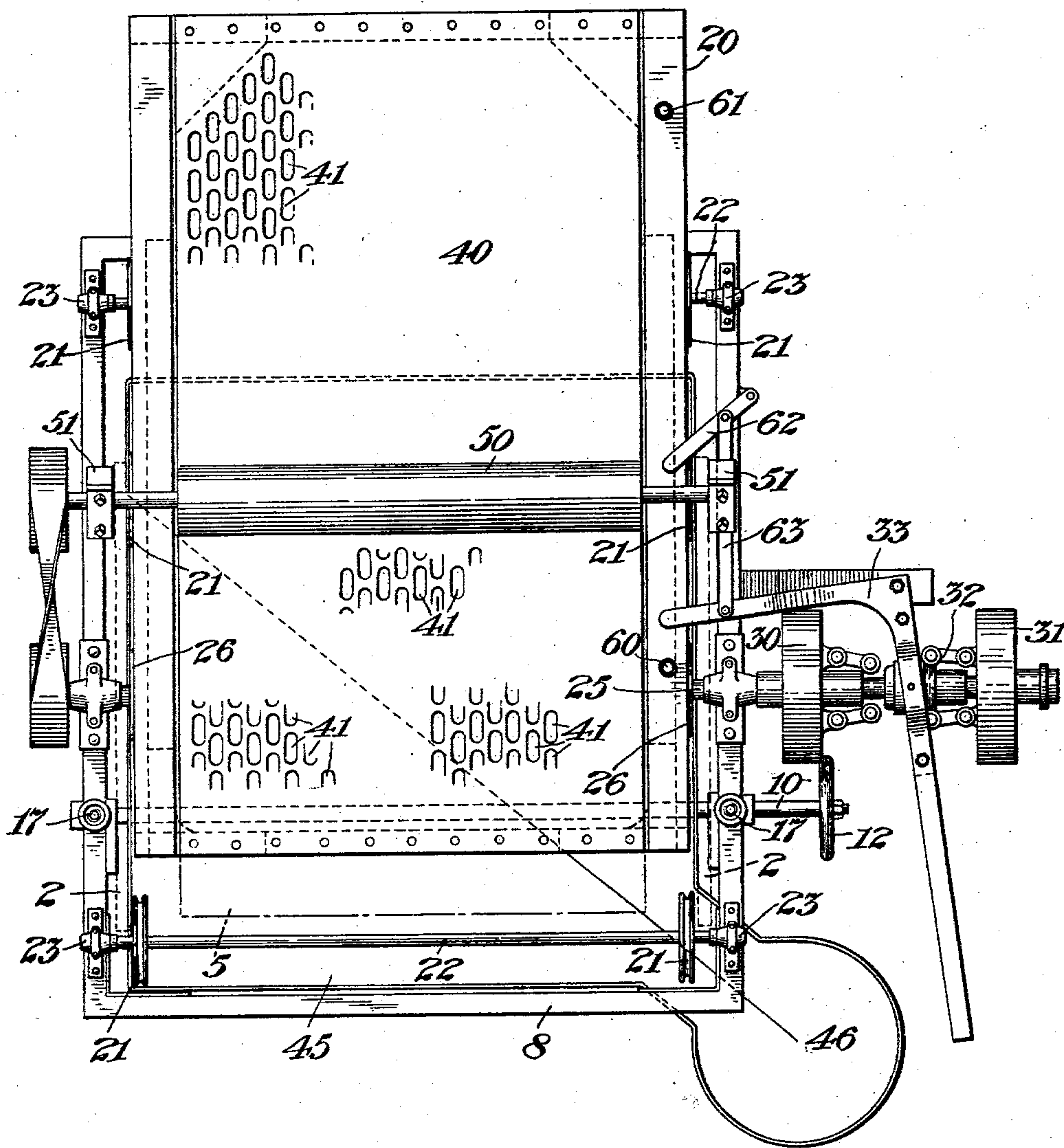


PATENTED DEC. 1, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

*Fig. 1*



Witnesses  
C. W. Smith  
E. Faith

Inventor  
Edward J. Murphy  
By his Attorney  
Chas. F. Wane

No. 745,646.

PATENTED DEC. 1, 1903.

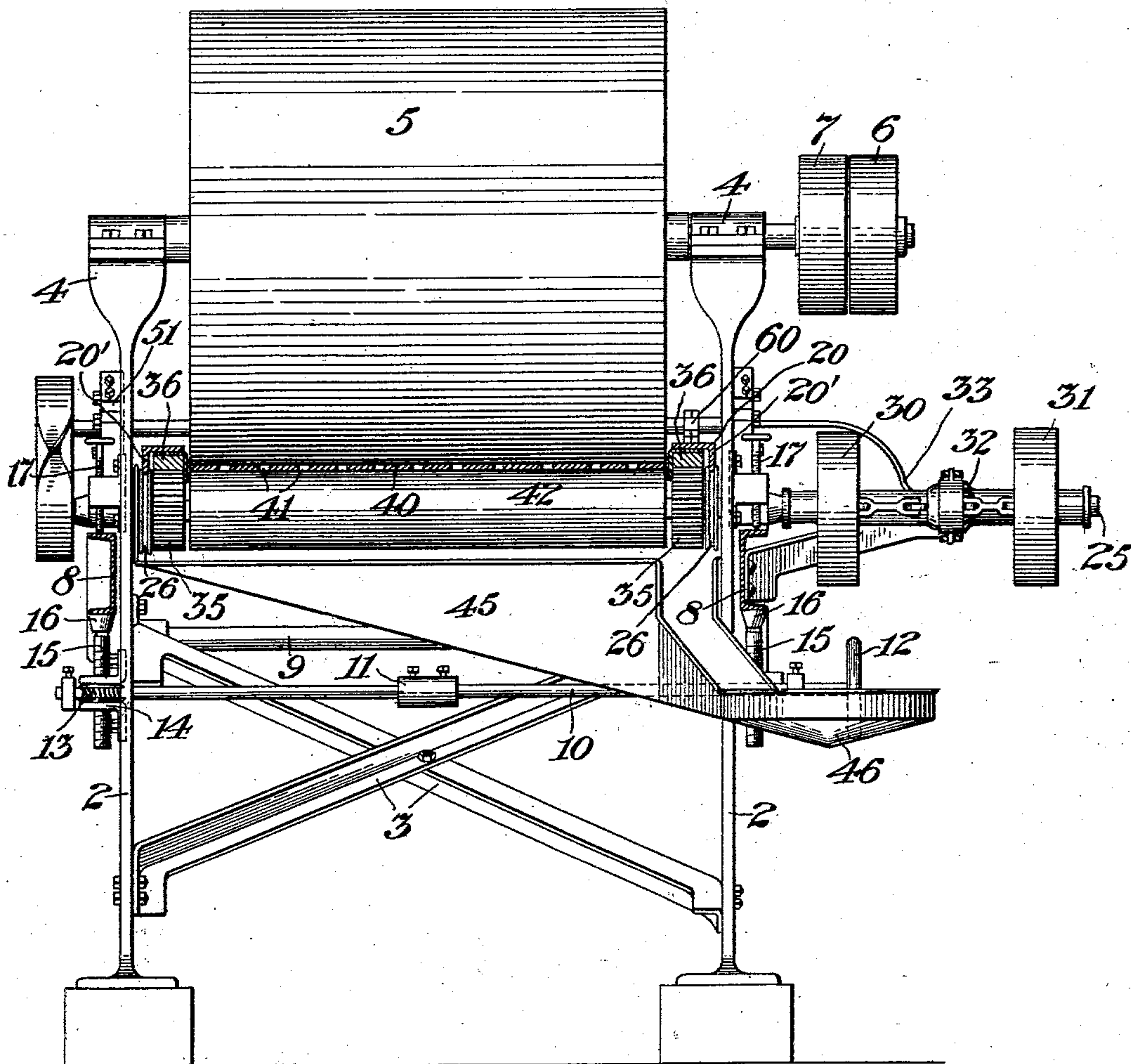
E. J. MURPHY.  
POLISHING MACHINE.

APPLICATION FILED AUG. 6, 1903.

NO MODEL.

3 SHEETS—SHEET 2.

*Fig. 2*



Witnesses  
*W. Smith*  
*C. Faith*

Inventor  
*Edward J. Murphy*  
By his Attorney  
*Chas. F. Dane*

No. 745,646.

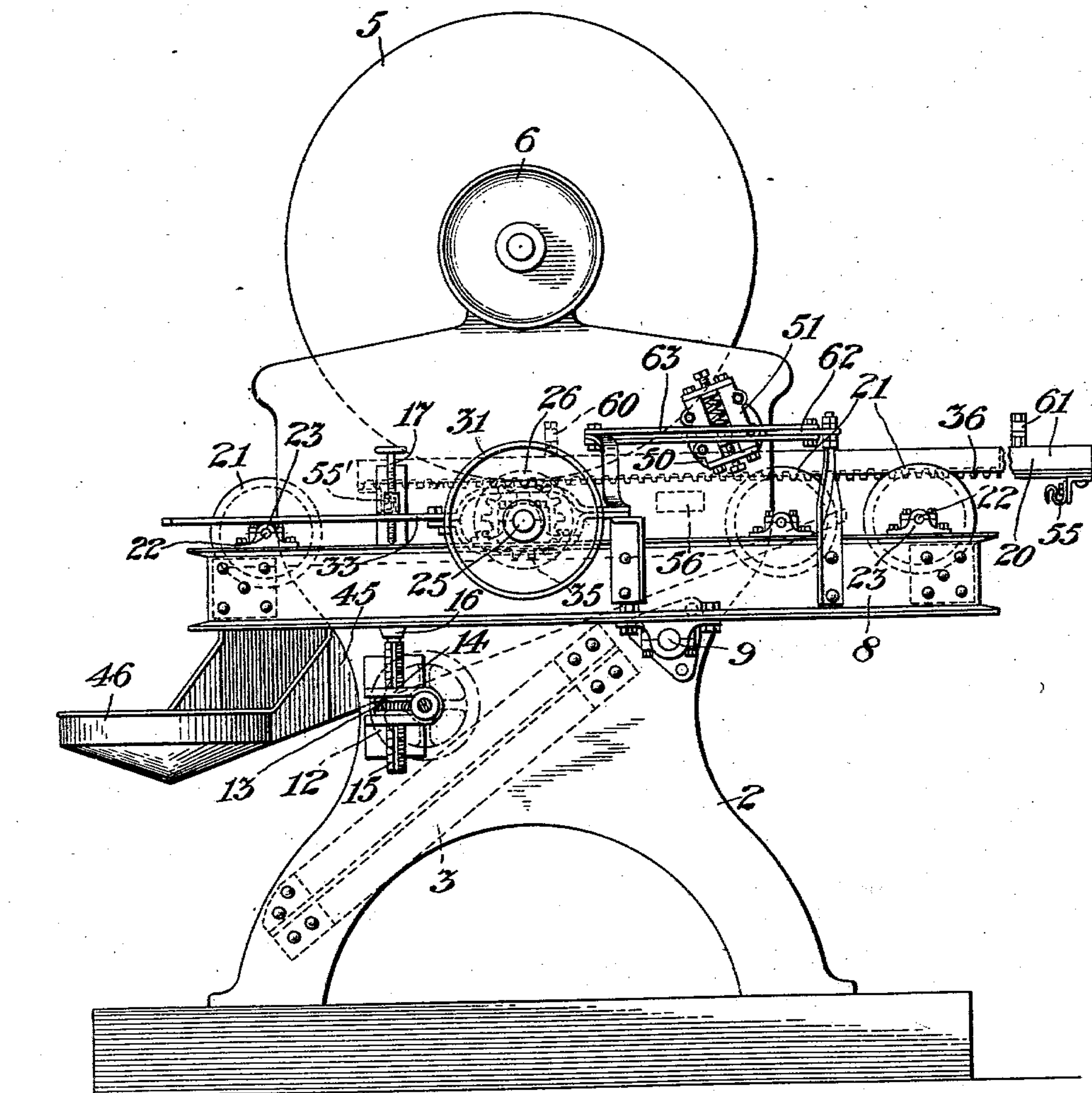
PATENTED DEC. 1, 1903.

E. J. MURPHY.  
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APPLICATION FILED AUG. 6, 1903.

NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 3*



Witnesses  
*E. W. Smith*  
*E. Faith*

Inventor  
*Edward J. Murphy*  
By *his* Attorney  
*Chas. F. Dane*



# UNITED STATES PATENT OFFICE.

EDWARD J. MURPHY, OF NEW YORK, N. Y., ASSIGNOR TO A. BRYANT FISHER AND WILLARD FISHER, OF NEW YORK, N. Y.

## POLISHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 745,646, dated December 1, 1903.

Application filed August 6, 1903. Serial No. 168,414. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD J. MURPHY, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Polishing-Machines, of which the following is a specification.

This invention relates to polishing-machines, and especially to machines of that class employed by engravers for polishing plates; and the principal object of the invention is to provide an improved organization of devices by means of which the plate or other article to be polished can be perfectly adjusted and controlled in its movements and in which also the polishing material is quickly removed from the polishing-bed and collected in a receiver, from which it may be taken to be used over and over again.

One of the principal features of the invention is a polishing-bed in which the bed-plate, on which the plate or other article to be polished rests, is perforated substantially throughout the length and breadth thereof, so that the polishing material or pumice as soon as it leaves the surface of the plate being polished falls through these perforations, and hence does not interfere with the proper positioning of the plate which is to be polished. This polishing material when it falls through the perforated bed-plate is collected by a receiver which extends under part of the perforated area of the bed-plate and preferably slopes both lengthwise and crosswise of the machine and forms substantially a wide gutter, which terminates at the intersection of the converging sides of the receiver in a catch-pan, in which the polishing material accumulates and from which it may be taken to be used again.

Another important feature of the invention relates to the construction of the polishing-bed, this preferably consisting of a frame which may be made of angle-irons suitably connected and braced and on which is stretched a bed-plate, which is preferably connected to the polishing-frame only at the ends thereof, this bed-plate being of course preferably ably perforated, as hereinbefore described.

A further feature of this invention relates

to the means by which perfect coöperation of the polishing-roller with the polishing-bed and the parts carried thereby is assured. This result is accomplished by mounting the polishing-roller on the main frame and by providing an auxiliary frame movable in the main frame and adjustable toward and from the polishing-roller to bring the polishing-bed and the article to be polished to the proper adjusted position with respect to the surface of the polishing-roller. This auxiliary frame may be mounted on an axis at one end of the main frame in such manner as to swing the contacting portion of the polishing-bed toward or away from the adjacent surface of the roller, as may be required.

Other features of the invention not hereinbefore referred to will be hereinafter described and are shown in the accompanying drawings, in which—

Figure 1 is a plan of a polishing-machine constructed in accordance with this invention, the polishing-roller and the main frame being indicated by dotted lines. Fig. 2 is a front elevation of the machine, partly in section. Fig. 3 is a side elevation of the same.

Similar characters designate like parts in all the figures of the drawings.

Any suitable framework may be employed for supporting the several operative parts of the machine, this framework usually comprising a pair of uprights or end frames connected and strengthened by suitable cross-braces, such as 3. At the upper ends thereof these main end frames have the usual bearings 4 4, in which is journaled the usual polishing-roller 5, this being driven from any suitable source of power, fast and loose pulleys being shown at 6 and 7 for this purpose.

The polishing-bed is mounted for reciprocation beneath the polishing-roller 5 and is operated by different driving connections from those just described. This polishing-bed is preferably mounted on an auxiliary frame, such as 8, carried by the main frame and adjustable thereon toward and from the polishing-roller. This adjustment may be obtained in any desired manner; but it is preferable to mount said auxiliary frame for oscillation about an axis 9 at one end of the main frame, so that the portion of the aux-



iliary frame which is immediately adjacent to or in contact with the polishing-roller 5 may be quickly adjusted toward and from the adjacent surface of the polishing-roller, 5 as may be required, to bring said roller and the plate or other article to be polished into proper relation with each other. In the construction shown this auxiliary frame is made up of channel-irons suitably connected and 10 braced to form a strong but light rectangular frame. This frame may be raised or lowered evenly and smoothly at both sides thereof by means of adjusting mechanism which will operate upon both sides of said frame 15 simultaneously. In the construction shown I have illustrated at 10 an adjusting-shaft, which is preferably in two parts connected by means of a coupling-sleeve 11, this shaft having at one end thereof a hand-wheel 12 20 for turning the same. Near opposite ends thereof worms may be formed on said shaft and may operate worm-gears, such as 13, which are held against movement in the direction of their axes between the guide-walls 25 of suitable lugs, such as 14, and are bored and internally threaded for the purpose of vertically reciprocating a pair of feed-screws, such as 15, at opposite sides of the machine, these feed-screws being splined in the lugs 30 14, as indicated in Fig. 3, for the purpose of preventing rotation thereof. By means of the hand-wheel 12 and its connections to these feed-screws it will be obvious that the opposite sides of the forward end of the auxiliary frame 8 may both be raised simultaneously and evenly to obtain the desired adjustment. At their upper ends the feed-screws 15 preferably have ball-and-socket connections, such as 16, with the channel-irons of 40 the frame 8, which they support and adjust. After the desired adjustment has been obtained it may be held and upward movement of the auxiliary frame prevented by means of suitable stop-faces, such as the adjustable 45 stops or screws 17, carried by lugs on the main frame.

The frame of the polishing-bed is preferably similar to the auxiliary frame just described—that is to say, it is a rectangular frame 50 made up of angle-irons suitably connected and braced to form a stiff but light frame—this polishing-frame being designated generally by 20. The angle-irons of this frame are preferably so constructed and located 55 that at opposite sides thereof there will be two parallel supporting ribs or flanges 20', which may be mounted on and supported by guide-rolls, such as 21, these guide-rolls being disposed at different points in the length 60 of the auxiliary frame 8 and carried in pairs at opposite sides of said frame by suitable bearings. In this construction said guide-rolls are secured to shafts, such as 22, the ends of which are mounted directly in said 65 bearings on the frame 8, these bearings being indicated at 23. All of these guide-rolls are grooved in order that they may receive

the ribs of the said angle-irons of the polishing-frame and positively locate said polishing-frame crosswise of the machine in addition 70 to supporting it and guiding it in its travel back and forth. Another pair of guide-rolls similar to those just described may be secured to the main shaft 25 of the machine, and these rolls are indicated at 26. 75

The movements of the polishing-frame back and forth under the polishing-roller are preferably derived from the main shaft 25 just referred to, which shaft may be driven from any suitable source of power and preferably carries a pair of driving-wheels, such 80 as 30 and 31, controlled by a clutch mechanism 32, which may be operated by a shipping-lever 33 in one direction or the other for the purpose of reversing the direction of rotation 85 of said shaft 25, these devices constituting a reversing mechanism, which may be controlled either by hand or automatically, as will be hereinafter described. The movement of this shaft 25 is preferably imparted to the 90 polishing-frame by a rack-and-pinion movement, two pinions being shown herein at 35 at opposite sides of the polishing-frame, and these pinions mesh into the teeth of a pair of racks 36, secured to the side angle-irons of 95 the polishing-frame 20. This construction assures a positive reciprocation of the polishing-frame in one direction or the other, according as the shaft 25 is rotated to the right 100 or to the left. The polishing-bed is in this case made up of a polishing-frame and a polishing-plate. The frame of this polishing-bed has been hereinbefore described. The polishing-plate on which the engraver's plate 105 or other article to be polished rests is preferably a perforated plate of sheet material secured at its ends only to the end bars of the frame 20, this polishing-plate being designated herein by 40. Said polishing-plate 110 has a multiplicity of perforations 41 therein, through which the polishing material or pumice may fall and be removed. At the polishing-line or line of contact with the polishing-roller 5 this polishing-plate rests on 115 and is supported by a supporting-roller 42, carried by the main shaft 25, and a thorough polishing action at the line of contact with the polishing-roller is thereby assured.

For the purpose of catching the polishing substance or pumice as it falls through the 120 openings 41 in the plate 40 a receiver is placed under a portion of the area of said polishing-plate, this receiver being in the construction shown a wide sheet-metal gutter or pan 45, which slopes toward its center line from one 125 side of the machine and also slopes from the rear toward the front of the machine, the general direction of inclination being diagonal and toward one of the forward corners of the machine, at which point, preferably outside 130 the frame of the machine, the receiver terminates in a catch-pan 46, into which the polishing material will fall.

For the purpose of controlling the move-



ment of the plate that is being polished and to prevent its ejection from the machine at the end of the forward stroke of the polishing-bed a brake in the form of a spring-pressed roller is preferably employed. Such a roller is indicated at 50 and at its ends is mounted in bearings which are spring-pressed and are adjustable in guides 51 at opposite sides of the framework, this construction assuring a firm pressure downwardly against the plate at all times. This is necessary, because the speed at which the plate travels and the speed of rotation of the polishing-roller are such that the force exerted on the plate might otherwise be sufficient to eject it from the machine.

At the under side of the ends of the polishing-bed I have shown stops in the form of spring-buffers 55 and 55', which may strike against a suitable element or elements of the machine as the polishing-bed is moved to one end or the other of its travel, and thus limit the movements of said bed in both directions. One of these buffers may strike against a stop-bar, such as 56, and the other against the roller 42. In addition to using such a stop device automatic reversing-stops are preferably used in connection with the reversing mechanism hereinbefore described, these stops being located at different points in the length of the polishing-bed and being preferably constructed, as shown at 60 and 61, with antifriction sleeves or rolls. These stops coöperate, respectively, with the inner end of the shipping-lever 33 and with a second and shorter lever, such as 62. These two levers are connected in this case by a double link 63, so that they will operate simultaneously, one controlling the rotation of the shaft 25 in one direction and the other controlling the rotation of said shaft in the other direction, as will be obvious.

What I claim is—

1. In a polishing-machine, the combination with a polishing-bed and with supporting-rolls therefor, of means for reciprocating said bed, and a spring-pressed roller for pressing a plate against said bed.

2. In a polishing-machine, the combination with a polishing-bed comprising a bed-frame and a bed-plate secured at its ends only to

the ends of said frame, of means for reciprocating said bed.

3. In a polishing-machine, the combination with a polishing-bed comprising a bed-frame and a perforated bed-plate secured at its ends only to the ends of said frame, of means for reciprocating said bed.

4. In a polishing-machine, the combination with a polishing-bed comprising a bed-frame made up of angle-irons and a bed-plate secured to said frame, of supporting-rolls for said angle-irons, and means for reciprocating said bed.

5. In a polishing-machine, the combination with a main frame, of a polishing-roller mounted in said frame, an auxiliary frame adjustable on said main frame toward and from said polishing-roller, a polishing-bed, and means for reciprocating said bed.

6. In a polishing-machine, the combination with a main frame, of a polishing-roller mounted in said frame, an auxiliary oscillatory frame adjustable on said main frame toward and from said polishing-roller, a polishing-bed, and means for reciprocating said bed.

7. In a polishing-machine, the combination with a main frame, of a polishing-roller mounted in said frame, an auxiliary frame adjustable on said main frame toward and from said polishing-roller, adjusting-screws at opposite sides of said auxiliary frame, an adjusting-shaft and gears for simultaneously operating said adjusting-screws for raising or lowering the auxiliary frame evenly at both sides thereof, a polishing-bed, and means for reciprocating said bed.

8. In a polishing-machine, the combination with a polishing-bed having a pair of stops located at different points in the length thereof, of power mechanism for reciprocating said bed, and reversing mechanism operated by said stops for controlling the direction of movement of said bed.

Signed at New York, in the county of New York and State of New York, this 3d day of August, A. D. 1903.

EDWARD J. MURPHY.

Witnesses:

CHAS. F. DANE,  
E. FAITH.