June 9, 1931. F. T. POWERS 1,808,906

ETCHING MACHINE

Filed Aug. 15, 1930 2 Sheets-Sheet 1

Fig. 1.

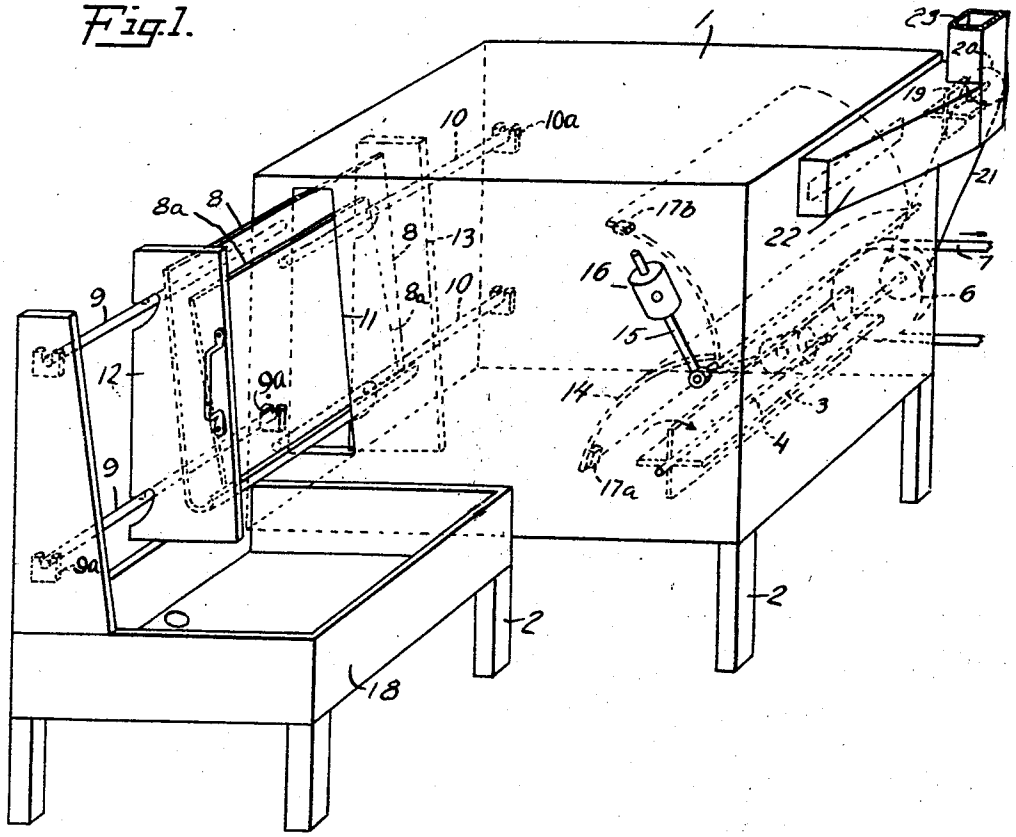


Fig. 2.

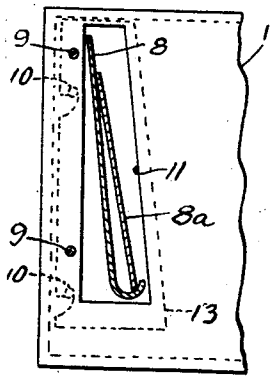
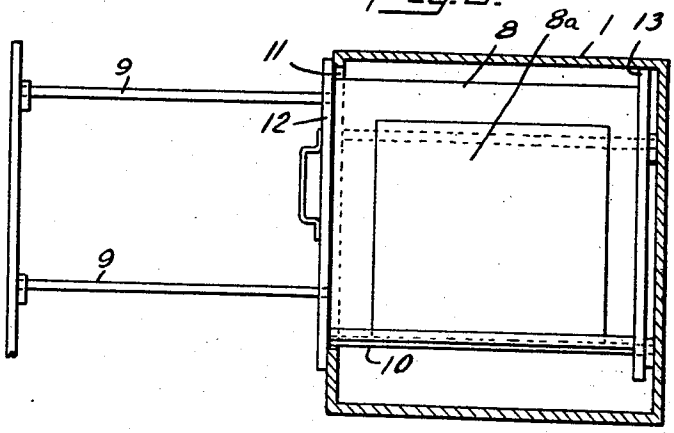


Fig. 3.



INVENTOR

June 9, 1931. F. T. POWERS 1,808,906

ETCHING MACHINE

Filed Aug. 15, 1930 2 Sheets-Sheet 2

Fig. 4.

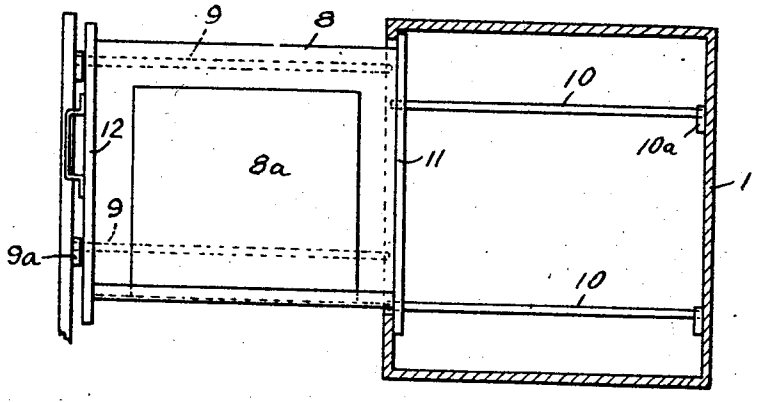
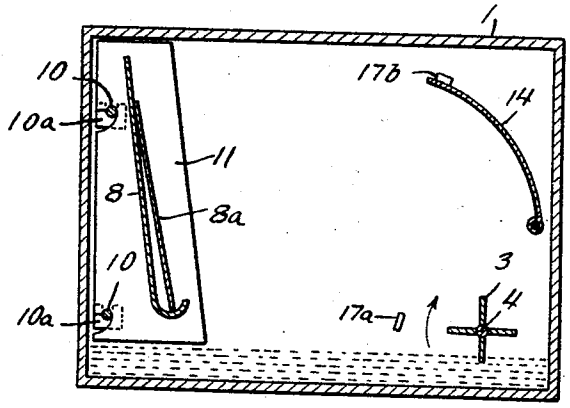


Fig. 5.



INVENTOR

Patented June 9, 1931 1,808,906

UNITED STATES PATENT OFFICE

FRANK T. POWERS, OF DOUGLASTON, NEW YORK

ETCHING MACHINE

Application filed August 15, 1930. Serial No. 475,564.

My invention relates to the art of making printing plates by the photo mechanical process, and more specifically to the improvements in etching machines, in which printing plates prepared by the half tone or line cut processes are etched.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

My improved etching machine is shown in its preferred embodiment in the accompanying drawings, in which Fig. 1 is an isometric of the machine. Fig. 2 is a section through the slidable support and Fig. 3 is a section through the chamber, showing plate carrier within the chamber. Fig. 4 is a section through the chamber showing plate carrier without the chamber. Fig. 5 is a vertical section through the chamber, at right angles to sections shown in Figs. 3 and 4.

In each of the several figures similar numerals designate similar parts and arrows indicate direction of motion or of rotation.

My machine consists of a tank or chamber, 1, supported preferably on legs, 2. Within the chamber is a sprayer, 3, mounted on a shaft, 4, carried on suitable bearings not shown, and rotatable in the direction of the arrow by means of a pulley, 6, cooperating with a belt, 7, leading to any suitable source of power not shown in the drawings. A slidable carrier, 8, for supporting the plate to be etched, 8*a*, moves on four track members, two of which, 9, 9, are without the chamber and the other two, 10, 10, are within the chamber. The carrier is slidable through the opening, 11, in the side of the chamber and is provided with end members, 12 and 13, one of which, 12, serves as a closure for the opening, 11, when the carrier is in its extreme position without the chamber.

To permit of removing the carrier from the chamber without stopping the machine, I provide a rotatable baffle plate, 14, operatable from the exterior of the etching chambers by means of the lever, 15, upon which is mounted a counter poise, 16, the function of which is to hold the baffle in either its elevated position or its lowered position, as desired, by means of which baffle plate the spray, thrown in the direction of the carrier by the sprayer, 3, may be completely intercepted, when said baffle plate is in its lower position against the stop, 17*a*. When the baffle, 13, is in its upper position against the stop, 17*b*, the spray of etching fluid thrown by sprayer is projected against the plate to be etched, which rests upon the carrier, 8.

It will be noted that the track members, 9, 9, and 10, 10, are each separate and independent of each other, and that each end of each track member is capable of separate adjustment or alignment. Also that none of these track members pass completely through the sides of the etching chamber, tracks, 9, 9, being entirely without the chamber and terminating in small pockets, 9*a*, at each end; while tracks 10, 10 are entirely within the chamber and have each of their ends resting in suitable pockets, 10*a*, on the inner sides of the chamber. I also provide a suitably supported tray, 18, for convenience in washing the etched plate and to catch such drippings of etching fluid as may fall from the plate or the carrier. Since the fumes and gases generated by the action of the etching fluid on the plate being etched, are obnoxious and irritating, I provide a ventillating fan, 19, driven by means of a pulley, 20, and a belt, 21, from the pulley, 6. This fan draws vapours, gases and fumes from the interior of the chamber through the duct, 22, and discharges them through the duct, 23, to some convenient point of discharge not shown in the drawings.

The method of operation and the action of the machine are well known to those skilled in the art. Etching fluid is placed in the lower portion of the chamber, 1, up to such a level that the rotating sprayer, 3, will pick it up and project it against the plate being etched, which stands on the carrier, 8. When starting up, and until the sprayer has reached full speed, the baffle, 14, is turned down against the lower stops, 17*a*, to intercept all

of the spray. The plate to be etched, 8*a*, is placed upon the carrier, 8, while it is positioned outside of the chamber, and the carrier is then moved into the etching chamber. When the carrier is moved to its extreme position within the chamber, the closure member, 12, closes and completely shuts off any leakage of etching fluid around the carrier through the opening in the side of the chamber. It will be noted that no leakage whatever can occur at ends of the track members, 9, 9, and 10, 10, since none of them pass through the side of the chamber. Heretofore it has been customary to build etching machines of this type with two continuous track members or guides extending through the opening in the side of the chamber. This construction made it difficult or impossible to maintain a tight closure of the opening while the machine was in operation, with the result that a considerable amount of etching fluid was lost and resulting in a gradual lowering of the level of the fluid in the chamber, which in turn reduced the effectiveness of the sprayer, since it must for best results dip into the etching fluid a definite amount.

This gradual leakage at openings in the chamber is a very important matter. A lowering of the level of the etching fluid by an eighth of an inch below the optimum level will materially reduce the speed of the etching process. Not only is the maintenance of a constant level an important matter, but the etching fluids used are relatively expensive and any loss of fluid is a financial loss also. Then, too, these fluids are very corrosive and any leakage around the machine on the floor or on the supporting frame of the machine is objectionable.

In my copending application, Serial Number 446,394, I have described an etcher of this type, but with the continuous track and guide members extending through the opening in the side of the chamber. This invention is an improvement of my former machine, but I do not wish to confine its application to that particular use, since it is susceptible of utilization in other ways.

I claim:

1. The combination in an etching machine of the type described, of a carrier for the object to be etched, cooperating with a plurality of track members, part of which are located wholly within the etching chamber, and part of which are located wholly without the etching chamber.

2. An etching machine of the type described, having a receptacle for the etching fluid, an etching chamber, a sprayer for projecting the etching fluid against the plate to be etched, a slidable carrier for the plate to be etched, which is characterized by having a plurality of separately alignable track members cooperating with said carrier to serve as rails and guides to guide the movement of the carrier into and out of the etching chamber.

3. The improvement in etching machines of the type described, which comprises a plurality of track members wholly within the etching chamber, adapted to cooperate with and guide the movement of one end of the carrier for the plate to be etched, and a plurality of track members wholly without the etching chamber, adapted to cooperate with and guide the movement of the opposite end of the carrier for the plate to be etched.

4. The improvement in etching machines of the type described, comprising a carrier for the plate to be etched, one end of which is slidably mounted upon and guided in its movement by a plurality of track members within the etching chamber, and the other end of which is slidably mounted upon and guided in its movement by a plurality of track members without the etching chamber.

Signed at Douglaston, in the county of Queens, city and State of New York, this 24th day of July, A. D. 1930.

FRANK T. POWERS.