

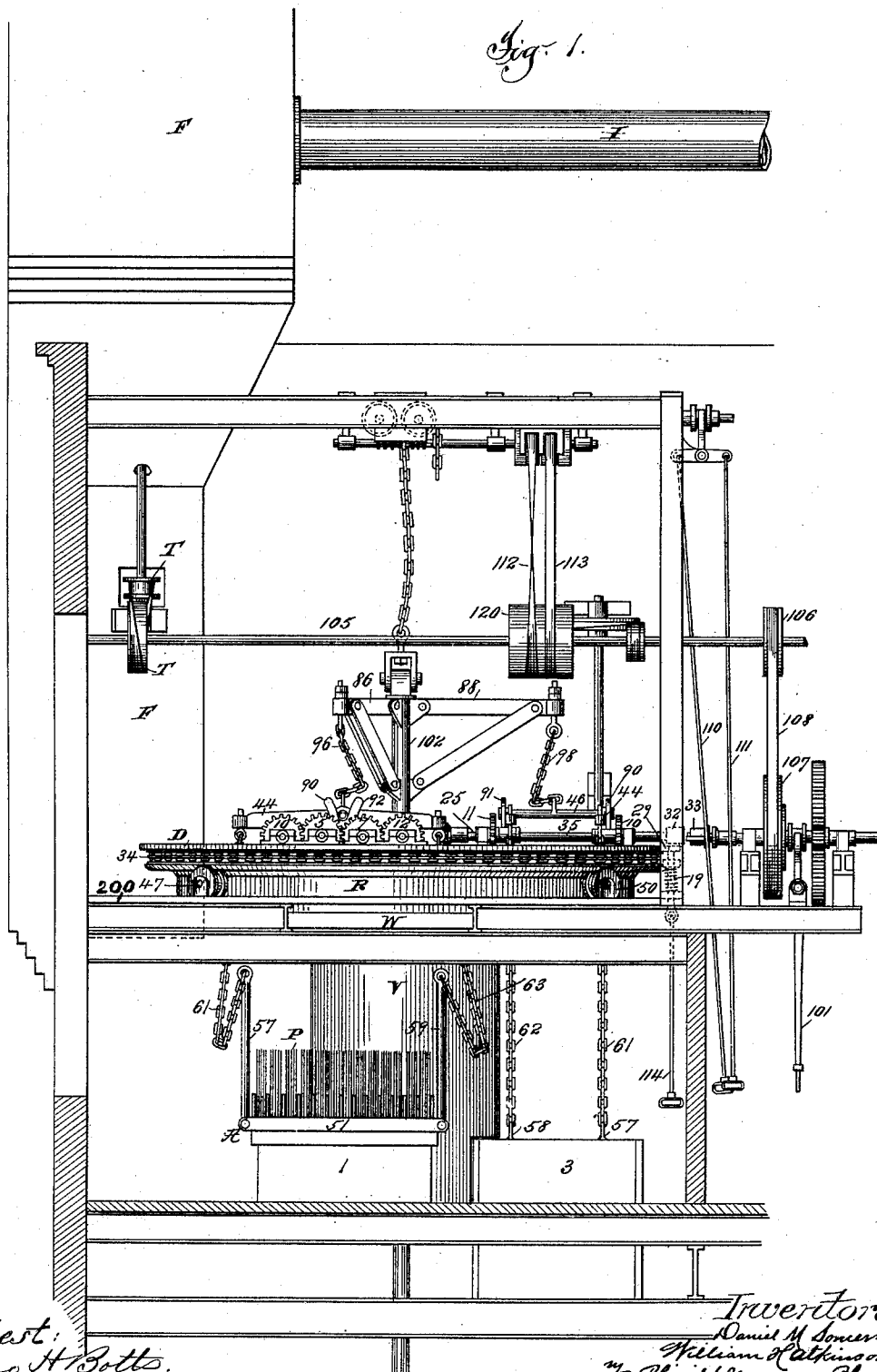
(No Model.)

4 Sheets—Sheet 1.

D. M. SOMERS & W. H. ATKINSON.
APPARATUS FOR PICKLING METAL PLATES.

No. 482,489.

Patented Sept. 13, 1892.



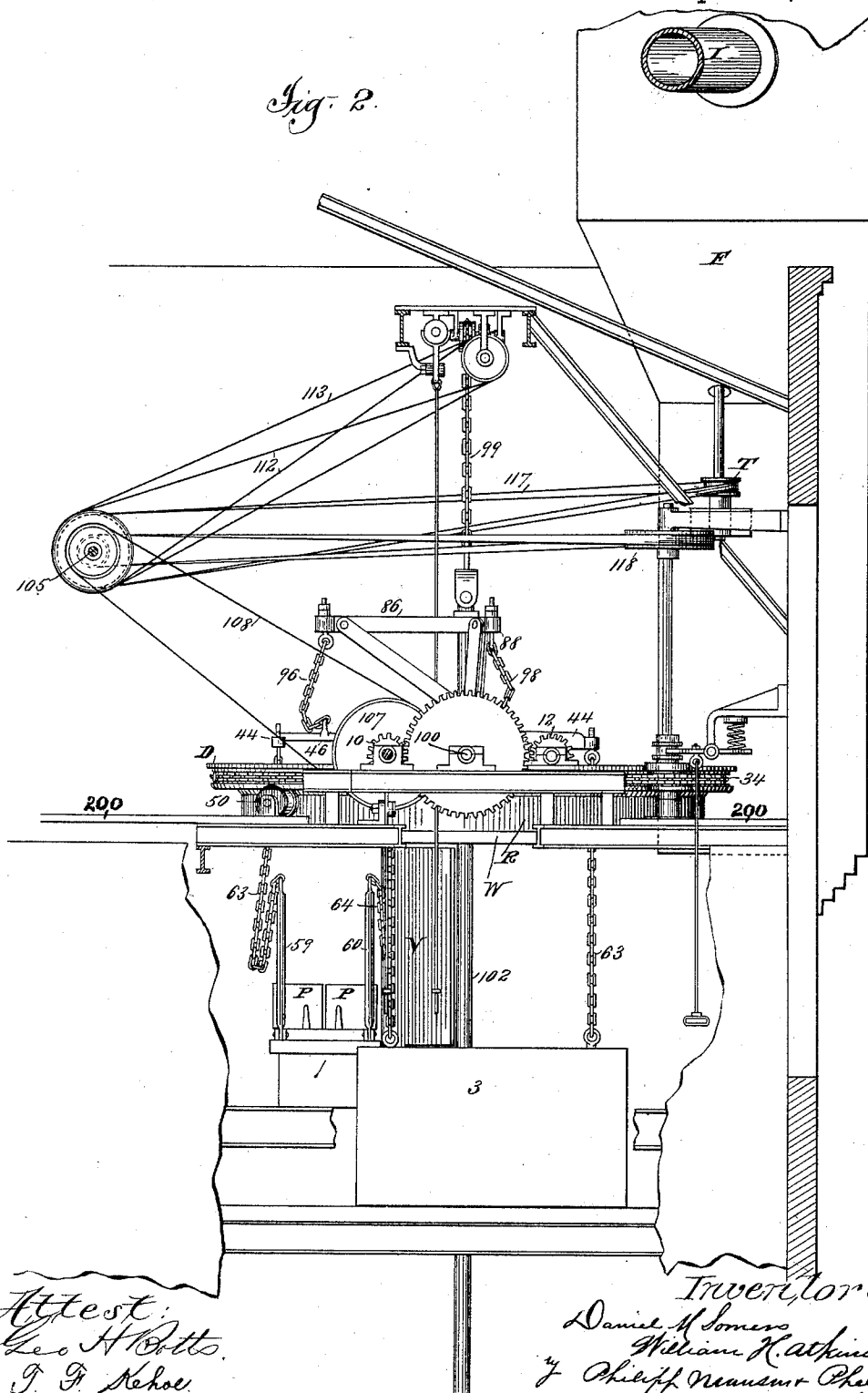
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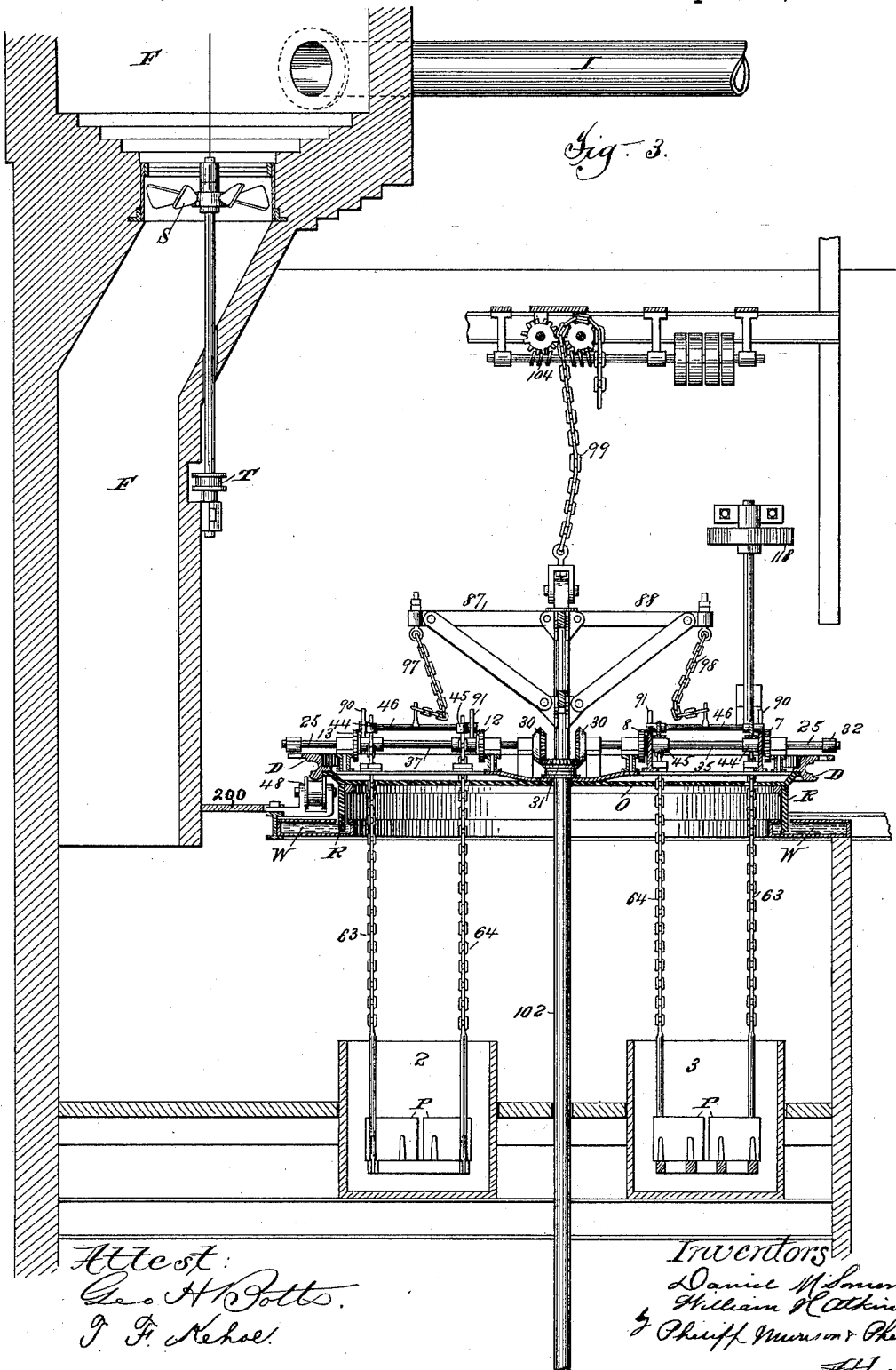
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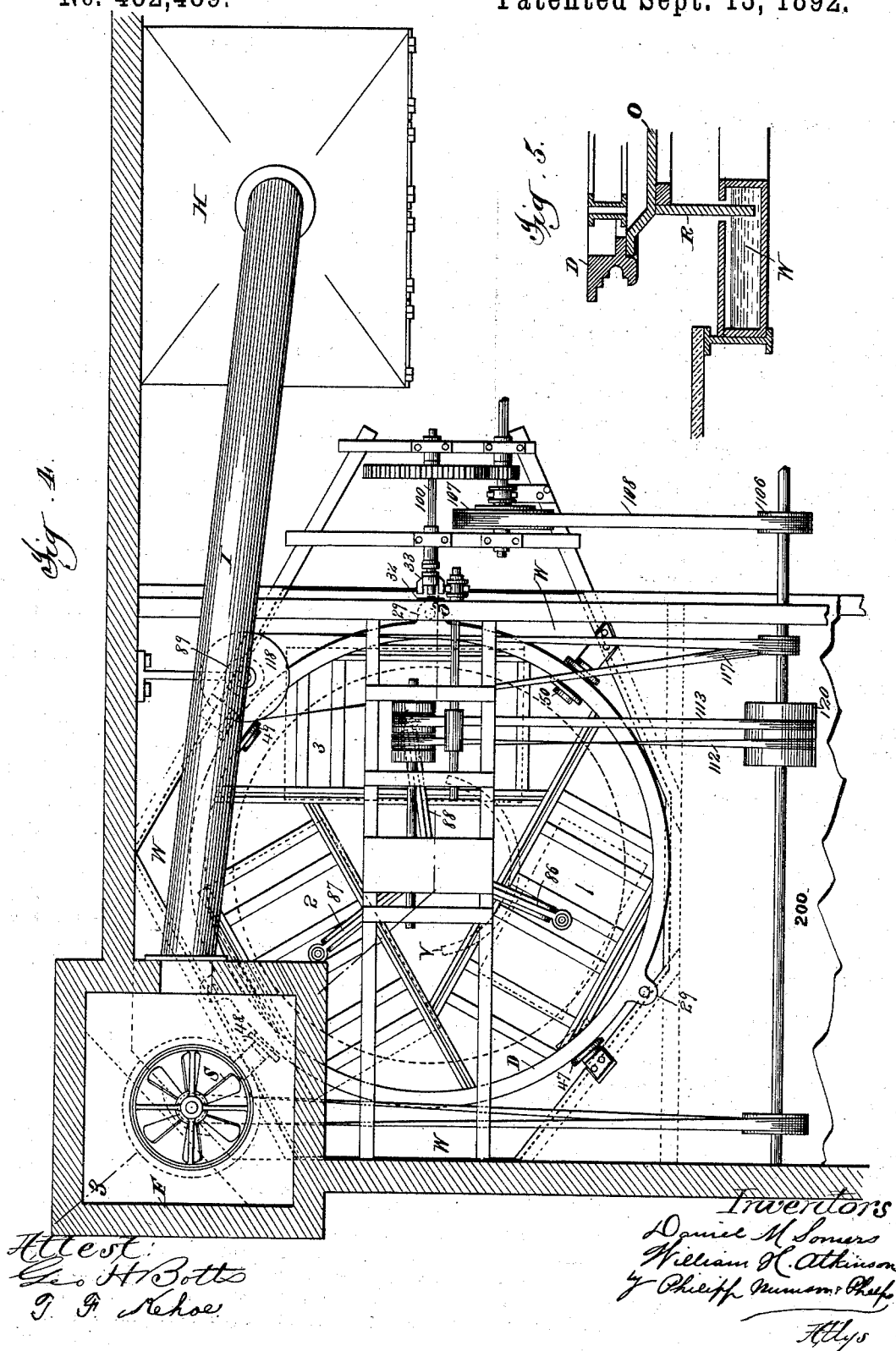
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No. 482,489.

Patented Sept. 13, 1892.



UNITED STATES PATENT OFFICE.

DANIEL M. SOMERS AND WILLIAM H. ATKINSON, OF BROOKLYN, NEW YORK.

APPARATUS FOR PICKLING METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 482,489, dated September 13, 1892.

Application filed August 7, 1891. Serial No. 401,957. (No model.)

To all whom it may concern:

Be it known that we, DANIEL M. SOMERS and WILLIAM H. ATKINSON, citizens of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Apparatus for Pickling Metal Plates, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates generally to that class of machines in which metal plates and other articles are subjected to an acid bath for the purpose of removing from their surface such scale, oxidation, or other blemish which would interfere with their subsequent treatment or unfit them for their intended use, the object of the invention being to remove or conduct away the noxious or injurious fumes rising from the acid contained in said bath directly from the bath itself, and thus prevent such fumes from attacking and destroying the machinery or entering into the operating-room to the injury of the occupants thereof.

In the embodiment of the invention shown the same is represented as applied to this branch of a plant designed for the production of tin plates, it being illustrated in connection with a pickling-machine in which plates to be operated upon are carried in cages suspended from a rotating carriage by which the cages containing the plates are through a step-like horizontal movement transferred from a receiving-table to the vat containing the said bath and thence to a vat containing the water or cleansing-bath. Such an apparatus is illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation. Fig. 2 is a side elevation; Fig. 3, a sectional elevation on the line 3 3; Fig. 4, a plan view, and Fig. 5 a sectional detail.

That the invention may be more readily comprehended, a general description of the main elements of the apparatus will first be given.

The machine is rotative in character and has three equidistant working points; a receiving-point, which is occupied by the table 1, an acid bath that is contained within the vat 2, and a cleaning or water bath within

the vat 3, and these characters 1 2 3 are placed upon Fig. 4 to indicate therein the location of said table and vats.

The plates P to be treated are supported in cages (see Figs. 1, 2, and 3) that are suspended by chains 61 62 63 64 from a rotating carriage D, that turns upon wheels, three, 47, 48, and 50, of which are shown. This carriage D might of course carry the wheels and the latter run upon a circular track properly supported, and any other means than wheels and a track may be employed for causing the carriage to move and transfer the cages from vat to vat. In the instances shown these chains are connected with rocking levers 44 45, by which the cages are rocked and otherwise moved in the vats and at suitable times raised therefrom and from the table 1 for horizontal transference, at which times said levers, and with them the cages, are raised by means of a hoist, to which they are connected by other chains 96 97 98. When raised by means of the chain 99, so that the cages clear the vats 2 3 and the table 1, said carriage D is horizontally rotated by means of a chain 34, so as to carry a loaded cage from the table 1 to a point over the vat 2, another from the vat 2 to a point over the vat 3, and a third from over the vat 3 to a point over the table 1, when, upon lowering the said chain 99, one cage will be deposited upon the table 1 to be unloaded and reloaded, another loaded cage will descend into the vat 2 to be treated by the acid bath therein, and the third, which has been treated to the acid bath, will be lowered into the water bath in the vat 3 to be cleansed of the adhering acid solution and other detachable matter.

The construction of many of the parts and the mode of their operation being identical with what is shown in our patent, No. 473,106, granted to us April 19, 1892, they are distinguished herein, when not specially described, by like letters of reference, so that they may be understood by the description of them contained in said patent.

As will be readily understood by those acquainted with this art and from the statement that in the modern pickling-machines required in the outfit of a plant for making tinned plates there must be a number of mechanisms all of which are above the acid vat

and each of which must in succession be brought directly over such vat, and since, as in the present case, the mechanisms are composed of a large number of metal parts, it is at once obvious that if they are unprotected from the fumes that arise from the acid bath they will soon be destroyed, and hence arises the necessity of providing the carriage by which these moving mechanisms are carried with a guard or deflector interposed between such mechanisms and the said vat. In addition to this protection to the machinery the noxious fumes that arise from the acid bath contained in vat 2 are not only offensive and injurious to the attendants of the pickling-machine and others within the room containing it, but if allowed to permeate said room will also destroy finished work or such plates as are approaching the stage of being finished, and as it is not only desirable but necessary to an economic production of tinned plates that all the operations shall be carried on in adjacent machines it becomes necessary that these acid-fumes shall be controlled and prevented from passing out into the room. To this end there is provided an open flue F, rising from a point from over the acid bath 2 and extending upward to a point outside of the building. This flue has at a suitable point a fan S, the centrifugal action of which operates to cause an upward outward draft in said flue, which fan is driven by a belt running on a pulley T on its shaft, which belt receives motion from a suitable driven shaft, as 105, and in order that the fumes rising from said acid bath shall be directed toward and into said flue and within the influence of the draft created by the fan, and thus be conducted from the bath to the atmosphere without, there is provided a deflector V, curved and shaped so as to act as a guard, preventing in a large degree the passage of the fumes rearward or into the room and causing fumes impinging upon it to be directed toward the flue F, and to the end that such fumes may not arise vertically into the mechanisms supported by the rotating carriage D it is provided with a horizontal guard-plate O, that will confine these fumes beneath it, and said guard-plate is given a tight area by means of a depending circular rim or flange R, whose lower edge dips into and runs in a water seal W, formed by means of plates suitably shaped, and this protection against the rising acid fumes is continued to any requisite extent outside of the space occupied by the said carriage by means of additional guard-plates, as 200, that fill the space between said carriage and the flue F and extend from said carriage into the room to a distance sufficient to afford the requisite area of such protection. As shown, the water seal W is a shallow circular box, so covered as to provide a narrow slit, through which the rim or flange R enters it, thus preventing evaporation to a large degree and preventing undue loss of the sealing liquid, which would result from splashing the same

in rapidly moving the carriage D. It will now appear that the greater portion of the fumes rising from the acid bath will be carried directly into the flue F in consequence of its proximity to the bath from which they rise, and that whatever of such fumes pass outwardly will meet the deflector V, be arrested by the plate O and its rim R and the plate 200, and thus having their movement suspended in these directions will readily yield to the action of the upward current induced in the said flue by the operation of the fan, and thus be carried off by the flue.

As has been intimated, these pickling-machines are, for economic reasons, generally associated with other machines, and in the case of a plant for the production of tinned plates the cooling-table for annealed plates may be quite near. Now that the heat resulting from these cooling plates, usually lost, may be utilized to aid the removal of the said acid-fumes and be conducted into the flue F to rarefy the air therein and thus cause an upward current therein a hood H is arranged over said plate-cooling table and a pipe I is made to connect said hood with the flue F, the result of which is that the hot air produced by the cooling plates passes into the flue and aids in a marked degree the production of a current therein sufficient much of the time, and always in connection with the devices described, to carry away all the acid-fumes given off by the acid bath and keep the room freed from their injurious effects.

What we claim is—

1. In a pickling-machine, the combination, with a series of vats for containing baths for the treatment of metal plates and a moving carriage operating to transport the plates from vat to vat and supporting mechanisms for the manipulation of the plates in the vats, of a guard-plate O, interposed between the vats and said mechanisms to protect the latter from destructive fumes arising from the vats, and a flue for conducting said fumes away, substantially as described.

2. In a pickling-machine, the combination, with a series of vats for containing baths for the treatment of metal plates and a moving carriage operating to transport the plates from vat to vat and supporting mechanisms for the manipulation of the plates in the vats, of the guard-plate O, fixed to the carriage, and a guard-plate 200, fixed outside of said carriage, both of which plates are interposed between the vats and said mechanisms to protect the latter from destructive fumes arising from the vats, and a flue for conducting said fumes away, substantially as described.

3. In a pickling-machine, the combination, with a series of vats for containing baths for the treatment of metal plates and a moving carriage operating to transport the plates from vat to vat, supporting mechanisms for the manipulation of the plates in the vats, and provided with means to prevent the passage of the fumes through it, of a flange pro-

jecting from the carriage into a liquid seal, substantially as described.

4. In a pickling-machine, the combination, with a series of vats for containing baths for the treatment of metal plates and a movable carriage operating to transport the plates from vat to vat and supporting mechanisms for the manipulation of the plates in the vats, of a flange projecting from the carriage into a liquid seal and a guard-plate *o*, co-operating with said flange and liquid seal to prevent the acid-fumes from passing upward through said carriage, substantially as described.

5. In a pickling-machine, the combination, with a series of vats for containing baths for the treatment of metal plates and a movable carriage operating to transport the plates from vat to vat and supporting mechanisms for the manipulation of the plates in the vats, of a flange projecting from the carriage into a liquid seal, a guard-plate co-operating with said flange and liquid seal, and a guard-plate about said carriage, whereby the passage of the acid-fumes upward through the carriage and about the carriage is prevented, substantially as described.

6. In a pickling-machine, the combination,

with a series of vats for containing baths for the treatment of metal plates, a moving carriage operating to transport the plates from vat to vat and supporting mechanisms for the manipulation of the plates in the vats, and a flue *F* for conducting away the fumes from the vat, of a vertical deflector or guide *V* at the outer side of the vat, substantially as described.

7. In a pickling-machine, the combination of a series of vats for containing baths for the treatment of metal plates, a moving carriage operating to transport the plates from vat to vat and supporting mechanisms for the manipulation of the plates in the vats, and a horizontal deflecting-plate arranged above the vats and about the carriage, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

DANIEL M. SOMERS.
WILLIAM H. ATKINSON.

Witnesses:

OSCAR M. BERRY,
CHAS. A. FOSTER.