

No. 708,970.

Patented Sept. 9, 1902.

J. R. PHILLIPS.

APPARATUS FOR TREATING AND TINNING PLATES.

(Application filed July 10, 1901.)

(No Model.)

8 Sheets—Sheet 1.

Fig. 1.

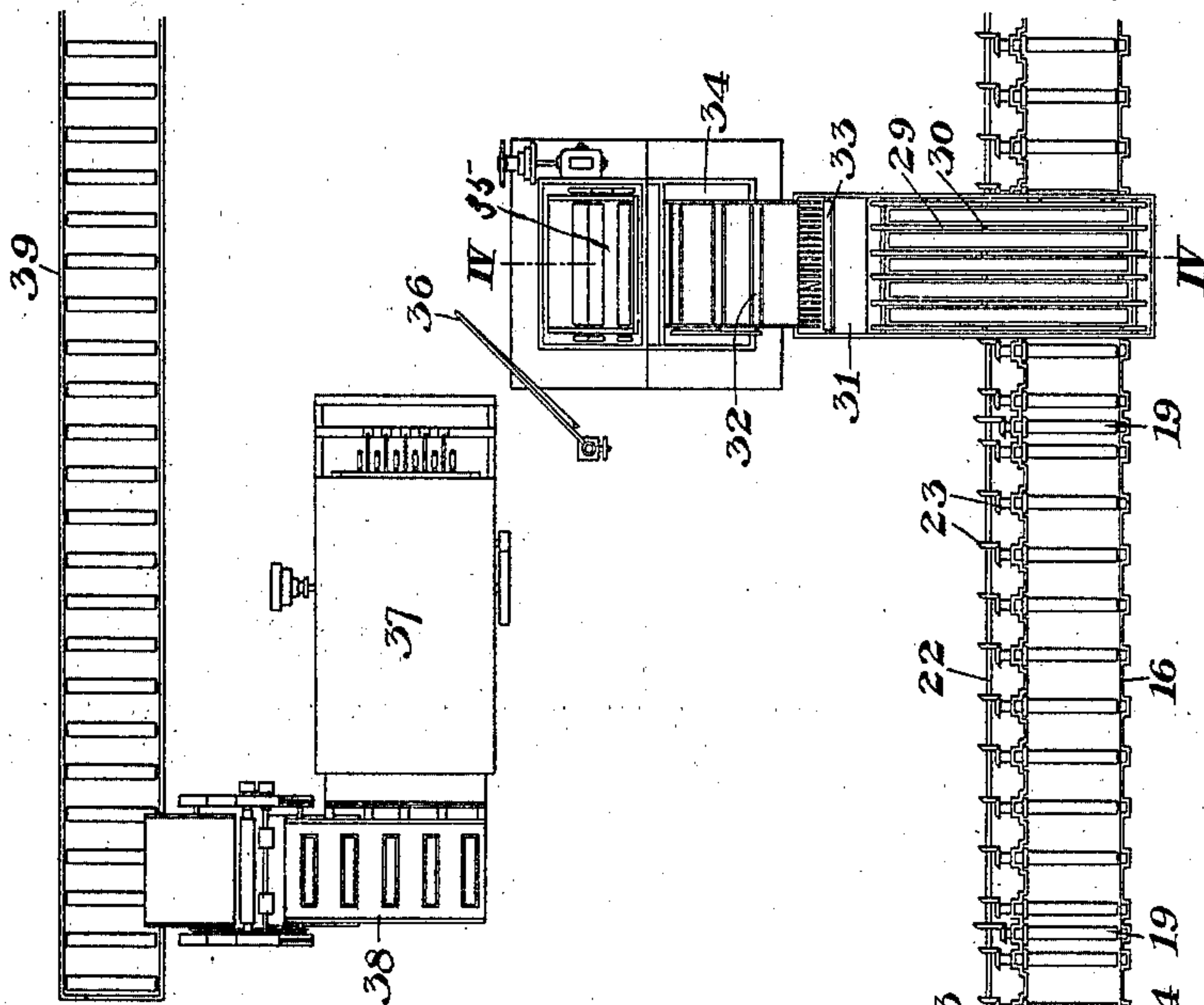
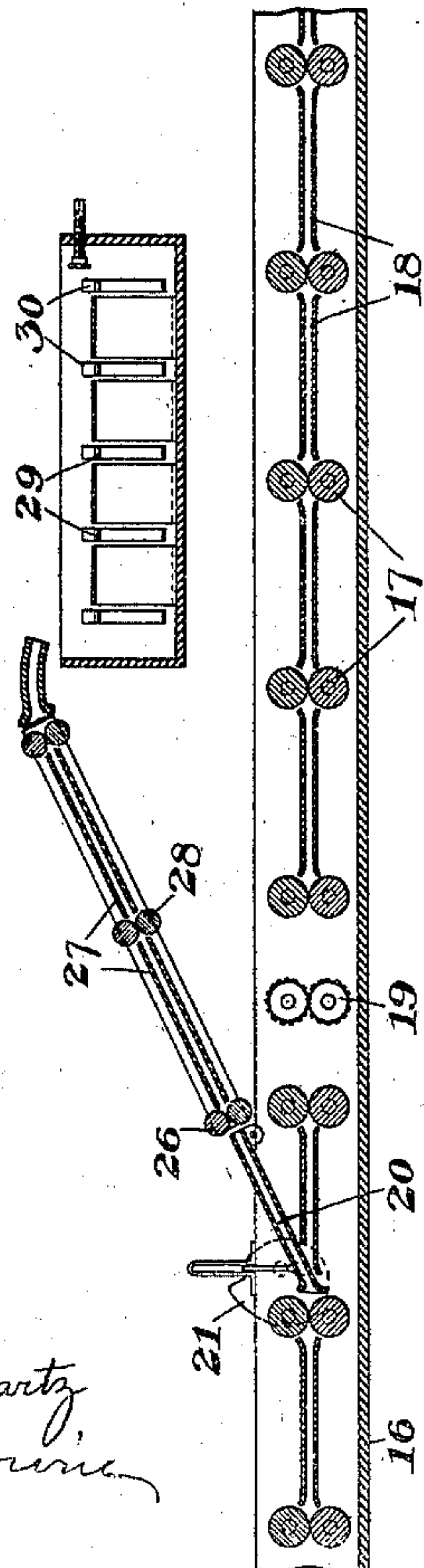


Fig. 5.



WITNESSES

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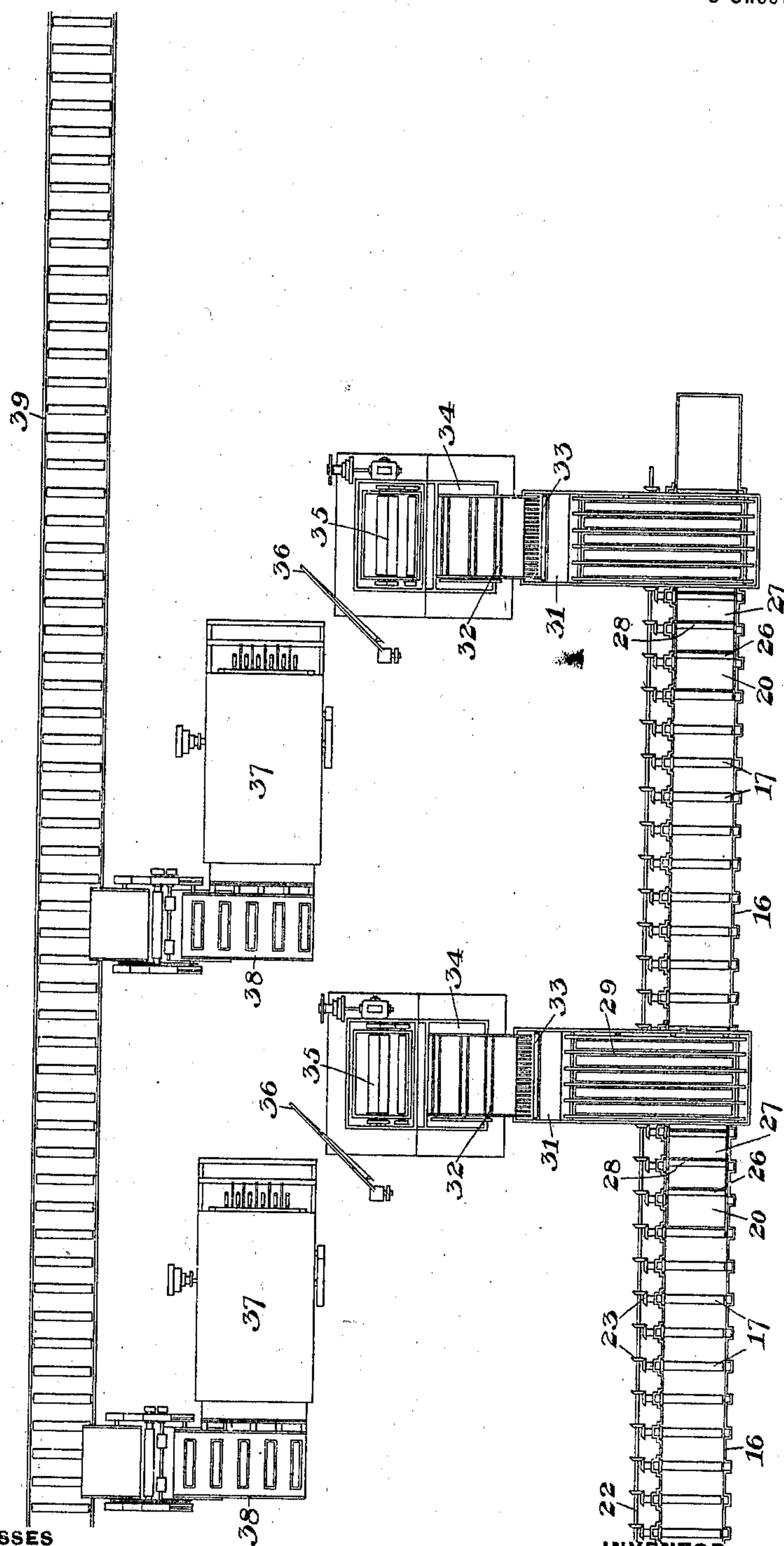
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(No Model.)

3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

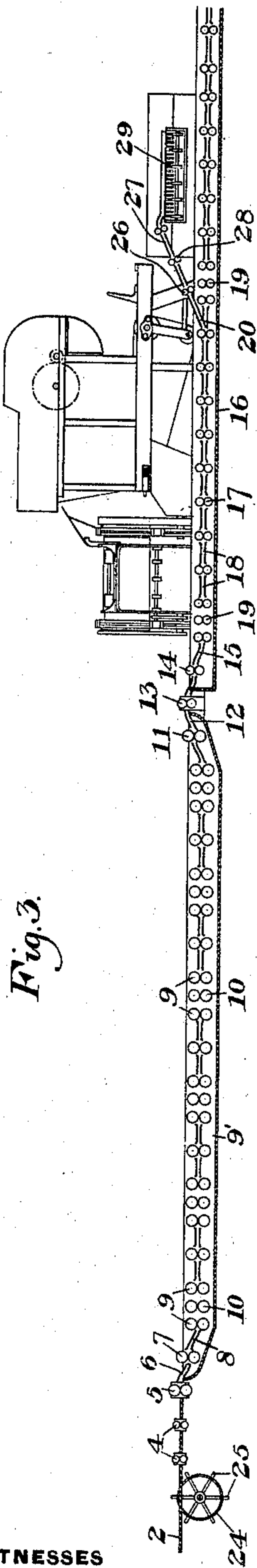


Fig. 3.

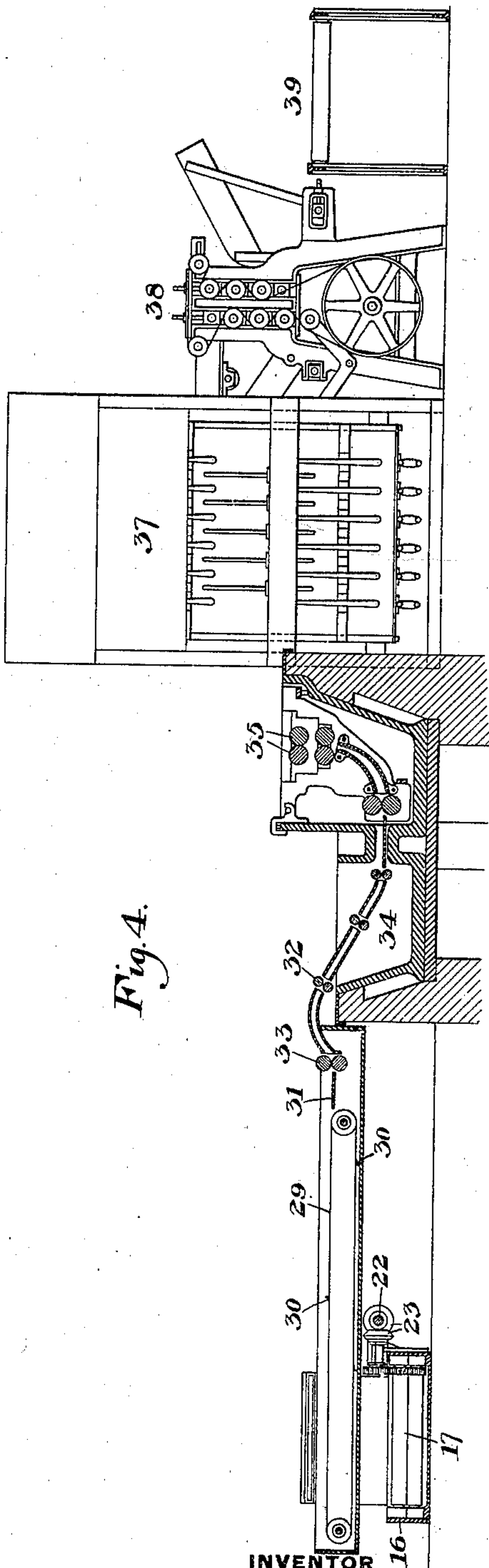


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TREATING AND TINNING PLATES.

SPECIFICATION forming part of Letters Patent No. 708,970, dated September 9, 1902.

Application filed July 10, 1901. Serial No. 67,778. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. PHILLIPS, of
Pittsburg, Allegheny county, Pennsylvania,
have invented a new and useful Apparatus for
5 Treating and Tinning Plates, of which the
following is a full, clear, and exact descrip-
tion, reference being had to the accompany-
ing drawings, forming part of this specifica-
tion, in which—

10 Figure 1 is a top plan view showing the
left-hand end portion of a plant constructed
in accordance with my invention. Fig. 2 is
a similar view showing the right-hand end
portion. Fig. 3 is a longitudinal section of
15 Fig. 1, taken through the troughs; and Fig. 4
is a cross-section on the line IV IV of Fig. 1.
Fig. 5 is a longitudinal section, on a larger
scale, of a portion of the swilling-trough,
showing one of the swinging switches and
20 lifting-cam.

My invention relates to the automatic de-
livery of sheets to tinning-pots, and is de-
signed to provide improved apparatus which
will automatically act upon a series of plates
25 fed thereto and transfer them to different
tinning-pots and also pass them through the
tinning apparatus and branning apparatus
and carry them to the assorting-room. The
preliminary treating may consist in pickling
30 and swilling or the swilling alone or simply
in a wet delivery of the sheets, my appara-
tus being adapted for use in either way,
though I have shown it as arranged for both
pickling and swilling prior to feeding to the
35 tinning-pots.

In the drawings, 2 represents a table upon
which the plates are placed when taken from
the annealing-stand by the operator. The
plates are squared up on this table against
40 side guides 3 and are then fed singly and
successively through sets of rollers 4 4 to a
set of feed-rollers 5 5. The plates thence pass
through guides 6 to feed-in rollers 7 and
thence through guides 8 to a series of sets of
45 feed-rollers 9, which rotate in the pickling liq-
uid and feed the sheets successively through
the trough 9'. I also provide in this pickling-
trough sets of brush-rollers 10, which are lo-
cated between the rollers 9 and driven at a

higher speed, preferably twice as great as the 50
feed-rollers. These brush-rollers are pro-
vided with brushing-surfaces of any desired
form and coact with the pickling liquid to
remove the scale and impurities from the sur-
faces of the plate, thus greatly shortening the 55
time required for pickling. At the end of
the pickling-trough the sheets pass through
feed-out rolls 11 and guides 12 to a set of
transfer-rollers 13 and thence through feed-
in rollers 14 and guides 15 into the swilling- 60
trough 16. This swilling-trough is provided
with sets of feed-rollers 17, with intermedi-
ate guides 18, similar to those in the pickling-
trough, the swilling-trough being of sufficient
length to allow a series of tinning and bran- 65
ning machines to be located at different points
in its length. The swilling-trough is also
preferably provided with brush-rollers 19,
which brush the surfaces of the sheets simi-
larly to the rollers 10 in the pickling-trough, 70
but which need not be placed as closely to-
gether as those in the pickling-trough.

At suitable distances apart along and over
the swilling-trough I provide swinging
switches 20, which are swung by lifting-cams 75
21 to raise them into inoperative position or
lower them into position to receive a sheet as
it is fed through the swilling apparatus.
The cams for these swinging lifters or switches
and all of the feed-rollers and brushing-rolls 80
are driven from a common shaft 22, which
extends alongside the pickling and swilling
tank and is connected with the feed-rollers
and brush-rolls by bevel-gears 23. The cams
for the successive switches are so arranged 85
or timed that they will be lowered succes-
sively to pick up the successive sheets pass-
ing through the swilling-trough, and in or-
der that the operator may know to which tin-
ning apparatus any particular sheet will be 90
fed I provide at the table 2 an indicator-
wheel 24, which is driven from the same set
of connections as the shaft 22 and is provided
with a series of numbered pins or pointers 25,
corresponding to the number of the tinning- 95
pots. The gearing of this indicator-wheel is
so timed that when the number of any par-
ticular pot appears on the pin or spoke of the

wheel above the table the sheet fed by the operator at that moment will be picked up by the switch of the pot having that number, and hence if any pot is out of order the number for such pot may be removed from the indicator-wheel and the operator will then omit the feeding of the sheet for such number.

The system is intended to operate upon plates up to thirty-two inches in length and of any width from sixteen to twenty-four inches, and the speeds are so arranged in the form shown as to allow the travel of thirty-three inches for each sheet to allow clearance between the sheets. The time of passage of each plate from the original feed-rolls to each switch is accurately determined, and the lifting-cam for such switch is set on the shaft at such a point that it will lower the switch before the previous plate has completely cleared, so that when the next plate belonging to it reaches this point it will be engaged and lifted as soon as one-half the plate length has entered such switch and has engaged the set of feed-rollers 26 at the upper end of the lifter. Any plate not properly seized by its own switch will not be engaged by any of the switches, but will be fed through the entire swilling-trough and deposited at its end, where such plates can be gathered up when the operations upon sheets of that size have been finished.

In feeding different sizes of plates the only change in the apparatus will be to increase or decrease the speed for different widths of plate, the speed being increased for plates of less width and decreased for wider plates. This can be easily arranged by using a step form of pulley having the fastest speed for, say, plates sixteen inches wide and different speeds for each two-inch difference in widths up to plates twenty-four inches wide.

The plate having been seized by the appropriate switch and deflected into the bite of the feed-rolls 26 therefor is fed through guides 27 and rollers 28 to and upon an endless-belt carrier 29. This carrier consists of sprocket-chains carrying angle-bar pushers 30. The carrier travels slower than the feed-trough, but at about twice the speed of the tinning-machine. Stops are used at the rear side of the endless carrier to stop the plate at the proper point, according to its size, so that it can be fed into the center of the tinning-machine, these stops being adjustable for such purpose. The pushers 30 are preferably set at about forty-two inches apart, this being twice the average width of the plates, and the sprocket-chains are timed so that sufficient time is allowed for the plate to settle between the pushers and on the stationary carry-bars between the sprocket-chains. The plate is then fed over plate 31 and into the first set of feed-rolls 32, leading to the tinning-machine and rotating at the same speed as those of the machines, and as the sheet passes through such feed-rolls it is acted upon by brush-rolls 33, which have the same surface

speed as the sprocket-chains and about twice the speed of the tinning-machine proper. The plate is fed through the tin-pot 34 in the usual manner, and as it emerges from the upper rolls 35 thereof it is seized by a mechanical catcher 36, which may be of any well-known type, and is thereby fed into a branning-machine 37. From the branning-machine the plates pass through a duster 38, and thence to a feed-table 39, which carries the plates singly to the assorting-room, this carrier extending alongside the different dusters.

In the operation of the apparatus the sheets are fed one by one to the pickling-trough as the pointers on the indicator-wheel are successively brought above the table. As they pass through the pickling-trough they are subjected to the combined action of the pickling fluid and the brush-rolls, and thus quickly and efficiently cleaned. They then pass into the swilling-trough, and as each plate reaches its switch it is engaged thereby and taken to the tinning-pot corresponding to the number on the indicator-wheel in position at the time the sheet was fed. The sheets thus pass to the different tinning-pots in succession and are automatically fed through these pots and through the branners and dusters to the common feed-table, by which they are delivered to the assorting-room.

The advantages of my invention result from the automatic feeding of the sheets to the different tinning-pots, the doing away with the large amount of manual labor, and increasing the output, while improving the quality of the sheets and decreasing the quantity of wastes and practically eliminating menders.

The feed-rollers may be made of any suitable acid-proof material. The switches, the indicator, and the feeding devices, as well as the particular form of the tinning-pots, &c., may be varied widely without departing from my invention as defined in the claims. The apparatus may be used without the pickling-trough, in which case the feed-table and indicator would be arranged at the front end of the wet feeding-trough.

I claim—

1. The combination with a tank arranged to contain liquid for treating plates, of tinning-pots in proximity thereto, mechanism for feeding the sheets through the liquid, and a switch device arranged to transfer the sheets laterally from the liquid to the tinning-pots; substantially as described.

2. A tank arranged to contain liquid for treating plates, a series of tinning-pots adjacent thereto, mechanism for feeding a series of plates through the tank, and switch mechanism arranged to feed the sheets successively to the different tinning-pots; substantially as described.

3. A pickling-tank, a swilling-tank arranged in tandem therewith, mechanism for feeding sheets successively through the tanks, a tinning-pot at one side of the swill-

ing-tank, and transfer mechanism arranged to feed the sheets from the swilling-tank to the tinning-pot; substantially as described.

5 4. A trough arranged to contain liquid, mechanism for feeding plates through said trough, a series of tinning-pots arranged along said trough, switches arranged to transfer the sheets from the tank into the tinning-pots, and mechanism for operating
10 said switches successively one after the other, to feed the plates to the different pots; substantially as described.

5 5. A tank arranged to contain liquid, mechanism for feeding sheets into and through
15 said tank, a series of tinning-pots arranged at different points along the length of the tank, branning and dusting apparatus adjacent to the tinning-pots, and mechanism for transferring the successive sheets from the
20 tank successively to different pots, and feeding them through the pots and the branning and dusting devices; substantially as described.

25 6. A tank arranged to contain liquid, mechanism for feeding sheets through the tank, a set of switch devices, tinning, branning and dusting devices to which the switches lead,

and a common feed-table to which the sheets are fed from the dusting apparatus; substantially as described.

30 7. A tank arranged to contain liquid mechanism for feeding sheets therethrough, transfer devices located at different points in the length of the tank, mechanism for actuating the switch devices successively, and indicating mechanism arranged to show the transfer
35 mechanism which will act upon any particular sheet; substantially as described.

8. A pickling-trough, a swilling-trough arranged in tandem therewith, rollers for feeding the sheets successively through both
40 tanks, tinning-pots arranged at different points along the swilling-tank, and switch devices arranged to engage successive sheets in the swilling-tank and transfer them to the
45 several tinning-pots; substantially as described.

In testimony whereof I have hereunto set my hand.

J. R. PHILLIPS.

Witnesses:

H. M. CORWIN,
GEO. B. BLEMING.