

N. D. LEWIS.

MACHINE FOR POLISHING TIN AND TERNE PLATES.

No. 571,071.

Patented Nov. 10, 1896.

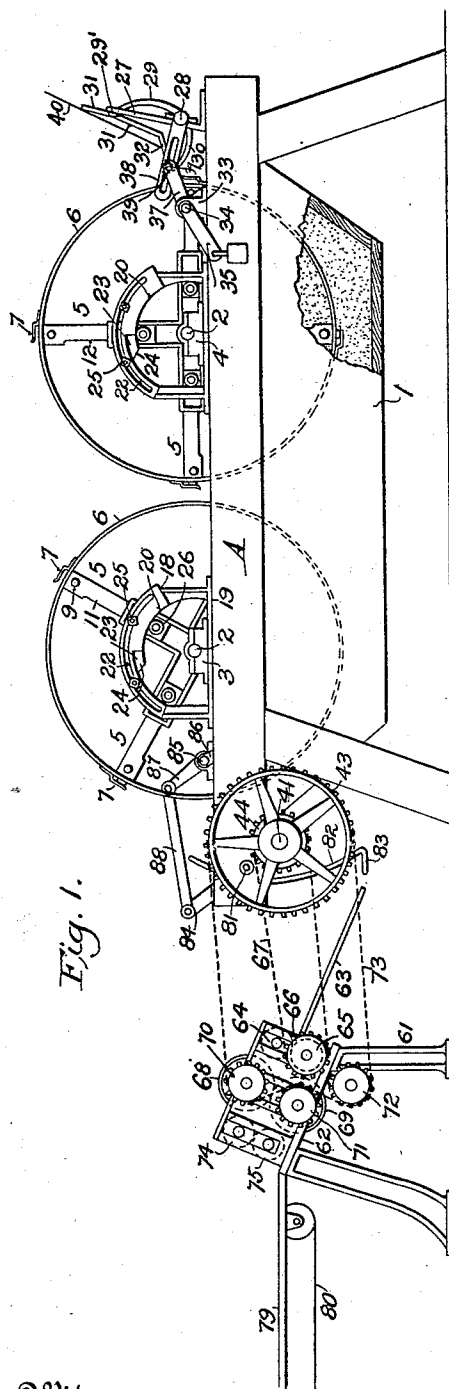


Fig. 1.

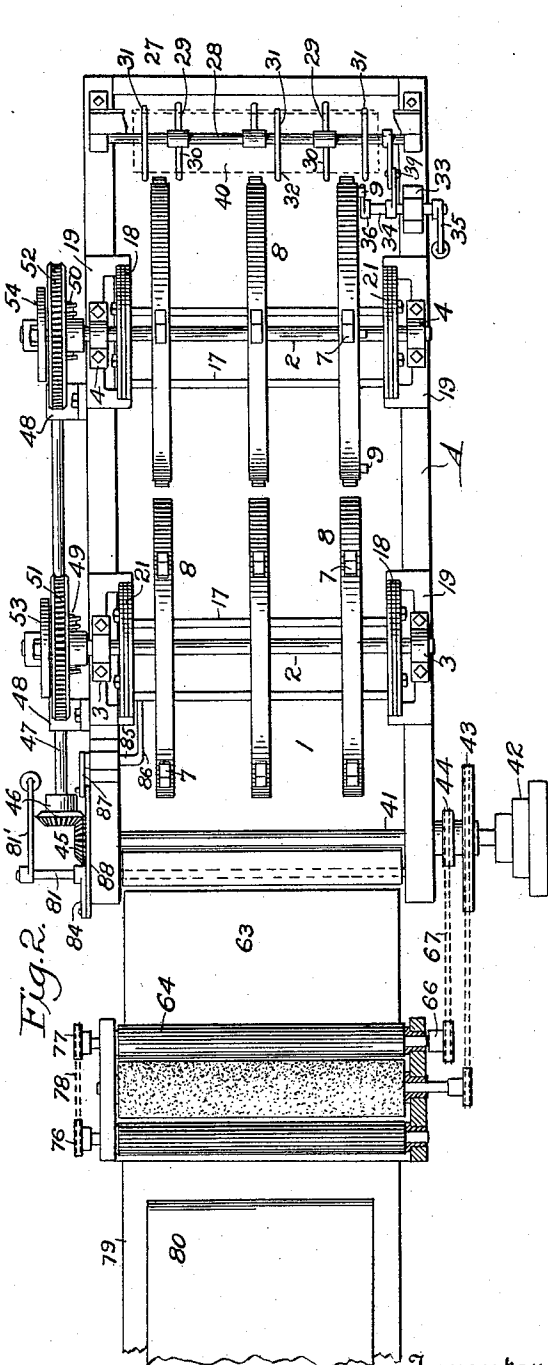


Fig. 2.

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(No Model.)

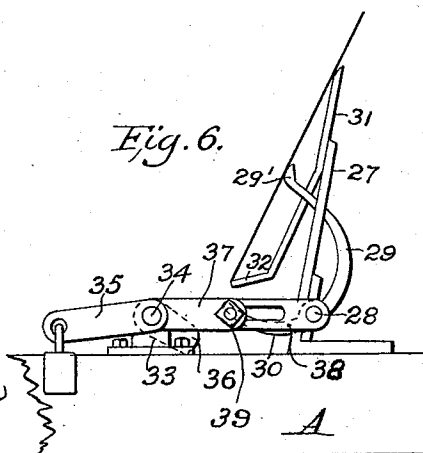
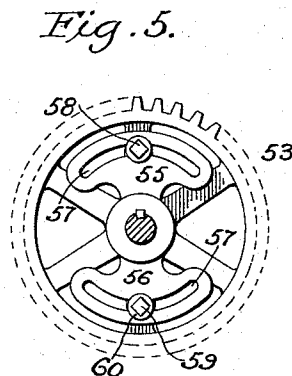
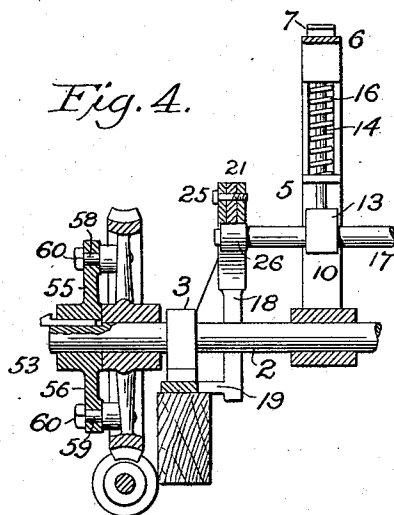
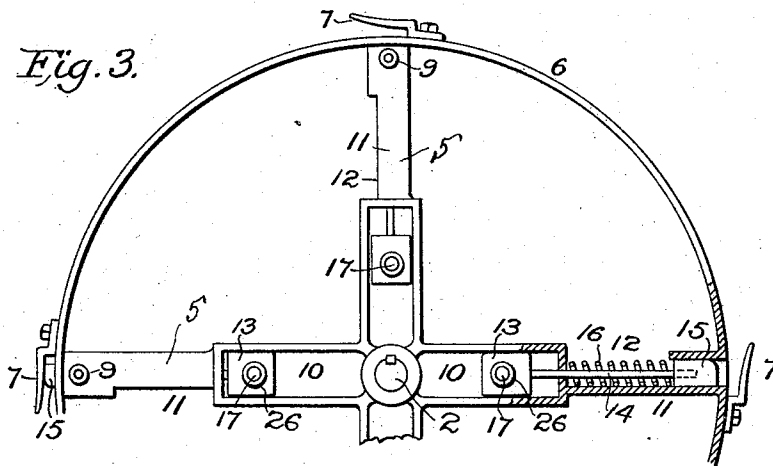
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

NATHANIEL D. LEWIS, OF JOLIET, ILLINOIS.

MACHINE FOR POLISHING TIN AND TERNE PLATES.

SPECIFICATION forming part of Letters Patent No. 571,071, dated November 10, 1896.

Application filed June 4, 1896. Serial No. 594,280. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL D. LEWIS, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Machines for Polishing Tin and Terne Plates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for cleaning and polishing tin and terne plates.

My object is to provide an improved machine of the character described which will be adapted to clean and polish sheet tin and terne plates in a highly superior manner.

Having this object in view, the invention consists of certain novel features and combinations of parts appearing more fully hereinafter.

In the accompanying drawings, Figure 1 is a side elevation showing a part of the cleaning-box broken away; Fig. 2, a plan view; Fig. 3, a detail view of one of the gripping wheels or disks; Fig. 4, a sectional detail view of certain mechanisms; Fig. 5, a detail view of one of the worm-gears, and Fig. 6 a detail view of certain feeding mechanism.

A designates the machine-frame, and 1 the cleaning-box which depends from the frame, and is adapted to hold any preferred cleaning material, such as bran, sawdust, charcoal, &c. There are two gripping-drums which revolve in opposite directions, and as they are duplicates a description of one will suffice.

The numeral 2 designates a shaft which is revolubly mounted in suitable journal-boxes 3 and 4, respectively. This shaft carries a series of wheels or disks, preferably three in number, which are provided with spokes 5 and rims 6. On the rims at the ends of the spokes are located a series of gripping-fingers 7. One of the gripping-wheels 8 of one of the drums has rollers 9 at the ends of its spokes, these rollers projecting outwardly toward one side of the machine. The lower portion of each spoke is enlarged, as at 10, to form an open plunger-box, while the upper portion 11 of the spokes is somewhat reduced in diameter, but hollow and cut away at the side, as at 12.

The numeral 13 designates a plunger which

works in the plunger-box, while 14 is a plunger-rod, and 15 a gripping-bolt connected to the outer end of said rod.

The numeral 16 designates a coil-spring which encircles the plunger-rod, being interposed between the outer end of the plunger-box and the inner end of the gripping-bolt. The tendency of the coil-spring is to force the gripping-bolt normally against the gripping-finger 7, so that the plunger will be at the outer end of the plunger-box. The spokes of the respective gripping-wheels of each drum are located in alinement, and the plungers of the respective alined spokes are connected by a shaft 17.

There is an arch-shaped upwardly-extending bracket 18 at each end of the respective shafts 2, said bracket being provided with a base 19, which is connected to the frame of the machine immediately under the bearing for said shaft 2 in such manner that the bracket is offset inwardly from the side beam of the frame. One-half of the bracket is provided with a cam-surface 20, extending for a quadrant's length, and the entire arch is bifurcated vertically, as at 21. Said arch is also provided with two alined arc-shaped slots 22.

The numeral 23 designates a slidable cam member, which is of the same curve as the cam portion 20, and has its outer end beveled, as at 24, while its other end lies in the bifurcation 21.

The numeral 25 designates clamp-bolts for holding this slidable cam member in adjusted relation. This construction permits of a cam-surface of any desired length to be provided. The ends of the respective shafts 17 are provided with rollers 26, and said shafts are of such length that these rollers project through the bracket and are adapted to ride on the cams connected thereto. The relation of the parts is such that these rollers come into engagement with the cams and hold the gripping-bolts depressed for more than a quarter-revolution of the gripping-drums. As the rollers of one shaft connecting the plungers are leaving the cams, the rollers' shafts immediately following have just come into engagement therewith. Hence the gripping-bolts of each series of alined spokes are held depressed from the time they reach a point slightly in advance of the vertical until they

pass slightly beyond horizontal position when pointing toward the nearest end of the machine. The gripping-drums just described have their lower half rotating in the cleaning-box, so that the tin is subjected to the cleaning operation during one entire half-revolution, as will appear more fully hereinafter.

At the feeding end of the machine there is located a rearwardly-inclined upwardly-extending rest 27, in the legs of which is journaled a shaft 28. This shaft carries a series of substantially U-shaped arms, which consist of outwardly-curved and upwardly-extending portions 29 and horizontally and upwardly extending portions 30. The central arm is not provided with portion 30. A series of inclined feeding-racks have their upper portions 31 connected to the rest 27, while their lower portions 32 are inwardly and downwardly inclined. A short inclined slide 29' is connected to the portion 29 of each arm. On one side of the machine-frame there is located a bracket 33.

The numeral 34 designates a short shaft, which is journaled in the bracket, and this shaft carries on its outer end a weighted arm 35. On the inner end of the shaft is located a tripping-arm 36, which lies in the path of rollers 9 on the spokes of wheel or disk 8. This shaft is also provided with a link 37, while 38 designates a slotted link, which is secured to shaft 28 and is connected to link 37 by a bolt 39. By means of this slot-and-bolt connection the two links may be adjusted in relation to each other.

The numeral 40 designates a piece of sheet tin or terne which extends across the machine and rests in the respective feeding-racks, having its lower edge resting on the portions 32 of the feeding-racks.

As the gripping-drums revolve the rollers 9 on the disk 8 come into engagement with the tripping-arm 36, one after another, and rock shaft 34 against the action of the weighted arm; and through the medium of the links and U-shaped arms force the feeding-racks forward and allow the sheet of tin to slide in between the gripping-fingers and the disks. As the gripping-drum revolves somewhat farther the gripping-bolts are released and firmly clamp the sheet against said gripping-fingers and carry it around with the drum through the cleaning material in the cleaning-box until the inclined portion 24 of the cam member 23 is reached, whereupon the sheet is released and slides down, only to be again gripped by the lower set of gripping bolts and fingers of the other drum, and the latter drum carries the sheet again through the bran or cleaning material in the cleaning-box and cleans the opposite side of said sheet from that which was formerly cleaned. When the latter drum has revolved around to the inclined portion of the cam member, the sheet of tin or terne is released and falls upon transferring mechanism to be described later.

At the left-hand end of the machine is lo-

cated a main drive-shaft 41, which carries on one end a stepped pulley 42, a large sprocket-wheel 43, and a small sprocket-wheel 44. On the other end of this shaft is located a bevel-gear 45, which meshes with another bevel-gear 46, located on the end of an auxiliary shaft 47, mounted in bearings 48. This auxiliary shaft carries two worms 49 and 50. These worms mesh with respective worm-gears 51 and 52, which are carried loosely on the ends of the shaft 2 of the gripping-drum. On the extreme ends of the shafts 2 there are located respective clamping members 53 and 54. Each of these clamping members is provided with two heads 55 and 56, which are provided with respective arc-shaped slots 57. Sets of bolts 58 and 59, which are securely connected to diametrically opposite spokes of the worm-gear, pass through these slots and are provided with nuts 60. Upon loosening the nuts the gear and clamping member can be relatively adjusted and again clamped in position. I provide this peculiar construction so that adjustment can be effected to accommodate sheets of tin or terne of different lengths when desirable.

I employ an auxiliary machine-frame 61, which has an inclined bed 62 and is provided with an inclined table 63, which projects toward the delivery end of the machine.

The numerals 64 and 65 designate rubber-faced feeding-rollers, which are located at the upper end of the inclined table 63. The spindle of roller 65 is provided with a sprocket-wheel 66, which is connected to the sprocket-wheel 44 on the main shaft by a sprocket-chain 67. It will thus be observed that these rollers revolve toward each other and would tend to draw in and feed between them away from the machine any piece of tin or terne plate that was laid on table 63. To the rear of these rollers there are located two polishing-rollers 68 and 69, which are covered with sheepskin and are considerably larger than the feeding-rollers. These rollers are provided with respective sprocket-wheels 70 and 71. At the lower portion of the auxiliary machine-frame there is located a sprocket-wheel 72.

The numeral 73 designates a sprocket-chain which passes around sprocket 72 and the sprockets of the polishing-rollers, and extends around the large sprocket 43 on the main shaft. The polishing-rollers revolve toward each other and in an opposite direction to the feed-rollers. At the extreme rear of the auxiliary machine-frame there are located two rubber-faced delivery-rollers 74 and 75, and on the spindle of the lower one of these rollers there is located a sprocket 76, which is in connection with the sprocket 77 on the spindle of the lower feeding-roller by sprocket-chain 78, so that these delivery-rollers revolve in the same direction as the feeding-rollers.

The numerals 79 designates a delivery-table, which is preferably provided with an endless apron 80, adapted to carry away the

sheets of tin or terne as they are fed onto it from the delivery-rollers.

At the rear of the machine there is located a shaft 81, and a delivery-rack is connected to this shaft. This rack consists of two curved arms 82, terminating at their lower ends in feet 83, and the feet of the arms are adapted to move close to the table 63 when shaft 81 is turned. On one end of this shaft there is located an arm 84. The numeral 85 designates a second shaft, which is suitably journaled in the machine-frame, and is provided at its inner end with a tripping-arm 86 and at its outer end with a second arm 87, which is located at right angles to the tripping-arm. A link 88 connects arm 87 with arm 84. A weighted arm 81' is connected to shaft 81.

The operation is as follows: The sheet is first placed on the rack at the front of the machine. As the gripping-drum rotates the feeding-rack is operated, as before described, and the sheet fed against the drum and caught by the gripping fingers and bolts. As the drum revolves the sheet is carried through the cleaning material in the cleaning-box and one side thoroughly cleaned. After the drum has revolved for about three-fourths of the way around the gripping mechanism is released, as before described, and the sheet gravitates down and is caught by the lowest set of gripping mechanisms adjacent to the drum from which it has just been released. As the second drum revolves it carries the sheet again through the cleaning material and the opposite side of the sheet is thoroughly cleaned. When the drum has rotated far enough, so that the gripping mechanism is released, the sheet slides down by gravity onto the delivery-rack, but immediately after this operation the tripping-arm is raised and the delivery-rack swung around, thereby depositing the sheet on the inclined table. When the drum rotates a little farther, the delivery-rack begins to return to normal position, and in so doing feeds the sheet of tin or terne along the table 63 and in between the feeding-rollers. The feeding-rollers pass it on through the polishing-rollers, and it is then passed through the delivery-rollers and onto the endless apron, which carries it to the place where the sheets are assorted.

Having thus described the invention, what is claimed as new is—

1. In a machine for cleaning tin-plate, the combination with cleaning mechanism, of polishing mechanism, a table leading to the polishing mechanism, a pivoted delivery-rack adapted to receive the tin-plate after it has been cleaned, mechanism for swinging the rack so that it will deliver the tin-plate to the table, and mechanism for reswinging the rack so that it will lift the tin or terne plate and pass it along the table and deliver it to the polishing mechanism.

2. In a machine for cleaning tin-plate, the combination with cleaning mechanism, of pol-

ishing mechanism, an inclined table leading to the polishing mechanism, a pivoted delivery-rack normally in horizontal position and adapted to receive the tin or terne plate after it has been cleaned, mechanism for swinging the rack so that it will deliver the tin-plate to the inclined table, and mechanism for reswinging the rack so that it will be lifted along the table and delivered to the polishing mechanism.

3. In a machine for cleaning tin-plate, the combination with a rotary drum adapted to hold the tin-plate and clean it, of polishing mechanism, a table, a delivery-rack, adapted to receive the tin-plate after it has been cleaned, mechanism operated by the drum to move the rack after the tin-plate has been delivered thereon so that the latter will be deposited on the table, and mechanism for removing said rack to lift the tin-plate along the table and deliver it to the polishing mechanism.

4. In a machine for cleaning tin-plate the combination with a rotary drum and gripping mechanism carried thereby for holding the tin or terne plate during the cleaning operation, of a gear-wheel carried loosely on the shaft of the drum, a clamping member having a slotted head and fixed securely on the shaft, a bolt passing through the slot in the clamping member and connected to the gear-wheel, whereby the clamping member and gear-wheel may be adjusted relatively, a second gear meshing with the gear-wheel, and mechanism for driving the gear.

5. In a machine for cleaning tin or terne plate, the combination with a bracket having a cam portion, of a cam member forming a continuation of the cam portion, and adjustable in relation thereto.

6. In a machine for cleaning tin or terne plate, the combination with a bracket having a cam portion and provided with a slot, of a cam member forming a continuation of the cam portion, and a clamping-bolt passing through the slot and secured to the cam member.

7. In a machine for cleaning tin or terne plate, the combination with a bifurcated bracket having a cam portion and provided with slots, of a cam member slidable in the bifurcation between the slots, and bolts passing through the cam member and slots.

8. In a machine for cleaning tin or terne plate, the combination with a gripping-wheel having a spoke which is provided with a hollow plunger-box, of a plunger working in said plunger-box, a plunger-rod and gripping-bolt connected to the outer end of said rod, and a spring interposed between the gripping-bolt and plunger-box.

9. In a machine for cleaning tin or terne plate, the combination with a gripping-wheel having a spoke which is provided with a hollow plunger-box, of a plunger in said box, a plunger-rod and gripping-bolt connected to the outer end of the rod, a spring encircling

the rod between the plunger and bolt, a gripping-finger on the wheel, and a cam adapted to engage with the plunger.

10. In a machine for cleaning tin or terne
5 plate, a feeding-rack comprising the combination with a stationary rack or rest adapted to receive the tin or terne, of a pivoted arm adapted for removing the tin or terne from
10 the rest, a pivoted weighted arm adjustably connected to the foregoing arm and rotary gripping-wheel, and a trip connection actuated by the wheel which operates the feeding mechanism.

11. In a machine for cleaning tin or terne
15 plate, a feeding-rack comprising the combination with a stationary rest adapted to re-

ceive the tin or terne, of a pivoted arm for removing the tin or terne from the rest, said arm having a slot, a pivoted and weighted arm, a bolt connected to the latter and movable in the slot, a tripping-arm connected to the weighted arm, a gripping-wheel, and means carried thereby adapted for engagement with the tripping-arm.

In testimony whereof I have signed this
specification in the presence of two subscribing witnesses.

NATHANIEL D. LEWIS.

Witnesses:

A. E. GALASS,
JOHN M. WOLFRUM.