F. F. BRADLEY.

APPARATUS FOR COATING OBJECTS WITH SUBDIVIDED MATERIAL.

APPLICATION FILED OCT. 24, 1910. RENEWED OCT. 22, 1912.

1,068,736. Patented July 29, 1913.

Fig. 1

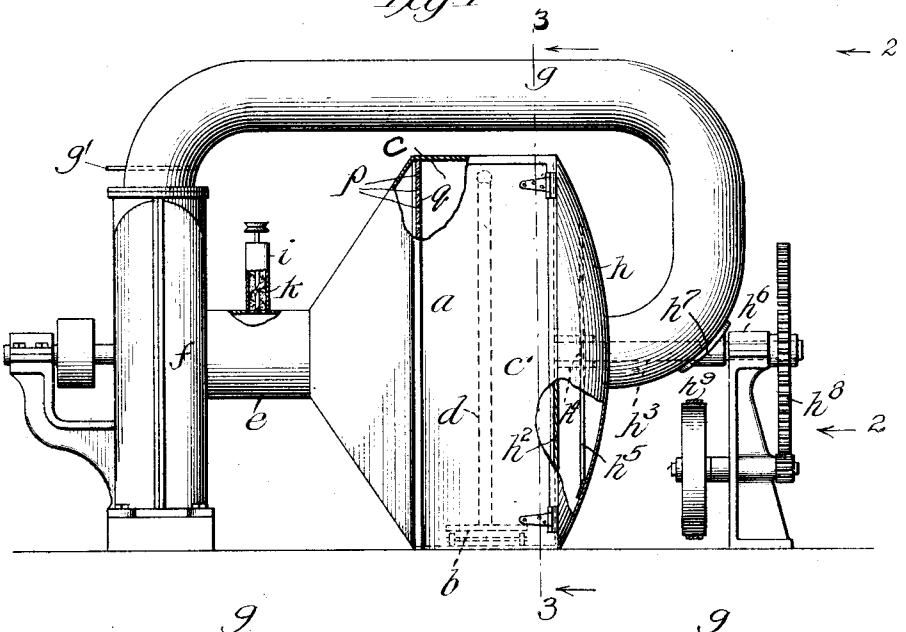


Fig. 2

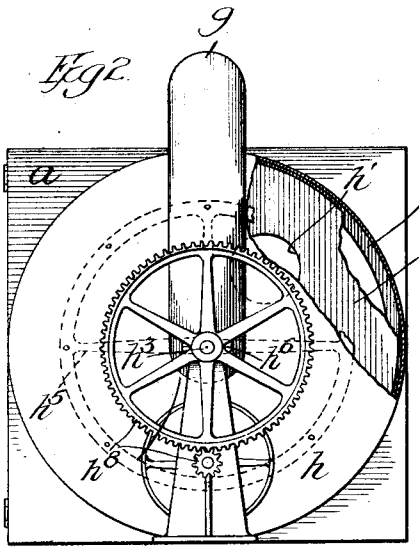
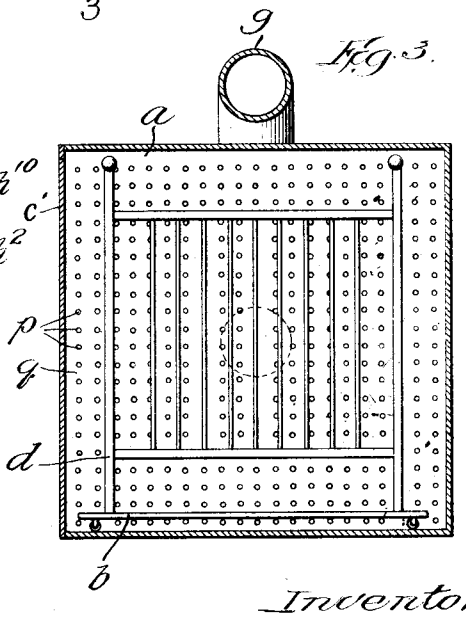


Fig. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR COATING OBJECTS WITH SUBDIVIDED MATERIAL.

1,068,736. Specification of Letters Patent. Patented July 29, 1913.

Application filed October 24, 1910. Serial No. 588,731. Renewed October 22, 1912. Serial No. 727,244.

To all whom it may concern:

Be it known that I, FRANKLIN F. BRADLEY, a 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 comminuted, subdivided or powdered material and is of particular service in spreading bronze powder upon objects whose surfaces to be coated are covered or painted with suitable adhesive material or paint which in its fresh state holds the powder scattered thereupon and in its dry state firmly fixes the powder in place.

In practising my invention, I employ a receptacle for containing the object that is to be coated with the powdered material, a fan or blower for effecting forced circulation of air through the receptacle, and piping which desirably includes the blower and receptacle in serial relation to establish a closed local path or circuit, which is preferred, for the circulating air, though I do not wish to be limited to this way of practising my invention.

The powder is admitted to the flowing air preferably through the piping. As my invention is preferably practised, the air is received into the receptacle through a moving discharge opening preferably provided in a moving diaphragm, the said opening being so located as to cause the powder laden air to swirl and thereby carry the powder to all exposed surfaces of the object in addition to the surfaces directly facing the air entrance. The air is desirably caused to leave the receptacle through a plurality of exit openings that are distributed over an area substantially coextensive with the largest area to be coated with the powder, to insure the access of the powder to the largest surface that may be exposed thereto. In the preferred embodiment of my invention, the aggregate area of the air exit openings does not exceed the area in right cross section of the piping conveying the air from the receptacle, so that the powder laden air is forced to seek all that space within the receptacle where the objects to be coated with powder are properly located. In the preferred embodiment of my invention, the exit openings are afforded by means of a screen or perforated plate located in front of the exit portion of the pipe and in which screen the openings are distributed over the desired area.

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

Figure 1 is an elevation, partly in section, of such preferred embodiment; Fig. 2 is a side view in the direction of arrows 2 2 in Fig. 1; and Fig. 3 is a sectional view in the direction of arrows 3 3 in Fig. 1.

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

The receptacle *a* is shaped suitably to the objects to be received therein, the construction illustrated being well adapted to receive metal bedstead parts that are moved into and out of the receptacle upon a truck *b* through a doorway *c*, a bedstead part *d* being illustrated within the receptacle. The door way constitutes an opening through which the objects to be coated may be passed into the receptacle interior in position to enable the air to be circulated around and toward the objects, and the door *c'* constitutes a closure for said opening for preventing escape of material laden air therethrough while the objects are being coated. A section *e* of suitable piping leads from the air exit side of the receptacle to a power driven fan or blower *f*, the complemental section *g* of the piping leading from the blower to the air entrance side of the receptacle located opposite the air exit side. The powdered or subdivided material, such as bronze powder, is admitted to the piping preferably through an upright conduit *i*, said conduit inclosing a power driven feeding worm *k* for forcing the powder through an opening at the bottom of the conduit which establishes communication between the interiors of the piping and the conduit. The piping section *g* has a terminal in the form of a bell *h* in which the air is received and from which it is adapted to be discharged through an opening h^1 formed in the wall, partition or diaphragm h^2 that separates the bell

from the receptacle interior. The circular partition or diaphragm h^2 is fixed upon a rotating shaft h^3 that is supported at its inner end by a bearing h^4 carried by a spider h^5 and at its other end by a bearing h^6, said shaft passing through a stuffing box h^7 that passes through the piping. The shaft may be rotated or caused to travel in any suitable manner, as by means of the gearing h^8 driven by a belt h^9. The periphery of the disk h^2 bears against a rim h^{10}. The opening h^1 is eccentric to the shaft h^3 so that the powder laden air admitted under pressure to the receptacle a through said opening is caused rapidly to swirl, or have its direction within the receptacle changed thoroughly to distribute the air throughout the interior of the receptacle and in a manner to cause it to reach all exposed portions of the article to be coated, the powder finding lodgment not only upon those adhesively coated surface portions of the object or structure d that are immediately in front of the opening, but also upon all other exposed adhesively coated surfaces of said object as well, including those at the top, bottom, ends and back of said object. Further to insure the carriage of the powder to all surfaces upon which it is to be lodged, and to improve the swirling action of the air for this purpose I also multiple the air exit openings and distribute them over an area that preferably exceeds the largest exposed surface upon the structure d that is to receive the powder. These multiplied air exit or discharge openings are desirably constituted of the perforations p in a screen plate q preferably constituting a wall of the receptacle a. The aggregate area of these screen openings is preferably not greater than the area of a right cross section through the portion of the pipe e that is uniform in diameter, the escaping air passing through all of the openings p in seeking paths of least resistance. The end of the pipe section e adjacent to the screen q flares toward said screen and embrace its borders.

The structure d may remain in the receptacle more than a sufficient length of time required to coat it with the powder, as the adhesive material will only hold what powder is properly required to coat the structure. The powder that does not adhere to the structure d continues to circulate through the closed air circuit which has been described as long as the fan or blower is forcing the air through the receptacle, and the amount which becomes lodged upon said structure is replenished at i.

Reference may be had to my co-pending applications Serial No. 543,215, filed February 11, 1910, Serial No. 550,115, filed March 18, 1910, Serial No. 588,730, filed October 24, 1910, Serial No. 603,726, filed January 20, 1911, Serial No. 609,203, filed February 17, 1911, Serial No. 611,042, filed February 27, 1911, Serial No. 654,678, filed October 14, 1911, Serial No. 654,679, filed October 14, 1911, Serial No. 681,390, filed March 4, 1912.

In order to prevent the powder laden air from escaping at the door of the receptacle when articles are inserted within and withdrawn from the receptacle without stopping the operation of the fan or blower, I discontinue the path for the blowing air through the bell h, preferably by cutting off communication between the blower and the pipe section g as by means of a valve g^1.

I have herein shown and particularly described the preferred embodiment of my invention, to which, however, I do not wish to be limited.

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; mechanism for effecting forced passage of air within the receptacle, a diaphragm or partition provided with an opening having communication with the receptacle interior and through which the air is forced; and mechanism whereby said partition and the opening therein is permitted travel to cause the air to have its direction within the receptacle changed to carry the material with which the air is laden to various parts of the object to be coated therewith, there being a plurality of distributed openings affording communication between the receptacle interior and exterior and located to have the object to be coated placed between the same and the aforesaid opening.

2. Apparatus for coating objects with subdivided material carried by air, including a receptacle for the objects; mechanism for effecting forced passage of air within the receptacle; a diaphragm or partition provided with an opening having communication with the receptacle interior and through which the air is forced; and mechanism whereby said partition and the opening therein is permitted travel to cause the air to have its direction within the receptacle changed to carry the material with which the air is laden to various parts of the object to be coated therewith.

3. Apparatus for coating objects with subdivided material carried by air, including a receptacle for the objects, there being an element provided with an opening having communication with the receptacle interior and through which air is forced; mechanism whereby said opening is permitted travel to cause the air to have its direction within the receptacle changed to carry the material with which the air is laden to various parts of the object to be coated therewith; and mecha-

nism for effecting forced passage of air through said opening, there being a plurality of distributed openings affording communication between the receptacle interior and exterior and located to have the object to be coated placed between the same and the aforesaid opening.

4. Apparatus for coating objects with subdivided material carried by air, including a receptacle for the objects; there being an element provided with an opening having communication with the receptacle interior and through which air is forced; mechanism whereby said opening is permitted travel to cause the air to have its direction within the receptacle changed to carry the material with which the air is laden to various parts of the object to be coated therewith; and mechanism for effecting forced passage of air through said opening.

In witness whereof, I hereunto subscribe my name this twentieth day of October A. D., 1910.

FRANKLIN F. BRADLEY.

Witnesses:
GEORGE L. CRAGG,
GEO. C. DAVISON.