No. 834,144. PATENTED OCT. 23, 1906.

R. C. KROLL.

ETCHING MACHINE.

APPLICATION FILED SEPT. 18, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

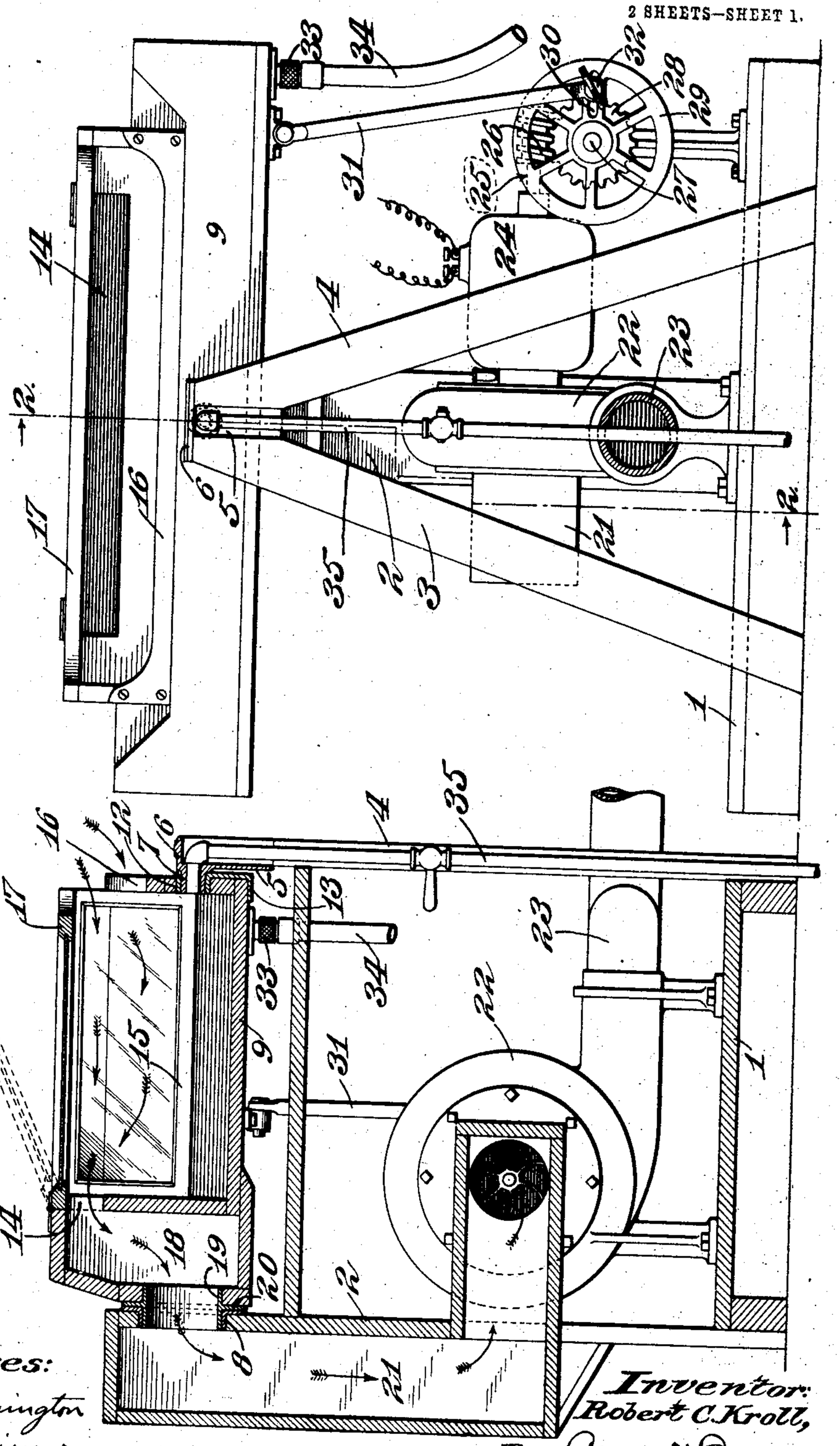

Fig. 2.

Witnesses:
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Fred F. Reiners

Inventor:
Robert C. Kroll,
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2 SHEETS—SHEET 2.

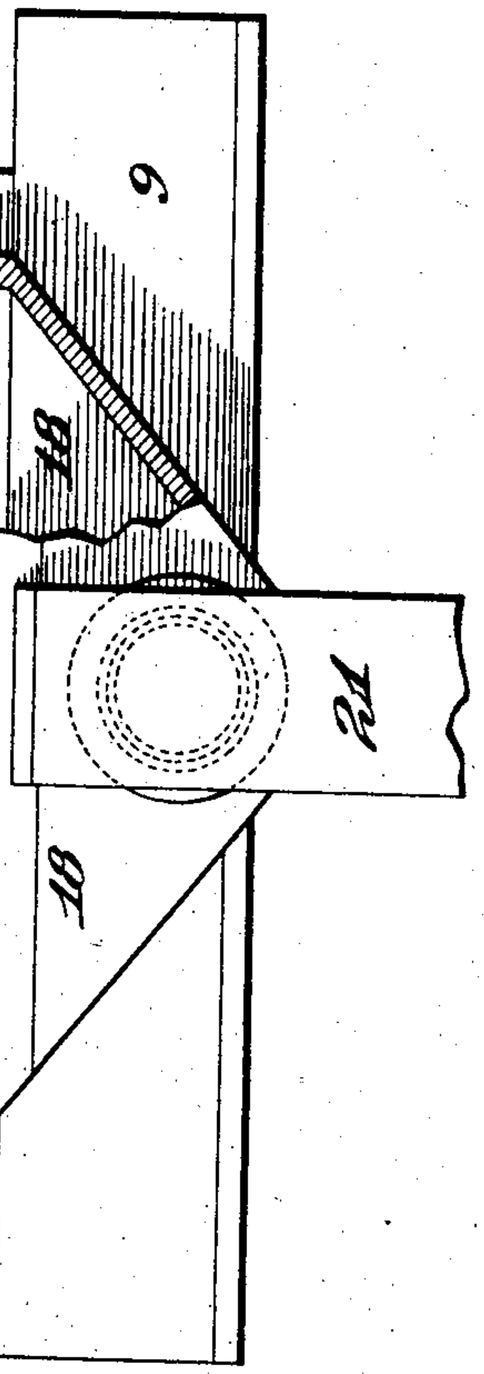

Fig. 4.

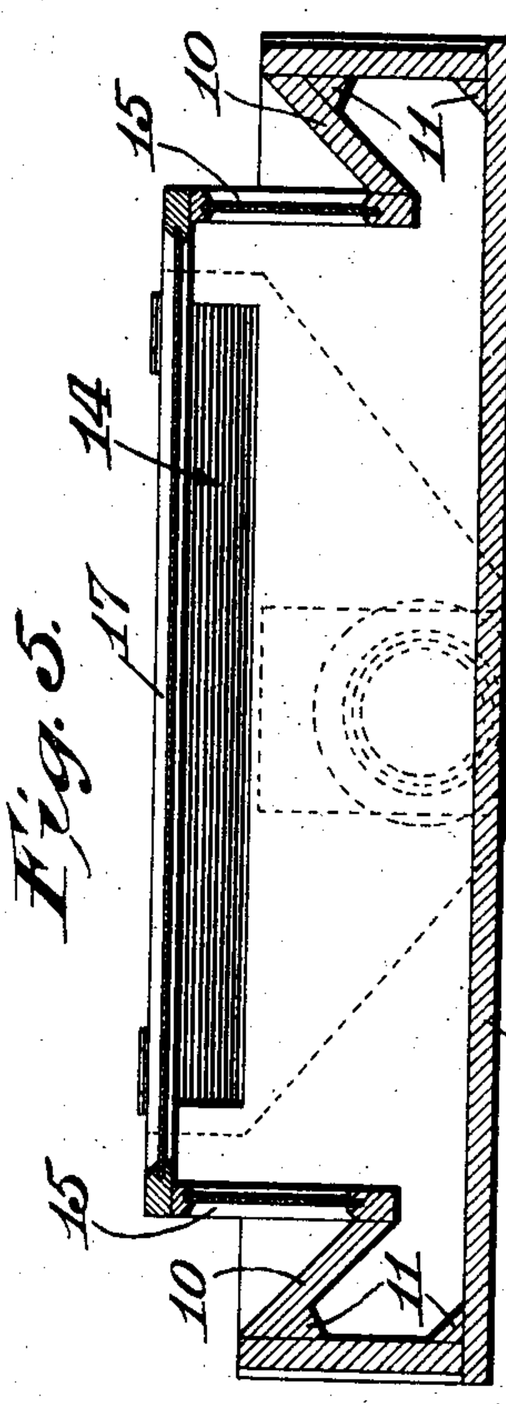

Fig. 5.

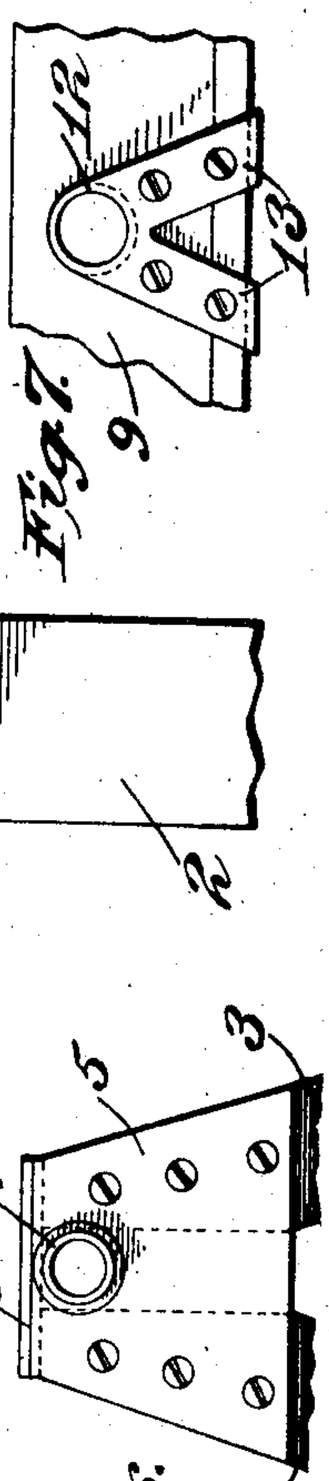

Fig. 7.

Fig. 6.

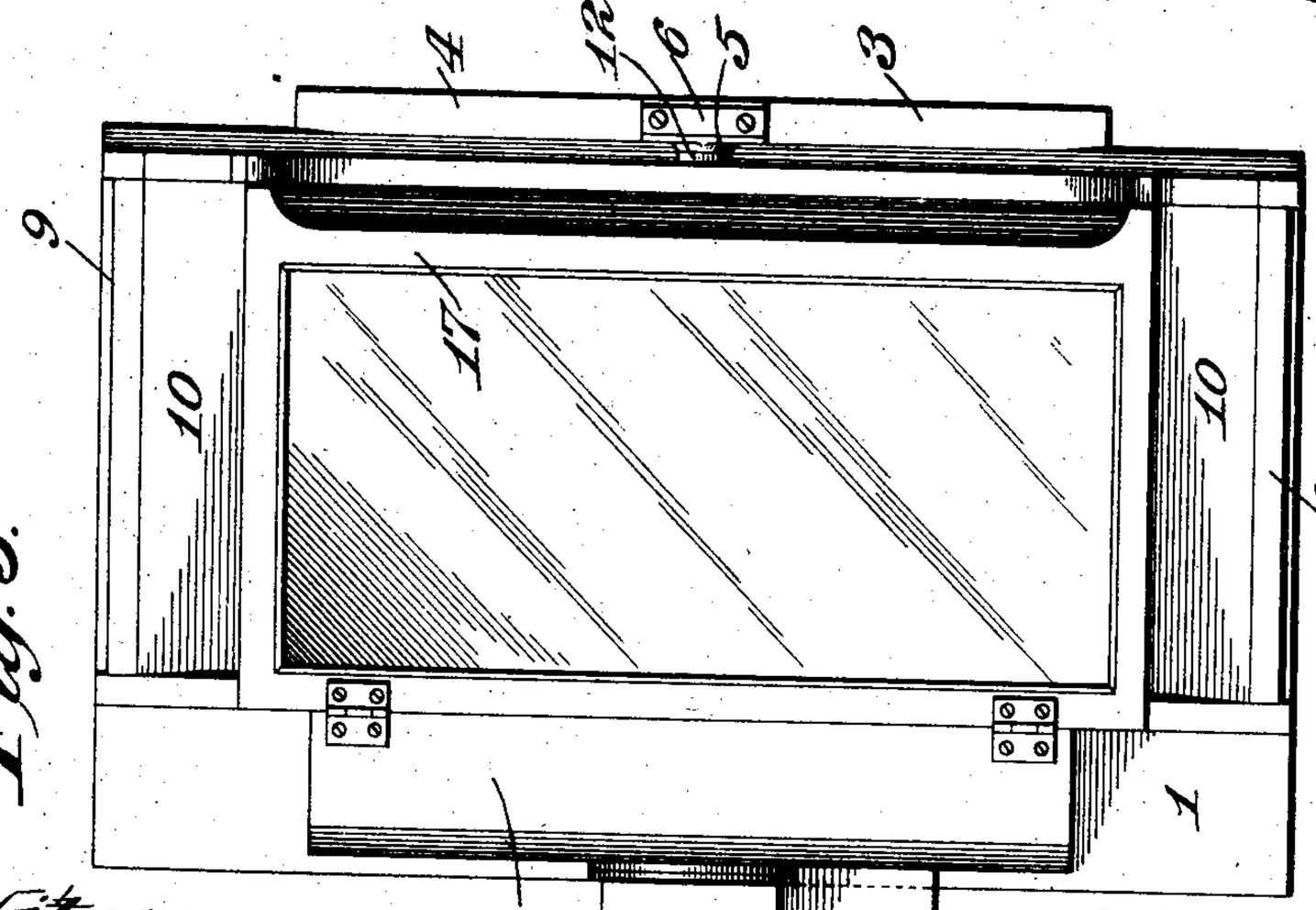

Fig. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT C. KROLL, OF ST. LOUIS, MISSOURI.

ETCHING-MACHINE.

No. 834,144. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed September 18, 1905. Serial No. 278,879.

To all whom it may concern:

Be it known that I, ROBERT C. KROLL, a subject of the Czar of Russia, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Etching-Machines, of which the following is a specification.

My invention relates to etching-machines for photo-engravers' use. It is the prevailing practice to etch the plates under treatment in an open tub which is rocked by hand. The noxious and poisonous fumes which result from the action of the acid on the plates rise unhindered from the tub and escape into the room. All the men in the room are thus forced to inhale the fumes and especially the operator who is continually stooping over the tub inspecting the plates under treatment.

The principal objects of my invention are to obviate these objectionable features of the etching process, to rock the etching-tub mechanically, to create a draft over the etching-tub away from the operator, to prevent the escape of gases and fumes from the tub into the room, and other objects hereinafter more fully appearing.

My invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a front view of the etching-machine. Fig. 2 is a vertical sectional view on the line 2 2 of Fig. 1. Fig. 3 is a plan view. Fig. 4 is a rear view of the upper portion of the machine. Fig. 5 is a vertical longitudinal sectional view through the tub, and Figs. 6 and 7 show details of construction of the front pivotal bearing of the tub.

The etching-machine comprises an etching-tub in which the ordinary etching process may be carried out, means to rock the tub, means to introduce water into the tub, means to empty the tub, and means to create a draft over the tub and carry away the fumes and gases arising therefrom.

The supporting structure of the machine comprises a base 1, from which rise a front support and a rear support 2. The front support is formed of two upwardly-converging bars 3 4, which are connected at the top by a casting 5. The latter has a horizontal flange 6, which rests upon the tops of the bars, and a truncated triangular vertical plate, which is secured to the inner faces of the bars. The bars 3 4 do not meet at their ends, but are separated by a space sufficient to accommodate a pipe for a purpose hereinafter appearing. The casting has a rearwardly-extending tubular portion 7, which constitutes one of the journals for the tub. The rear support 2 is provided near its upper end with a bearing 8 for the tub. This bearing is in horizontal alinement with the journal 7 on the front support, but is of larger diameter.

The etching-tub 9 is oblong in plan and has vertical side walls. At its ends it has inclined splash-boards 10 to prevent the escape of the acid as the tub is rocked. The splash-boards being inclined downwardly and outwardly from the ends of the tub, they cut off very little light. The lower end corners of the tub and the corners formed by the ends of the tub and the splash-boards are filled with triangular pieces 11. This reduces the splashing of the acid considerably, as its course is gradually turned by the inclined surfaces of the corner-filling pieces, and it does not abruptly dash against a surface at right angles to its course. In the lower central part of the front wall of the tub a cylindrical bushing 12 is arranged. The tubular journal 7 on the front support enters this bushing, and these parts constitute the front pivotal mounting for the tub. Flanged straps 13 are made integral with the bushing 12 and extend downwardly and engage the bottom of the tub.

The rear side of the etching-tub is higher than the remaining sides and is provided with an elongated rectangular opening 14. At the ends of the tub glazed frames 15 are arranged, being secured to the lower inner sides of the splash-boards and extending upwardly to the same height as the rear side of the tub. At their front ends the frames 15 are braced by a bar 16, which is so reduced in width between its ends as to leave ample space for the insertion and withdrawal of the plates. A glazed frame or window 17 is arranged over the top of the tub. This window is cut away at the front side between its ends to increase the opening at the front of the tub. The window 17 is hinged to the top of a chamber 18, arranged at the rear of the tub.

The chamber 18 has downwardly-converging side walls. At its front side it communicates with the tub through the opening 14. In its rear side is mounted a cylinder 19, having a peripheral flange 20 extending around it midway between its ends. The portion of the cylinder projecting rearwardly from the flange 20 constitutes the rear journal of the etching-tub and is journaled in the bearing 8 in the rear support 2.

An air-conduit 21 is mounted upon the rear support 2 and communicates with said chamber 18 through said hollow journal 19. The conduit leads downwardly and forwardly to a blower or fan 22, which may be of any desired type and is mounted on the base 1. The discharge-pipe 23 of the fan may lead to a flue or the like. The fan creates a draft from the front of the tub through the chamber 18, through the conduit 21, and out through the discharge-pipe 22 and flue or the like. The noxious fumes will thus be carried away and will not escape into the room. The operator can stand over the tub and observe the progress of the etching process through the window 17 without inhaling any fumes. All ordinary plates can be inserted and withdrawn without raising the window 17, and hence no fumes need be permitted to escape into the room. The fan may be driven by a motor or from a power-shaft. An electric motor 24 is used in the machine illustrated, the fan being mounted on the armature-shaft 25.

On the end of the armature-shaft 24 opposite the fan is mounted a worm 26. A horizontal shaft 27 carries a worm-wheel 28, which meshes with said worm. A wheel 29 is mounted on the shaft 27 and is provided with a slot 30. A link 31 is pivotally mounted at one end on the bottom of the tub, near one end thereof, and at its other end is pivotally connected to a pin 32, adjustably mounted in said slot 30 of said wheel 28. The tub is rocked by this mechanism. The amplitude of the rocking movement may be varied by adjusting the position of the pin 32 in the slot 30 of the wheel 29.

A short waste-pipe 33 is mounted in the bottom of the tub, and a flexible tube 34 is connected to said waste-pipe and leads to a sewer-pipe or receptacle for the refuse acid. A water-pipe 35 extends through the hollow journal 7, and thus water can be readily admitted to the tub.

Obviously my device is capable of considerable modification within the scope of my invention, and therefore I do not wish to be limited to the particular construction shown and described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An etching-machine comprising an oscillating tub, having an opening for the admission of air, a hinged cover for said tub, an air-outlet conduit in communication with said tub, and means to cause a current of air over said tub and directed into said conduit.

2. An etching-machine comprising a pivotally-mounted tub, having a hinged cover and having an opening for the admission of air, a fixed air-conduit in communication with said tub, and means to cause a current of air through said opening into said tub and thence into said conduit.

3. An etching-machine comprising a pivotally-mounted tub, hollow journals for said tub opening into the interior thereof, an air-conduit in communication with said tub through one of said journals, a pipe arranged in the other of said journals, and means to cause a current of air over said tub and directed into said conduit.

4. An etching-machine comprising a pivotally-mounted tub, a cover for said tub having a transparent section, an air-conduit in communication with the interior of said tub, and means to cause a current of air through said tub and directed into said conduit.

5. An etching-machine comprising a pivotally-mounted tub, a hinged cover on said tub and having a transparent section, a hollow journal for said tub, an air-conduit in communication with the interior of said tub through said hollow journal, and means to cause a current of air through said tub and directed into said conduit.

6. An etching-machine comprising a pivotally-mounted tub, a cover for said tub having transparent sections in the top and sides, an air-chamber on said tub and a conduit in communication with said air-chamber, and means to cause a current of air through said tub and air-chamber and directed into said conduit.

7. An etching-machine comprising a pivotally-mounted tub, inclined splash-boards and a hinged top having a transparent section, a conduit in communication with the interior of said tub and means to cause a current of air through said tub and directed into said conduit.

8. An etching machine comprising a pivotally-mounted tub, a hinged cover having a transparent section, and splash-boards mounted at the ends of said tub and inclined downwardly and inwardly therefrom.

9. An etching-machine comprising a pivotally-mounted tub, a window therein, a hinged cover therefor, splash-boards arranged at the ends of said tub and inclined downwardly and inwardly therefrom, and corner-strips arranged in the corners formed by said splash-boards and the ends of said tub and by the ends and bottom of the tub.

10. An etching-machine comprising a pivotally-mounted tub, and means to oscillate said tub, said means being adjustable to vary the amplitude of the oscillation.

11. An etching-machine comprising a piv-

otally-mounted tub, a link pivotally connected at one end to said tub, a rotary shaft and a member fixed on said shaft and adjustably connected to the free end of said link.

12. An etching-machine comprising a pivotally-mounted tub, a hinged cover therefor, a window therein, a fan arranged to cause a current of air over said tub, and means to actuate said fan and oscillate said tub.

St. Louis, Missouri, September 16, 1905.

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Witnesses:

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