

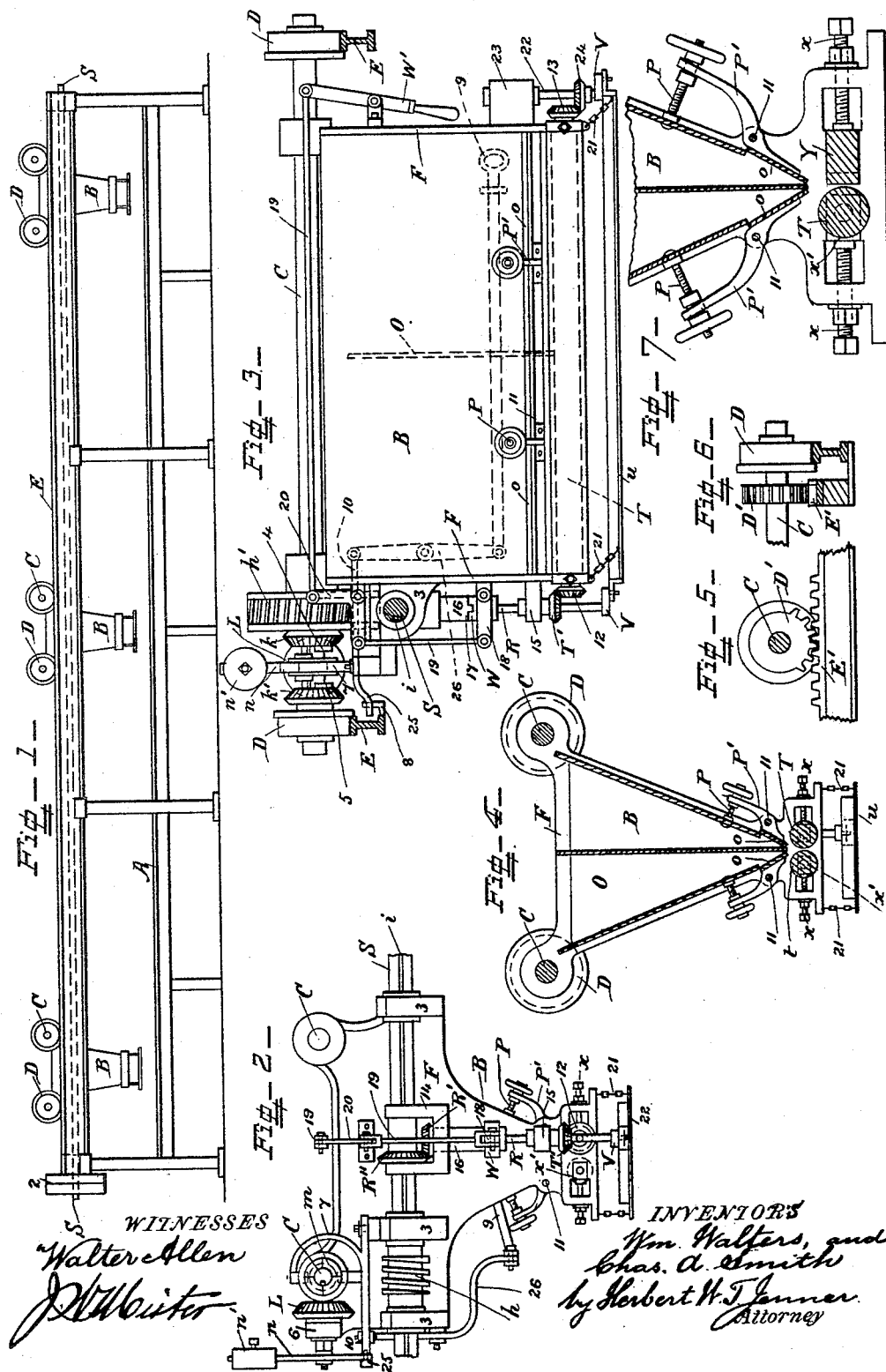
(No Model.)

W. WALTERS & C. A. SMITH.

MACHINERY FOR DISTRIBUTING ENAMELING POWDERS.

No. 454,312.

Patented June 16, 1891.



UNITED STATES PATENT OFFICE.

WILLIAM WALTERS AND CHARLES ARTHUR SMITH, OF BIRMINGHAM,
ENGLAND.

MACHINERY FOR DISTRIBUTING ENAMELING-POWDERS.

SPECIFICATION forming part of Letters Patent No. 454,312, dated June 16, 1891.

Application filed March 25, 1891. Serial No. 386,370. (No model.) Patented in England July 27, 1889, No. 11,932.

To all whom it may concern:

Be it known that we, WILLIAM WALTERS and CHARLES ARTHUR SMITH, residing at Birmingham, in the county of Warwick, Great Britain, have invented certain new and useful Improvements in Machinery for Distributing Enameling-Powders; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Letters Patent for this invention have been obtained in England, No. 11,932, dated July 27, 1889.

This invention relates to machines used for spreading powder upon the surface of plates in the process of making enameled plates.

This invention consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view of the complete machine. Fig. 2 is a side view of one of the distributing-hoppers with some portions of the traveling mechanism removed. Fig. 3 is an end view of one of the distributing-hoppers. Fig. 4 is a cross-section through the hopper. Figs. 5 and 6 are detail side and end views of a rack and a pinion for preventing the traveling wheels from slipping. Fig. 7 is a cross-section of part of the hopper drawn to a larger scale and showing a modification of the feeding devices.

A is the table upon which the plates are placed. These plates receive an even coat of fine powder from the hoppers, and the powder is subsequently converted into enamel.

B are the powder-hoppers, provided with traveling wheels D, which run upon the rails E, supported above the level of the table.

S is a longitudinal driving-shaft, provided with driving-pulleys 2 and supported parallel with the rails E.

F are the side plates of the hoppers. The shaft S runs in bearings 3, projecting from the side plates F of each hopper, and *h* is a worm carried by each hopper and splined to the said shaft S, which is provided with the long keyway *i*.

The traveling wheels D are secured upon the axles C, journaled in the side plates F, and one of the axles has a worm-wheel *h'*

journaled on it and gearing into the worm *h*. A beveled toothed wheel *k* is secured to the worm-wheel *h'* and is provided with the clutch-jaw 4. A beveled toothed wheel *k'* is also journaled on the said axle C, and is provided with the clutch-jaw 5. An idle beveled toothed wheel L is journaled on a pin projecting from the boss 6 on the side plate F and gears into the said wheels *k* and *k'*, so that they are revolved continuously and in opposite directions by the shaft S. A clutch *m* is splined to the axle C between the clutch-jaws 4 and 5, and is adapted to be thrown into gear with either of them by means of the clutch-lever 7, pivoted to one of the bearings 3. A pivoted lever *n* engages with the end of the lever 7, and is provided with a weight *n'* for holding the clutch in gear with the clutch-jaws. An arm 25 projects from the lever 7 and comes in contact with fixed pins 8, projecting from the rails E, so that the direction of travel of the hopper may be reversed automatically at suitable intervals. The direction of travel may also be reversed by hand by means of the handle 9, which is pivoted to the lever 26, which is connected to the said lever 7 by the rod 10. In order to prevent the said wheels D from slipping on the rails and to insure uniformity of travel, a toothed wheel D' may be secured on each axle C and caused to engage with a stationary rack E', secured to one of the rails E, as shown in Figs. 5 and 6.

The hopper is divided into sections by cross-partitions O, and each section is provided with a door *o* for regulating the outlet of powder. As many sections may be used as desired, and the doors may be adjusted in any approved manner. The doors *o* are pivoted on rods 11 and are provided with operating-levers P', worked by screws P. The sections of the hopper can be closed to adapt it to spread the powder on plates of different widths.

T is a feed-roller journaled below the hopper and having the beveled toothed wheels 12 and 13 secured on its ends. The feed-roller T works in connection with a second roller *t*, and the bearing-blocks *x'* of both rollers slide in slots in the side plates F, and are provided with screws *x* for adjusting their

position. A stationary block Y can be used instead of the roller *t*, as shown in Fig. 7, if desired.

R'' is a beveled toothed wheel splined to the shaft S and gearing into a beveled toothed wheel R', carried by the bracket 14.

R is a vertical shaft journaled in the bracket 15 and in the hub 16 of the wheel R', which is provided with the clutch-jaw 17 on its lower end.

W is a clutch splined to the shaft R, and 18 is a pivoted lever for operating the said clutch and throwing it into and out of gear with the clutch-jaw 17.

T' is a beveled toothed wheel secured to the shaft R and gearing into the wheel 12. The motion of the shaft S revolves the feed-roller T when the clutch W is in gear with the clutch-jaw, and the said clutch is thrown out of gear when the machine is not required in action by means of the pivoted handle W' and the rod 19 and pivoted bell-crank lever 20, which are connected to the said lever 18.

A sieve *u* is suspended by the links 21 below the feed-rollers for distributing the powder evenly. A vertical shaft 22 is journaled in the bearing 23 on the opposite side of the hopper from the shaft R, and has a beveled toothed wheel 24 secured on it, which gears into the said wheel 13. The sieve is vibrated by means of the cranks V, secured to the lower ends of the shafts R and 22, so as to cause the powder to fall through it onto the plates, which are supported by the table A, as hereinbefore described.

What we claim is—

1. The combination, with the table and the rails E, of a series of powder-distributing hoppers carried by the said rails, and a single driving-shaft common to all the hoppers and adapted to traverse them simultaneously and synchronously upon the rails, substantially as set forth.

2. The combination, with the table and the rails E, of a driving-shaft, a series of powder-distributing hoppers provided with axles, wheels running on the said rails, and toothed wheels secured on the said axles, and a toothed rack secured to one of the rails and engaging with the said toothed wheels, whereby the hoppers are kept the same distance apart from each other and are moved back and forth on the rails, substantially as set forth.

3. The combination, with a powder-distributing hopper provided with wheels and axles, of the driving-shaft, the worm-wheel and beveled toothed wheels provided with clutch-jaws and journaled on one of the said axles, the idle-wheel, and the clutch splined to the said axle between the said clutch-jaws, substantially as and for the purpose set forth.

4. The combination, with the rails, of the powder-distributing hopper provided with wheels and axles and running on the said rails, a driving-shaft, intermediate reversible driving mechanism operatively connecting the driving-shaft with one of the said axles, a clutch-lever for reversing the said driving mechanism, and a pin projecting from one of the rails for the said clutch-lever to strike against, whereby the direction of the movement of the hopper may be reversed automatically, substantially as and for the purpose set forth.

5. The combination, with a powder-distributing hopper divided laterally into sections, of adjustable doors for closing the sections separately, and driving mechanism for moving the hopper longitudinally, whereby plates of different widths may be coated with powder, substantially as set forth.

6. The combination, with the feed-roller T, having a beveled toothed wheel on each end, of two vertical shafts, each provided with beveled toothed wheels gearing into the aforesaid wheels, driving mechanism and a clutch for revolving one of the said shafts, a sieve suspended below the feed-roller, and cranks secured to the ends of the said shafts and adapted to vibrate the said sieves, substantially as and for the purpose set forth.

7. The combination, with a powder-distributing hopper, of feeding devices, such as rollers, below the hopper, a sieve below the feeding devices, a driving-shaft, and intermediate driving mechanism for simultaneously moving the hopper in a longitudinal direction, operating the feeding devices, and vibrating the sieve, substantially as and for the purpose set forth.

In testimony whereof we have affixed our signatures in presence of two witnesses.

WILLIAM WALTERS.

CHARLES ARTHUR SMITH.

Witnesses:

ERNEST HARKER,
WILLIAM EVANS.