

No. 607,825.

Patented July 26, 1898.

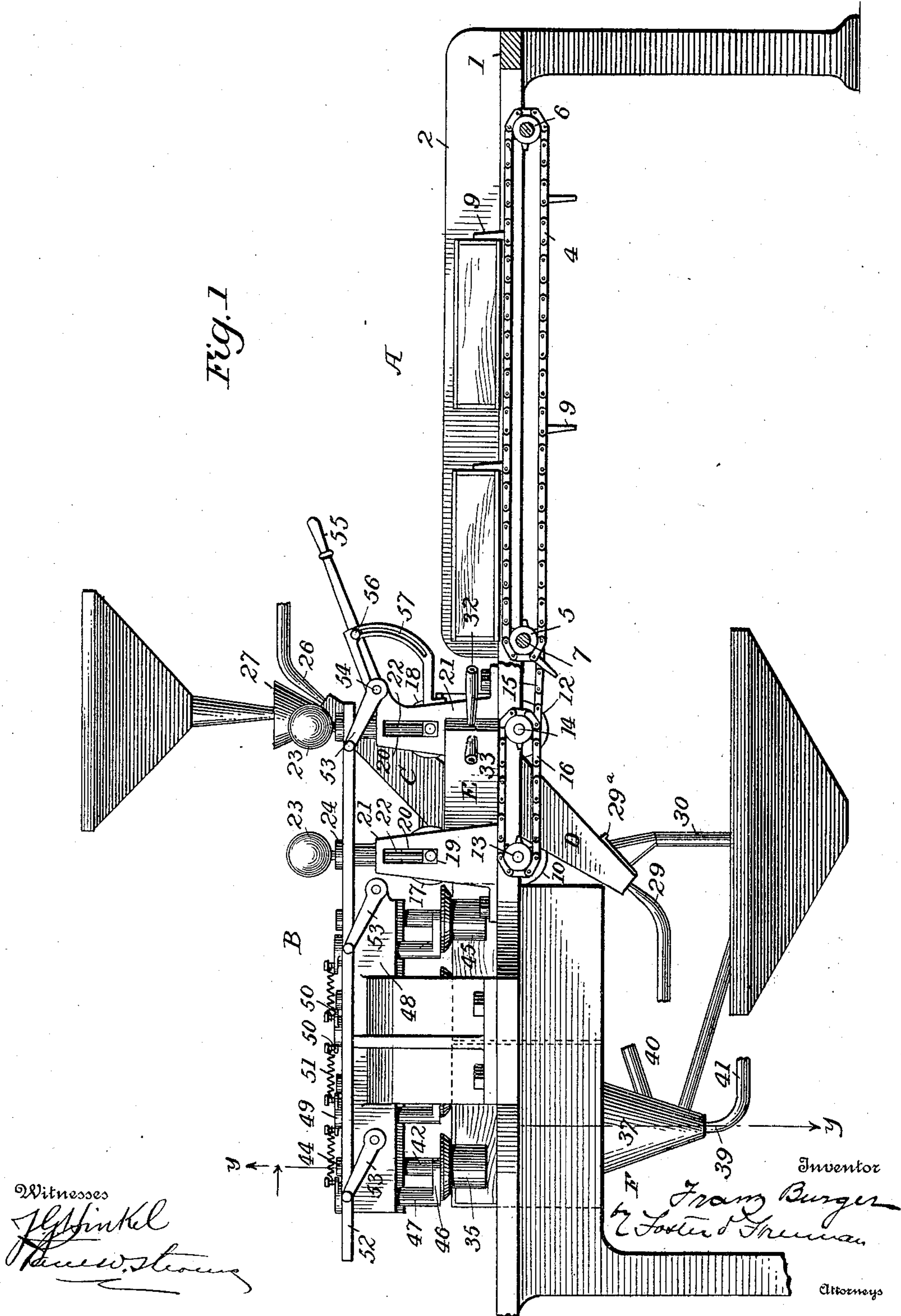
F. BURGER.  
SAND BLAST.

(Application filed Sept. 1, 1897.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1



Witnesses

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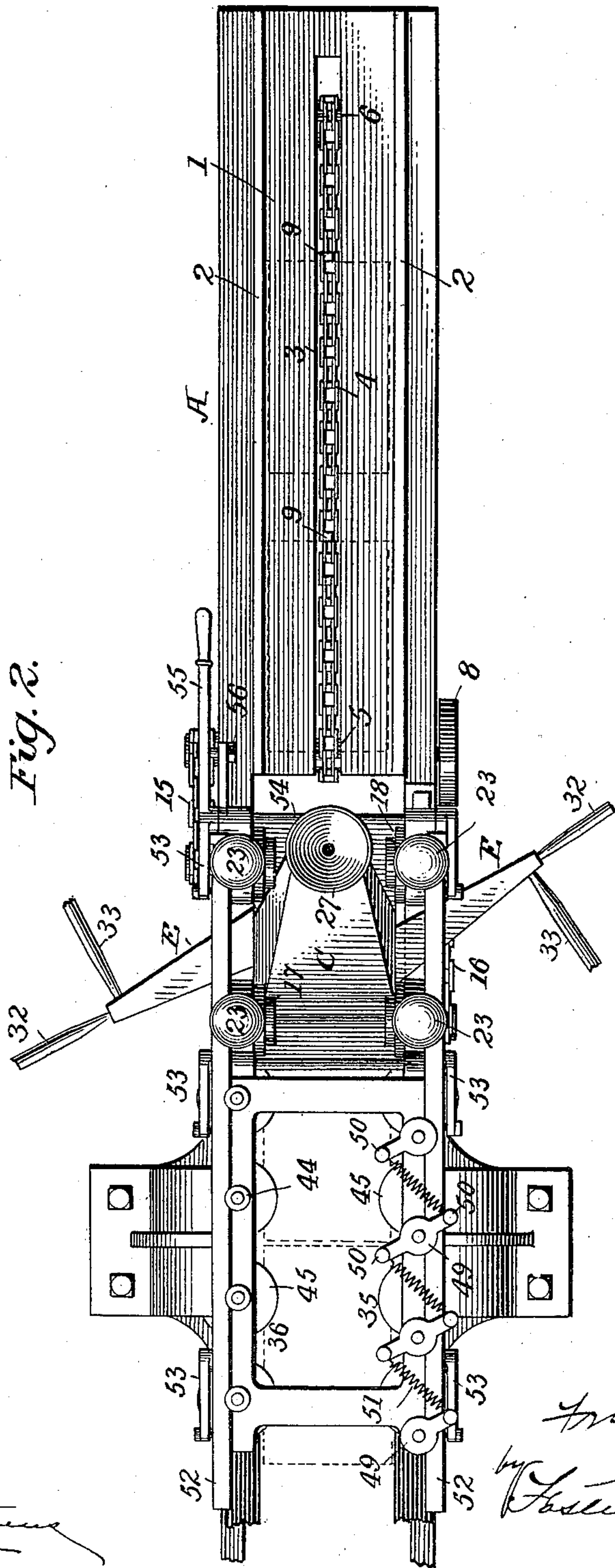
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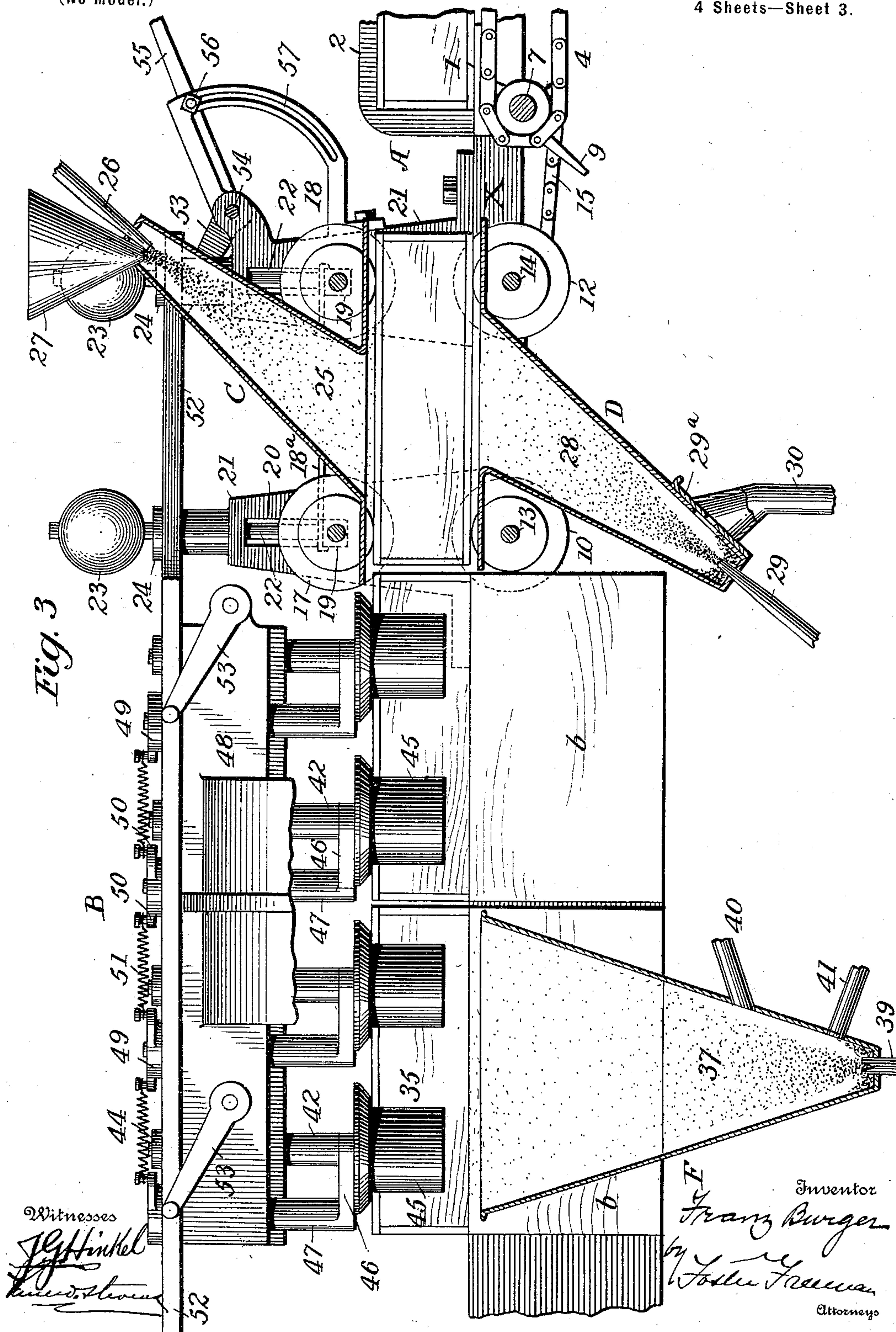
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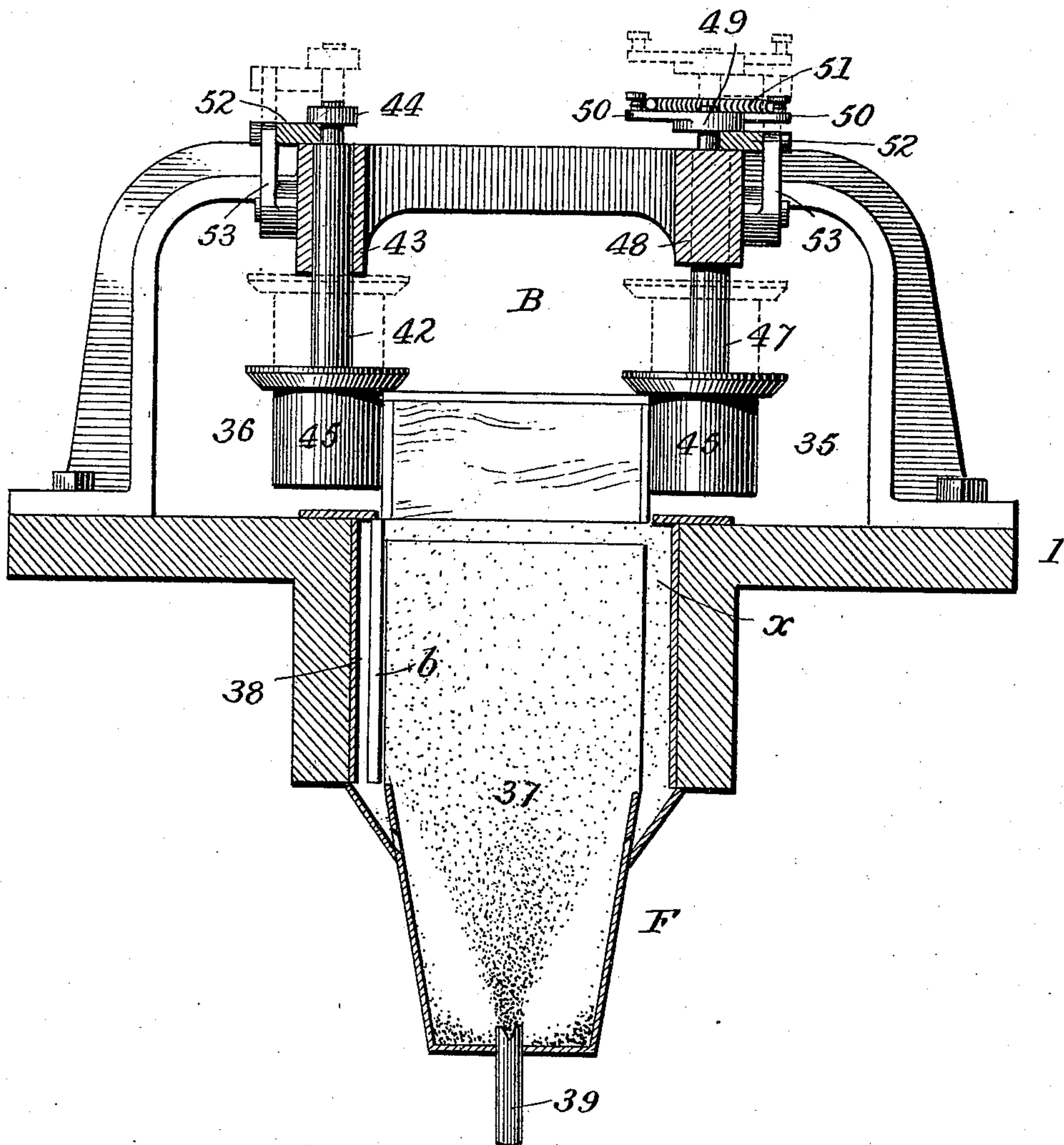
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4 Sheets—Sheet 4.

Fig. 4.



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# UNITED STATES PATENT OFFICE.

FRANZ BURGER, OF FORT WAYNE, INDIANA, ASSIGNOR OF THREE-FOURTHS  
TO HENRY M. WILLIAMS, OF SAME PLACE.

## SAND-BLAST.

SPECIFICATION forming part of Letters Patent No. 607,825, dated July 26, 1898.

Application filed September 1, 1897. Serial No. 650,290. (No model.)

*To all whom it may concern:*

Be it known that I, FRANZ BURGER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Sand-Blasts, of which the following is a specification.

This invention relates to certain new and useful improvements in sand-blast apparatus for cleaning various articles, it being particularly adapted for removing paper and paint from the interior and exterior of wooden and other boxes; and it has for its object to provide a machine for quickly and effectively accomplishing this result without injury to the boxes.

With this object in view the invention consists in the novel construction, combination, and arrangement of the parts hereinafter more particularly described.

In the accompanying drawings, forming a part of this specification, and in which like letters and figures of reference indicate corresponding parts, Figure 1 is a side elevation of a machine embodying the invention, parts being in section and broken away. Fig. 2 is a plan view of the machine. Fig. 3 is an enlarged side elevation of the cleaning mechanism, parts being in section; and Fig. 4 is a cross-sectional view on the line *y y* of Fig. 1.

Briefly stated, the invention comprises a feed-table with means coöperating with the table for feeding boxes or other articles to the cleaning mechanism, where, in the case of boxes, they are subjected to the action of suitably-arranged sand-blasts to clean the paper and paint from all the exterior sides thereof, the boxes being then fed forward by feed-rolls, and their lids, if they are provided with lids, are opened and the interior surfaces of the boxes and inner faces of their lids are subjected to the action of another sand-blast to thoroughly clean the boxes upon their interior.

Referring more particularly to the drawings, A designates the feeding mechanism, comprising a table 1, having side guides 2 and formed with a central longitudinal slot 3, beneath and in line with which is an endless belt or chain 4, passing around sprocket-wheels 5 6, the former of which is mounted

upon a driving-shaft 7, carrying a band-wheel 8. Carried at regular intervals upon the chain 4 are carriers 9, which are adapted to project through the slot 3 and engage the rear ends of the boxes and feed them to the cleaning mechanism B. Where the boxes are provided with hinged lids they are turned upside down and fed to the cleaning mechanism with the lids closed, for the purpose which will hereinafter appear.

The cleaning mechanism B comprises, as shown, two separated pairs of flanged feed-rolls 10 12, mounted upon shafts 13 14, respectively, with the rolls of each pair upon opposite sides of the machine and arranged with their peripheries substantially in the plane of the upper face of the feed-table 1. Preferably the peripheries of these rolls are formed of rubber to insure better frictional contact and prevent injury to the boxes fed over them, and said rolls are positively driven by means of a chain 15, passing around sprocket-wheels upon the driving-shaft 7 and shaft 14, and by means of a second chain 16, passing around sprocket-wheels on the shafts 13 and 14.

Arranged above and in line with the rolls 10 12 are corresponding pairs of flanged friction-rolls 17 18, journaled in blocks 19, adapted to move vertically in slots 20 of journal-boxes 21 of the frame, and connected to each of said blocks are vertical standards 22, extending through the tops of the boxes 21 and provided at their upper ends with weights 23 and immediately below the weights with annular flanges 24, the purpose of which will presently be described.

Supported above the friction-rolls 17 18, by means of arms 18<sup>a</sup>, projecting from the blocks 19, is a sand-blast apparatus C, comprising a funnel-shaped casing 25, inclined upwardly in a direction opposite to the line of feed of the boxes and having its flaring end disposed immediately above the plane of the lower surface of the rolls 17 18 and arranged to practically fill the space between the rolls. Projecting into the contracted end of the casing is an air-delivery nozzle 26, connected with a suitable source of air-supply, (not shown,) and connected to the casing and opening into the contracted end thereof in close proximity



to the air-nozzle is a sand-hopper 27 for supplying sand to the interior of the casing.

Supported rigidly upon side bars X of the frame is a second vertically-inclined sand-blast apparatus D, comprising a funnel-shaped casing 28, having a closed contracted end and an open flaring end filling the space between the feed-rolls 10 12 immediately below the plane of the upper surfaces thereof. This apparatus is adapted to deliver a sand-blast in the opposite direction to the line of travel of the boxes, and projected into the contracted end of its casing 28 is an air-nozzle 29, connected to a source of air-supply, and near said end the casing is provided with an overflow-opening controlled by a slide 29<sup>a</sup>, through which opening the surplus sand within the casing is discharged into an overflow-pipe 30. The flaring mouths of the two casings 25 28 are in the same vertical plane, and the sand which is blown through the upper casing falls by gravity into the lower one to be again utilized.

Rigidly mounted upon opposite sides of the frame are two correspondingly-constructed horizontal sand-blast apparatus E, each comprising a funnel-shaped casing 31, having air and sand delivery pipes 32 33, respectively, in their contracted ends. The flaring ends of these casings are arranged to close the spaces between the upper and lower feed-rolls upon opposite sides of the machine, and one of them is disposed at an angle to deliver a blast of sand in the direction in which the boxes are fed, and the other casing is arranged to deliver a blast in the opposite direction. The mouths of these horizontal sand-blasts are in line with each other and are in the same vertical plane as the mouths of the vertical sand-blasts C D.

The operation of the above-described parts is as follows: A box is fed by the feeding mechanism to the front end of the cleaning mechanism B, and as the front end of the box passes between the feed-rolls 12 18 sand is forcibly projected by the blast D and one of the horizontal blasts against the advancing end with sufficient force to cut the paper or paint from said end, and as the box continues to be fed along between the rolls the blast C acts upon the upper surface of the box, the blast D against the bottom surface, and the horizontal blast E upon the opposite sides thereof, thereby cleaning all but the rear end of the box. This is accomplished, however, by the upper vertical blast C, together with one of the horizontal side blasts which point in the direction in which the box is being fed, the sand from said blast striking the rear end of the box as it passes between the feed-rolls 10 17. As the box leaves these latter rolls it is fed between two horizontal series of flanged guide-rolls 35 36, one series being arranged upon each side of the frame in position to engage the sides of the box at their peripheries, with the flanges of the rolls overlying the upper surface of the

box. These rolls are not positively driven, and when a box is fed between them it remains stationary until the succeeding box is fed between the guide-rolls, when it is pushed along by the second box a distance corresponding to its length. When the box is first fed from the rolls 10 17 to the guide-rolls, it is brought over a longitudinal opening  $x$  in the top of the frame. This opening is greater in width than the box, and consequently when the box is brought over it there is nothing to hold the hinged box-lid  $b$  in its closed position, and said lid drops to a vertical position, as shown in Fig. 4, exposing the interior of the box.

Near the rear end of the frame and arranged below the side bars X is a vertical sand-blast F, comprising a funnel-shaped casing 37, having its flaring end opening into the opening  $x$  and its sides cut away at 38 to permit a depending box-lid to be moved longitudinally through the casing. Arranged in the lower contracted end of the casing 37 is a vertical air-nozzle 39, and in its sides the casing is formed with a sand-supply opening 40 and an overflow-opening 41. By this arrangement when a box is fed over the mouth of the sand-blast F the sand is projected against the interior walls of the box as well as against the inner face of its lid, cutting all paper and paint therefrom, and when this has been accomplished the interior and exterior of the box is thoroughly cleaned, and it is expelled from between the guide-rollers 35 36 at the rear end of the machine ready to be refilled.

The rolls 36 are carried upon the lower ends of short vertical shafts 42, journaled and adapted to move vertically in boxes 43 of the frame, and each of the said shafts is provided with annular heads 44. The rolls 35 are journaled upon spindles at the ends of horizontal crank-arms 46, carried upon the lower ends of short vertical shafts 47, adapted to rotate and to be moved vertically in journal-boxes 48 of the frame, and at their upper ends the said shafts are formed with heads 49, from opposite sides of which project arms 50, which are connected to corresponding arms of adjacent shafts by means of springs 51, which are adapted to rotate the shafts 47 and throw the crank-arms 46 and their rolls inward toward the boxes, the said springs permitting the rolls to yield laterally and adapt themselves to any inequalities in the size or surfaces of the boxes.

Normally resting upon the tops of the journal-boxes 43 48 and engaging the under faces of the heads 44 49, as well as the under faces of the flanges 24, are horizontal lifting-bars 52, pivotally supported at the ends of separated arms 53, which are in turn pivoted upon the frame of the machine. One of these is arranged upon each side of the machine, and at their front ends they are connected to opposite sides of the casing 25 of the sand-blast C. To one end of the pivot-rod 54 of the arms 53 at the front end of the machine is



connected a lever-arm 55, provided intermediate its length with a clamp-screw 56, adapted to move through a segmental slot 57 of the frame. From the above it will be apparent  
 5 that when the lever-arm 55 is depressed the arms 53 upon opposite sides of the machine will be simultaneously swung upwardly on their pivots, causing the lifting-bars to be elevated, and thereby effecting the raising of  
 10 the rolls 35 36, feed-rolls 17 18, and the upper sand-blast C. It will thus be apparent that the machine may be utilized in cleaning boxes of different heights.

When it is desired to merely clean the exterior surfaces of boxes, it will be readily understood that the guide-rollers 35 36 and their cooperating devices may be omitted, the boxes being cleaned by the vertical sand-blast apparatus C D and the horizontal sand-blast  
 20 apparatus E E.

Without limiting myself to the exact construction and arrangement of the parts shown and described, since it will be understood that the parts may be variously constructed and  
 25 arranged without departing from the spirit or scope of the invention and some of the features of the invention may be used without others,

What I claim is—

30 1. In a cleaning-machine, the combination with feeding mechanism, of vertical sand-blast apparatus arranged above and below the feeding mechanism and cooperating therewith to forcibly project sand in opposite directions, one of said apparatus being inclined  
 35 in the direction of the line of feed and the other being inclined in the opposite direction, substantially as described.

40 2. In a cleaning-machine, the combination with feeding mechanism, of a sand-blast apparatus upon each side of the said mechanism

and cooperating therewith to forcibly project sand against opposite sides of the object being fed, one of said apparatus being arranged to project the sand in the same general direction in which the object is fed and the other in the opposite direction, substantially as described. 45

3. In a cleaning-machine, the combination with feeding mechanism, of sand-blast apparatus cooperating with said mechanism to forcibly project sand against the top, bottom and sides of the object being fed, substantially as described. 50

4. In a machine for cleaning hinged-top boxes, the combination with feeding mechanism, of sand-blast apparatus cooperating with said mechanism to forcibly project sand against the top, bottom and side of the box as it is being fed, devices for opening the lid  
 60 of the box, and a sand-blast apparatus for forcibly projecting sand against the interior walls of the box and against the inner face of the lid thereof, substantially as described.

5. In a cleaning-machine, the combination 65 with vertically-adjustable feed-rolls and means for driving the same, of a vertically-adjustable sand apparatus, substantially as described.

6. In a cleaning-machine, the combination 70 of upper and lower vertically-adjustable feed-rolls, laterally-adjustable side guide-rolls, and a sand-blast apparatus cooperating with said rolls, substantially as described.

In testimony whereof I have signed my  
 75 name to this specification in the presence of two subscribing witnesses.

FRANZ BURGER.

Witnesses:

GEO. K. TORRENCE,  
 F. EVERETT ANDERSON.