A. H. ROBERTS.

POWDER SEPARATOR.

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1,310,633. Patented July 22, 1919.

Fig. 1.

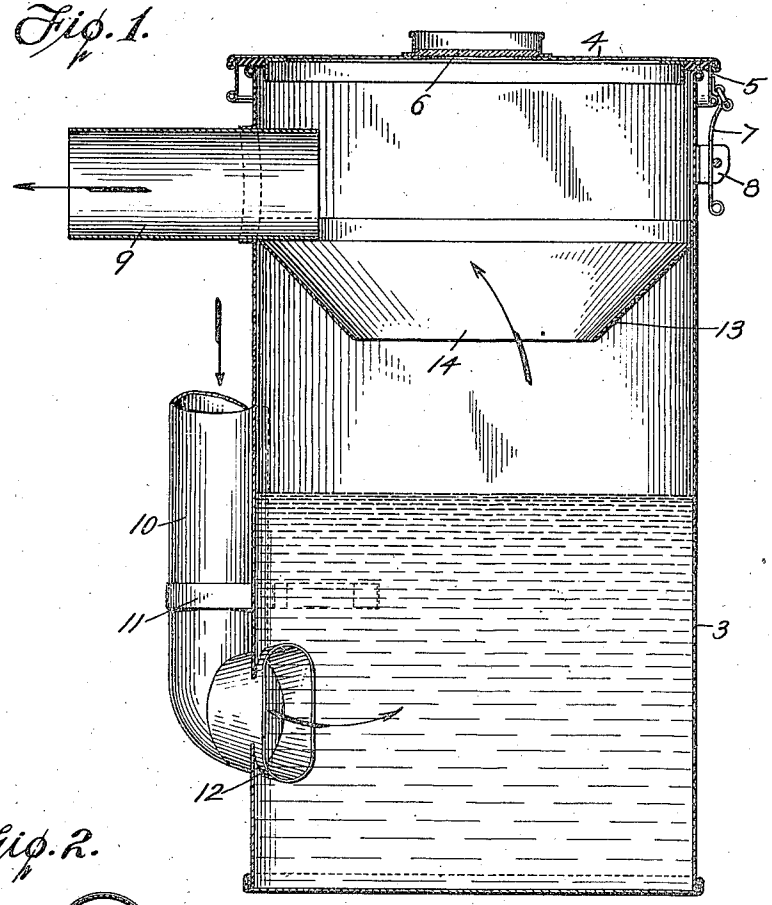
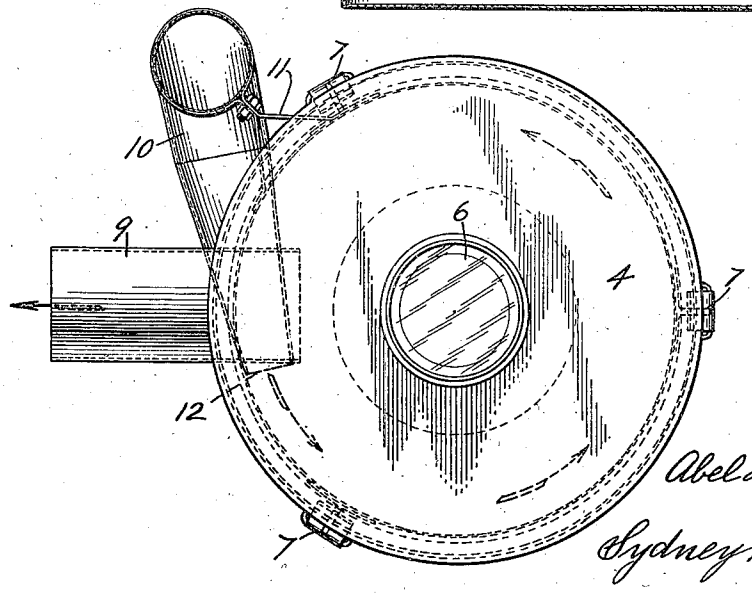


Fig. 2.



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POWDER-SEPARATOR.

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To all whom it may concern:

Be it known that I, ABEL H. ROBERTS, a citizen of the United States, residing at Montreal, Province of Quebec, and Dominion of Canada, have invented a new and useful Improvement in Powder-Separators, of which the following is a specification.

This invention relates to an improvement in powder separators.

In the manufacture of projectile fuse time train rings, the powder is inserted in the ring groove under heavy pressure and the ring and the powder in the groove are then faced off to produce a smooth and flat surface. The particles of metal and the particles of powder thus produced are then separated. It has been customary to effect this separation by means of an air exhausting apparatus into the mouth of which the metal and powder particles are drawn by suction and conducted to a still water container the purpose of which is to entrap the metal particles and to dissolve the powder particles. It has been found in practice, however, that the devices heretofore used for this purpose do not always completely dissolve the powder particles which pass through the water and constitute a source of danger by fire in the apparatus beyond the water. It has been discovered that this defect in powder separators heretofore used can be overcome by producing a swirling movement of the water or other powder solvent used to hold the powder submerged in the solvent until completely dissolved, and the production of such a device is the main object of the present invention. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same or like parts, Figure 1 is a central section of a device constructed in accordance with the invention; and Fig. 2 is a plan of the same structure.

In carrying the invention into effect, there is provided means for supporting a powder solvent, and means for conducting the powder to and for producing a swirling movement of the solvent to hold the powder submerged in the solvent until completely dissolved. In the best constructions, the supporting means for the powder solvent consists in an upright cylindrical tank with which is associated air exhausting means for conducting the powder to and for producing the swirling movement of the air and solvent in said tank. In the best constructions also, there is further provided a baffle plate within the solvent supporting means located above the solvent and adapted to co-act with the air exhausting means to produce and confine a heavy spray above the surface of the solvent for washing the air and arresting any powder particles which may not be completely dissolved in the event of insufficient solvent in the tank. All of the above mechanism may be varied in construction in many ways within the scope of the claims. The invention therefore is not to be restricted to the precise details of the structure shown and described. Furthermore, the device is capable of uses other than as a powder separator, such for instance as for trapping dust of any nature taken from a machine by the air exhausting means; and such other uses are contemplated.

Referring to the drawings, 3 indicates a cylindrical tank constructed of sheet metal, this tank being both air and water tight, and provided with a removable cover 4 fitting upon a rubber gasket 5 and provided with an inserted glass plate 6. The cover 4 is held in place by means of a plurality of clamps 7 engaging lugs 8 secured to the walls of the tank. This tank is adapted to hold water or other powder solvent, as clearly shown in Fig. 1.

Means are provided for conducting the powder to and for producing a swirling movement of the solvent to hold the powder submerged in the solvent until completely dissolved; as shown, this means consists in a simple air exhausting means associated with the tank. This means includes an outlet pipe 9 leading from the tank above the solvent. It further includes an inlet pipe 10 supported by a bracket 11 secured to the wall of the tank 3, said inlet pipe opening tangentially into the tank at 12 below the surface of the solvent. It is to be understood that the outlet pipe 9 is connected with a suitable

air exhausting means of well known character and therefore needing no specific description, and that the inlet pipe 10 leads from the machine tool in which the time train ring with its powder is faced off.

As the metal and powder particles are drawn through the inlet pipe 10, they enter the water or other solvent in the tank tangentially with the air and a swirling movement of the air and solvent—in the direction of the broken arrows in Fig. 2—is thereby produced. This swirling movement of the air and water carries the powder particles around and around the tank for a sufficient length of time to permit the powder particles to be completely dissolved. The particles of metal, however, are heavy enough to cause them to sink to the bottom of the tank notwithstanding the swirling movement of the solvent.

As the solvent swirls about in the tank like a whirlpool, its outer edges climb up the sides of the tank. To prevent solvent thus climbing up the tank from being drawn into the outlet pipe 9, there is provided a dished or conical baffle plate 13 having a central aperture 14, this baffle plate being located between the surface of the solvent and the outlet pipe 9. It serves to transform the climbing solvent into a heavy spray and to confine this spray so that no part of it will be drawn into the outlet pipe 9 and thence to the exhausting fan. This heavy spray serves the purpose of washing the air passing through the device and for completing the dissolving of the powder particles in the event of insufficient solvent in the tank.

At suitable time intervals the tank is opened, the metal particles in the powder charged solvent removed therefrom, and a fresh body of water or other solvent substituted.

What is claimed is:

1. In a powder separator, the combination with means for supporting a powder solvent, of means for conducting the powder to and for producing a swirling movement of the solvent and a heavy spray above said solvent to hold the powder submerged in the solvent until completely dissolved.

2. In a powder separator, the combination with an upright cylindrical tank for containing a powder solvent, of means associated therewith for conducting the powder to and for producing a swirling movement of the solvent and a heavy spray above said solvent in said tank to hold the powder submerged in the solvent until completely dissolved.

3. In a powder separator, the combination with an upright cylindrical tank for containing a powder solvent, of air exhausting means associated therewith for conducting the powder to and for producing a swirling movement of the air and solvent and a heavy spray above said solvent in said tank to hold the powder submerged in the solvent until completely dissolved.

4. In a powder separator, the combination with an upright cylindrical tank for containing a powder solvent, of means for exhausting air from the tank above the solvent, and means for conducting the powder to and discharging it tangentially into the solvent, whereby a swirling movement of the air and solvent and a heavy spray above said solvent is produced and the powder is held submerged in the solvent until completely dissolved.

5. In a powder separator, the combination with means for supporting a powder solvent, of means for exhausting air from said supporting means above the solvent, a baffle plate within said means above the solvent and adapted to co-act with the exhausting means to produce and confine a heavy spray above the surface of the solvent, and means for conducting the powder to and discharging it tangentially into the solvent, whereby a swirling movement of the air and solvent is produced and the powder is held submerged in the solvent until completely dissolved.

6. In a powder separator, the combination with an upright cylindrical tank for containing a powder solvent, of means for exhausting air from the tank above the solvent, a baffle plate within the tank above the solvent and adapted to co-act with the exhausting means to produce and confine a heavy spray above the surface of the solvent, and means for conducting the powder to and discharging it tangentially into the solvent, whereby a swirling movement of the air and solvent is produced and the powder is held submerged in the solvent until completely dissolved.

7. In a powder separator, the combination with an upright cylindrical tank for containing a powder solvent, of means for exhausting air from the tank above the solvent, a dished baffle plate within the tank above the solvent and having a central aperture and adapted to co-act with the exhausting means to produce and confine a heavy spray above the surface of the solvent, and means for conducting the powder to and discharging it tangentially into the solvent, whereby a swirling movement of the air and solvent is produced and the powder is held submerged in the solvent until completely dissolved.

8. In a powder separator, the combination with an upright cylindrical tank for containing a powder solvent, of means for exhausting air from the tank including an outlet pipe leading from the tank above the solvent, a dished baffle plate between the solvent and outlet pipe and adapted to co-

act with the exhausting means to produce and confine a heavy spray above the surface of the solvent, and an inlet pipe opening tangentially into the tank below the surface of the solvent for conducting the powder into the solvent, whereby a swirling movement of the air and solvent is produced and the powder is held submerged until completely dissolved.

9. The combination with an upright cylindrical tank for containing water, of means for exhausting air from the tank including an outlet pipe leading radially from the tank above the water, a dished baffle plate between the water and outlet pipe, and an inlet pipe opening tangentially into the tank below the surface of the water.

In testimony whereof, I have signed my name to this specification.

ABEL H. ROBERTS.