

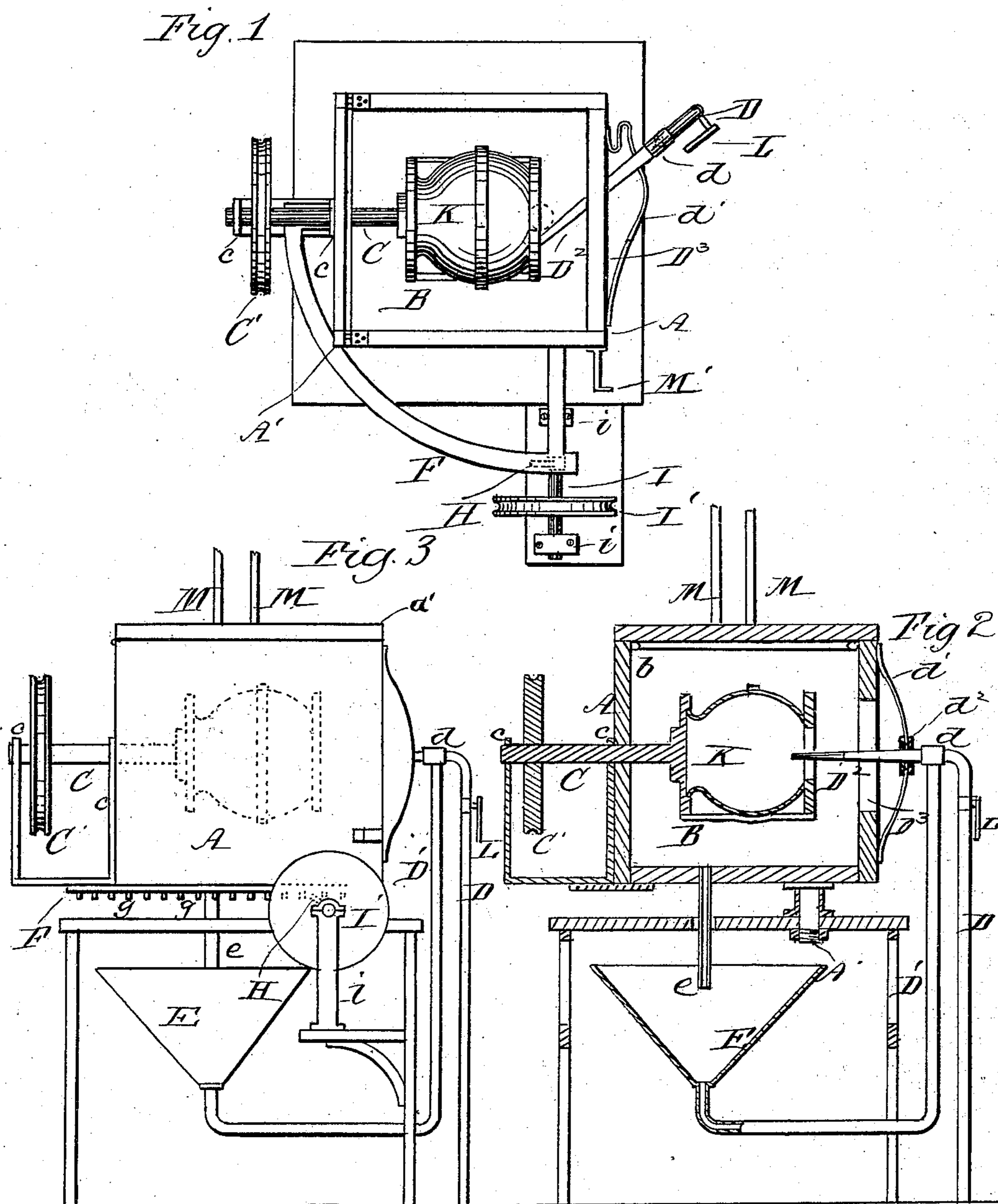
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Patented Sept. 9, 1902.

F. J. HEIDEGGER.  
SAND BLAST MACHINE.

(Application filed Oct. 8, 1901.)

(No Model.)



WITNESSES

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# UNITED STATES PATENT OFFICE.

FRANK J. HEIDEGGER, OF WEST BRIDGEWATER, PENNSYLVANIA.

## SAND-BLAST MACHINE.

SPECIFICATION forming part of Letters Patent No. 708,880, dated September 9, 1902.

Application filed October 8, 1901. Serial No. 77,965. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK J. HEIDEGGER, a citizen of the United States, residing at West Bridgewater, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Sand-Blast Machines; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part thereof.

My invention has relation to sand-blast machines, and particularly to machines for frosting the interior surfaces of hollow glass articles, such as lamp-globes, chimneys, &c. The machine now usually employed for this purpose consists of a stationary casing equipped with appliances for projecting a jet of sand into its interior. The article to be frosted is supported upon a horizontal spindle which is turned by hand, and the spindle in turn is supported upon a vertical shaft, so that as the work progresses the article may be swung around horizontally to cause the sand jet to impinge successively against all parts of the surface to be frosted. Machines of this class are imperfect, unreliable, and slow in the performance of the work intended. As the rotation and horizontal swinging of the articles is done entirely by hand the machine requires the constant attendance of an operator, whose skill and judgment must be entirely depended on for the production of even acceptable results. The hand rotation and horizontal movement of the article is necessarily lacking in the constancy and uniformity required for the production of the best results, so that the frosting or grinding is rough and uneven.

The object of my invention is to overcome the defects and imperfections of the old-style machine and to provide a machine which will be entirely automatic, so that the application of the sand jet to the surfaces to be frosted will be regular, and thus insuring a degree of smoothness and perfection of finish not attainable by any other method or apparatus. The machine being entirely automatic performs its work much more speedily than other machines, and as it requires no attention while in operation one man can easily control the operations of several machines, where

heretofore each machine required the constant attention of an operator.

In the accompanying drawings, Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a vertical central sectional view. Fig. 3 is a side elevation.

A designates the box or casing in which the articles to be frosted are mounted in a cage B, attached to the end of a horizontal spindle C, which extends outwardly through one end of the casing and is journaled in bearings *c c*. A pulley C', secured to the spindle, is driven from a power-shaft. The casing A is provided with a hinged lid *a'*, and a sealing-strip, such as a tube of soft rubber *b*, is fastened to the inner surfaces of the walls of the casing below the lid to prevent the escape of sand through the crevices or joint when the machine is in operation.

D designates an air-pipe leading from a source of supply of compressed air, and D' is a sand-supply pipe leading from the bottom of a chest or hopper E below the casing A, containing a supply of dry sand. The sand-pipe D' is connected to and communicates with the air-pipe through the coupling-joint *d*, and the sand is sucked up by the vacuum created by the air-blast and driven by the blast into the chest A through the nozzle D<sup>2</sup>. The end of the chest A through which the nozzle enters has a large opening D<sup>3</sup>, to which is fitted a flexible diaphragm *d'*. The nozzle passes through the center of this diaphragm and is secured thereto by disks or washers *d<sup>2</sup>*. The diaphragm *d'* is secured to the end of the chest A and the joints made air-tight. The jet pipe or nozzle inside the chest is bent obliquely, so that when a globe is arranged in position on the cage B the nozzle will point toward one side thereof.

The chest A is mounted on a vertical central pivot A', so that it may turn freely in a horizontal direction to accommodate the article being frosted to the positions required as the work progresses in order that the blast may be caused to impinge successively against all parts of the interior surface of the article.

Attached to the bottom of the chest A is a segmental plate F, from the under side of which depend the pins *g g*, arranged in a quarter-circle and forming a rack for the en-

gagement of the dog H, by which the chest A is rotated step by step until it has been turned a quarter-circle. The dog or tooth H projects radially from the end of a horizontal spindle I, mounted on bearings *i i*, driven from a suitable power-shaft.

Fig. 1 shows the position of the chest A when the work of frosting is about to be started, the globe to be interiorly frosted being shown at K, inclosed within the cage B, with its open end toward the sand-nozzle and the latter projecting inside and pointing toward one side of the globe. The lid of the chest is now closed, the pulleys C' I' started by means of a belt-shifter connected with the power-shaft, and the jet turned on by means of the valve-handle L on air-pipe D. The globe now rotates automatically, while at every revolution of the spindle I the dog H engages with one of the pins *g* of the segmental plate F and moves the chest A, and with it the spindle C, carrying the globe, the distance corresponding to the intervals between the pins *g*. The movement of the globe is in the arc of a circle and is, while intermittent, regular and uniform. When the chest A has been turned a quarter of a circle, the pins are all out of engagement with the dog H and the chest comes to a stop, the globe having completed its travel in a circular direction and the sand jet having impinged against every part of its inner surface and produced a frosted finish perfectly uniform throughout and entirely devoid of roughness and irregularity necessarily consequent upon the manipulation of the globe in the ordinary manner. The sand driven into the chest A is conveyed to the sand-hopper E by a pipe *e* and is used over and over again. The air forced into the chest is carried away through air-exhaust pipes M.

To shut off the blast automatically when the chest A has completed its movement, a stud M' is attached to one of its sides, which at the termination of each movement strikes the handle L and closes the air-valve, which is afterward opened by hand.

The pulley C' is driven by any suitable means—as, for instance, a long belt from an overhead power-shaft, which will not leave the pulley on a quarter-turn of the sand-chest.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sand-blast machine, the combination with a closed chest mounted on a vertical axis, a horizontal spindle journaled on said chest and having a work-holder and means for turning the chest on its axis and for revolving the spindle, of a sand-nozzle projecting into the chest, an air-pipe to which said nozzle is connected, an air-valve on said pipe, and means for closing said valve automatically when the chest has turned the requisite distance.

2. In a sand-blast machine, the combination with a closed chest mounted on a vertical axis, a horizontal spindle mounted on said chest and means for imparting a rotary motion to the spindle, of means for imparting a rotary movement to the chest independently of the movement of the spindle, whereby the rates of motion of the spindle and chest may be varied each independently of the other, substantially as described.

3. In a sand-blast machine, the combination of a closed chest mounted on a vertical axis, a revolving spindle mounted on said chest and carrying a work-holder and means for imparting rotary motion to the chest and the spindle, of a sand-nozzle extending into said chest and a flexible diaphragm attached to the chest and through which said nozzle projects, substantially as described.

4. In a sand-blast machine the combination with the air-pipe D, a valve on said pipe and a valve-handle L, and automatically-rotating box or chest A, of means for automatically closing the air-valve, when the work is finished.

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Witnesses:

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