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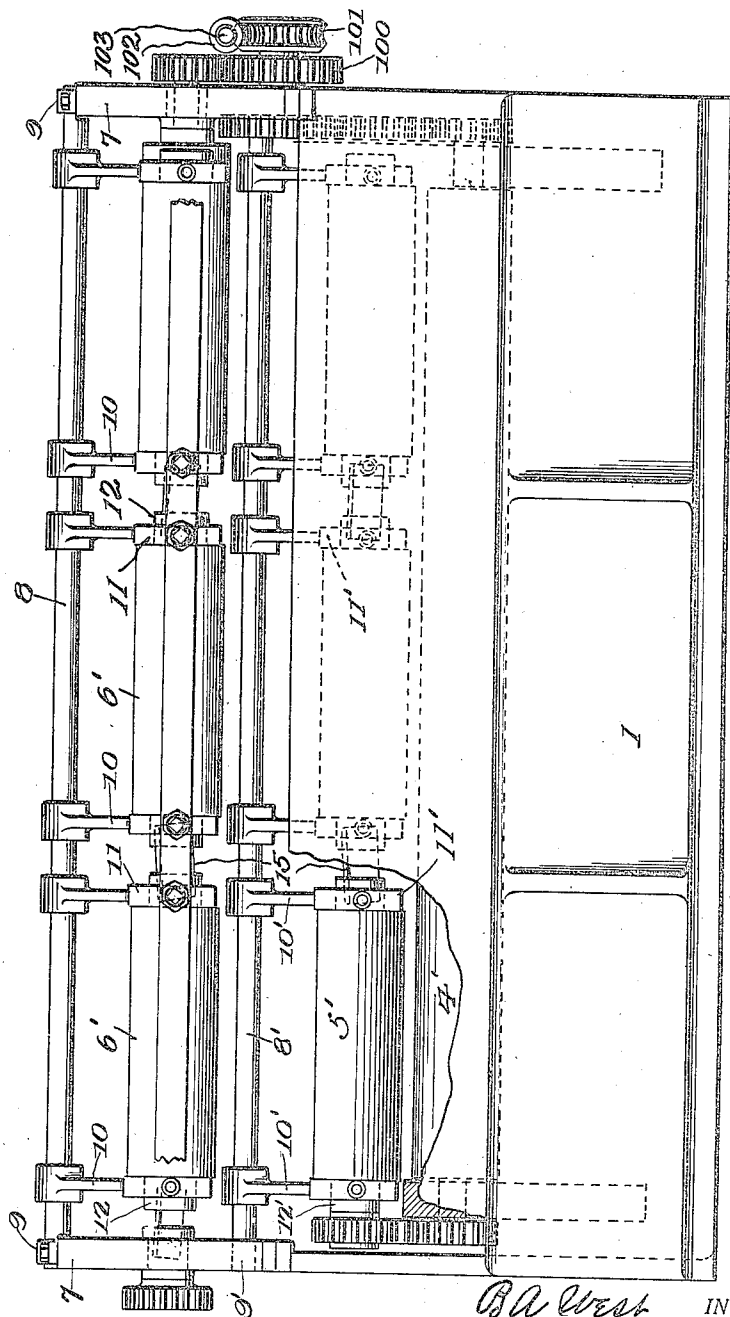
Jan. 23, 1923.

1,442,838

B. A. WEST
CATCHER FOR TINNING MACHINES.
FILED DEC. 31, 1920.

5 SHEETS-SHEET 1

Fig. 1.



B. A. West INVENTOR.

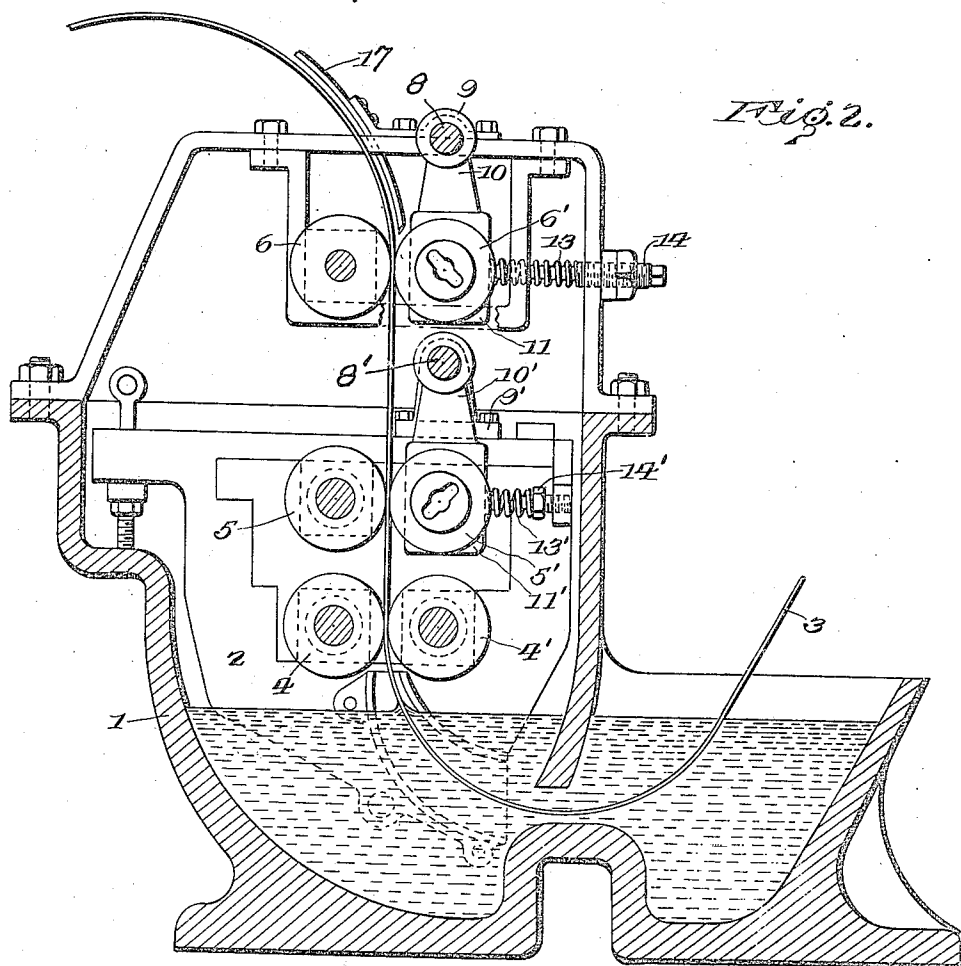
BY *Adrian Dyer*
his ATTORNEYS.

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5 SHEETS-SHEET 2



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5 SHEETS-SHEET 3



INVENTOR.

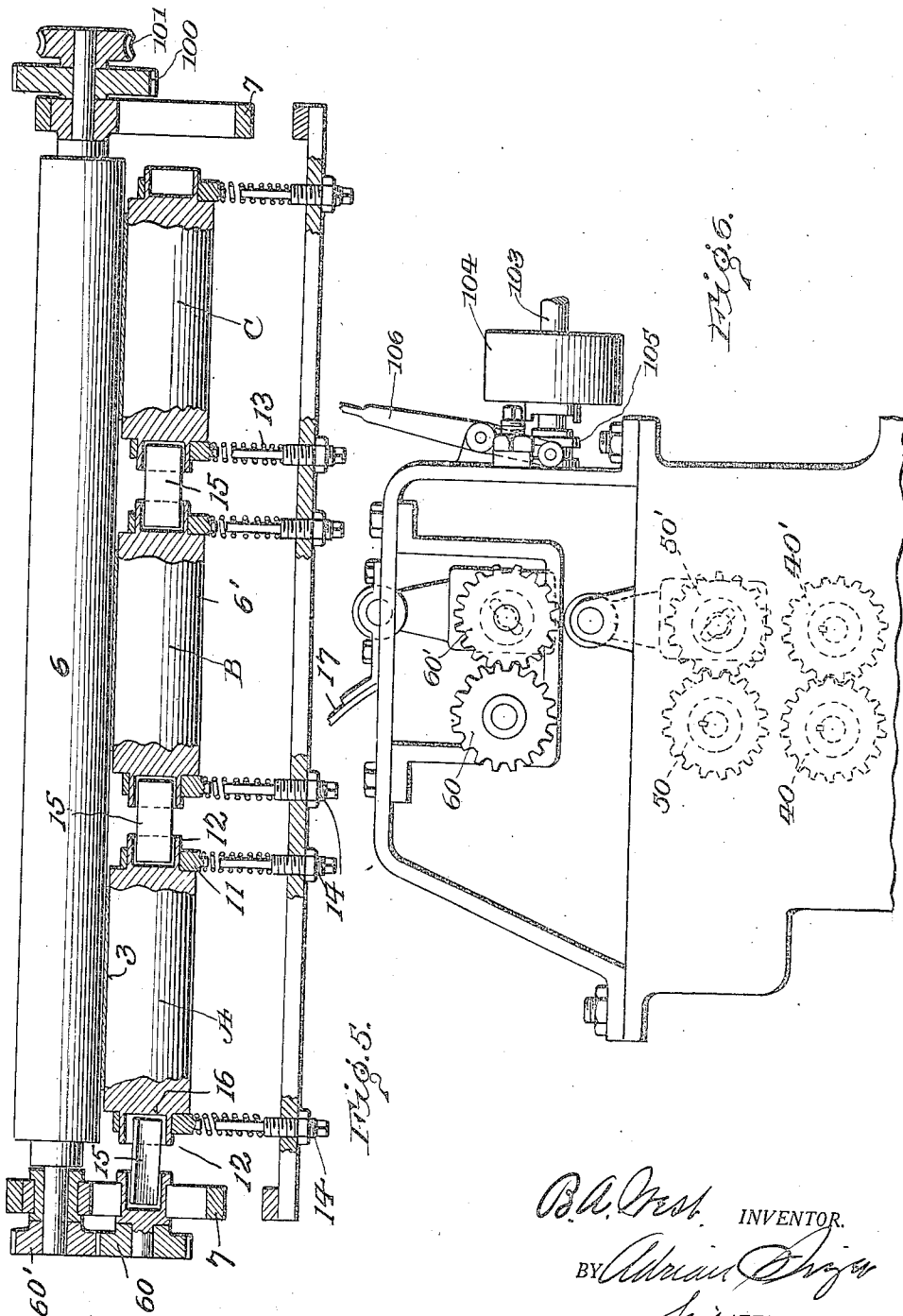
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5 SHEETS-SHEET 4



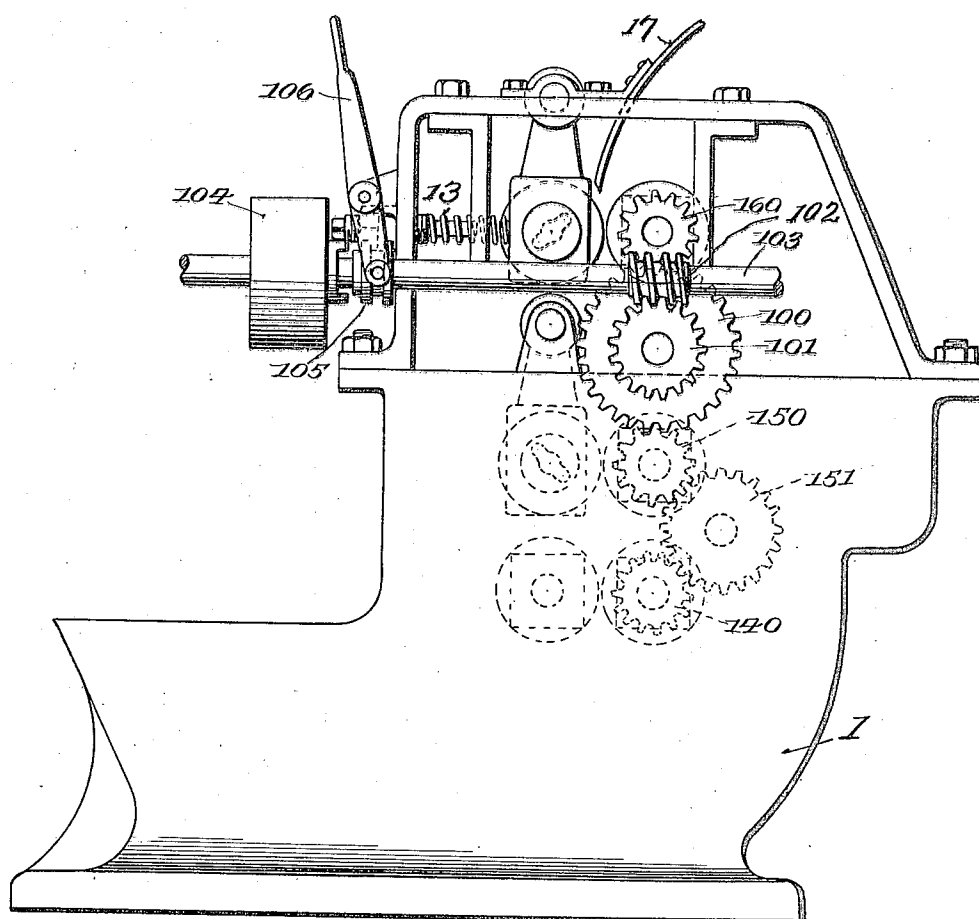
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5 SHEETS-SHEET 5

Fig. 7.



B. A. West. INVENTOR.

BY *Adrian Singer*
his ATTORNEY.

UNITED STATES PATENT OFFICE.

BIRNEY ANDREW WEST, OF CLARKSBURG, WEST VIRGINIA.

CATCHER FOR TINNING MACHINES.

Application filed December 21, 1920. Serial No. 434,385.

To all whom it may concern:

Be it known that I, BIRNEY A. WEST, a citizen of the United States, residing at Clarksburg, in the county of Harrison and State of West Virginia, have invented certain new and useful Improvements in Catchers for Tinning Machines, of which the following is a specification.

This invention relates to apparatus for use in connection with the manufacture of tin, or other like coated plates. In the manufacture of tin plate, the plates to be tinned are passed through a tinning bath of molten tin, and intermediate of rotating friction rollers, which impart movement to the sheets and convey them into engagement with other means that further dispose of the sheets in a manner well known in the art.

The primary object of my invention is to provide means whereby a plurality of plates may be successfully coated and handled simultaneously. In my improved apparatus I am able to join the steps of plate coating, and plate catching, as the terms are known in the art, in the one machine, and actuate the movement necessary to carry out both steps from the same source of power.

My apparatus consists of two pairs of companion rollers, each pair comprising a rigid roller, and a roller made up of sections, each section being so mounted as to admit of independent bearing against the rigid roller, and to yieldingly adapt itself to the varying thicknesses of the plates fed intermediate thereof and the rigid roller.

By this novel arrangement I overcome the difficulties heretofore experienced in attempting to feed plates of varying thicknesses in parallel rows between the rollers.

In handling the plates undergoing the process of being coated, they are passed through a bath of molten metal in a pot, and are conveyed upwardly between friction rollers, and it is of the utmost importance to the most efficient operation of tinning machines, that the sheets of steel to be coated be so fed between the friction rollers, that only a small clearance between each succeeding sheet occur, so that the surface of the oil finished rollers are kept in contact with the sheets, and are not allowed to bear one upon

the other, otherwise the rollers become covered with patches of oil and scuff, which will be transferred to the plates that follow, causing "wasters" or imperfectly coated plates.

In attempts that have heretofore been unsuccessfully made to feed plates in parallel rows through a tinning machine, the difficulty has been that the rolls did not allow for variation in the thickness of the plates being fed in parallel, resulting in a failure to feed a thin plate interposed between two thicker plates successfully.

Another object of my invention is to effectively take care of the freshly coated plates as they emerge in parallel rows from the tinning bath, without marring or causing abrasion of the freshly coated surfaces.

With these and other objects in view which will readily appear, the invention consists in the combination, arrangement and construction of the parts hereinafter fully described, and pointed out in the appended claims, and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts, as well as certain changes in details of construction, all within the scope of the claims.

In the drawings which show by way of illustration one embodiment of the invention:

Fig. 1 is a side elevation of the machine.

Fig. 2 is a cross section of the machine.

Fig. 3 is a plan view of one pair of companion rollers.

Fig. 4 is a section in an enlarged scale of one of the flexible rollers.

Fig. 5 is a plan view of the companion rollers, showing the sectional flexible roller with parts broken away at the intersections.

Fig. 6 is an end elevation of the machine.

Fig. 7 is likewise an end elevation, but opposite to that shown in Fig. 6.

In the several views, like reference characters indicate like parts, and the machine as a whole is intended for use in an establishment where tin plates are manufactured, and it operates to perform the combined functions of plate tinning, and plate catching, as the terms are used in the art.

Referring to the drawings (Fig. 2) 1 is a tinning pot containing the molten metal in which the sheets are brought into coating contact with the molten tin, 2 is the oil space in the upper portion thereof, 3 is a sheet of metal undergoing a coating of tin. Residing within the oil space are oil finishing rolls 4-4' and the rolls 5-5'. Located above the oil space are rolls 6-6'.

Except as hereinafter pointed out with respect to the rolls 5' and 6' these parts are of the usual construction well known in the art, and will need no further description. The form and construction of rolls 5' and 6' and the manner in which they function, comprise important features of my invention. In Fig. 1 of the drawings, are shown the rolls 5' and 6' with their mode of mounting and attachment to the tinning pot housing ends, wherein 7 represents the pot housing ends to which are suitably journaled the ends of the hanger rods 8 and 8'. Located on the hanger rods and spaced apart thereon, are the roller journal hangers 10 and 10'. Located at the extremities of the hangers 10 and 10' are roller journals 11 and 11'. Within the journals 11 and 11' and adapted for rotative movement therein, are the roller bearing ends 12 and 12'.

Referring to the hangers 10 and 10' (Fig. 2) it will be observed that they are adapted for oscillating movement on the hanger rods 8 and 8' to permit of a spreading between the rolls 5' and 6' and the rolls 5 and 6, in order to admit of sheets of varying thicknesses to be introduced between the rolls 5 and 5' and between the rolls 6 and 6'.

To hold the rollers 5 and 5' and 6 and 6' in contact with the sheet of metal introduced intermediate thereof, coil springs 13 and 13' bear against the roller journals 11 and 11', the tension of such contact being adjustable by the movement of the set screw 14 and the nut 14' bearing against the opposite ends of the springs 13 and 13'.

The rollers 5 and 6 have fixed bearings and are rigid intermediate of said bearings, and resist the tension applied by the springs 13 and 13'. The rollers 5' and 6' comprise as shown in the drawings (Figs. 1, 2 and 3) of a number of sections A, B, and C, suitably connected for rotative movement as one integral roller. This function is accomplished by a novel method of connecting the contiguous ends of the sections, by the insertion of a key 15 into an aperture 16 provided in the adjacent ends of each roller section. (Fig. 4.)

This method of joining the sections for rotative movement, allows for a variation of the axial alignment between the several sections making up the flexible rollers 5' and 6', and the positions assumed by the rollers through their change in axial alignment, in

conjunction with the actuating means of the compressing springs 13 and 13' in adjusting their bearings upon all portions of the surface of the sheet intermediate of the rollers, forms an important feature of this invention. In this connection attention is invited to the drawings in Figs. 3 and 5 showing sections of either of the sectional rollers 5' and 6' and their relative position to the rigid companion rollers 5 and 6. In Fig. 5 it will be observed that the periphery of section B of the flexible roller is shown slightly nearer the periphery of the rigid roller, than is the periphery of sections A and C, a greater or lesser degree than that shown, or between any other sections is resultant, according to the variations of the thickness of the sheets interposed between each of the sections A B and C, and the opposite companion roller.

A further object obtained by this novel arrangement, is the provision for the allowance of each of the sections A B and C, independent of each other, to assume a position wherein the axial alignment thereof, is at an angle with the axial line of the rigid roller, thereby providing for a continuous contact of the periphery of the section with the sheet, at such portions as are intermediate of the rollers, as the thickness of the sheet passing intermediate thereof, may increase or decrease from one edge to the other.

In the several forms of tinning machines now in use, equipped with rigid rollers, an attempt to feed sheets in parallel intermediate thereof, would meet with difficulty due to the occasional variation of the thickness of one sheet exceeding that of others passing through at the same time, and causing the spreading of the rigid rollers at the point of contact with other sheets to such an extent that the thinner sheet would have no feeding engagement with the rollers, and either fail of movement or drop away from the rolls. This condition also occurs wherein sheets, due to capillary attraction, more of the liquid tin coating adheres to the lower edge thereof, causing them to be thicker at this point and requiring a greater space between the rollers at the time of passing of the lower edge of the sheet therethrough.

I overcome these difficulties by my improved form of sectional roller, each section of which is yieldingly held against the rigid roller independent of the adjacent section, and the yielding feature, due to the independent compressing means of the coil springs 13 and 13' at each end of the sections, allows the axial alignment of each roller section to be at a variance with the axial alignment of each adjacent section, as well as assuming an angle to the alignment of the rigid companion roller.

The adaptability of the several sections of

the flexible roller to adjust themselves to the plane of the surface of the sheet in contact therewith, admit of a more uniform coating of tin, and by the continuous and uniform feeding of the sheets due to such contact, the oil finishing rollers are kept in proper condition.

The drawings disclose a machine for feeding sheets in three parallel rows. I do not limit myself to the specific number shown, as the machine may be so constructed as to feed a greater or lesser number.

In the passing of the sheets of steel between the rollers in the process of coating them with liquid tin, it is essential that the speed of the rotative movement of the rollers be equivalent, in that equal draft be applied to both sides of the sheet. To accomplish this result, each companion pair of rollers are provided at their ends with intermeshing spur gears 60 and 60', and 50 and 50'.

The intermeshing gears for each pair of companion rollers are exactly the same size and give synchronizing movement of rotation to the companion rollers.

Located at the opposite ends of the rigid rollers 5 and 6, are spur gears 150 and 160, (Fig. 7) located intermediate of spur gears 150 and 160, and meshing therewith is a larger spur gear 100. Located on the outer face of the spur gear 100 and adapted for rotative movement therewith is the worm gear 101. Meshing with worm gear 101 is the worm 102, the worm 102 is rigidly attached to the shaft 103, the shaft 103 has an engaging connection with the driving pulley 104 by the clutch mechanism 105, which is thrown in and out of engagement by shifting the lever 106, in a manner well known in the art.

To convey movement to the lower rollers 4 and 4', the spur gear 151 is placed in mesh with spur gear 150 and 140, and movement is conveyed thereby from roller 5 to roller 4. To cause roller 4' to rotate with roller 4, there is provided at the opposite end of roller 4, a spur gear 40, meshing with the spur gear 40' located on the end of roller 4'.

It is to be understood that I do not confine myself to the exact means herein shown of imparting the necessary movement, as other means to accomplish the same results may be employed without departing from my invention.

As power from any suitable source (not shown) is applied to the pulley 104, and rotative movement is conveyed to the rollers by the intermeshing gears herein described, an upward movement is conveyed to the sheets of steel 3, until they come in contact with the deflecting means 17 when the upward movement is diverted to a horizontal movement, which deposits the freshly coated

sheet upon an adjacent carrier (not shown) and the sheet is further cared for by means well known in the art.

As shown in the drawings the form of tinning pot with its accessories, is the conventional form of apparatus used in the art, and I lay no claim to any novelty therein. The form and construction of the friction rollers disclosed therein however, constitute an advanced step in the art, and provide for a more nearly automatic device for coating and handling tin plates, as well as more effectively dispensing with skilled manual labor in the art. than has been heretofore accomplished.

It will of course be understood that parts of the described mechanism may be employed without other parts, and that therefore my invention is not limited to the use of all the parts described and operated as a whole. Moreover it will be readily comprehended by those skilled in the art, that many changes in form, location, and relative arrangement of the various elements described may be made without departing from the spirit of my invention.

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

1. In an apparatus of the character described, a pair of rolling members mounted in bearings opposite each other having their peripheries contiguously extended intermediate of said bearings, comprising one member in sections operatively connected for rotative movement with each other adapted for varied alignment of each section in its contiguous relation with the opposite rolling member.

2. In an apparatus of the character described, a pair of rolling members mounted in bearings opposite each other having their peripheries contiguously extended intermediate of said bearings, comprising one member in sections adapted for movement of each section in and out of alignment with the opposite rolling member during the rotation thereof and having operative connections between sections for rotative movement with each other.

3. In an apparatus of the character described, a pair of rolling members mounted in bearings opposite each other having their peripheries contiguously extended intermediate of said bearings, comprising an integral rolling member and a member made up of yieldingly disposed sections operatively connected for rotative movement bearing against the integral member.

4. In an apparatus of the character described, a pair of rolling members mounted in bearings opposite each other having their peripheries contiguously extended intermediate of said bearings, comprising an inte-

gral member and a member made up of yieldingly disposed sectional unit members bearing against the integral member, with means for imparting movement from one sectional unit to the adjacent unit.

5 5. In an apparatus for handling plates in the manufacture of tin or like coated plates, the combination of a plurality of pairs of spring actuated bearing boxes suspended for
10 oscillating movement, stub shafts supporting friction roller sections journaled in each pair of bearing boxes, and actuating means for conveying rotative movement located intermediate of the roller sections.

15 6. In an apparatus for handling plates in the manufacture of tin or like coated plates, the combination of a plurality of pairs of bearing boxes mounted for oscillating movement, springs interposed between said bearing boxes and an abutment, roller sections
20 journaled in each pair of journal boxes, with means for communicating rotative movement from one section to the other.

25 7. An apparatus of the character described, comprising a pair of parallel journaled shafts, circular rolling members carried by each of said shafts, the rolling members of one shaft being in contiguous sections joined by flexibly adjustable couplings and
30 means for placing the rolling members in yielding contact with each other.

35 8. An apparatus of the character described, comprising a pair of parallel journaled shafts, circular rolling members carried by each of said shafts, the rolling mem-

ber of one shaft being formed of contiguous sections joined by a flexibly adjustable coupling and having non-elastic peripheral surfaces, pressure exerting elements interposed between the journals of the last mentioned
40 rolling members and adjacent abutments adapted to yieldingly hold said rolling members in bearing engagement.

9. An apparatus for handling tin plates, comprising two series of rolling members opposite each other each pair comprising a
45 fixed journaled member and a movable journaled member, the last mentioned member being formed of contiguous sections joined by flexibly adjustable couplings, pressure exerting elements interposed between the movable journals and adjacent abutments where-
50 by a yielding gripping pressure is exerted upon a plate interposed between the said rolling members.

55 10. An apparatus of the character described, comprising a pair of paralleled journaled shafts, circular rolling members carried by each of said shafts, the rolling member of one shaft being composed of contiguous sections joined by flexibly adjustable
60 couplings, and means for conveying equal rotative speed of the rolling members.

In testimony whereof I have affixed my signature in the presence of two witnesses. 65

BIRNEY ANDREW WEST.

Witnesses:

ALBERT S. MORROW,
W. E. CALL.