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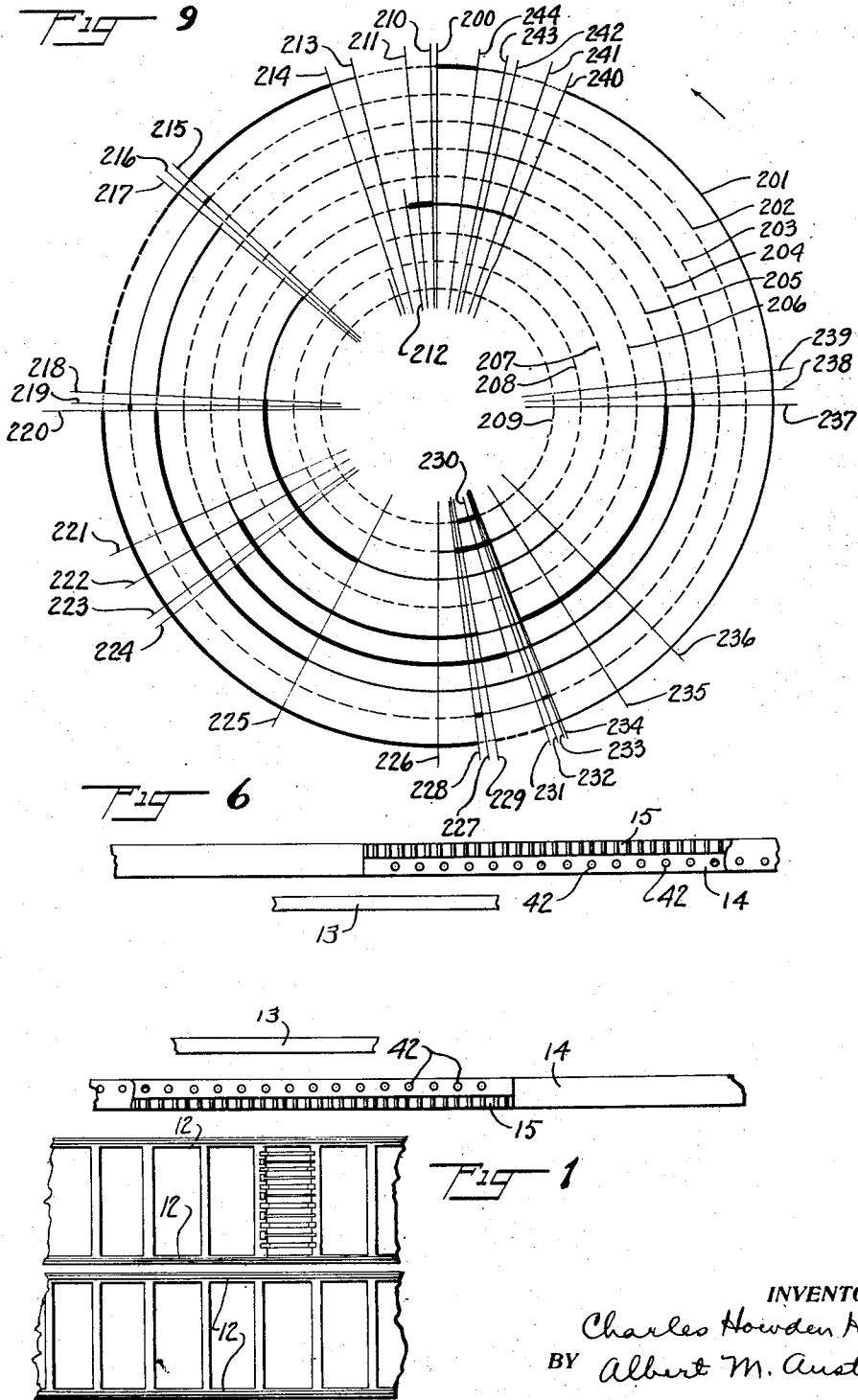
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C. H. HILL

AUTOMATIC STRIPPING MACHINE

Filed Nov. 25, 1921

6 Sheets-Sheet 1



INVENTOR
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BY Albert M. Austin
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Sept 8, 1925.

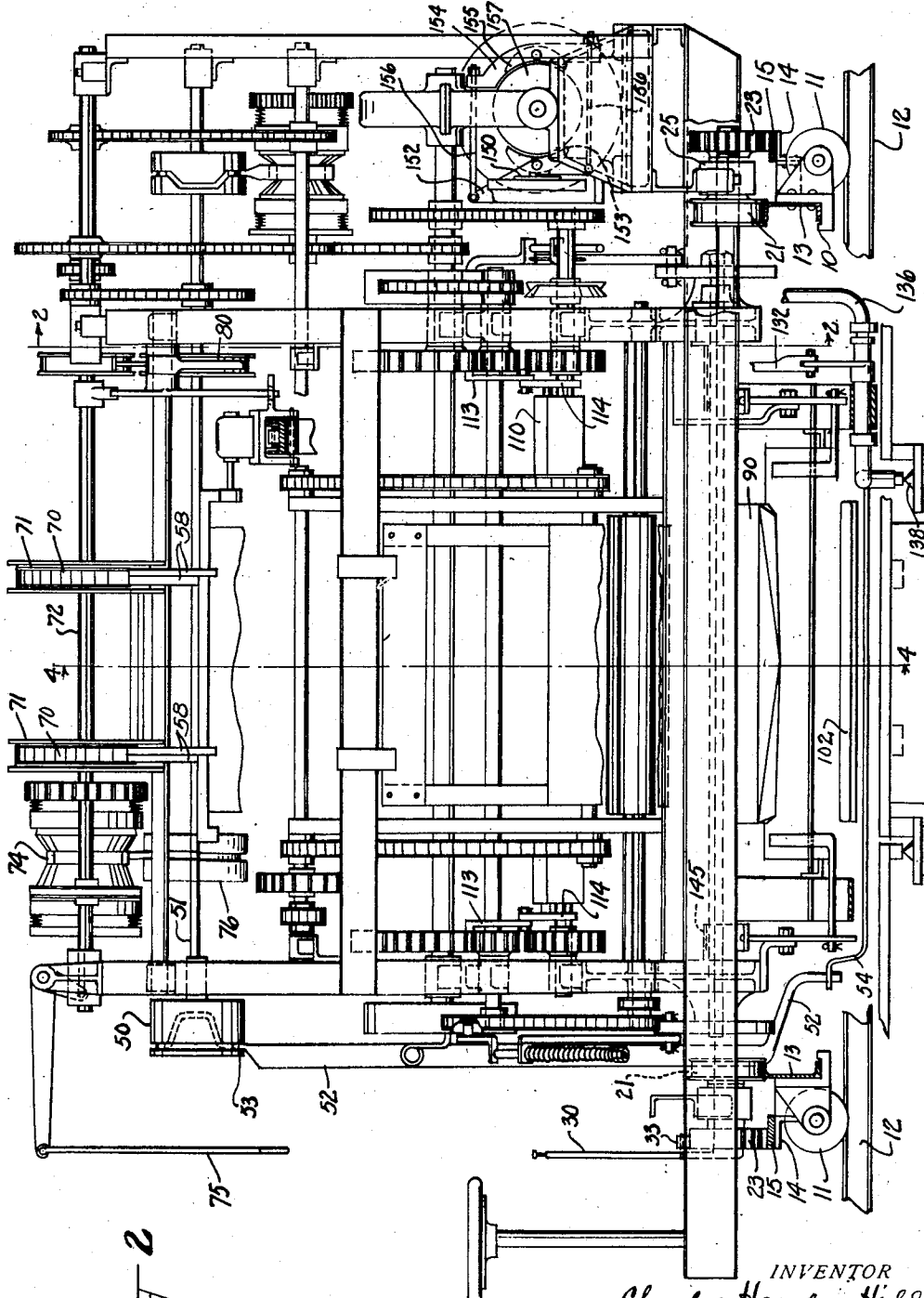
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AUTOMATIC STRIPPING MACHINE

Filed Nov. 25, 1921

6 Sheets-Sheet 2



2

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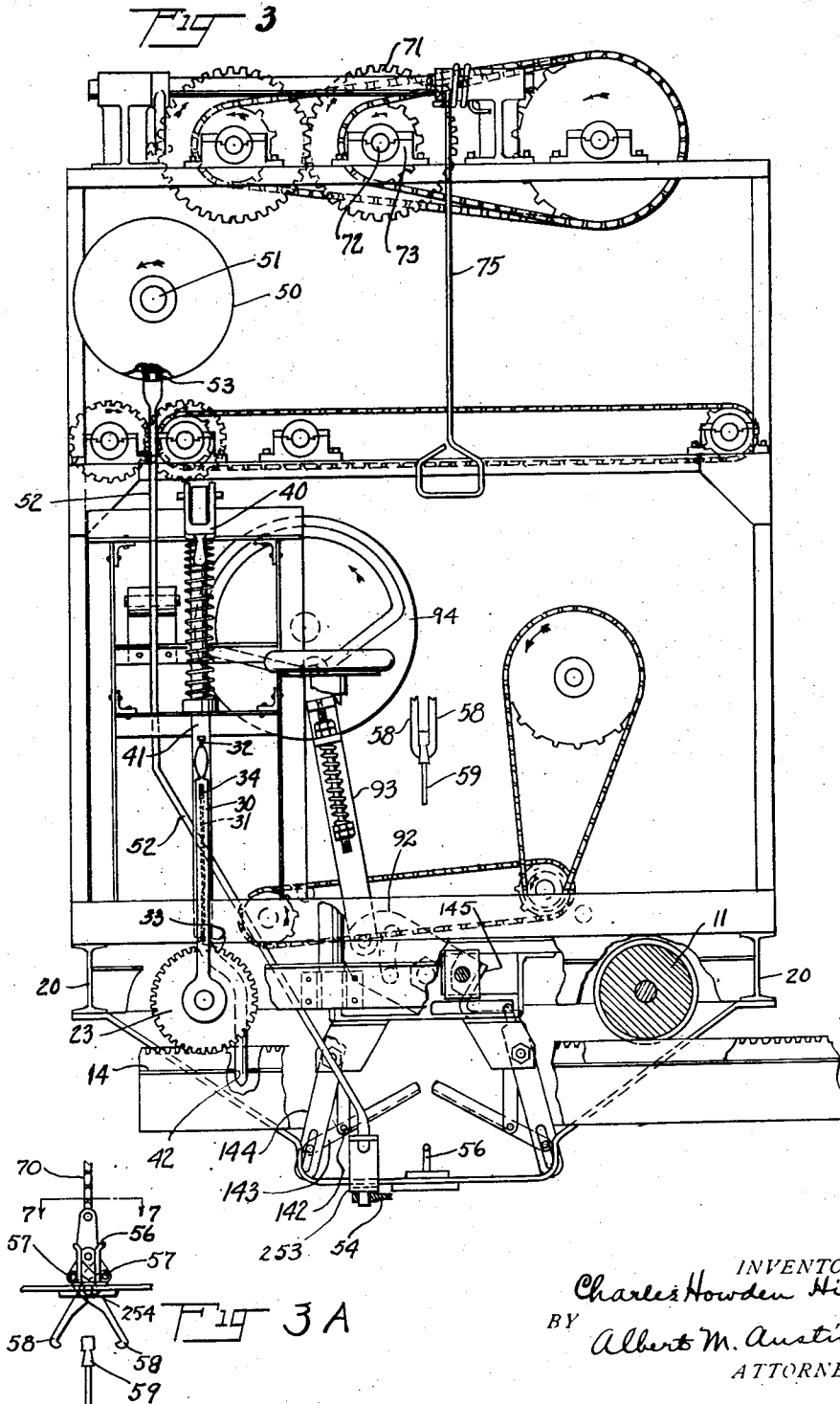
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AUTOMATIC STRIPPING MACHINE

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6 Sheets-Sheet 3



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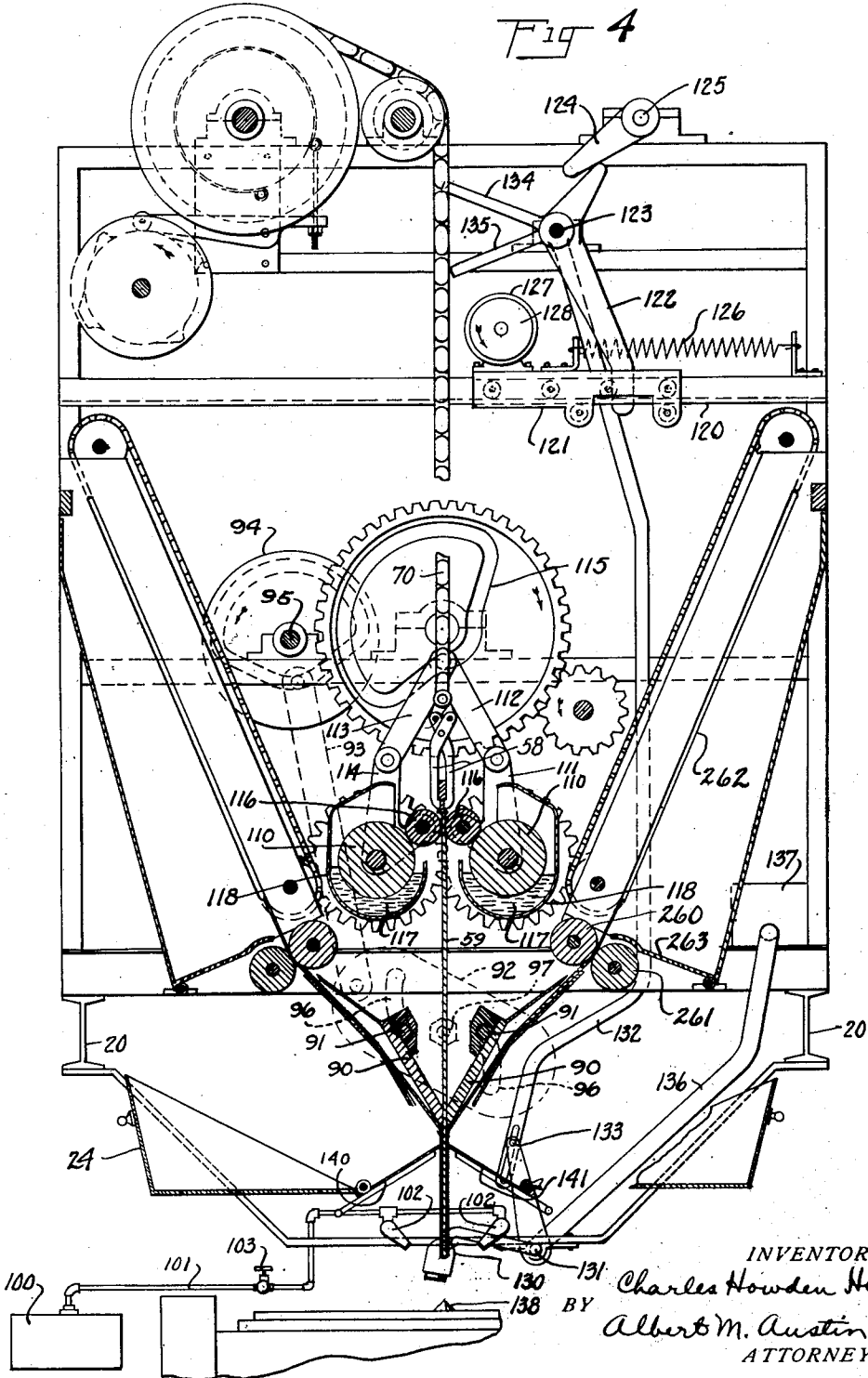
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AUTOMATIC STRIPPING MACHINE

Filed Nov. 25, 1921

6 Sheets-Sheet 4



Sept. 8, 1925.

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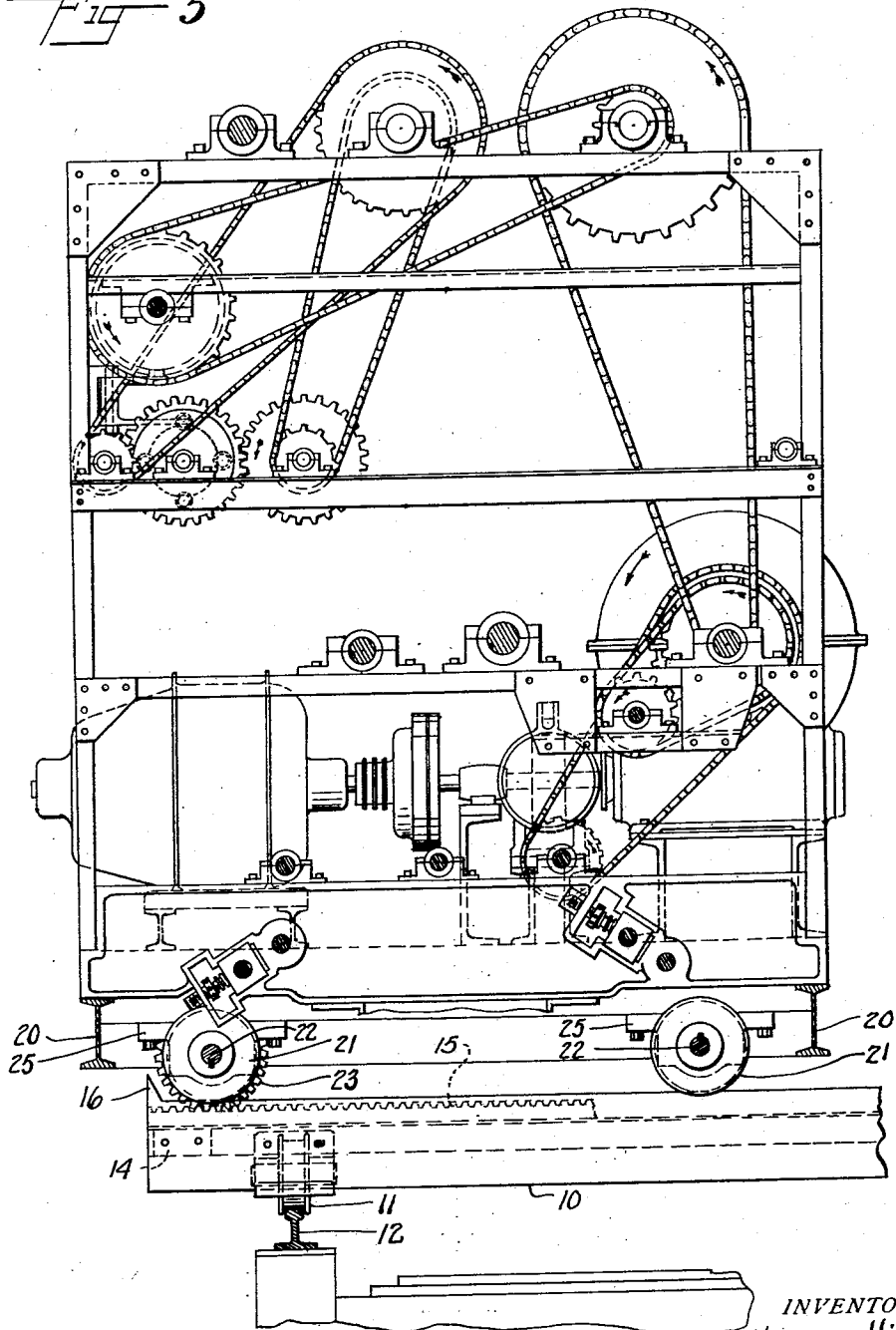
C. H. HILL

AUTOMATIC STRIPPING MACHINE

Filed Nov. 25, 1921

6 Sheets-Sheet 5

Fig 5



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AUTOMATIC STRIPPING MACHINE

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6 Sheets-Sheet 6

FIG 8

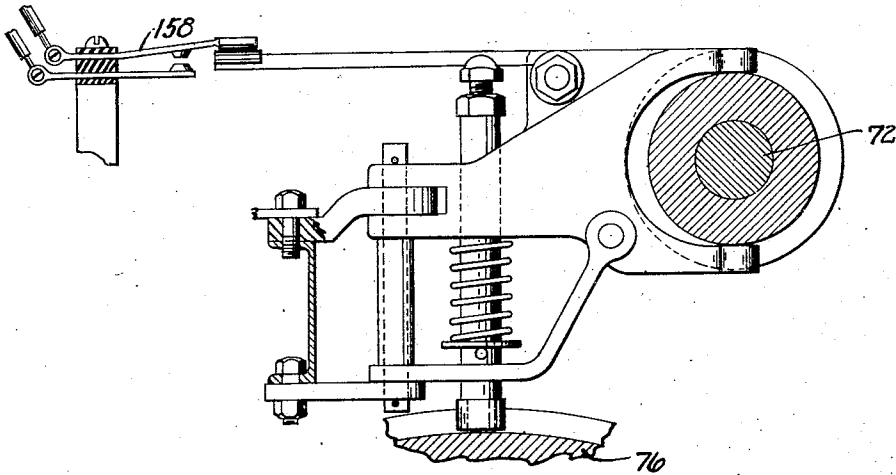


FIG 7

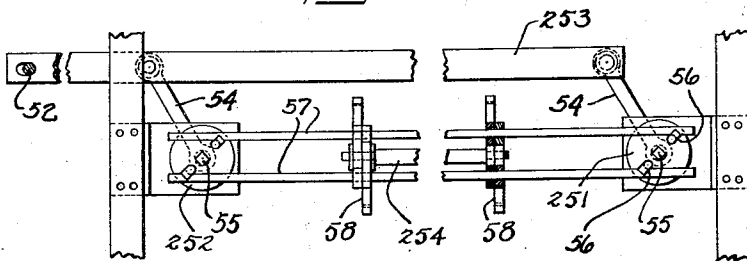


FIG 10

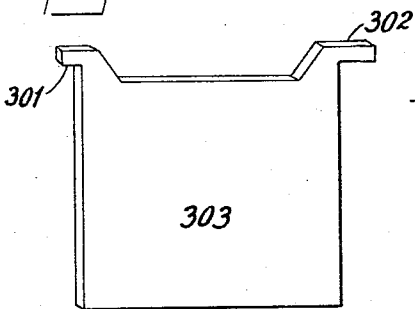


FIG 12

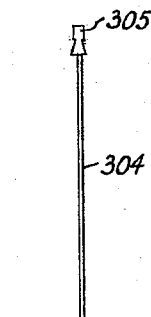
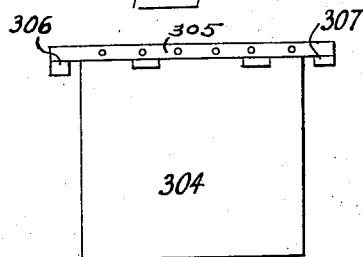


FIG 11



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UNITED STATES PATENT OFFICE.

CHARLES HOWDEN HILL, OF PERTH AMBOY, NEW JERSEY, ASSIGNOR TO UNITED STATES METALS REFINING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

AUTOMATIC STRIPPING MACHINE.

Application filed November 25, 1921. Serial No. 517,464.

To all whom it may concern:

Be it known that I, CHARLES HOWDEN HILL, a citizen of the United States, and resident of Perth Amboy, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Automatic Stripping Machines, of which the following is a specification.

This invention relates to machines for treating starting sheets or cathode blanks used in certain electrolytic processes and in other similar metallurgical processes and more particularly to an automatic machine for performing one or more of the operations of lifting, drying, stripping, greasing, polishing and replacing such plates, stacking stripped sheets, oiling contact bars and storing scrap.

In this art as at present practiced it is usual to provide a number of electrolytic vats each employing a plurality of cathode plates. The treatment of such cathode plates requires at present their removal from the vat and by a suitable operation, such as by chiselling or by employing the apparatus described in my co-pending application, Serial Number 334,029, filed October 28, 1919, cutting the coating therefrom; and performing other necessary and desirable operations upon the blanks before their replacement.

Broadly stated, it is the object of the present invention to provide improved means for treating cathode blanks and to perform such operations automatically. According to one feature of the invention means are provided for automatically lifting the cathode blank from the vat and for adjusting the lifting mechanism into position corresponding to the several blanks. Other features of the invention relate to improved means for moving the machine from one position to another and for supporting or adjusting the machine accurately in each of such predetermined positions; improved means for seizing the blanks and automatic actuating means for operating such seizing means; automatically raising the blank into operative relation with the cutting knives, whereby the surface coatings of the blank are removed, so as to provide a fresh surface

suitable for subsequent use in the vat; provision of automatic greasing mechanism for treating the cut surfaces of the blank; automatically discharging the stripped metal independent of the subsequent movement of the remaining portion of the blank; automatically buffing or polishing a portion of the blank so that improved electric contacts are obtained; means for disposing of the scrap resulting from the cutting operation; replacing the blank in position in the tank; and other novel features which will appear as the description of the invention progresses.

Referring to the drawings,

Figure 1 shows the arrangement of several vats, together with a track upon which the treating machine is supported;

Figure 2 shows a side elevation of the machine with parts broken away;

Figure 3 shows an end view with parts broken away;

Figure 3^a shows the gripping device in open position;

Fig. 4 shows a section on the line 4—4 of Figure 2;

Figure 5 shows details of the driving mechanism;

Figure 6 shows details of supporting platen;

Figure 7 shows a section on the line 7—7 of Figure 3^a;

Figure 8 shows the clutch control member and electric brake operating springs;

Figure 9 shows a diagram of the order in which the various operations take place;

Figure 10 shows one of the anode plates of a vat;

Figure 11 is a side elevation of a cathode plate; and

Figure 12 is an end elevation of a cathode plate.

Like reference characters denote like parts in the several figures of the drawings.

In general the machine comprises a plurality of cooperating parts, one of which forms the main bed, arranged to be placed in position over a selected electrolytic vat.

Upon the main bed is a traveling carriage adapted to be spotted or placed in predetermined position with relation to the selected

vat so that the machine may cooperate with any one of the blanks in the vat. Upon this traveling carriage is mounted a driving apparatus and suitable shafts driven thereby for causing automatic operation of the various parts thereof.

Means are provided for seizing the blank in its position in the vat and for lifting the blank upwardly into active engagement with the operating elements of the machine in successive order and for subsequently replacing the blank inside of the vat. Among these operating elements are the cutting knives which automatically cut away or shear off the surface portion of the blank. Another element is an arrangement for receiving the edge portions of the blank when cut away, such portions being useless; and for directing their movement into a desired portion of the machine, so that they will not interfere with the subsequent control of the blanks.

Another operating element is provided for greasing the blanks after the surface material has been cut away, another for discharging the surface portion into a stacking machine. This greasing element comprises a pair of rollers arranged to be supplied with a suitable compound which is applied to the blank during its upward travel. When the blank reaches its uppermost position a buffing mechanism is automatically brought into operation for polishing a portion of the blank, this mechanism comprising a driving motor independent of the driving mechanism of the machine but supported upon an auxiliary carriage which is moved into operative position at predetermined times.

The entire operation from the time of seizing a blank in the vat to the time of restoring the blank into position is automatic and the operator is required only to spot the machine for treatment of the next blank.

A more detailed description of the structure will now be given in which reference is made to a preferred embodiment of the invention shown in the drawings comprising a main bed or traveling carriage 10 supported upon a plurality of wheels such as 11 shown more fully in Figures 2 and 5. These wheels are rotatably mounted in suitable bearings and are provided with double flanges engaging the T-rails 12 in a well known manner. The main bed may be constructed of suitable channel irons such as 13 and is preferably provided with an angle iron 14 upon which is mounted a rack 15 extending the length thereof. Near the extremities of the frame 10 are limiting stops 16, the purpose of which is to limit the movement of the upper carriage. Fig. 6 shows the interrelation of the angle irons 14, the rack 15 and the channel irons 13.

The upper carriage comprises a pair of parallel spaced beams such as 20 and suit-

able cross members arranged to support the superstructure in a well known manner. This framework is mounted on a plurality of wheels 21, each of which has a pair of flanges to engage the upper surface of the channel 13, whereby the upper carriage may ride freely along the frame 10. The wheels 21 are arranged in pairs, each pair being keyed to an axle 22 to which there is also keyed a cog wheel 23 cooperating with the rack 15. Suitable bearings 25 are provided for supporting the superstructure upon the axles 22. This arrangement provides for supporting the upper carriage upon the main carriage in a simple and economical manner and for securing tractive effort whereby the upper carriage may be easily and efficiently moved.

For moving the upper carriage into a desired position corresponding to the blank which is to be treated, there may be provided an advancing mechanism such as a hand lever 30 mounted on a suitable bearing. In the illustrative embodiment shown, the body of the lever 30 is hollow and a rod 31 (see Fig. 3) extends therethrough terminating in a release button 32. The rod 31 actuates a pawl 33 which cooperates with the gear wheel 23. The rod 31 is normally retained in position by means of a suitable spring 34. The arrangement is such that when the operator presses the button 32 the pawl 33 is unlatched and the operator may then swing the lever 30 through an angle so as to permit the pawl 33 to engage with the next tooth of the gear wheel 23.

For maintaining or "spotting" the upper bed in the desired position on the main bed there is provided a release rod 41 which is operated by a release handle 40. The lower extremity of the rod 41 is arranged to enter an orifice such as 42 in the horizontal portion of the angle iron 14 attached to the main bed as shown in Figure 2. These orifices are clearly shown in Figure 6, and one of them is shown in Figure 3, it being understood that there are as many such orifices as there are blanks in the vats and that the orifices are positioned according to the position of the blanks. By this means the upper bed is accurately positioned with respect to the main carriage and thus accurate stopping is obtained.

The cathode and anode plates of the vat are arranged alternately. One form of anode plate is shown in Figure 10, and as shown is provided at its upper portion with laterally extending ears 301, 302 for supporting the plate on the edges of the vat. One of these ears, 302, is slightly longer than the other, and is arranged to contact with the external portion of the circuit. The downwardly extending portion 303 extends downwardly into the electrolyte of the tank.

The cathode plate, shown in Figures 11

and 12, has a main portion 304 which extends downwardly into the electrolyte, and a cross bar 305 secured thereto in any desired manner, as for example, by being riveted. The bar 305 is extended outwardly from the edges of the portion 304 to form the extensions 306, 307 for supporting the cathode plate on the edges of the vat. One of the extensions 306 is somewhat longer than the other and is arranged to contact with the external portion of the circuit.

The means for seizing the blank comprises mechanism shown in detail in Figure 7 and consists of two pairs of jaws or tongs 58 spaced apart and pivotally mounted in pairs upon bars 254 controlled by the rods 57. The rods 57 are disposed outwardly of the pairs of jaws or tongs and in the lowermost position of the jaws are in proximity to and in engagement with guide-rods 56. The guide-rods 56 are mounted upon members 251, 252, each of which has a laterally extending arm such as 54 pivotally connected with an actuating bar 253 substantially parallel with and spaced from the rods 57. A control rod 52 engages a slot in the bar 253 and terminates at its upper end in a contacting member 53, (see Fig. 2), which cooperates with the operating cam 50. The cam 50 is keyed to a driven shaft 51 and causes at predetermined periods of the cycle of operation displacement of the control rod 52 and the arms 54 operatively connected therewith. The function of the rods 57 is to open the jaws of the gripping mechanism to release the plate and to hold them open while the machine is being placed over the next plate. The actual gripping of the blank is performed by upward movement of the lifting chain, the first upward movement of which draws the jaws 58 towards each other by a scissors like operation thereof. When the plate has been completely treated and returned, the rods 57 are again operated to release the blank.

The lifting mechanism comprises a plurality of chains such as 70 (Figs. 2 and 4) attached to the upper portion of a frame supporting the jaws 58 (see Fig. 3^a). The chains are supported upon a corresponding pair of sheave pulleys 71 mounted on a shaft 72. The shaft 72 is rotatably supported in suitable bearings such as 73 (see Fig. 3) and is arranged to be actuated in either of two directions through the two-way clutch mechanism 74 (see Fig. 2).

A control handle 75 is provided for initiating the action of the clutch mechanism. When started the cycle of operation is entirely completed automatically before the machine is brought to rest. After being started the operation of the clutch mechanism is controlled by a cam 76, the contour of which is shown in Figure 8. This cam is arranged so that at the proper period of a

cycle, just after the seizing means above described has been actuated, the up-drive clutch will be engaged and the chains 70 and jaws 58 together with the blank 59 held thereby will be moved upwardly. The operating cam 76 is also arranged to release a mechanical brake 80 by means of a shaft not shown. When the blank has been moved upwardly under control of the cam 76 to a predetermined point, the clutch mechanism will be disengaged and the mechanical brake applied and thus the shaft 72, as well as the apparatus including the blank 59 connected thereto, will be held in fixed position.

As soon as the blank has been brought above the top of the tank a cleaning device operates to clean off the acid therefrom so as to prevent the machinery above this level from being damaged by acid. As shown the cleaning device comprises a source of compressed air 100 connected through a suitable channel 101 to nozzles 102 disposed proximate to the path of the blank during its upward travel and arranged to be effective when the blank passes near them. Operating mechanism which may comprise a valve 103 operated by the driving mechanism of the machine may be arranged to render the cleaning means operative only at predetermined times.

During the upward progress of the blank 59 as described the cutting knives become effective. The cutting knives comprise a pair of blades 90 sharpened at their lower edges. These are each secured to a block or shaft 91 having supporting pins integral therewith, which slide in slots 96 cut into a movable block 92 which is reciprocated by means of a lever 93 operatively connected with a cam 94. The cam 94 is keyed to an operating shaft 95 operatively connected with the driving mechanism in a conventional manner. As the block 92 oscillates on its pivot 97 and the pivots 91 ride in the circular slot 96, the knives are moved towards and away from each other alternately so as to have their cutting edges brought into engagement with the blank 59.

In the lower portion of the machine there is provided a pair of trap doors 140, 141. These doors are pivoted so that in the position shown in Figure 4 their edges are brought into intimate contact in the path of movement of the blank. In the open position the doors are separated from each other sufficiently to permit the blank to be moved between them without interference. The arrangement is such that the scraps from the edges of the blank being trimmed fall into these members and are thereby discharged away from the path of the blank so that there is no danger of these scraps being allowed to fall into the electrolytic vat. The doors are each pivoted on a pivot 142, (see Figure 3) and are fastened to a member

143 which is operatively connected to a lever 144, the lever being controlled by means of a member 145 reciprocated by the action of the block 92 whose motion is controlled by rotation of the cam 94, as previously described. The scrap is discharged into suitable trays 24 shown in Figure 4 which may be emptied out at intervals.

An electric brake is provided for holding the mechanism rigid when stopped and is arranged to be effective only when electrically de-energized. Said electric brake comprises a solenoid 150 secured to the upper bed of the machine in any suitable manner, and a pair of actuated arms 152, 154 having mounted thereon the brake shoes 153, 155 respectively. The arms 152, 154 are operatively interconnected by a rod 156. A brake drum 157 is secured to one of the driving shafts of the machine and is arranged to be restricted in its movement by compression of the brake shoes 153, 155 against it. A retractile spring (not shown) normally maintains the brake shoes in position against the drum and upon operation of the solenoid the brake shoes are withdrawn from contact with the drum, thereby releasing the drum and the shafts connected therewith for movement. A source of electric current (not shown) supplies energy for the operation of the solenoid, the circuit being controlled by the contact 158 (see Figure 8), which is automatically closed during the operation of the mechanism, whenever the blank is to be raised or lowered. The brake is thus automatically disengaged during movement. It remains set while the blank is at rest, without the expenditure of electric energy except during the relatively short period of movement of the blank.

Above the knives is mounted a pair of grease feed rollers 110, 110 which are operated through suitable driving gear from the main driving mechanism of the machine. Loosely mounted upon each of the shafts supporting these rollers 110 is a toggle lever 111 forming part of the toggle system 111, 112, 113, 114 which is operated by a cam 115 at predetermined intervals. Upon the free ends of the toggle system are rotatably mounted a pair of greasing rollers 116, 116 which are normally in contact with the feed rollers 110, 110 respectively. The feed rollers are supplied with a suitable grease or compound 117 contained in a semi-circular dish 118, an extension of which is arranged to prevent splashing of the compound. The arrangement is such that rotation of the cam 115 controls the actuating of the toggle system and brings the rollers 116, 116 into and out of line with the path of the blank; the grease meanwhile being supplied to the greasing rollers by the feed rollers 110.

Near the upper portion of the path of

travel of the blank there is mounted a bracket 120 suitably secured to the superstructure of the machine. A carriage 121 is adapted to ride upon the bracket 120 being controlled in its movement by the bell crank lever 122 keyed to the shaft 123 and actuated by cam 124 keyed to a rotating shaft 125. A spring 126 normally tends to retain the carriage 121 in the position shown in Figure 4. Upon the carriage 121 there is mounted a buffing wheel 127 and a motor 128 adapted to rotate the buffing wheel. Suitable conductors (not shown) are provided for supplying current to the motor in a well known manner.

A contact cleaning mechanism is provided comprising an arm 130 pivotally mounted on a pivot 131 and actuated by a control rod 132 through a lost motion connection 133. At its upper end the rod 132 is provided with a pair of fingers 134, 135 arranged to throw into and out of engagement the lever 130 at predetermined times. An oil supply pipe 136 leading from an oil chamber 137 supplies oil and operation of the lever 130 causes a predetermined quantity of oil to be supplied to the contact member 138. The arrangement is such that this oil is supplied to the contact and counteracts the effect of the electrolyte upon subsequent electrical connections made through the contact thus materially improving the subsequent operation of the blank in the vat by reducing electrical resistance.

For driving the operating mechanism comprising the machine there is provided a suitable system of sprockets, chains and gears adapted to rotate the various shafts in the directions indicated by the arrows in the drawings. This driving mechanism is arranged to cause the operation of said elements at the relative periods of the cycle of operation as shown in Figure 9.

In operation the attendant places the main bed of the machine over a selected electrolytic vat and then spots the upper carriage in position for treating a selected cathode blank or plate, by employment of the lever 30 which operates the cog wheel and thus shifts the upper carriage relative to the main bed. The locking rod 41 in combination with the orifice or spotting hole of the main bed channel (see Figure 6) maintains the upper bed fixed in the selected position.

The machine is started by actuating the handle 75 which causes the clutch to be operated and thus causes the cycle of operation as shown in Figure 9 to take place. Referring to Figure 9 the several circles refer to the various operating elements of the machine already described and indicate by heavy full lines or dash lines the relative conditions of the several elements through-

out the cycle of operation. The dotted portions of the curved lines represent diagrammatically the inoperative portions of the cycle of operation of the respective elements.

5 The heavy full lines indicate correspondingly the operative position of the respective elements. The thin, unbroken curved lines indicate a transitional condition of the respective elements. The starting point is indicated by a radial line 200 and at this point it is assumed that the starting handle 75 is actuated. As indicated by the circle 201, which refers to the clutch mechanism, the arrangement of the driving gear is such that
10 the lifting mechanism is now moved downwardly until the point in the cycle of operation described by the radial line 211 is reached; whereupon the clutch mechanism reverses. The seizing mechanism comprising the jaws 58 and the gripping plates 251, 252 is actuated at the point designated by radial line 212 and causes seizure of the selected cathode blank or plate. At the period in the cycle indicated by radial line
25 213, the spindles 71 are rotated so as to pull the chains 70 upwardly and the seizing means fully operate, and after the period indicated by radial line 214 the blank is raised out of the vat. At the period designated by radial line 215 the up-drive clutch is released and the brake is applied so that the brake maintains the blank in its position.

30 The circle 202 refers to the brake mechanism; 203 to the cutting knives; 204 to the greasing or lubricating rollers and the toggle operating the same; circle 205 refers to the driving clutch of the stacking mechanism, which will be described subsequently; 40 206 to the seizing operating mechanism; 207 to the scrap trap door mechanism; the circle 208 refers to the oil swabbing mechanism; and 209 to the polishing or buffing mechanism.

45 The acid removing mechanism now becomes effective and removes the acid from the blank. It will be seen that the brake is not applied until radial line 216 is reached, there being a period of short duration after
50 the clutch is released before the brake is applied. When the point indicated by radial line 217 is reached, the knife-closing mechanism becomes effective by means of the cam 94 and the knives are moved into their cutting position. The knives are constructed
55 so as to shear or wedge off a coating from the blank along the face of the blank and also to remove the scrap from the end edges of the blank. The stripped coating of the plate is passed diagonally upwardly from the knives into a stacking machine comprising the rollers 260, 261 and the carriage operating mechanism 262. The strips are discharged from the stacker into a shelf 263
60 (circle 205, radial lines 221, 222), where

they are stacked in a bin ready to be removed at desired intervals. The scrap from the edge of the plates is deposited into the scrap bins 140, which begin to open at the period indicated by radial line 217 and are
70 fully opened by the time the knives have completed their work. Thus the scrap is deposited in the trays 24 and may be removed whenever a quantity has collected. At the point indicated by radial line 219 the
75 brake is released and at the point indicated by radial line 220 the clutch is engaged to lift the stripped blank still further.

The greasing rollers become effective through the action of the toggle 112, 113 and the cam 115 at the period indicated by radial line 223 and the greasing operation begins at the point indicated by radial line 224. The plate is thus fully greased, the applied lubricant being such as to prepare the blank
85 for subsequent use in the vat.

At the point in the operation indicated by the radial line 225 the cutting knives (circle 203) and the scrap trap doors (circle 207) are retracted, the retractive movement being completed when radial line 236 is reached. During the period indicated by the radial lines 226 to 228, which occurs as the plate approaches the upper part of the machine, a contact is made with the finger
90 134, thus causing the rod 132 to be operated and a small quantity of oil to be applied at a certain spot on the contact 138 of the vat, (circle 208). This mechanism is restored during the period between radial lines 233 and 235. Subsequently the clutch mechanism is reversed and the blank is returned downwardly into the machine. (Radial lines 228, 227, 229, 232, 233.) At this point
95 indicated by radial line 230 the greasing rolls are retracted being fully restored when radial line 238 is reached. In the period between the radial lines 229 and 231 the contact polishing or buffing mechanism (circle 209) is actuated. In the period between radial lines 229 and 234 the stacker clutch mechanism (circle 205) is reversed and the stacker restored to normal, the home position being reached at radial line 237; the clutch of the stacker is fully released at
110 radial line 239. It will be seen that the clutch operating mechanism and the brake operating mechanism are actuated alternately, there being in each case a short period intervening so as to prevent stalling the machine. When the point indicated by radial line 242 has been reached, the seizing mechanism is fully open and thus the plate is deposited back in the vat. At the point indicated by radial line 244, the clutch mechanism is thrown into the up-drive position for moving the seizing device above the upper edge of the vat to permit its movement into the position corresponding to the next
120 blank. At the position corresponding to
125
130

radial line 200 the machine comes to rest and the operator may then spot it as before and proceed in the treatment of the next blank.

5 The operation of the machine from the time the plate is seized in the vat until it is returned thereto is entirely automatic, and no manual treatment thereof is required. Thus a considerable saving in labor costs in
10 such work is obtained, and increased accuracy in removing the surplus material from the coated plate is made possible.

The sequence of operations is so proportioned that a proper amount of time is allowed for each of the several operations to
15 which a plate is subjected, so that each plate is not only properly treated but no waste of time between the operations is permitted. Thus the amount of time required
20 for removing deposited metal from a set of blanks is materially reduced, and great savings and economies are thereby rendered possible.

The amount of time required for the complete treatment of a blank with a machine
25 of the present invention is relatively so short that the blank can be replaced in the vat while still warm. Thus little or no energy is required for heating the blank upon its
30 replacement in the vat, and deposition of metal thereon is resumed each time with practically the same efficiency as immediately before removal.

It will be seen that the use of my machine
35 in electrolytic work of the character described will reduce the work to a systematic and organized basis in which the speed of operation may be forecasted with improved
40 accuracy and schedules in ordinary manufacturing may be employed, thus assuring a definite output for each day's work.

While I have shown and described and
45 have pointed out in the annexed claims certain novel features of my invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in
50 the art without departing from the spirit of my invention.

Having thus described my invention, I claim:

1. In a machine for stripping metal coated plates the combination of means for
55 supporting the machine in position corresponding to the normal position of the plates with means for seizing and lifting the plates out of position.

2. In a machine for stripping metal
60 coated plates the combination of means for spotting the machine in position corresponding to the normal position of the plates with means for seizing and lifting the plates out of position and for restoring the plates in-
65 to position.

3. In a machine for treating metal coated plates the combination of means for treating the plates and automatic means for restoring the treated plates into position.

4. In a machine for stripping metal
70 coated plates the combination of means for spotting the machine in position corresponding to the normal position of the plates, means for seizing and lifting the plates out of position, means for stripping the plates,
75 and automatic means for restoring the stripped plates into position.

5. In a machine for stripping metal coated plates the combination of means for
80 spotting the machine in position corresponding to the normal position of the plates, means for seizing and lifting the plates out of position, means for stripping and treating the plates, and automatic means for restoring the stripped plates into position.
85

6. In a machine for stripping metal coated plates the combination of means for
90 spotting the machine in position corresponding to the normal position of the plates, means for seizing and lifting the plates out of position, means for stripping the plates, means for applying lubricant to the plates and automatic means for restoring the
95 plates into position.

7. In a machine for treating metal
100 coated plates the combination of means for seizing and lifting the plates out of an electrolytic vat with a coat stripping device normally disposed in an inoperative position, means for moving the plate into position to
105 be engaged by said stripping device, and means having a timed relation to said last-named means and operatively connected to the stripping device to move the stripping device from its inoperative position to engage the surface of the plate.

8. In a machine for stripping metal coated plates the combination of means for
110 seizing and lifting a plate out of position in an electrolytic vat and means for removing electrolyte from the plate.

9. In a machine for stripping metal coated plates the combination of means for
115 seizing and lifting a plate out of position in an electrolytic vat and means for removing electrolyte from the plate having a timed relation to the lifting means and actuated subsequent to the lifting of the plate out of the vat.

10. In a machine for stripping metal
120 coated plates the combination of means for seizing and lifting a plate out of an electrolytic vat, with acid removing means automatically operated to remove electrolyte from the plate.
125

11. In a machine for treating metal coated plates the combination of means for
130 seizing and lifting a plate out of position in an electrolytic vat, means for treating the plate, and automatic means for removing

ing electrolyte operated after the plate is lifted from the vat and before treatment thereof.

12. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for cutting the scrap from the edges of the plate and a receptacle for receiving the cut scrap arranged to be automatically oscillated into and out of active position.

13. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for cutting the scrap from the edges of the plate and a receptacle normally out of the line of movement of the plate and arranged to be automatically placed in line therewith to receive the scrap.

14. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for cutting the scrap from the edges of the plate and a pair of receptacles each normally disposed out of line of movement of the blank and automatic means for causing said receptacles to be brought in line therewith in contact with each other to receive cut scrap.

15. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, and automatic means for applying lubricant to the surface of the plates.

16. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for stripping a surface of the plate therefrom and automatic means for applying lubricant to the stripped surface of a blank.

17. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of an electrolytic vat, and means for automatically polishing a portion of a plate when removed from the vat.

18. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of an electrolytic vat, means for stripping a portion of said plate therefrom, means for applying lubricant to the plate, and automatic means for buffing a portion of said plate when removed from the vat.

19. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of an electrolytic vat, means normally out of line with the path of movement of the plate for buffing a portion of the plate when removed from the vat and automatic means having a timed relation with said lifting means to

shift said polishing means into operative position.

20. In a machine for stripping metal coated plates, means for seizing a plate to be stripped comprising a plurality of jaws pivotally mounted in pairs, a pair of substantially parallel rods engaging said jaws, the position of the jaws being determined by the distances said rods are spaced apart and means for varying the relative position of said rods.

21. In a machine for stripping metal coated plates, means for seizing a selected plate comprising a plurality of jaws, a pair of substantially parallel rods engaging said jaws in pairs, and arranged to vary the position of the jaws in accordance with the relative position of said rods, and means for varying the relative position of the rods at predetermined periods in the operation of the machine.

22. In a machine for stripping cathode plates, the combination of a movable carriage for supporting the operating elements of the machine in position over an electrolytic vat corresponding to the normal position of one of the cathode plates of the vat with means for seizing and lifting the plates out of position.

23. In a machine for stripping cathode plates, the combination of a movable carriage, means for spotting the carriage in position corresponding to the normal position of one of the cathode plates of an electrolytic vat, means for seizing and lifting the plates out of position and means for restoring the plates into position.

24. In a machine for stripping cathode plates of electrolytic tanks, the combination of means for stripping the plates and automatic means for restoring the stripped plates into position.

25. In a machine for stripping cathode plates of electrolytic tanks, the combination of means for seizing and lifting one of the plates out of an electrolytic vat, means for removing surface metal deposited on the plate, normally disposed in an inoperative position, means for moving the plate into position to be engaged by said removing means and means having a timed relation to said last-named means and operatively connected to the removing means to move the same from its inoperative position to engage the surface of the plate.

26. In a machine for stripping metal coated plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat and means for removing electrolyte from the plate, actuated subsequent to the removal of a plate out of the vat for a predetermined period.

27. In a machine for stripping cathode plates, the combination of means for seizing and lifting a plate out of an electrolytic vat,

- driving means for actuating the machine, and means automatically operated at predetermined periods in the movement of said driving means to remove electrolyte from the plate. 5
28. In a machine for stripping cathode plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for treating the plate, driving means for actuating the machine, and means having a timed relation to said driving means and automatically operated after the plate is lifted from the vat and before treatment thereof. 10
29. In a machine for stripping cathode plates, the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for cutting the scrap from the edges of the plate and a pair of containers for receiving the cut scrap arranged to be automatically oscillated into and out of active position, said containers being positioned so as to be in edge contact with one another to protect the vat from the cut scrap. 15
30. In a machine for stripping cathode plates, the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for cutting the scrap from the edges of the plate and a pair of containers normally out of the line of movement of the plate and means for automatically setting said containers in position over the vat to protect the vat from the cut scrap. 20
31. In a machine for stripping cathode plates, the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for cutting the scrap from the edges of the plate, driving means for operating the machine and a pair of containers each normally disposed out of line of movement of the blank and automatic means actuated by said driving means for causing said receptacle to be brought in line therewith in contact with each other to receive cut scrap. 25
32. In a machine for treating cathode plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat with automatic means comprising a pair of rollers for applying lubricant to the surface of the plates. 30
33. In a machine for stripping cathode plates the combination of means for seizing and lifting a plate out of position in an electrolytic vat, means for stripping a surface of the plate therefrom, driving means for operating the machine and automatic means comprising a toggle operated at a predetermined time by said driving means for applying lubricant to the stripped surface of a blank. 35
34. In a machine for treating cathode plates the combination of means for seizing and lifting a plate out of an electrolytic vat, driving means for operating the machine, means for automatically polishing a portion of a plate when removed from the vat, comprising a buffer, and driving means for said buffer independent of said machine driving means. 40
35. In a machine for stripping cathode plates the combination of means for seizing and lifting a plate out of an electrolytic vat, means for stripping a portion of said plate therefrom, means for applying lubricant to the plate, automatic means for buffing a portion of said plate while removed from the vat, and means for rendering said buffing means effective actuated at predetermined periods in the cycle of operation. 45
36. In a machine for treating metal coated plates the combination of means for seizing and lifting a plate out of an electrolytic vat, means normally out of line with the path of movement of the plate for buffing a portion of the plate when removed from the vat, driving means for actuating the machine, automatic means having a timed relation with said lifting means to shift said polishing means into operative position, and driving means for operating said buffing means, independent of said machine driving means. 50
37. In a machine for stripping cathode plates, means for seizing a plate to be stripped comprising a plurality of jaws pivotally mounted in pairs upon a vertically movable member, a pair of substantially parallel rods engaging said jaws, the position of the jaws being determined by the distances said rods are spaced apart and means supported on a relatively fixed portion of the machine for varying the relative position of said rods. 55
38. In a machine for stripping metal coated plates, means for seizing a selected plate comprising a plurality of jaws, a supporting member therefor arranged to be moved in a vertical plane, a pair of substantially parallel rods engaging said jaws in pairs, arranged to vary the position of the jaws in accordance with the relative position of said rods, and relatively fixed means for varying the relative position of the rods at predetermined periods in the operation of the machine. 60
39. In a machine for stripping cathode plates of an electrolytic vat, the combination of a movable carriage, a track positioned above said vat for supporting the carriage, a track carried by said carriage, a second carriage movably supported upon said second track and means positioned on said second carriage for removing coating deposited on said cathode plates. 65
40. In a machine for stripping cathode plates of an electrolytic vat, the combination of a movable carriage, a track positioned above said vat for supporting the 70

carriage, a track carried by said carriage, a second carriage movably supported upon said second track and means positioned on said second carriage for removing said cathode plates from the vat for treatment.

41. In a machine for stripping cathode plates of an electrolytic vat, the combination of a movable carriage, a track positioned above said vat for supporting the carriage, a track carried by said carriage, a second carriage movably supported upon said second track and means positioned on said second carriage for removing said cathode plates from the vat for treatment and for returning the plates to the vat.

42. In a machine for stripping metal coated plates, automatic means for removing liquid from the plates.

43. The combination with a machine for stripping electrolytic blanks, of automatic means for removing electrolyte from the blanks.

44. In a machine for treating metal coated plates, means for cutting scrap from the edges of a plate and a receptacle constructed to receive cut scrap, and means for automatically oscillating the receptacle into and out of active position.

45. In a machine for treating metal coated plates, automatic means for applying lubricant to the plates.

46. The combination with a machine for stripping electrolytic blanks, of automatic means for applying lubricant to the blanks.

47. In a machine for treating metal coated plates, means for automatically polishing a portion of a plate.

48. In a machine for stripping metal coated plates, automatic means for removing acid from the plates, additional automatic means for applying lubricant to the plates, and means for polishing a portion of each of the plates.

49. In combination with an electrolytic vat having plates therein, means for supporting a metal stripping machine in position above the vat and means for automatically seizing and lifting a selected plate out of position.

50. In combination with an electrolytic vat having removable plates, means for spotting a metal stripping machine in position over the vat and means for automatically seizing and lifting a selected plate out of position and for automatically restoring the plate into the vat.

51. In combination with an electrolytic vat having removable plates, means for seizing and lifting a selected plate out of position, means for stripping metal from the surface of the plate, means for moving the plate into position to be engaged by said stripping means and means having a timed

relation to said last-named means and operatively connected to the stripping means to move the stripping means from its inoperative position to engage the surface of the plate.

52. In combination with an electrolytic vat having removable plates, means for automatically seizing and lifting a plate out of position and means for removing electrolyte from the plate.

53. In combination with an electrolytic vat having removable plates, means for automatically seizing and lifting a plate out of position, means for cutting the scrap from the edges of the plate and a receptacle for receiving the cut scrap arranged to be automatically oscillated into and out of active position, whereby the scrap is prevented from falling into the vat.

54. In combination with an electrolytic vat having removable plates, means for automatically seizing and lifting a plate out of position, and automatic means for applying lubricant to the surface of the plates.

55. In a machine for handling plates the combination with means for stripping a coating from said plates of automatic means to receive said coating as it is stripped from the plate and convey the same to a point removed from the stripping means in predetermined order.

56. In a machine for handling plates having a coating deposited on opposite sides thereof the combination of means for stripping the coatings from each side of the plate simultaneously, a receptacle removed from the stripping means adapted to receive each of the coatings and automatic means for conveying each of said coatings to its appropriate receptacle.

57. Apparatus of the kind described which comprises means for supporting stripping blanks in substantially parallel, spaced relation and means for permitting said supporting means and blanks to be individually moved out of position between its adjacent blanks.

58. Apparatus of the kind described which comprises means for suspending stripping blanks from their upper edges in spaced relation and means for permitting a blank to be moved in its suspended relation to a position clear of its adjacent blanks.

59. Apparatus of the kind described which comprises means for supporting a stripping blank edgewise, and means for permitting said supporting means and blank to be moved in the plane of the blank.

Signed at New York in the county of New York and State of New York this 22nd day of November, A. D. 1921.

CHARLES HOWDEN HILL.