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E. NORTON.
TIN PLATE FINISHING MACHINE.
APPLICATION FILED AUG. 1, 1906.

Patented Nov. 23, 1909.

2 SHEETS—SHEET 1.

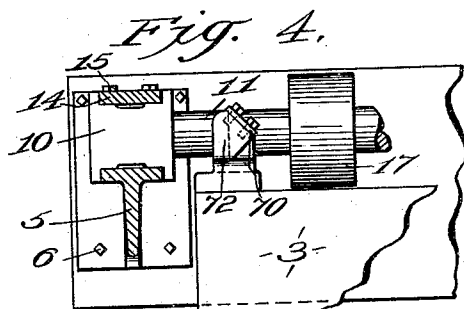
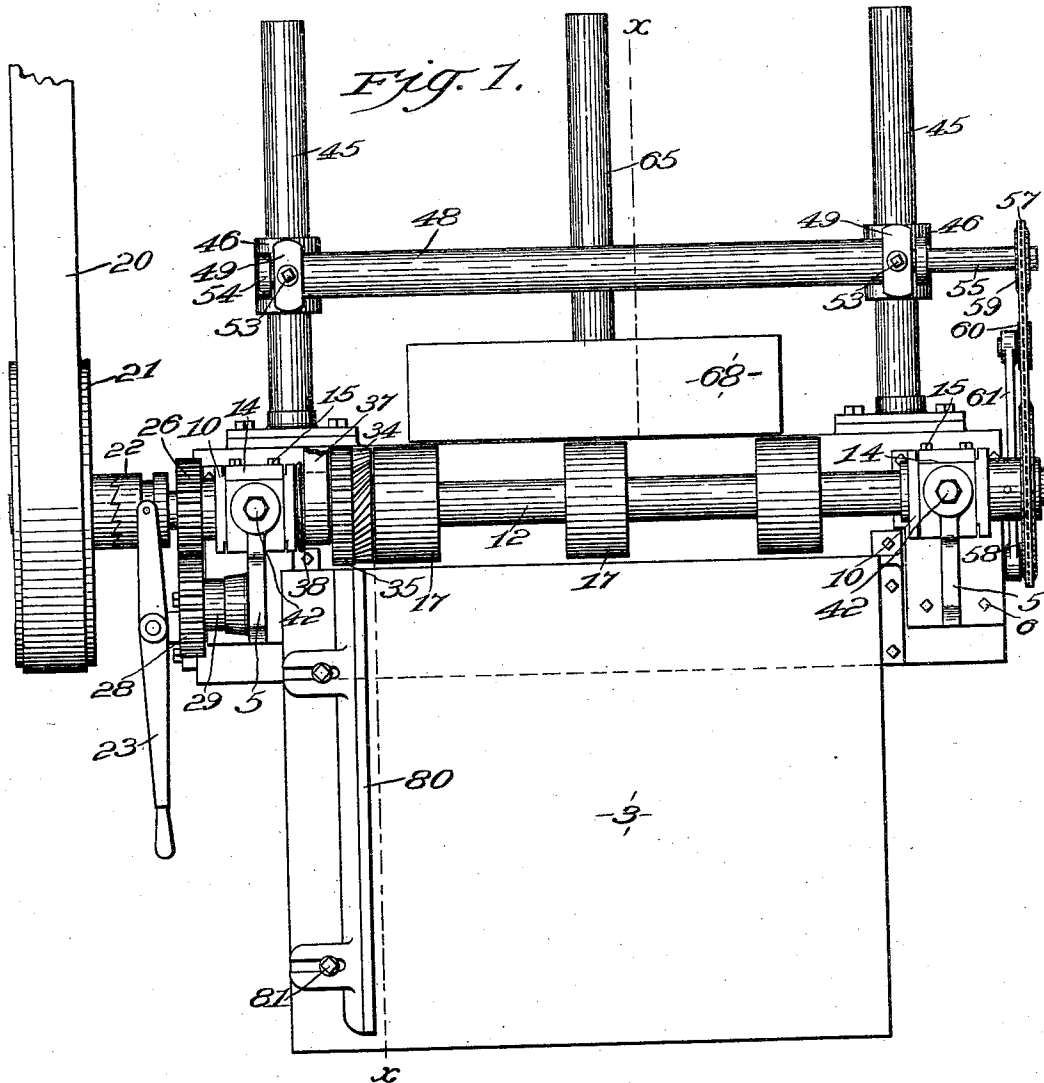
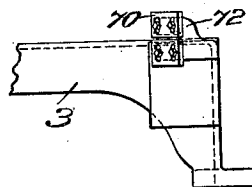


Fig. 5.



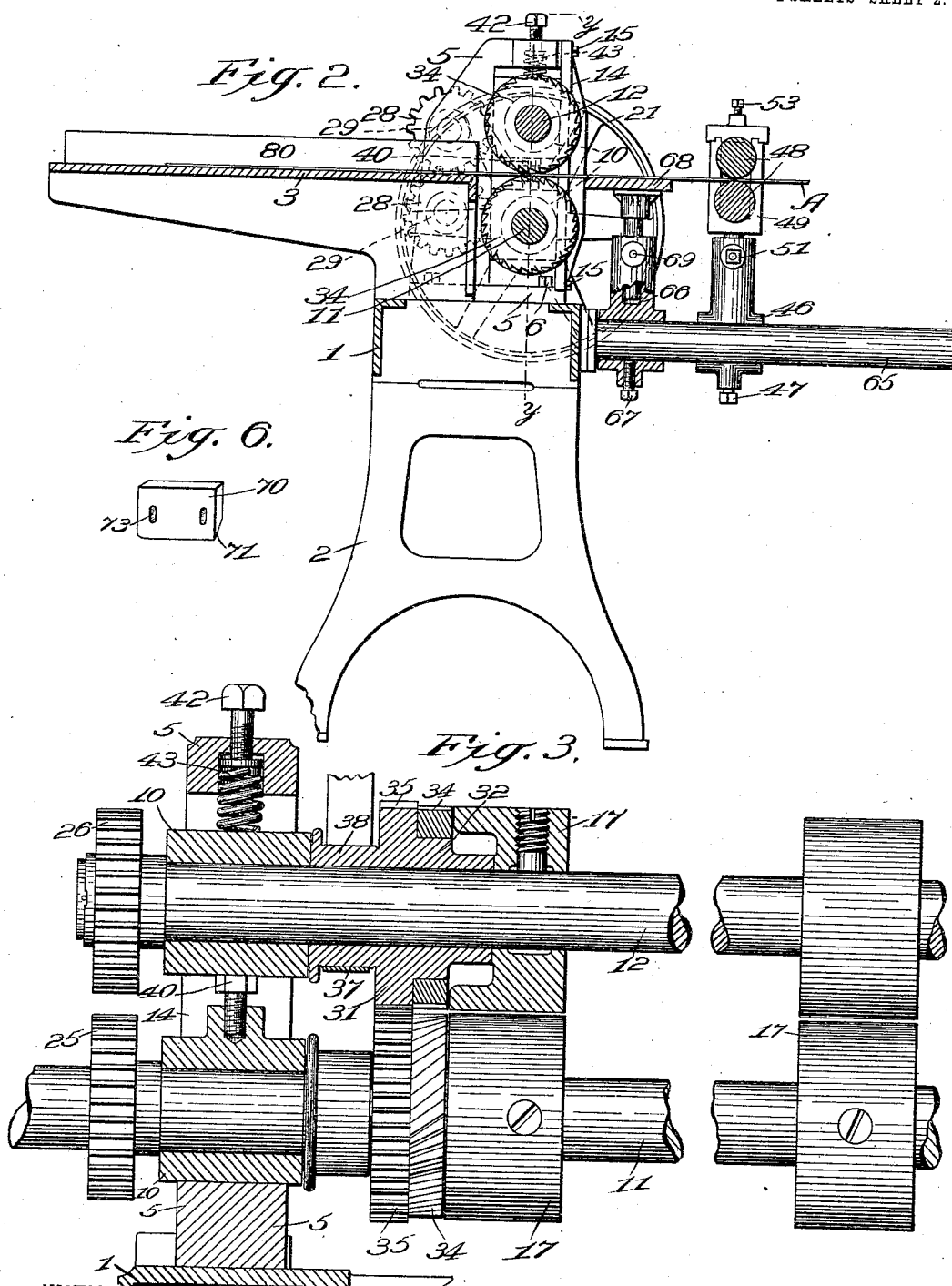
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2 SHEETS—SHEET 2.



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EDWIN NORTON, OF NEW YORK, N. Y.

TIN-PLATE-FINISHING MACHINE.

940,715.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed August 1, 1906. Serial No. 328,693.

To all whom it may concern:

Be it known that I, EDWIN NORTON, a citizen of the United States, residing at 154 Riverside Drive, New York city, in the county of New York and State of New York, have invented a new and useful Tin-Plate-Finishing Machine, of which the following is a specification.

My invention relates to means for "delisting" or removing the extra tin that adheres to one edge of tinned plates, and consists in a new machine for a new purpose and having a new mode of operation, and in a new method for removing the surplus tin.

Heretofore the so-called "list edge" has always been produced in the operation of tinning iron or steel plates, and no successful method of remedying or avoiding it has heretofore been discovered or practiced, so far as I am aware. As the tinned sheet, or plate, leaves the tinning pot filled with molten tin, it passes between one or more pairs of smooth, steel, finishing rolls, commonly revolving in heated oil, whereby the surplus tin is removed. To give a proper finish to the plate a small quantity of molten tin is retained on top of the rolls and of this and of the tin which flows down the surface of the sheet before the coating metal sets, there remains a surplus at the lower edge of each plate on both sides, producing a thickened edge, or "list edge." This list edge not only wastes the pure tin in making the plates, but is a great disadvantage to the user of the plates, because it has to be trimmed off, otherwise there would be danger of making defective work, or injuring or breaking the expensive dies used for cutting and stamping articles from tin plate.

I have discovered that the surplus tin may be removed from the list edge, and that edge made absolutely uniform with the rest of the sheet, by passing said list edge between a pair of cutters, preferably rotating and suitably spaced.

I have here shown and described a desirable construction of machine. The rotating cutters are preferably provided with inclined or spiral cutting teeth, which give a particularly smooth surface to the finished list edge. Feed disks, or feed rollers, are provided to feed the sheets between the cutters, and auxiliary feed rollers to draw the sheets squarely through are convenient. In front of the feed rollers and cutters, and substantially at a level with their points of

meeting, may be arranged a horizontal feeding table provided with an adjustable side gage for regulating the width of list edge to be engaged by the cutters, and behind these main rollers, and between them and the auxiliary feed rollers, may be arranged a supplementary small receiving table. Any suitable means may be provided for operating the cutters and the feed rollers.

The construction of machine here shown is well adapted to its purpose, but I do not intend to limit myself to the particular form or arrangement of parts.

In the drawings Figure 1 is a top plan of my machine. Fig. 2 is a vertical, longitudinal section on line *x* of Fig. 1. Fig. 3 is an enlarged, vertical, cross section on line *y* of Fig. 2. Figs. 4 and 5 are respectively partial top plan and rear elevation illustrating stationary cutters. Fig. 6 is a perspective view of one of the fixed cutters detached.

Corresponding reference numerals and letters are used in the drawing and the description.

In the figures, 1 indicates a base or frame, provided with legs 2, and a feed-table 3 for the sheets to be fed between the cutters.

5 5 are the housings, or brackets, secured at each side of the machine by bolts 6 6 and adapted to receive the sliding bearings 10 10 for the main shaft 11, and countershaft 12, arranged above the main shaft and parallel thereto as here shown. Said bearings are secured in position in the brackets by face-plates 14 and bolts 15. On the shafts are secured the feed rollers 17 17, preferably made in sections as shown, by which the plates A are engaged and drawn between the rotating cutters at a suitable speed. The shafts and feed rollers are operated by any desirable means such as a belt 20, a power pulley 21, on main shaft 11, a usual clutch 22 and a lever 23 for connecting and disconnecting the power. The main shaft carries a gear 25 and the upper, countershaft a corresponding gear 26, which are connected by meshing spur-gears 28 28 mounted in bearings 29 in front of the shafts as shown.

Collars 31, fitted to turn freely on the shafts, are arranged and maintained in position between the bearings 10 10 and the adjacent feed rollers as best shown in Fig. 3. To shoulders 32, at the inner ends of the collar, are fixed the rotary cutters 34, preferably provided with spiral cutting teeth.

The collars are connected to rotate together by gears 35 and are operated at a high rate of speed by belt 37 on pulley 38, or by other suitable means. The cutters are spaced to admit between them the sheet of usual thickness but to cut therefrom all the surplus tin, adhering and forming the list edge. Their relation and the distance between the shafts and the feed rollers may be slightly varied for plates of different thickness by adjusting bolts 40. Similar bolts 42 and tension springs 43 are arranged in the upper portion of the brackets to engage with the upper sliding bearings and maintain the cutters in position with a firm but yielding tension.

To the rear posts 45 45 on the frame are fitted the sliding bearings 46 provided with set-screws 47 for the auxiliary or take-out rollers 48, carried in the brackets 49, vertically adjustable in the bearings 46 and secured in position by the set-screws 51. The relation of these take-out rollers, and therefore their "bite" on the plates, may be adjusted by bolts 53 and springs, similar to bolts 42 and springs 43. These take-out rollers may be independently operated through pulley 54 on the shaft 55, or by a connection to the main shaft 11 as shown in Fig. 1, where 57 indicates a sprocket chain connecting the sprocket 58 on the main shaft to the sprocket 59 on shaft 55. An idler 60 on a swinging arm 61 may be arranged to keep the chain tight. On a corresponding post 65 is arranged a similar sliding bearing 66, having a set-screw 67 for a vertically adjustable, small table 68, useful, particularly with longer sheets, to guide them to the take-out rollers. 69 is a set-screw to maintain this small table at the proper height. On the main table 3 is arranged a side gage 80 to regulate the width of the portion of the tin plate to be received between the cutters. This gage is laterally adjustable on its bolts 81.

In using the machine the sheets are set with their list edge against the side-gage and fed to the feed rollers, which draw the sheets through. While so moving the cutters remove all the surplus tin from both surfaces of the list edge leaving it smooth and of uniform thickness and finish with the rest of the sheet. The width of the list edge varies somewhat, therefore the gage plate is made adjustable. As the sheets vary in thickness, and the list edge, on account of more or less molten metal adhering, the cutters are made adjustable to vary the space between them, so as to remove all the rough surface and surplus tin from the list edge, but not to injure the necessary coating of tin. The tin removed by the cutters is, of course, valuable. The cutters may be rotated in either direction, or one in one direction and one in the other, but I prefer to rotate them in the same direction as the

feed rollers, and at a much higher rate of speed. Evidently one cutter only could be used, if desired to remove the surplus tin from one side of the list edge only.

I have shown fixed cutters, which may be used for some kinds of work. These cutters should have beveled cutting edges 71 and be bolted, so as to engage with the plates on an incline, to an arm 72. The slots 73 are slightly elongated to permit a slight adjustment of the cutters, to vary the space between them.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a machine for finishing tinned plates, the combination with a suitable frame, of a main shaft and a parallel counter-shaft thereon, means to rotate the shafts in unison, sectional rollers on the shafts, a pair of collars journaled on the shafts and arranged in alinement, corresponding rotary cutters on the collars, and means to rotate the collars.

2. In a machine for finishing the list edges of tinned plates, the combination with a suitable frame, brackets on the frame, upper and lower bearings in the brackets, adjusting bolts in the lower bearing to adjust the position of the upper bearings, bolts and tension springs in the brackets engaging with the upper bearings, a main shaft journaled in the lower bearings, a counter-shaft journaled in the upper bearings, gears on said shafts, a pair of meshing spur gears meshing respectively with said shaft gears, means to rotate the main shaft, sectional feed rollers on the gears, collars journaled on the shafts near one end and maintained in longitudinal position between the bearings and the adjacent rollers on the shafts, circular cutters on the collars, meshing gears on the collars, and a belt pulley on one collar.

3. In a machine for finishing the list edges of tin plates, the combination with a supporting frame, of a main shaft, a parallel counter-shaft, feed rollers on the shafts to feed the plates, means to rotate the shafts in unison, rotary cutters journaled on the shafts, means to rotate the rotary cutters, a main table in front of the rollers and cutters, a supplementary small table behind the rollers and cutters, a pair of take-out rollers behind the small table, and means to operate the take-out rollers.

4. In a machine for finishing the list edges of tinned plates, the combination with a suitable frame, of shafts journaled thereon, feed rollers on the shafts to engage with the plates, a pair of rotating cutters journaled on the frame, means to rotate the feed rollers to force the plates through with their list edges between the cutters, means to rotate the cutters, a main table to receive the

plates and guide them to the rollers, a laterally adjustable side gage on the table to regulate the width of the plate edge to be engaged by the cutters, said side gage being
5 arranged on the table at the side corresponding to the position of the cutters, rearwardly extending horizontal posts on the frame, sliding bearings on said posts, vertically adjustable brackets in said bearings,
10 a pair of take-out rollers journaled in said bearings, a rotating connection between said take-out rollers and the shafts, a central horizontal post on the frame, a sliding bearing on said post, a vertically adjustable
15 bracket on said bearing and a small table on said bracket arranged intermediate of the feed rollers and the take-out rollers, substantially as described and shown.

5. In a machine for finishing or delisting
20 the list edges of tin plates, the combination with a suitable frame, of parallel shafts thereon, feed-rollers on the shafts, means to

rotate the shafts in unison, corresponding rotary cutters fitted to the shafts and means to rotate the cutters independently of the
25 shafts.

6. In a machine for finishing or delisting the list edges of tin plates, the combination with a suitable frame, of parallel shafts thereon, feed-rollers on the shafts, means
30 to rotate the shafts in unison and in opposite directions to feed the sheets forward between the rollers, corresponding rotary cutters fitted to the shafts, and means to rotate the cutters in same direction as the respective
35 rollers and at a higher speed.

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

EDWIN NORTON.

Witnesses:

J. B. MILLWARD,
ALFRED WILKINSON.