F. F. BRADLEY.

APPARATUS FOR COATING OBJECTS WITH SUBDIVIDED MATERIAL.

APPLICATION FILED JAN. 20, 1911.

1,068,734.

Patented July 29, 1913.

2 SHEETS—SHEET 1.

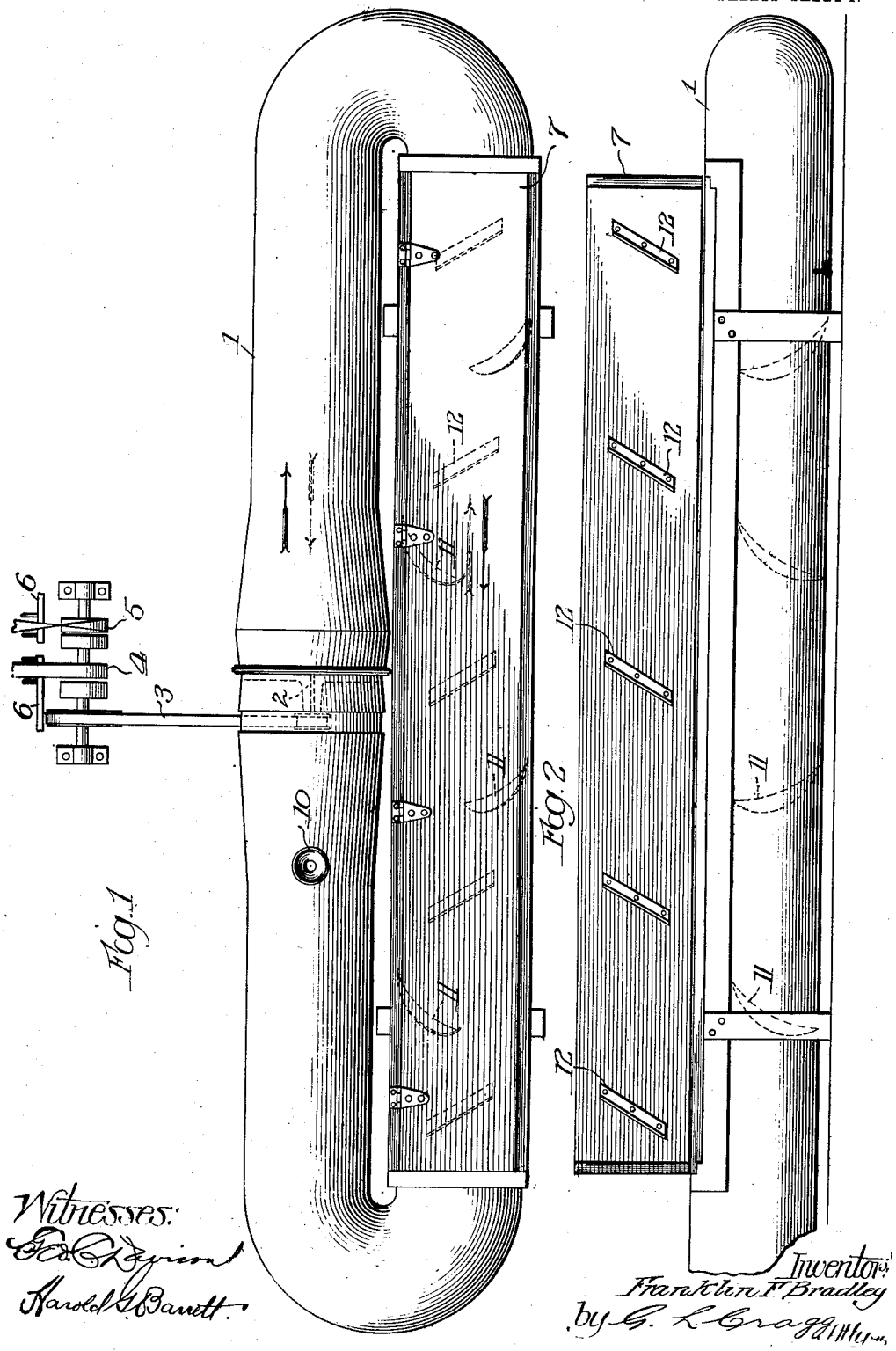


Fig. 1

Fig. 2

Witnesses:
E. C. Bryant
Harold G. Barrett.

Inventor:
Franklin F. Bradley
by G. L. Cragg & Co.

F. F. BRADLEY.

APPARATUS FOR COATING OBJECTS WITH SUBDIVIDED MATERIAL.

APPLICATION FILED JAN. 20, 1911.

1,068,734. Patented July 29, 1913.

2 SHEETS—SHEET 2.

Fig. 3

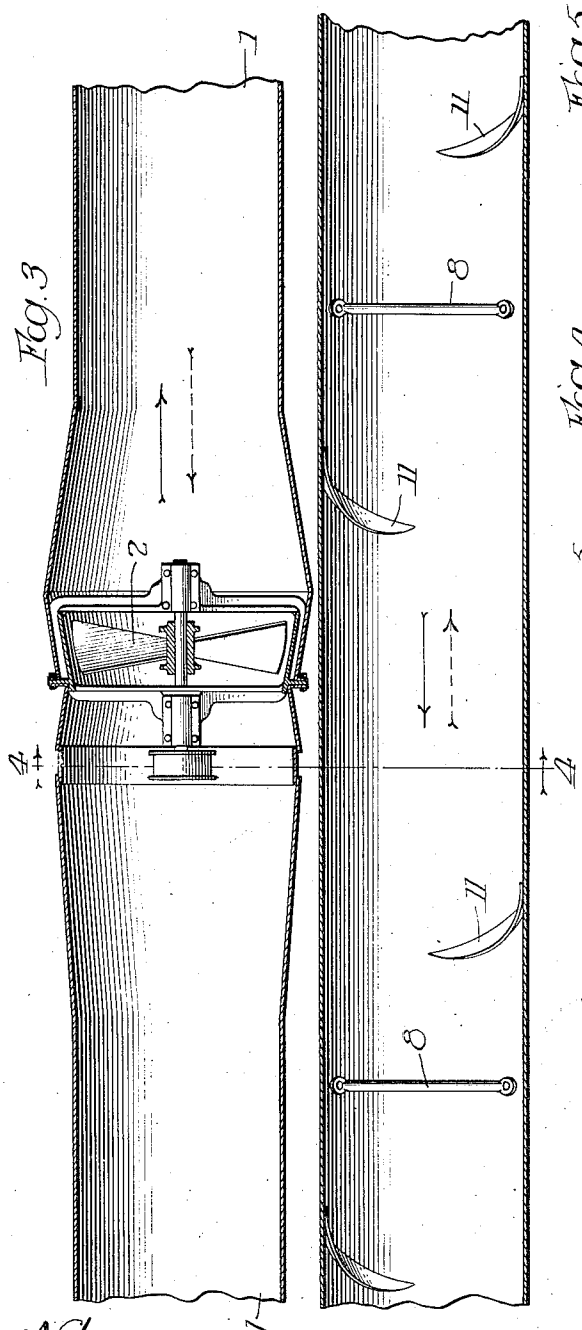


Fig. 5

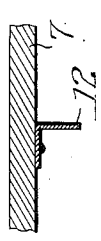
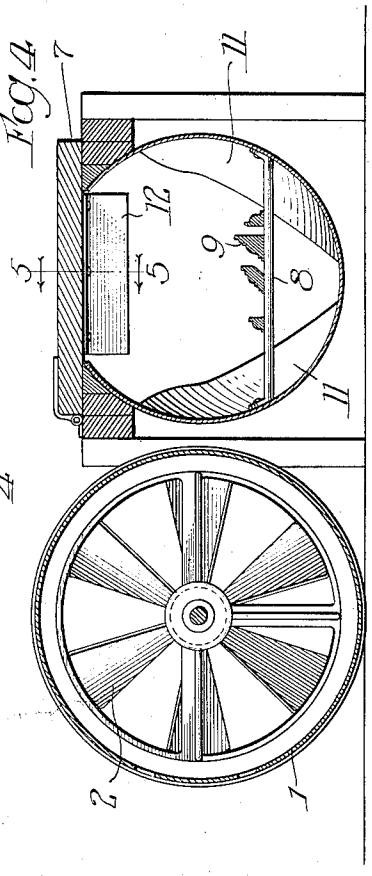


Fig. 4



Witnesses:

Geo. C. Davison

Harold G. Barrett.

Inventor:

Franklin F. Bradley

by G. L. Cragg Atty.

UNITED STATES PATENT OFFICE.

FRANKLIN F. BRADLEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO BRADLEY AND VROOMAN COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

APPARATUS FOR COATING OBJECTS WITH SUBDIVIDED MATERIAL.

1,068,734. Specification of Letters Patent. Patented July 29, 1913.

Application filed January 20, 1911. Serial No. 603,726.

To all whom it may concern:

Be it known that I, FRANKLIN F. BRADLEY, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Apparatus for Coating Objects with Subdivided Material, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to apparatus for coating objects with subdivided material and is of particular service for effecting the application of bronze or other powder to objects that have previously been coated with some suitable adhesive material such as paint or sizing, which in its wet state is adapted to cause the particles to adhere thereto and in its dry state to hold the particles firmly in position.

I have hitherto devised machines for effecting the application of subdivided material to objects that are to be coated therewith.

My present invention has for one of its objects the provision of a receptacle for receiving the articles that are to be coated with the powdered material and which receptacle is provided with an internal formation that will cause the air to flow therein in a stream, so that the air has a definite movement in its passage within the receptacle interior whereby the material with which the air is laden may be conveyed to the surfaces that are to be coated therewith effectively and with certainty, and I believe it broadly to be new with me to provide a receptacle having an interior formation encountered by the air as it flows in the receptacle that will so act upon the air as to cause it to flow in a definite stream and with a definite direction for the purpose which has been stated.

A specific feature of one embodiment of my invention resides in the employment of a pipe whose wall structure mainly serves to direct air forced into the pipe in a stream, this pipe having an opening through which objects to be coated may be admitted to the pipe interior in position to have the powder conveyed thereto by the flowing air and a closure for this opening to prevent the material-laden air from escaping therethrough when the apparatus is in operation. A machine thus constructed is of special utility in applying bronze coatings to moldings such, for example as are used in the manufacture of picture frames. I preferably supplement the wall structure of the pipe by additional interior construction that will coöperate with such wall structure in modifying the course of the air stream so that the air will flow in this stream throughout the entire interior of the pipe with such uniformity that the bronze or other powder will properly be conveyed to the object to be coated therewith irrespective of the location of such object within the pipe interior. The supplemental construction that I prefer to employ causes the air, when flowing in one direction, to flow in a spiral like stream, and when flowing in the reverse direction to follow a reversed spiral to insure conveyance of the powder to all surfaces that are to be coated therewith.

I will explain my invention more fully by reference to the accompanying drawings showing the preferred embodiment thereof and in which—

Figure 1 is a plan view of a structure equipped in accordance with that preferred embodiment of my invention which is of particular utility in connection with the bronzing of long objects such as picture moldings, but to which embodiment of my invention I do not wish to limit myself; Fig. 2 is a side view of the structure shown in Fig. 1 with the exception that the closure or door is shown open in Fig. 2; Fig. 3 is a sectional plan view taken through the axis of the pipe but with the end portions of the pipe omitted for lack of space; Fig. 4 in a sectional view on line 4—4 of Fig. 3; and Fig. 5 is a sectional view through a part of the closure door on line 5—5 of Fig. 4 showing an air deflecting fin or rib projecting from its under surface.

Like parts are indicated by similar characters of reference throughout the different figures.

In the embodiment of the invention shown I have employed an endless pipe 1 for establishing a closed circuit for air that is forced to flow through the pipe by means of a fan 2 that is driven by a belt 3 which is caused to travel in one direction by an open belt 4 and in the reverse direction by a crossed belt 5, these belts being illustrated upon loose pulleys, belt shifters 6 being em-

ployed to bring one or the other of the belts upon a tight pulley for the purpose of driving the fan in the direction desired so as to cause the fan to force the air through the pipe in one direction or the other as desired. The fan is provided with blades that are so inclined with respect to the axis of rotation of the fan as to cause the air to be pushed from one side of the fan and drawn toward the other side of the fan in order to effect the forced circulation of air within the pipe. At this point I desire to say that while I prefer to employ an endless pipe, I do not wish to be limited thereto. A long section of the pipe is provided with an opening therein that may be closed by a closure door 7 that constitutes a portion of the wall structure of the pipe.

A plurality of supports 8 are preferably provided across the pipe and beneath the door for the purpose of supporting the objects to be coated which are illustrated as being in the form of moldings 9 in Fig. 4, these supports desirably being in the form of rods so as not materially to interfere with the proper movement of the air. The objects 9, which are thus substantially surrounded in substantially all planes by the pipe after having been suitably coated with adhesive material, are placed upon the supports 8 whereafter the door 7 is closed and whereafter the fan 2 is set into operation whereupon bronze powder is admitted to the pipe interior through the funnel 10. When the fan is first started into operation it preferably forces the air to travel in the direction indicated by the arrows shown in full lines. After the air has followed the course indicated by the arrows in full lines for a predetermined length of time the rotation of the fan is preferably reversed so as to cause the air to flow in the direction indicated by the arrows shown in dotted lines, but I do not wish to be limited to such reversal of air flow. The receptacle, by its internal formation, causes the air to flow in a stream of substantially uniform velocity.

I have provided helically disposed inwardly projecting ribs 11 upon the fixed portion of the pipe that underlies the door 7 and provide similar ribs 12 upon the bottom of the door 7 whereby a spiral movement is imparted to the stream of air as it flows through the pipe when the air is moving in the direction shown by the arrows in full lines. The rib formation 11 and 12 is shown as being supplied in addition to the wall structure but I do not wish to be limited to this particular construction since it is within the scope of my invention to supply the rib formation whether or not it is constructed separately from and thereafter added to the wall structure. In the event of reversal in the direction of rotation of the fan after air has moved through the pipe in the direction indicated by the arrows in full lines for a predetermined length of time, the ribs 11 and 12 operate to cause the reversal of the spiral direction of the flowing air, the air in flowing in both directions longitudinally of the pipe acting effectively to convey the subdivided material to portions of the molding that might be escaped if the movement of the air was not reversed as desired.

The ribs 11 and 12 are preferably obliquely disposed with respect to the wall structure of the receptacle that is designed to contain the articles to be coated for the purpose of thoroughly agitating the air while it is flowing in a stream so as to cause the particles of powder to move laterally while also moving with the stream to insure the travel of the powder to all exposed parts of the objects that are to receive the coating, and while I prefer to incline the ribs 11 and 12 as illustrated, I do not wish to be limited in all embodiments of my invention to the directions in which the ribs project as I consider it to be broadly new with me to project ribs within a stream of powder-laden air for the purpose which has just been stated.

While I have used the term "air" throughout the specification and claims, it is obvious that any inert elastic fluid may be used, and I use the term "air" in the claims in this broad sense. While I have herein shown and particularly described the preferred embodiment of my invention as employed for the purpose of coating elongated objects such as picture molding, I wish it to be understood that I do not limit myself to the particular embodiment of the invention shown nor to the purpose for which this particular embodiment of the invention has been devised, nor do I limit myself to the precise details of construction and arrangement illustrated as changes may readily be made without departing from the spirit of my invention.

Having thus described my invention I claim as new and desire to secure by Letters Patent the following:—

1. Apparatus for coating objects with subdivided material carried by air including a receptacle for the objects that is in the form of a pipe that serves to cause air forced to move therein to flow in a stream, said pipe having an opening through which objects to be coated may be passed into the pipe interior; mechanism for forcing passage of air within the pipe which pipe operates upon the air to cause the air to move in a stream to convey the material with which the air is laden to exposed parts of the object that are to be coated; and an air deflecting formation shaped to cause the air to move spirally within the pipe.

2. Apparatus for coating objects with subdivided material carried by air including a receptacle of substantially uniform diameter throughout for the objects that serves to

cause air forced to move therein to flow in a stream filling the receptacle, said receptacle having an opening through which objects to be coated may be passed into the receptacle interior in position to be substantially surrounded in substantially all planes by the receptacle; and mechanism for forcing passage of air within the receptacle which receptacle operates upon the air to cause the air to move in a stream to convey the material with which the air is laden to exposed parts of the objects that are to be coated.

3. A machine of the kind specified, comprising a closed chamber for holding a body of air laden with coating material and adapted to receive articles to be coated, means for forcing air through said chamber, and means for reversing the direction of travel of said air through said chamber.

In witness whereof, I hereunto subscribe my name this 19th day of January A. D. 1911.

FRANKLIN F. BRADLEY.

Witnesses:

G. L. CRAGG,

ETTA L. WHITE.