

(No Model.)

2 Sheets—Sheet 1.

W. H. NICHOLAS & R. STEPHENSON.
BLACKLEADING MACHINE.

No. 571,199.

Patented Nov. 10, 1896.

FIG. 1.

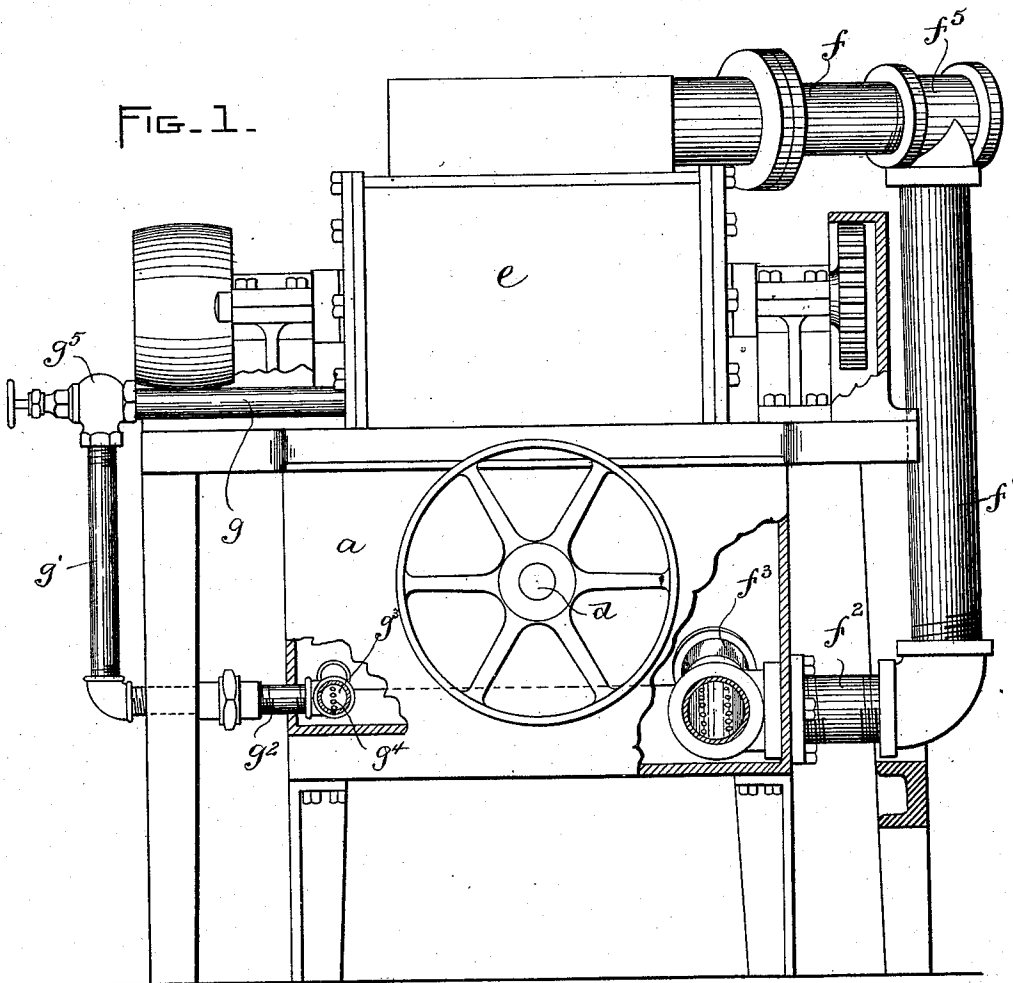
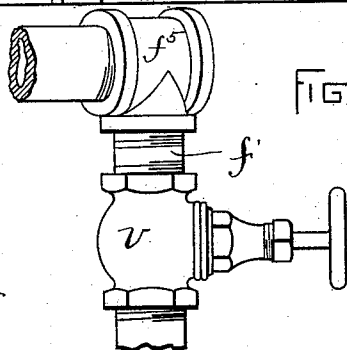


FIG. 5.



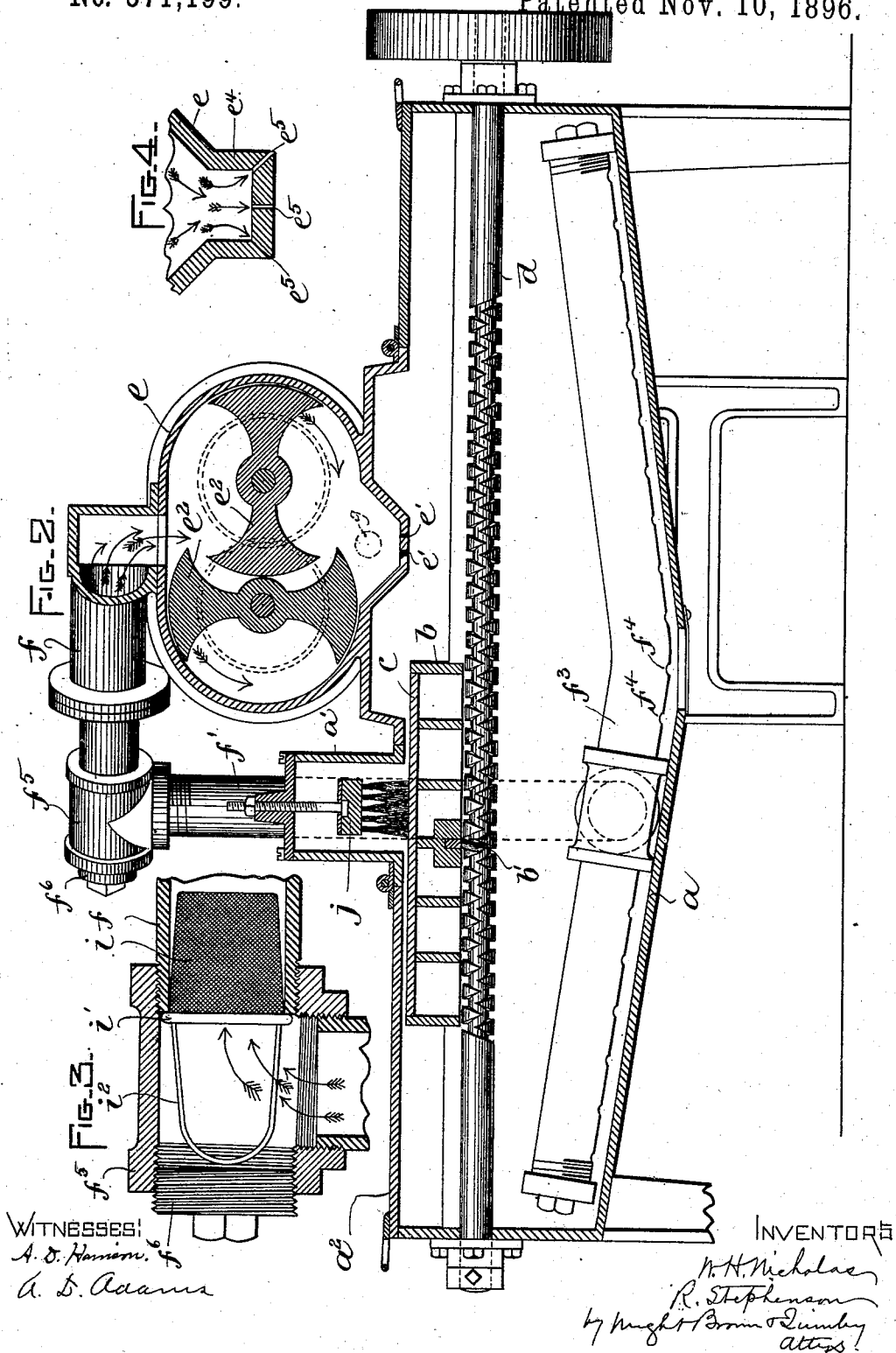
WITNESSES:
A. D. Harrison.
A. J. Adams.

INVENTORS:
W. H. Nicholas
R. Stephenson
by Wright, Brown & Quincy
Atty.

2 Sheets—Sheet 2.

BLACKLEADING MACHINE.

Patented Nov. 10, 1896.



UNITED STATES PATENT OFFICE.

WILLIAM H. NICHOLAS, OF BOSTON, AND RICHARD STEPHENSON, OF
QUINCY, MASSACHUSETTS.

BLACKLEADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 571,199, dated November 10, 1896.

Application filed January 27, 1896. Serial No. 576,927. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. NICHOLAS, of Boston, in the county of Suffolk, and RICHARD STEPHENSON, of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Blackleading-Machines, of which the following is a specification.

This invention relates to machines for applying powdered plumbago to wax molds prior to the electrotyping process.

The invention has for its object to provide simple and effective apparatus of this class having provisions for effective and thorough distribution of the powdered plumbago, the exclusion of particles of wax from the mold, and the regulation of the temperature.

The invention consists in the improvements which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents an end elevation of a machine embodying our invention, parts being shown in section. Fig. 2 represents a longitudinal section of the machine. Figs. 3 and 4 represent sectional views of parts of the machine. Fig. 5 represents a detail side elevation of a portion of the suction-conduit, illustrating a modification hereinafter described.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a box or casing containing a carriage or support *b* for the wax mold or plate *c* to be coated with plumbago and a feed-shaft *d*, journaled in bearings at the ends of the casing, and is provided with intersecting right and left helical grooves or screw-threads engaged with the yoke or finger *b'* on the carriage *b* and adapted to reciprocate the carriage in the box or casing in a manner that is well understood, the shaft *d* being continuously rotated.

e represents a blower-casing on the upper portion of the box *a*, the bottom of said casing communicating through narrow slits *e'* *e'* with the box, said slits being located just above the path in which the mold *c* is moved by the carriage *b*, so that plumbago blown through said slits will be deposited upon the upper surface of said mold. The casing *e* is provided

with rotary fans *e²* *e²*, operating in a well-known manner to force currents of air through the slits *e'*.

f f' f² represent the parts of a conduit that connect the blower-casing *e* with a suction-pipe *f³* within the casing *a*, said pipe extending lengthwise of the casing and being provided in its lower portion with numerous orifices *f⁴*, through which air is drawn from the lower portion of the casing by the action of the blower, the air carrying with it the powdered plumbago that is present in the lower portion of the chamber, so that the plumbago is raised to the blower-casing and passes with the air-currents through the slits *e'*.

g g' g² represent parts of an air-pipe or conduit extending from the blower-casing *e* to the interior of the box *a* and there communicating with a perforated air-distributing pipe *g³*, extending lengthwise of the casing parallel with the suction-pipe *f³*, said pipe *g³* having numerous perforations *g⁴* in its lower portion, through which currents of air enter the interior of the box.

g⁵ represents a valve by which the conduit composed of the portions *g g' g²* may be wholly closed to shut off the passage of air there-through or may be partially closed to regulate the volume of the air-current.

i represents a sieve, which is formed to be inserted in the portion *f* of the air-conduit to prevent the admission of lumps of wax or other foreign matter that may be carried by the air-current into the blower-casing, it being very desirable to prevent anything but finely-powered plumbago from being carried by the air into said casing, to the end that the slits *e'*, which are necessarily very narrow, may not be obstructed. The sieve *i* is preferably of a tapering form and is affixed to a frame or flange *i'*, formed to bear against one end of the section *f* of the conduit and provided with a handle *i²*, by which it may be inserted and removed through one end of the connection-piece *f⁵*, forming a part of the conduit, said piece having a screw-threaded plug *f⁶*, adapted to be removed to permit access to the sieve.

j represents a brush, which is located in a recess *a'* on the upper portion of the box *a* and is arranged to bear upon the upper sur-

face of the wax mold *c* to distribute the plumbago deposited thereon through the slits *e'*, brushing it into the recesses and grooves of the mold and removing the surplus plumbago.

5 The operation is as follows: The carriage *b* being at one end of its movement and occupying the left-hand end of the box, as viewed in Fig. 2, the wax mold *c* may be deposited upon it through an opening in the top of the box provided with a hinged cover *a*². The shaft *d* is then set in motion and imparts a slow movement to the carriage *b*, thus moving the wax mold along under the slits *e'*, first in one direction and then in the
10 opposite direction, the form of the grooves in the shaft *d* automatically reversing the direction of movement of the carriage just as it reaches either end of the box. The plumbago is deposited in the bottom of the box *a*, and is drawn therefrom by the blower and forced through the slits *e'* onto the mold when the latter is moving under said slits. This operation is continued until the mold is sufficiently coated with plumbago, after which the operation of the blower and of the shaft *d* is stopped and the mold is withdrawn. The air-distributing pipe *g*³, supplied, as described, by the blower and extending along one side of the box *a* near its bottom, delivers numerous jets of air along the bottom of the box, which agitate the plumbago and force it over toward the suction-pipe *f*³. Hence there is no inert accumulation of plumbago in any part of the box. The air thus discharged from
20 the blower serves to prevent the overheating of the air in the blower by the compression to which it is subjected. The valve *g*⁵ enables the quantity of air thus diverted from the blower to be increased or diminished, an increase in the quantity thus diverted decreasing the temperature in the blower, as will be readily seen.

By providing an elongated box or casing with a suction-pipe extending practically the entire length of the box and perforated to draw air and plumbago from the box at numerous points we obtain a constant circulation of the plumbago and prevent it from accumulating at any point. Hence there is no occasion to shovel the plumbago from one part of the machine to another nor to employ a feeding mechanism for this purpose, the circulation and distribution being constant and automatic.

55 In Fig. 4 we show a modification, in which the blower-casing *e* is provided with an offset *e*⁴, provided with outlet-slits *e*⁵, arranged at different angles.

In the following claims we include the parts *f f'* *f*² *f*³ under the term "suction-conduit," the part *f*³ being a perforated section of said conduit. The parts *g g'* *g*² *g*³ we include under the term "relief-conduit," the same serving to relieve the pressure and decrease the
60 temperature in the blower-casing.

It will be observed that the suction-conduit is connected with the receiving side of the

blower-casing, while the relief-conduit is connected with the discharge side. The relief-pipe therefore serves two purposes, namely, to regulate the temperature of the blower and prevent it from becoming overheated by excessive compression of air in the casing below the fans and to supply an agitating current of air to the box *a*.

An important feature of our invention is the provision of means for regulating the heat caused by the compression of the air in the blower-casing, so that the heat can be utilized to slightly soften the wax mold and cause the plumbago to properly adhere thereto without overheating or melting the mold. This result is secured in the construction above described by the relief-pipe and its valve, which enable the pressure and temperature to be varied to any desired extent by permitting the escape of more or less of the compressed air from the casing before it passes through the slits *e'* onto the mold. We do not limit ourselves, however, to this means of regulation, and may accomplish the same result, so far as the regulation is concerned, by varying the supply of air admitted to the blower through the suction-conduit. To this end the suction-conduit may be provided with a valve *v*, as shown in Fig. 5, said valve being adapted to vary the quantity of air supplied to the blower to any desired extent.

By the use of means for varying the temperature of the air by regulating its pressure we are enabled to supply air at a relatively high temperature when the machine is cold, thus quickly warming it to the desired point and sufficiently softening the wax, after which the pressure may be reduced to prevent excessive heat.

It is to be understood that the box or casing is practically air-tight to the extent that the powdered plumbago shall not escape therefrom. Furthermore, if the valve *v* in the suction-conduit be depended upon for regulating the temperature in the manner above described, the casing must be sufficiently tight to prevent the leakage of air when the latter is compressed therein.

We claim—

1. A machine of the character specified, comprising a box or casing, a mold-carriage movable therein, a blower the casing of which communicates with the box through suitable openings above the path of the carriage, a suction pipe or conduit connected with the receiving side of the blower-casing and including a perforated section within the box, and a valved relief pipe or conduit connected with the discharge side of the casing and including a perforated section within the box, the blower drawing air and powdered material through the said suction-conduit from the lower portion of the box and delivering it at the upper portion of the box, while the relief-conduit is adapted to conduct air from the blower-casing to the box to reduce the pressure and temperature in the blower-casing.

ing and agitate the powdered material in the box.

2. A machine of the character specified, comprising a box or casing, a mold-carriage 5 movable therein, a blower the casing of which communicates with the box through suitable openings above the path of the carriage, a suction pipe or conduit connected with the receiving side of the blower-casing and including a perforated section within the lower 10 portion of the box, and a removable sieve in said suction-conduit, the latter having an opening provided with a removable cover to permit the insertion and removal of the sieve.

15 3. In a machine of the character specified, the combination of a box or casing, a mold-carriage movable therein, a blower the casing

of which communicates with the box through suitable openings above the path of the carriage, a suction-pipe connected with the receiving side of the blower-casing, and means 20 for regulating the pressure and temperature of the air in the blower-casing, said means including a valved conduit connected with the casing of the blower. 25

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 22d day of January, A. D. 1896.

WILLIAM H. NICHOLAS.

RICHARD STEPHENSON.

Witnesses:

A. D. HARRISON,

A. D. ADAMS.