

No. 608,427.

Patented Aug. 2, 1898.

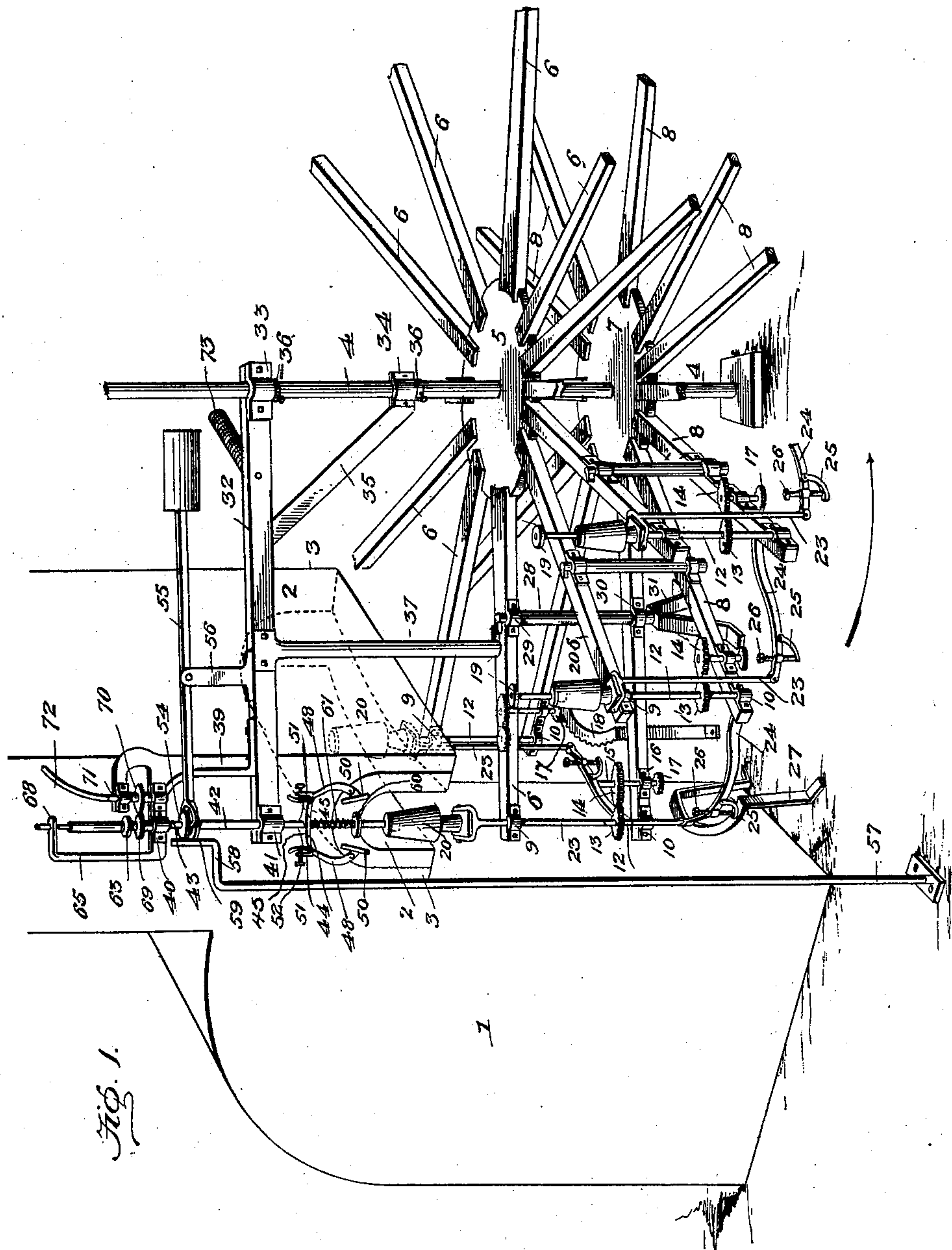
W. KAY & J. C. ADAMS.

REHEATING AND FINISHING MACHINE FOR GLASS ARTICLES.

(Application filed Jan. 11, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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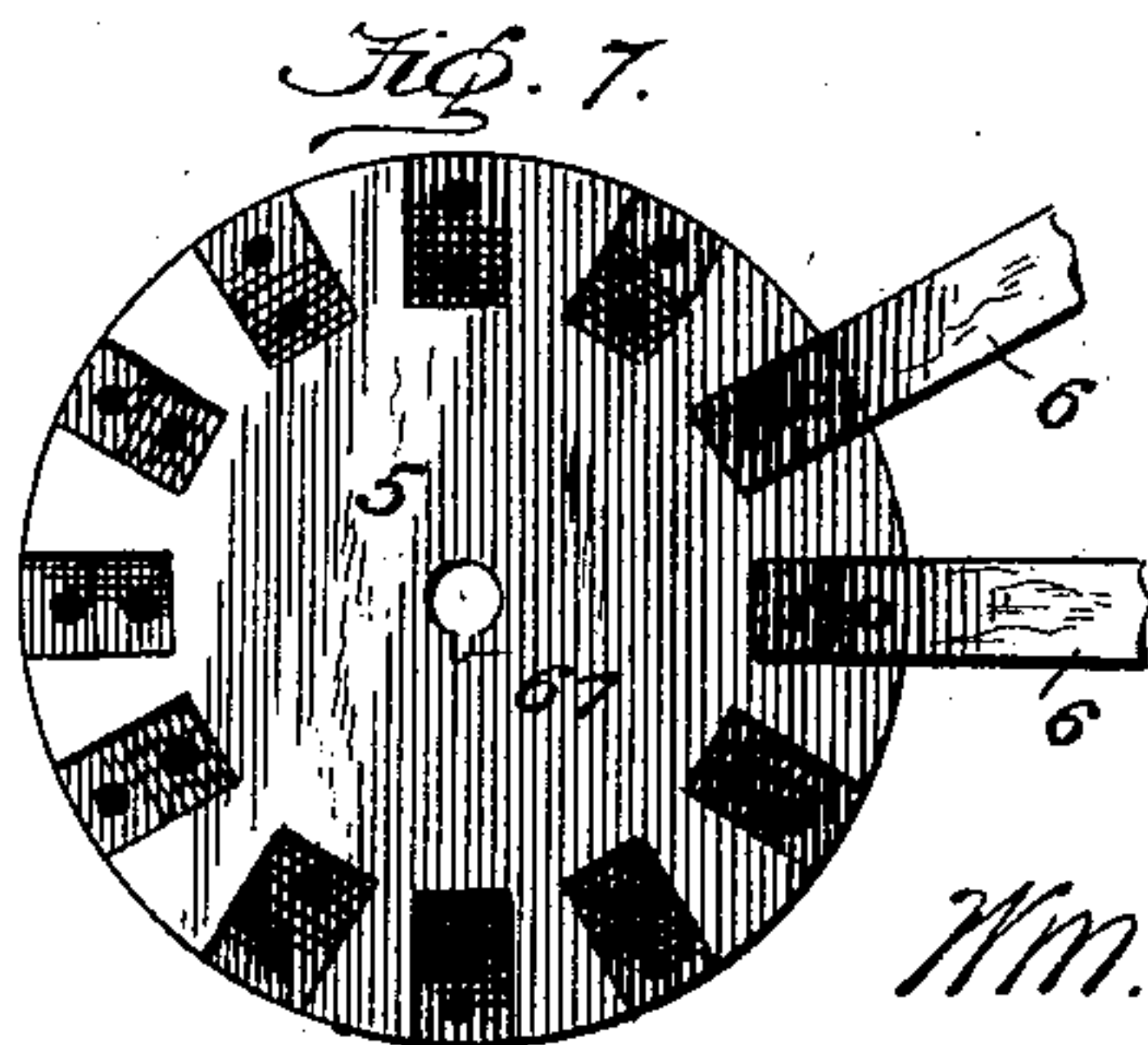
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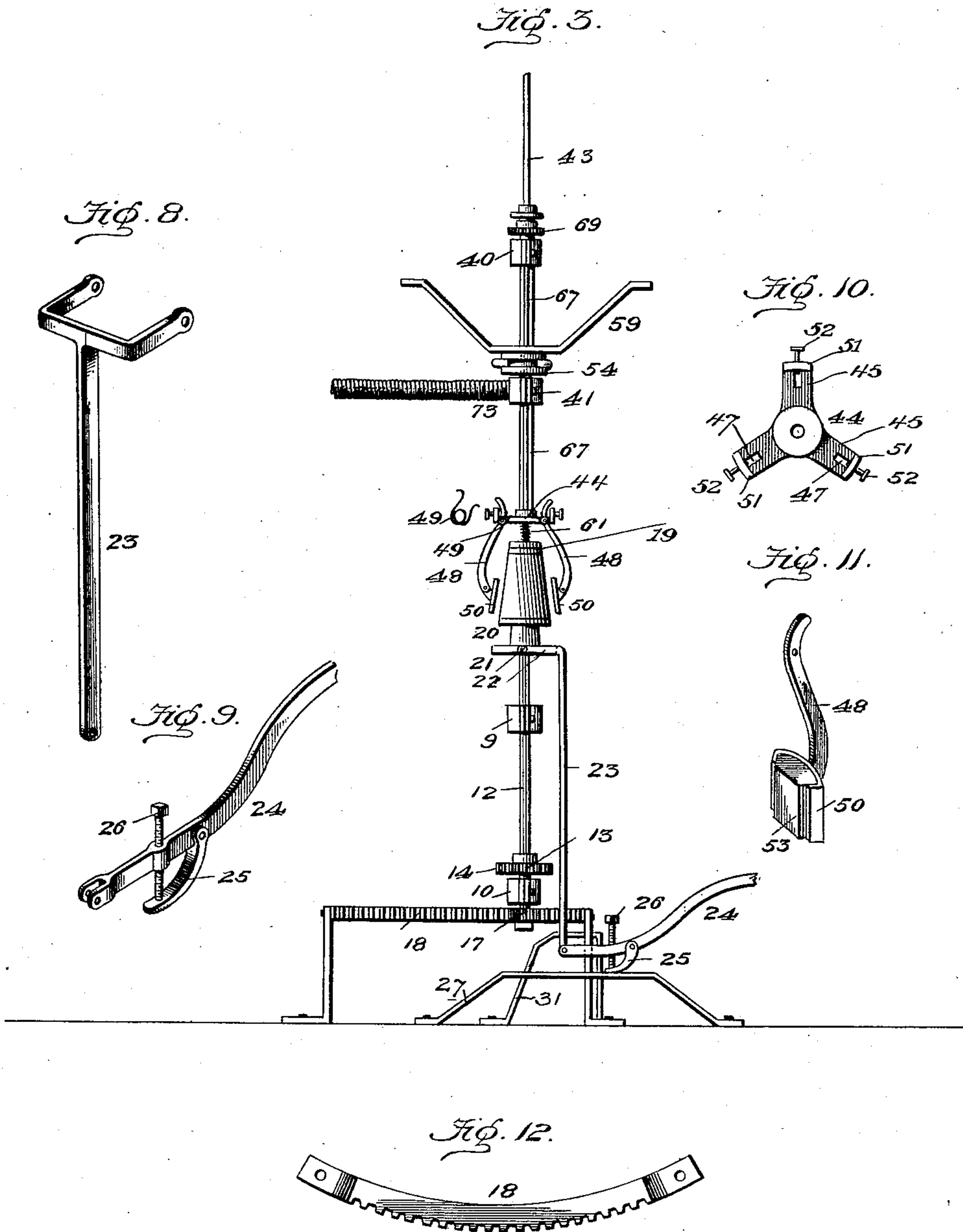
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# UNITED STATES PATENT OFFICE.

WILLIAM KAY AND JOHN C. ADAMS, OF JONESBOROUGH, INDIANA.

REHEATING AND FINISHING MACHINE FOR GLASS ARTICLES.

SPECIFICATION forming part of Letters Patent No. 608,427, dated August 2, 1898.

Application filed January 11, 1898. Serial No. 666,353. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM KAY and JOHN C. ADAMS, citizens of the United States, residing at Jonesborough, in the county of Grant and State of Indiana, have invented certain new and useful Improvements in Reheating and Finishing Machines for Glass Articles; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improved automatic warming-in or reheating and finishing machine for finishing glass articles; and the object is to increase the efficiency and capacity of the machine.

To this end the invention consists in the construction, combination, and arrangement of the device, as will be hereinafter more fully described, and particularly pointed out in the claims.

The accompanying drawings show our invention in the best form now known to us; but many changes in the details might be made within the skill of a good mechanic without departing from the spirit of our invention as set forth in the claims at the end of this specification.

The same reference characters indicate the same parts of the invention.

Figure 1 is a perspective view of a glass-finishing machine embodying our invention. Fig. 2 is a side elevation of one of the series of carrier-arms. Fig. 3 is a similar view of the same, taken from another point. Fig. 4 is a detail view of the former. Fig. 5 is a detail of one of the guide-rails. Fig. 6 is a similar view of one of the upper shifting-lever connections. Fig. 7 is a plan view of one of the carrier-disks. Fig. 8 is a perspective view of one of the shifting-rods. Fig. 9 is a similar view of one of the lower shifting-levers. Fig. 10 is a plan view of the spider. Fig. 11 is a perspective view of one of the buffer-levers. Fig. 12 is a plan view of the segmental rack.

1 represents the furnace, and 2 the reheating-chamber communicating therewith and having a longitudinal passage-way 3 open at its ends and bottom. This passage-way is curved longitudinally to a circle struck from the main operating-shaft 4, which is vertically journaled in suitable bearings and con-

tinuously rotated by any suitable means (not shown) in the direction of the arrow, as seen in Fig. 1.

5 represents a disk horizontally fixed on the vertical shaft 4, and it is provided with a series of radial arms 6 6 and a similar disk 7, fixed on the same shaft below the disk 5, is provided with a corresponding series of radial arms 8 8, which are vertically aligned with those on the disk 5. As the entire series of arms 6 6 and the corresponding series of arms 8 8 and their working parts are identical in construction and operation, we will now proceed to describe one set complete, which will answer for all.

9 10 denote boxes fixed on the outer ends of the arms 6 and 8, in which is journaled the vertical shaft 12, which has a rotary movement in said boxes in addition to a horizontal movement in its own plane concentric with the driving-shaft 4. 13 represents a pinion fixed on the lower end of said shaft, and it is adapted to mesh with the gear-wheel 14, fixed on the counter-shaft 15, journaled in the bearing-box 16, fixed on the arm 8, and the lower end of this counter-shaft is provided with a pinion 17, which meshes with the stationary segmental rack 18, fixed in the path of said pinion. The upper end of the shaft 12 is screw-threaded, on which is detachably secured the horizontal disk 19.

20 represents the former or plug, which supports the article while being finished, and it may be of any size and shape to correspond to the various articles adapted to be finished on a machine of this class. This former 20 encompasses the shaft 12, and it is detachably secured to a hub 21, formed with a flange 22, having oppositely-disposed radial pins to engage the corresponding orifices on the parallel jaws of the vertical rod 23, the lower end of which is pivoted in the outer end of the lever 24, fulcrumed in the preceding arm 8 of the series fixed to the disk 7. 25 represents a dog fulcrumed on said lever, and 26 denotes a set-screw extending through the lever and in contact with said dog to adjust the upward movement of the plug 20 with reference to the fixed disk 19. 27 represents an inclined rail fixed in the path of said dog, which, as the dog rides over it, raises the lever, rod 23, and former 20, so as to bring the upper edge of the latter in contact with the disk 19.

28 represents a rectangular bar having a



vertical movement in the alined boxes 29 30, fixed on the arms 6 and 8, and 31 denotes a raised rail fixed in the path of the lower end of said bar.

5 32 represents a radial arm supported horizontally by means of the boxes 33 34 and bracket 35 on the vertical shaft 4, the boxes resting on the collars 36 36, fixed to the shaft, so as to permit the latter to rotate independ-  
10 ently of said shaft, or, in other words, permit the arm 32 to move through the arc of a circle independently of the rotation of said shaft.

37 represents a bar depending from the arm  
15 32, its lower end terminating in a lateral toe which projects into the path of a corresponding toe on the bar 28.

39 denotes a bracket fixed on the outer end  
20 of the arm 32, and it is provided with a bearing-box 40, which is in vertical alinement with a corresponding box 41 on the arm 32 to receive the sleeve 42, journaled therein, and 43 denotes a cylindrical shaft extending vertically through said sleeve. 44 represents a spider  
25 fixed on the lower end of said sleeve, and the outer ends of its equilaterally-arranged arms 45 are formed with slots 47, in which are fulcrumed the buffer-levers 48, each one of which is provided with a V-shaped spring 49  
30 to hold the pivoted shoe 50 on the lower end of said levers in contact with the article being operated upon. The outer ends of the arms of the spider are formed with vertical lugs 51, in which are adjustably secured the  
35 thumb-screws 52, which project into the path of the upper end of said buffer-levers to limit their play in one direction. The shoes 50, which are pivoted on the lower end of the buffer-levers, are each formed with a dovetail  
40 groove to receive the buffer-block 53, and while these buffer-blocks 53 may be made of any suitable material we prefer to use a composition consisting of graphite and charcoal and a binding material, such as soluble glass  
45 or the like. This composition is pressed into blocks and then fitted to the shoes.

We do not wish to confine ourselves to the particular form of buffing mechanism, as it is evident that in some instances the buffer  
50 levers and blocks may be dispensed with and inverted conical cups used to encompass the article and accomplish the same purpose.

54 represents a double-flanged disk fixed  
55 on the sleeve 42, which engages the outer bifurcated end of the lever 55, fulcrumed in the vertical bracket 56, fixed to the arm 32, and the inner end of said lever is provided with an adjustable weight to counterbalance the weight of the sleeve and the parts car-  
60 ried by it.

57 represents a standard fixed to the base  
of the machine, and its upper end terminates in a lateral arm 58, on which is fixed an angular rail 59, which projects into the path of  
65 the duplex flanged disk 54, so as to depress the sleeve 42 when said disk comes in contact with said rail.

60 denotes a follower fixed on the lower end  
of the shaft 43, and 61 denotes a spiral spring  
70 encompassing the lower end of said shaft between said follower and the spider 44, and 63 represents a collar fixed on the upper end of said shaft to limit its downward movement. The upper end of said shaft is square and ex-  
75 tends through a corresponding orifice in the guide 64 on the upper end of a standard 65, fixed to the outer end of the bracket 39. This permits a vertical movement of said shaft and at the same time prevents it re-  
80 volving in the sleeve. The sleeve 42 is provided with a longitudinal keyway 67, which receives a key on the pinion 69, encompassing said sleeve, and which meshes with a corre-  
85 sponding pinion 70, fixed on the shaft 71, journaled in the bracket 39, and 72 represents a flexible shaft connected with the motive power and which imparts a continuous rotary motion to said sleeve and the buffer-levers.

73 represents a spiral spring one end of  
which is connected to the arm 32 and the  
90 other fixed to a suitable point of the machine to restore the arm to its normal position after it has arrived at the forward limit of its movement.

The operation is as follows: When the  
95 shaft 4 is rotated in the direction of the arrow, the formers on the outer ends of the arms 6 pass through the entire length of the furnace 3, and while doing so the pinion 17 meshes with the segmental rack 18 during  
100 the passage of the former through the furnace, so as to rotate the shaft 12 at such a speed as will slightly flare the article by centrifugal action when properly heated, thus permitting the insertion of the conical plug  
105 20 without touching the article until the plug is raised to its proper position at the point where the article leaves the furnace. The pinion 17 disengages the rack 18, discontinuing the  
110 revolution of the shaft 12 and allowing the article to settle around and about the plug 20, the buffers completing the operation, as before described. It may be here stated that the  
115 polish is imparted to the article by the operation of reheating, the buffer-finishing being merely to restore the article to its original or desired shape, which is done by our improved composition buffers without destroying the  
120 delicate polish already imparted to the article by the reheating operation. A very important feature of the device is the di-  
125 vided former consisting of the supporting-disk, and the fact that it is frequently the case that where an article is finished on a solid or one-piece plug it will crack by con-  
130 traction due to cooling before it can be removed from the solid plug. Assuming that the arm 6' has just withdrawn its former from the passage-way, the toe on the bar 28 comes in contact with the corresponding toe on the  
bar 27, thereby carrying the arm 32 around with it. At the same time the dog 25 on the lever 24 rides up on the rail 27, which carries the plug 20 up into the article, so as to engage



and support it at the same time the disk 54 on the sleeve 42 engages the fixed rail 59, which forces said sleeve, the spider 44, and the buffer-levers 48 downward, so that the buffer-blocks 53 encompass and rotate about the article to give it the required shape. The lower end of the bar 28 now rides up on the rail 31, which carries the toe on its upper end above the corresponding toe on the bar 37, so as to release the arm 32 and permit the spiral spring 73 to restore the arm to its first position and ready to engage the following former-arm as it withdraws its article from the furnace. The lever 24 has in the meantime passed over the rail 27 and allowed the plug 20 to drop, leaving the finished article supported on the disk 19, from which it is removed and replaced by another article to be similarly treated, and the operation continued as before.

Having thus fully described our invention, what we claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. The combination of a vertical driving-shaft provided with a series of radial arms arranged in pairs in the same vertical plane, a vertical former-shaft journaled in the outer ends of said arms, a vertically-reciprocating former carried by said shaft, an independent arm 32 mounted on said driving-shaft, a sleeve 42 journaled in the outer end of said arm, a series of buffer-blocks carried by said sleeve, means for continuously rotating said sleeve, as and for the purpose set forth.

2. The combination with the vertical driving-shaft, 4, the radial arms 6 and 8 carried thereby, the former-shaft 12 journaled in the outer ends thereof, means for intermittently rotating said former-shaft, a former or plug encompassing said shaft, and means for imparting a reciprocating movement to said former at predetermined intervals, of the radial arm 32 independently mounted on said driving-shaft and adapted to have a limited concentric movement therewith, the sleeve 42 journaled in the outer end of said arm and in the same vertical alinement with the former-shaft 12, the spider 44 fixed on the lower end of said sleeve and the buffer-blocks 53 carried by said spider, the shaft 43 journaled within said sleeve, the follower fixed on the lower end of said shaft and the spiral spring encompassing said shaft between the follower and the spider, as and for the purpose set forth.

3. The combination with the former-shaft 12, screw-threaded at its upper end, the horizontal disk 19 removably secured on the threaded end of said shaft, of the hub 21 encompassing said shaft, the former or plug 20 encompassing said shaft and removably secured to said hub, and means for imparting an intermittent reciprocating movement to said former, as and for the purpose set forth.

4. The combination with the driving-shaft

4, the disks 5 and 7 fixed to said shaft, the parallel arms 6, 8, fixed to said disks and the vertical shaft 12 journaled in the outer ends of said arms, and adapted to rotate in its own plane concentric with said driving-shaft, and means for intermittently rotating it on its own axis, of the disk 19 removably secured to the upper end of said shaft 12, the hub 21 encompassing said shaft and provided with radial pins, the vertical rod 23, formed with parallel jaws on its upper end provided with orifices which engage said pins, the lever 24, having its free end pivoted to the lower end of said rod, the former-plug 20 detachably secured to said hub 21, and the fixed raised rail 27 projecting into the path of said lever, as and for the purpose set forth.

5. The combination with the driving-shaft 4, the disks 5 and 7 fixed to said shaft, the parallel arms 6, 8 fixed to said disks, and the shaft 12 journaled in the outer ends of said arms and adapted to rotate in a horizontal plane concentric with said driving-shaft, of the pinion 13 fixed to said shaft 12, the counter-shaft 15 journaled in the arm 8, the gear-wheel 14 and pinion 17 fixed to said counter-shaft, the former in mesh with said pinion 13, and the segmental rack 18 fixed in the path of said pinion 17, so as to impart a rotary motion to said shaft 12, while it is rotating in its own plane, as and for the purpose set forth.

6. The combination with the driving-shaft, 4, the arms 6 and 8 carried by said shaft, the bar 28 having a vertical movement in said arms and the fixed rail 31 projecting into the path of the lower end of said bar, of the radial arm 32, independently mounted on said driving-shaft and the depending bar 37 fixed to said arm and having its lower end projecting into the path of said vertically-reciprocating bar 28, as and for the purpose set forth.

7. The combination with the driving-shaft 4, the radial arm 32 loosely mounted on said shaft, the bracket 39 fixed to the outer end of said arm, the sleeve 42 journaled in said bracket and arm, so as to permit of a reciprocating and a rotary motion, the spider 44 fixed to the lower end of said sleeve, the spring-actuated buffer-levers 48 fulcrumed in said spider, the shoes 50 formed with a dovetail groove and pivoted to the lower ends of said levers, and the buffer-blocks 53 removably secured in said grooves, of the cylindrical shaft 43 extending vertically through said sleeve, the follower 60 fixed on the lower end of said shaft, and the spiral spring 61 encompassing said shaft between the spider 44 and the follower 61, as and for the purpose set forth.

In testimony whereof we hereunto affix our signatures in presence of two witnesses.

WILLIAM KAY.  
JOHN C. ADAMS.

Witnesses:

W. T. YOUNG,  
A. E. WISER.