No. 821,908. PATENTED MAY 29, 1906.

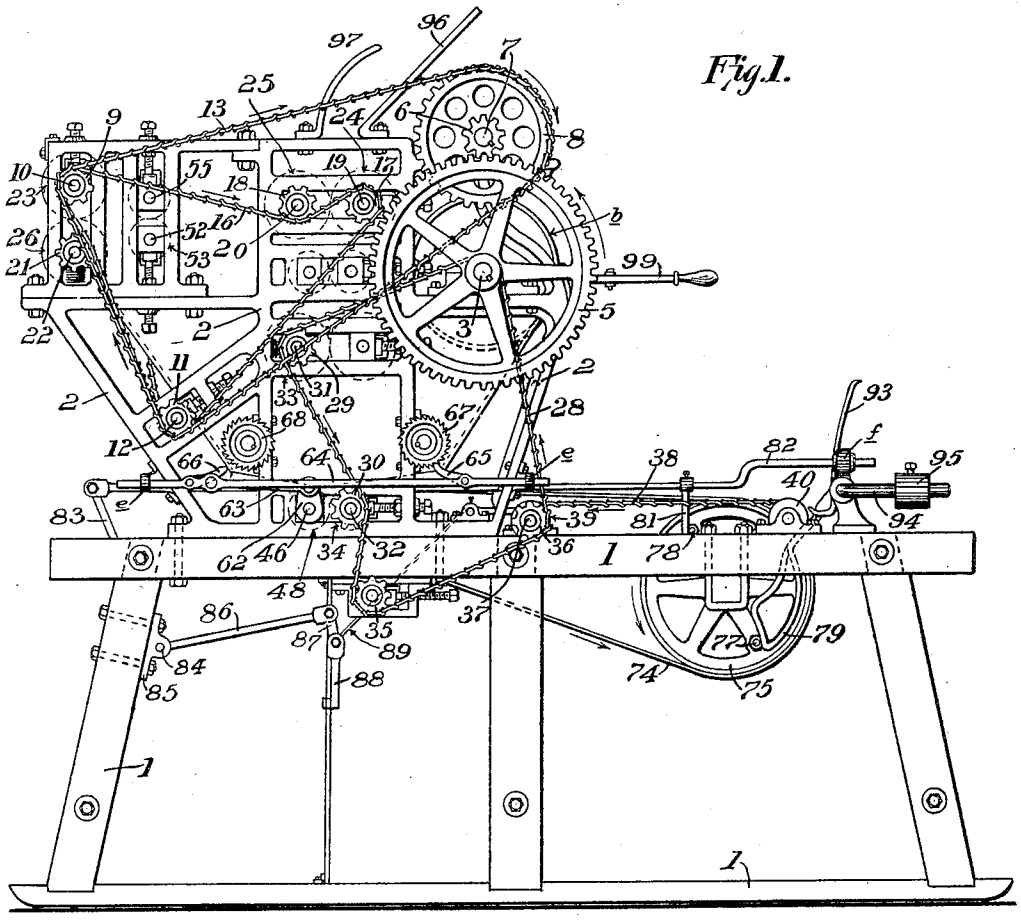
W. C. WEICHSEL & U. G. KNUPPENBURG.

MACHINE FOR CLEANING TIN PLATES.

APPLICATION FILED SEPT. 9, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses;

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Inventors;

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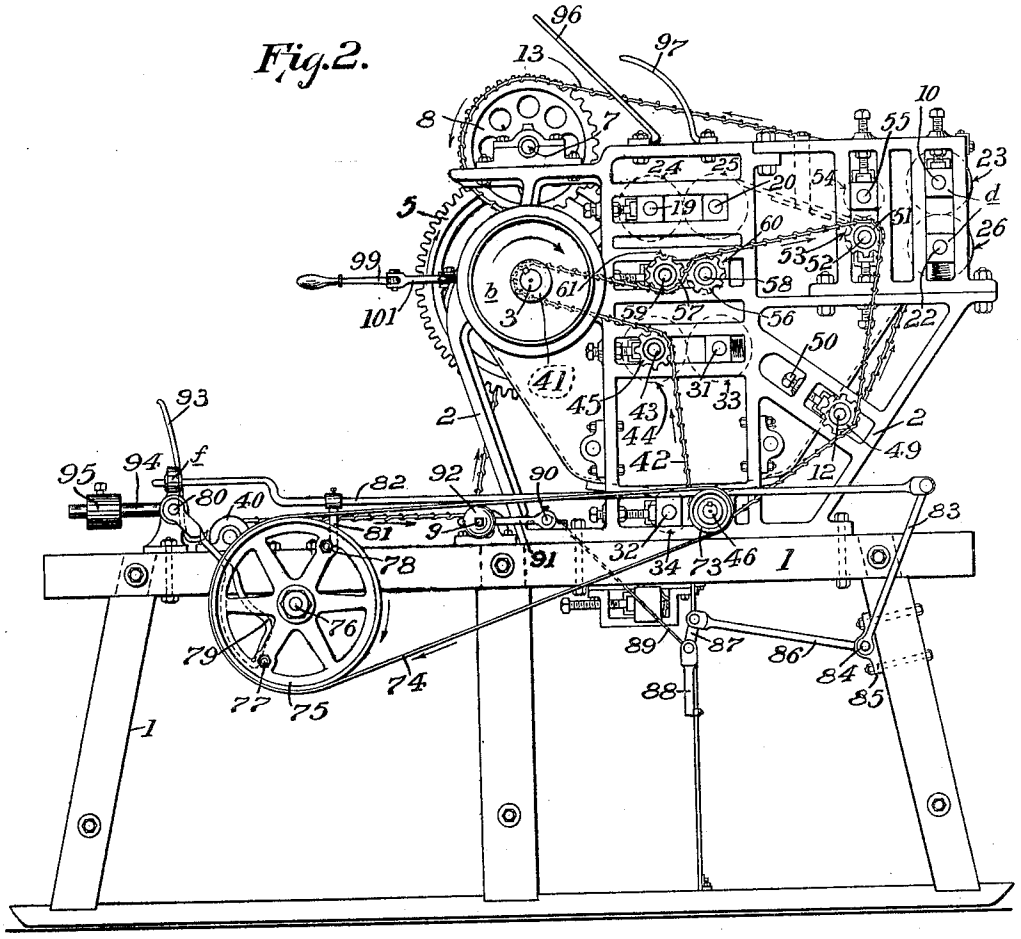
4 SHEETS—SHEET 2.

Fig. 2.



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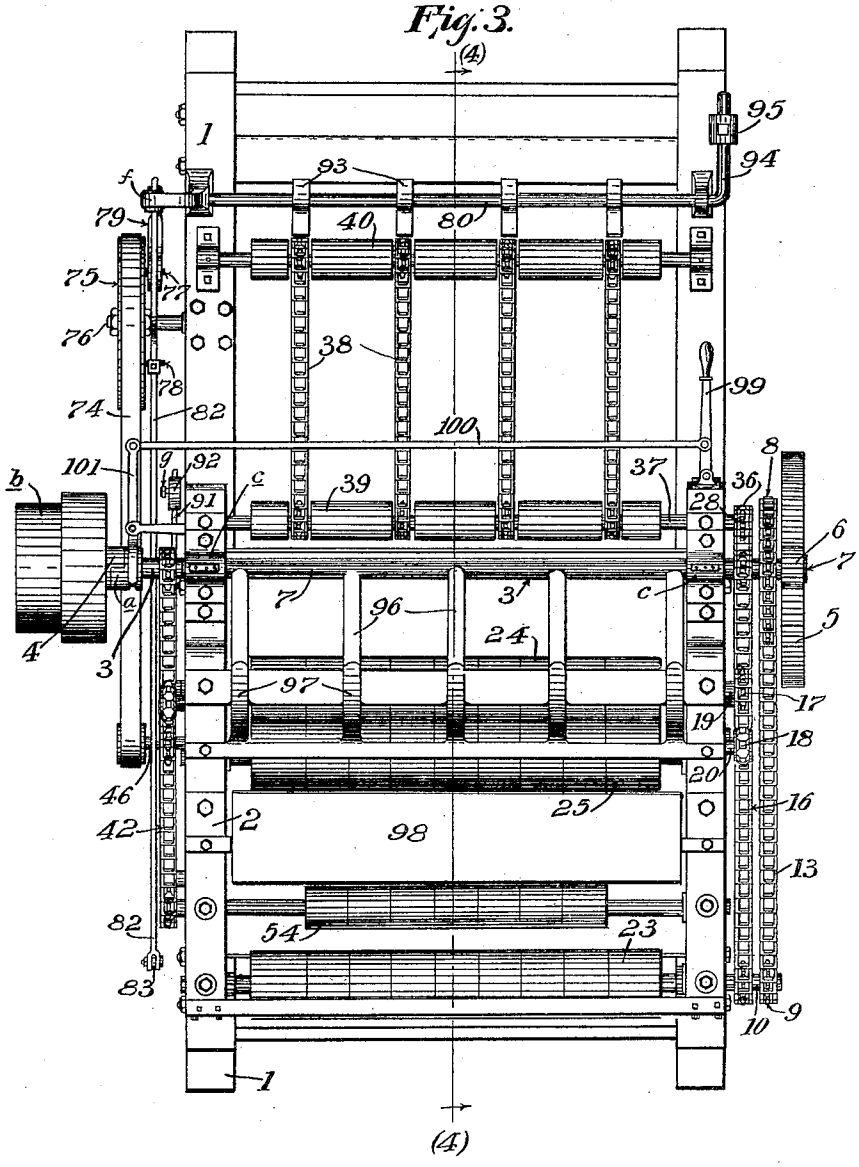
4 SHEETS—SHEET 3.

Fig. 3.



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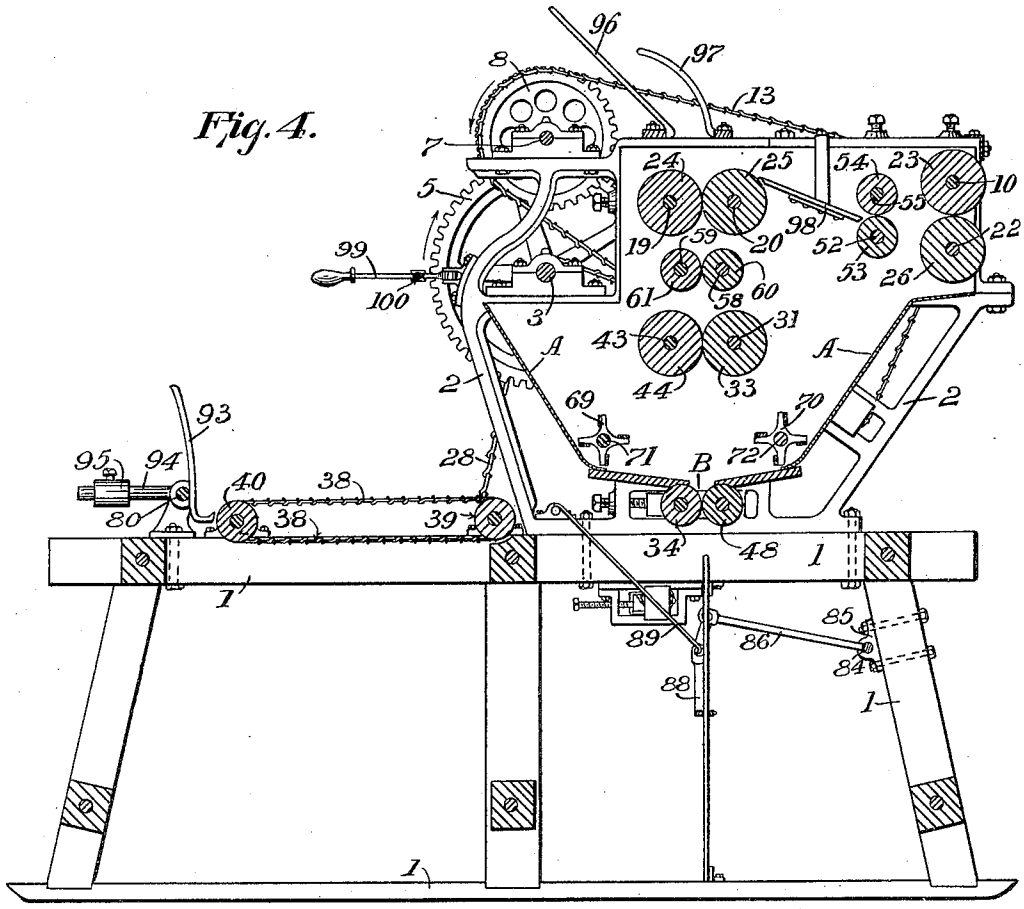
4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM CHARLES WEICHSEL AND ULYSSES GRANT KNUPPENBURG, OF AVONMORE, PENNSYLVANIA.

MACHINE FOR CLEANING TIN PLATES.

No. 821,908. Specification of Letters Patent. Patented May 29, 1906.

Application filed September 9, 1904. Serial No. 223,882.

To all whom it may concern:

Be it known that we, WILLIAM CHARLES WEICHSEL and ULYSSES GRANT KNUPPENBURG, citizens of the United States, residing at Avonmore, in the county of Westmoreland and State of Pennsylvania, have jointly invented a new and useful Improvement in Machines for Cleaning Tin Plates, of which improvement the following is a specification.

Our invention relates to improvements in mechanism or apparatus for cleaning tin or terne plates or sheets.

In the manufacture of tin or terne plates or sheets it is the usual practice to subject the sheets immediately after tinning to an oil-bath to give luster thereto and then to remove or absorb the oil by passing the sheets through bran or similar substances. It is desirable that the shortest practicable time elapse while the sheets are passing from the oil-bath to the body of bran and that as few transferring devices, such as feed-rolls, as possible act thereon to effect such passage, as the oil quickly becomes cold and in consequence difficult to remove, while the action of feed-rolls tends to blur or dull the finish of the sheets.

In the machines heretofore employed for cleaning plates or sheets the manner of applying the bran or similar cleaning substance was unreliable, failing to a very considerable extent to absorb and remove the oil from the surface of the sheets and tending to cake the oil on the plates and dull their finish.

The object of our invention is to produce a machine by the use of which the cleaning substance is effectively applied while the plate is hot from the tinning-bath and the oil on the plate is in a liquid state and is easily removable. The application of the cleaning substance and the removal thereof after the oil is absorbed are accomplished in a continuous operation and without intermission, thus performing in the most efficient manner that which was inefficiently accomplished by the use of the machines as heretofore, and this object we accomplish by the apparatus hereinafter more specifically described, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a side elevation of the left-hand side of the machine. Fig. 2 is the same of the opposite or right-hand side of the machine. Fig. 3 is a plan view. Fig. 4 is a longitudinal section on the line 4 4 of Fig. 3.

Referring to said drawings, 1 is a base or frame, upon which the housing 2 is suitably secured. 3 is a shaft which is journaled in bearings formed in the side of said housing, through which power is applied to the machine. One end of said shaft is provided with a clutch member *a*, which is adapted to engage a similar clutch member 4, connected to one of the belt-pulleys *b* for the purpose of making said pulleys rigid on said shafts 3, whereby power may be transmitted to said shaft 3. The end of said shaft 3 opposite to that on which the belt-pulley is mounted is provided with a large spur-gear 5, which meshes with and transmits power to the small pinion 6, mounted on one end of the shaft 7, which is journaled in bearings *c c*, formed in the pillow-blocks secured to the top of said housing at each side thereof. 8 is a sprocket-wheel mounted on shaft 7, through which motion is communicated to a small sprocket-wheel 9, mounted on the shaft 10, which is secured in the adjustable bearings *d*, formed in said housing, and to an idler sprocket-wheel 11, mounted on the shaft 12, secured in bearings adjustably secured in said housings by means of the chain 13. Upon the left-hand side of the machine the shaft 10 has mounted thereon, between the sprocket 9 and the side of said machine, a sprocket-wheel 14, and the spindle 12 a similar sprocket (not shown) in direct alinement with said sprocket 14, over which a chain 16 operates for the purpose of transmitting power to the sprockets 17 and 18, which are respectively mounted on shafts 19 and 20 and to the sprocket 21, which is mounted on the shaft 22. The chains 13 and 16 transmit power from the large sprocket 8 to the shafts 10, 19, 20, and 22 for the purpose of driving the rolls 23, 24, 25, and 26, mounted on said shafts, respectively, at a uniform rate of speed.

27 is a small sprocket-wheel, which is mounted on shaft 3 adjacent to the large spur-wheel 5, over which the chain 28 operates to transmit power to the sprockets 29 30 for the purpose of rotating the shafts 31 and 32, on which, respectively, said sprockets are mounted, and to rotate the rolls 33 and 34 also on said shafts,

respectively. The said chain passes over an idler 35 and the sprocket 36 on the shaft 37 for the purpose of transmitting motion to the conveyers 38, which operate over drums 39 40. Shaft 3 on the right-hand side of the machine adjacent to the belt-pulley *b* is provided with a small sprocket 41, on which a chain 42 operates to transmit motion to the shaft 43 and the roll 44, mounted thereon, through a sprocket-wheel 45 and over a similar sprocket-wheel on shaft 46 to operate the roll 48, mounted on said shaft 46. The said chain 42 then operates over an idler sprocket-wheel 49, mounted on the spindle 12, the bearings of which are adjustably secured in the housings 2 by means of the screw 50. The said chain further operates over the sprocket 51, mounted on the end of the shaft 52 for the purpose of rotating the roll 53, mounted on the shaft 55, being driven by friction from said last-mentioned roll. The said chain finally passes over the sprockets 56 and 57, which are mounted on the ends of shafts 58 and 59, respectively, for the purpose of rotating the rolls 60 and 61, mounted on said shafts, respectively. A crank 62 is mounted on the extreme outer end of shaft 46, and a link 63 extends from said crank and is connected to the rod 64, which is supported in bearings *e*, whereby when said crank is rotated by said shaft the said rod is caused to reciprocate longitudinally of the machine, and by means of the pawls 65 and 66, which are carried by said rod and which, respectively, engage the ratchet-wheels 67 and 68, operate the agitators 69 and 70, which are mounted on the shafts 71 and 72, respectively, on the ends of which the said ratchet-wheels are mounted. The extreme outer end of the shaft 46 on the right-hand side of the machine has mounted thereon the small belt-pulley 73, over which operates the belt or chain 74 for the purpose of transmitting motion to the large wheel 75, which is mounted on the shaft 76, secured in the frame below the top thereof. The said wheel 75 is provided with or carries two projecting pins or knockers 77 and 78, which during the revolution of said wheel contact with, respectively, the long projection or finger 79, fixed in the shaft 80, and the downwardly-projecting finger 81, which is adjustably secured to the rod 82 for the purpose hereinafter specified. The end of said rod 82 nearest said wheel 75 is loosely secured in the bearing *f*, and the opposite end is pivotally connected to one end of the arm or lever 83, the opposite end of which is fixed upon a shaft 84, mounted in the bracket 85, which is bolted or otherwise secured to the rear end or leg of the frame. One end of the rods 86 is likewise secured upon the shaft 84, the opposite end thereof being pivotally connected to the upper end of a link 87, the lower end of which is pivotally connected to the upper end of the plate or sheet feeder 88. A sheet-supporter 89, which receives the sheets as they leave the conveyer, is connected at its upper end to the rod 90, on which the counterweighted arm 91 is fixed, the counterweight 92 being secured upon said arm by the set-screw *g* and being adapted to be adjusted thereon to vary the fulcrum of said arm. A sheet-receiver 93 is fixed upon said shaft 80, the lower hooked end of which receives the lower edge of the sheet and maintains the same in a vertical position until thrown down, as hereinafter described. An arm 94, fixed upon said shaft 80, having a counterweight 95 adjustably secured thereon, returns the support to its normal position after the sheet has been transferred to the conveyers, as hereinafter set forth.

The agitators 69 and 70 are located in a compartment or box A, which extends transversely of the machine, near the sides thereof, in which bran or other suitable material is placed for cleaning the sheets or plates in their passage therethrough, the bottom of said box having an opening B, through which the sheets pass vertically from the rolls 34 and 48. The sheets then pass through the rolls 33 and 44 to and through the small rolls 60 61, and finally through the rolls 24 25, to the inclined support 96, the sheets being fed upon said support by the action of the rolls being directed thereon by the guide 97. Immediately the lower edge of the sheet clears the rolls it is carried forward to the inclined guide 98 by the action of the roll 25, assisted by gravity, and down the said inclined guide to the rolls 53 and 54, and finally through the rolls 23 and 26, being thoroughly cleaned and burnished by the action of the different sets of rolls. The clutch *b* is controlled by the lever 99, which is connected therewith by means of the rods 100 101.

In operating the machine the box A is filled with bran or other suitable material to clean the plates almost to the upper edge of the rolls 33 44. The rolls 34 48 are preferably formed of a series of paper disks. The two sets of large rolls 33 44 and 23 26 and 24 25 are formed of paper and flannel, the paper being formed upon the shaft about two thirds the diameter thereof. The two sets of small rolls 53 54 and 60 61 are composed of linen or muslin. One of the principal features of novelty of our invention resides in the series of horizontally-disposed rolls arranged in vertical alinement, which permits of the sheets or plates being fed through the cleaning material and through said rolls vertically, thus subjecting the sheets to a considerable body of cleaning material and enabling the rolls to readily remove the same and the oil absorbed from the sheets without compressing the same thereon prior to the cleaning operation, as in machines hereto-

fore used for this purpose. The machine in addition to being simple in construction and very efficient in its action upon the plates is capable of turning out a large amount of product at small labor cost.

The operation of the apparatus is as follows: The driving-shaft of the machine being connected to the power-shaft by the clutch, the various sets of rolls are driven, (those in vertical alinement in the same direction and those in horizontal alinement likewise in the same direction,) the sets 24 25 being driven at greater speed than those in alinement therewith and the set 23 26 at greater speed than the set of small rolls adjacent thereto. The sheets are placed one at a time upon the receiver, the lower edge thereof resting in the hooked lower end of the receiver, and are held in vertical position until the knocker 77 on the wheel 75 engages the finger 79, which is fixed on the shaft on which the receiver is mounted. The movement of the finger outward and upward rotates said shaft and throws the receiver downward and inward, thereby depositing the sheet on the conveyers, which carry it toward the inclined supporter 89, and from thence it passes by gravity to the sheet-feeder, which is vertically disposed and in alinement with the pass of the rolls through which it subsequently passes. Immediately after the sheet has been thrown upon the conveyer the wheel 75 in its further revolution brings the knocker 78 into contact with the finger 81 on the rod 82, moving the rod forward and through the levers 83 86, elevating the feeder, in which the sheet is then deposited sufficiently to enter said sheet between rolls 34 48, the action of which forces the sheet through the bran contained in the compartment A, thoroughly cleansing the sheet of the oil. The lower edge of the sheet is still in the rolls 34 48 when the upper edge enters the pass between rolls 33 44, the function of which is to remove the bran and feed the sheet to the small rolls 60 61, the action of which more completely cleans the sheets, and from the fact that the rolls 24 25, located a short distance therefrom, rotate more rapidly than the rolls 60 61 a burnishing operation is obtained. After the sheet is discharged from rolls 24 25 it is thrown upon the guide 96, and from there it is transferred by gravity and the action of the roll 25 onto the incline 98, and from thence through the two sets of rolls 52 53 and 23 26, when it is completely cleaned.

We claim as our invention and desire to secure by Letters Patent—

1. In a machine for cleaning tin or terne plates or sheets, the combination of a conveyer, a vertically-disposed plate-feeder, means to transfer the sheet from said conveyer to said feeder, a series of horizontally-disposed rolls in vertical alinement, and means to elevate the sheet-feeder to enter the sheet in the pass of the first set of rolls.

2. In a machine for cleaning tin and terne sheets or plates, the combination of a movable conveyer, a sheet-receiver, means to transfer the sheet from said receiver to the movable conveyer, a sheet-feeder, and means to transfer the sheets successively from said movable conveyer to said feeder.

3. In a tin-sheet-cleaning machine, the combination of a power-shaft, a series of sets of rolls in vertical alinement, means connecting said power-shaft and said rolls whereby said rolls are driven in the same direction, a sheet-conveyer, means to operate said conveyer from said power-shaft, a vertically-disposed sheet-feeder in alinement with the pass of one of said sets of rolls, a wheel carrying two knockers and rotated by power from one of said rolls, a rod carrying an adjustable finger, the said rod being located with reference to said wheel so as to enable the knockers thereon to contact with said finger, levers connecting said rod and said sheet-feeder, a normally vertically disposed sheet-holder mounted on a shaft, a counterweighted arm mounted on said shaft, a finger mounted on said shaft and adapted to engage the knockers on said wheel, whereby the rotation of said wheel successively elevates the feeder and depresses the sheet-holder.

4. In a machine for cleaning tin or terne plates or sheets, the combination with a reciprocating sheet-feeder, of cleaning-rolls adapted to receive the sheet, and means for subjecting the sheet to a cleaning material as it is passing from the reciprocating feeder to the cleaning-rolls.

5. In a machine for cleaning tin or terne plates or sheets, the combination with a reciprocating sheet-feeder, of feeding-rolls adapted to take the sheet from the reciprocating feeder, cleaning-rolls adapted to receive the sheet fed by the feeding-rolls, and means for subjecting the sheet to a cleaning material as it is passing from the feeding-rolls to the cleaning-rolls.

6. In a machine for cleaning tin or terne plates or sheets, the combination with a receptacle for containing the cleaning material, of a single set of rolls adapted to feed the sheets into the cleaning material, and cleaning-rolls positioned to receive the sheet as it emerges from the cleaning material.

7. In a machine for cleaning tin or terne plates or sheets, the combination with a receptacle for containing the cleaning material, of a single set of rolls adapted to feed the sheets into the cleaning material, cleaning-rolls positioned to receive the sheet as it emerges from the cleaning material, and an automatic feeder for delivering the sheets to the feeding-rolls.

8. In a machine for cleaning tin or terne

plates or sheets, the combination with cleaning means, of a reciprocating feeder for successively delivering the sheets to the cleaning means, an inclined sheet-supporter for feeding the sheets to the sheet-feeder, a conveyer for delivering the sheets to the inclined sheet-supporter, a tilting sheet-receiver for initially receiving the sheets and adapted to deliver the sheets to the conveyer, and mechanism adapted to automatically operate the devices aforesaid, whereby the sheets are successively fed from the sheet-receiver to the conveyer, thence to the sheet-supporter, and finally from the sheet-feeder to the cleaning means.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

WILLIAM CHARLES WEICHSEL.
ULYSSES GRANT KNUPPENBURG.

In presence of—
J. A. WAGLE,
A. W. SMITH.