not descend until the worm and worm-wheel are revolved in the opposite direction to raise the bar 32. When the knife-bar 5 is moved upward after completing the cut, the automatically-operated clamp-bar 21 is moved upward therewith until its end portions strike the stop-blocks 50, secured in the upper portions of the grooves 15, as shown in Figs. 3 and 4, when it is arrested, and the further movement of the knife and knife-bar is in an oblique direction.

The slotted yokes 8 are guided in their upward and downward movements by the guide-blocks 51, projecting outward from the frames

1, against which they are held by the tie-rod 52, by the knife-bar moving in the slots 7, and by the bearings near their lower ends comprising the rolls 53, bosses 54, and the cap 55, as shown in Figs. 1 and 2.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a paper-cutting machine, the combination with a vertically and longitudinally movable knife-bar, a knife carried thereby a paper-supporting bed, and a clamp-operating bar constructed and arranged to be moved vertically with, and by said knife-bar, of two side frames each provided with a groove 15; the metal straps 23 fitted to and movable vertically in said grooves; the clamping-bar 22 arranged at the rear of the knife-bar and beneath said clamp-operating bar, and firmly secured at its ends to the upper ends of the straps 23; the bar 24 firmly secured at its ends to the lower ends of said straps 23; a counterweight constructed and arranged to move said bars 22 and 24 and the straps 23 to the extreme of their upward movements and hold them in said raised positions until force is applied to move them downward; the vertically-movable bar 32, so constructed and arranged relative to the bar 24 as to contact therewith when moved downward, and thereby force said bar 24, the straps 23, and the bar 22 downward; and hand-operated mechanism constructed and arranged to impart downward and upward movements to said bar 22, as set forth.

2. In a paper-cutting machine, the combination with a vertically and longitudinally movable knife-bar, a knife carried thereby a paper-supporting bed, a clamp-operating bar constructed and arranged to be moved vertically with and by said knife-bar, of two side frames 1, 1, each provided on its inner face with the grooves 15 and 16; the metal straps 23 fitted to and movable longitudinally in said grooves 15; the clamping-bar 22 located in the rear of the said knife-bar and beneath said clamp-operating bar, and firmly secured by its ends to the upper ends of the straps 23; the bar 24 firmly secured at its ends to the lower ends of the said strap 23, and provided on the upper edge of its rear face with the lugs or stops 41; a counterweight constructed and arranged to raise said bars 22 and 24, and the straps 23, to the extreme of their upward movements, and hold them in said raised positions until force is applied to move them downward; the bar 32 fitted to and movable vertically in the groove 16, and provided on the lower edge of its front face, with the lugs

or stops 42, in positions to engage the lugs or stops 41, on the bar 24; two series of rack-teeth carried by said bar 32; the shaft 24 mounted in bearings in the frames 1, 1; the pinions 33 secured on said shaft and engaging said racks on the bar 32; the worm-wheel 35, secured on the end of said shaft 34; the shaft 37 mounted in bearings on the outer face of one of the frames 1; the worm 36 carried by said shaft and engaging said worm-wheel 35; and the hand-wheel 39 secured on said shaft all arranged and operating as set forth.

3. In a paper-cutting machine, the combination with a vertically and longitudinally movable knife-bar, a knife carried thereby, a paper-supporting bed, and a clamp-operating bar constructed and arranged to be moved vertically with, and by, said knife-bar, of the side frames 1, 1, each provided in its inner face with the grooves 15 and 16; the metal straps 23, fitted to and movable longitudinally in the grooves 15; the clamping-bar 22 located at the rear of the knife-bar, and beneath said clamp-operating bar, and firmly secured by its ends to the upper ends of the straps 23; the bar 24 firmly secured at its ends to the lower ends of said straps 23, and provided on the upper edge of its rear face with the lugs or stops 41; the treadle-lever 27, pivoted to some fixed part of the machine; the slotted link 26 connecting said treadle and the bar 24; the weight 31 mounted on the rear arm of said treadle-lever; the bar 32, fitted to and movable vertically in the groove 16, and provided on the lower edge of its front face, with the lugs or stops 42, in positions to engage the lugs 41 on the bar 24, and with two series of rack-teeth on its rear face; the shaft 34, mounted in bearings in the frames 1, 1; the pinions 33 secured on said shaft, and engaging the racks on said bar 32; the worm-wheel 35 mounted on said shaft 34; the shaft 37 mounted in bearings secured to the outside of one of the frames 1; the hand-wheel 39 secured on the front end of said shaft 37; and the worm 36, secured upon said shaft 35, and engaging said worm-wheel 35, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 30th day of October, A. D. 1902.

BENJAMIN F. DE COSTA.

Witnesses:

N. C. LOMBARD,  
EDWIN A. BABB.