May 25, 1926. 1,585,880

W. SCHNELL

MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES

Filed March 29, 1923 6 Sheets-Sheet 1

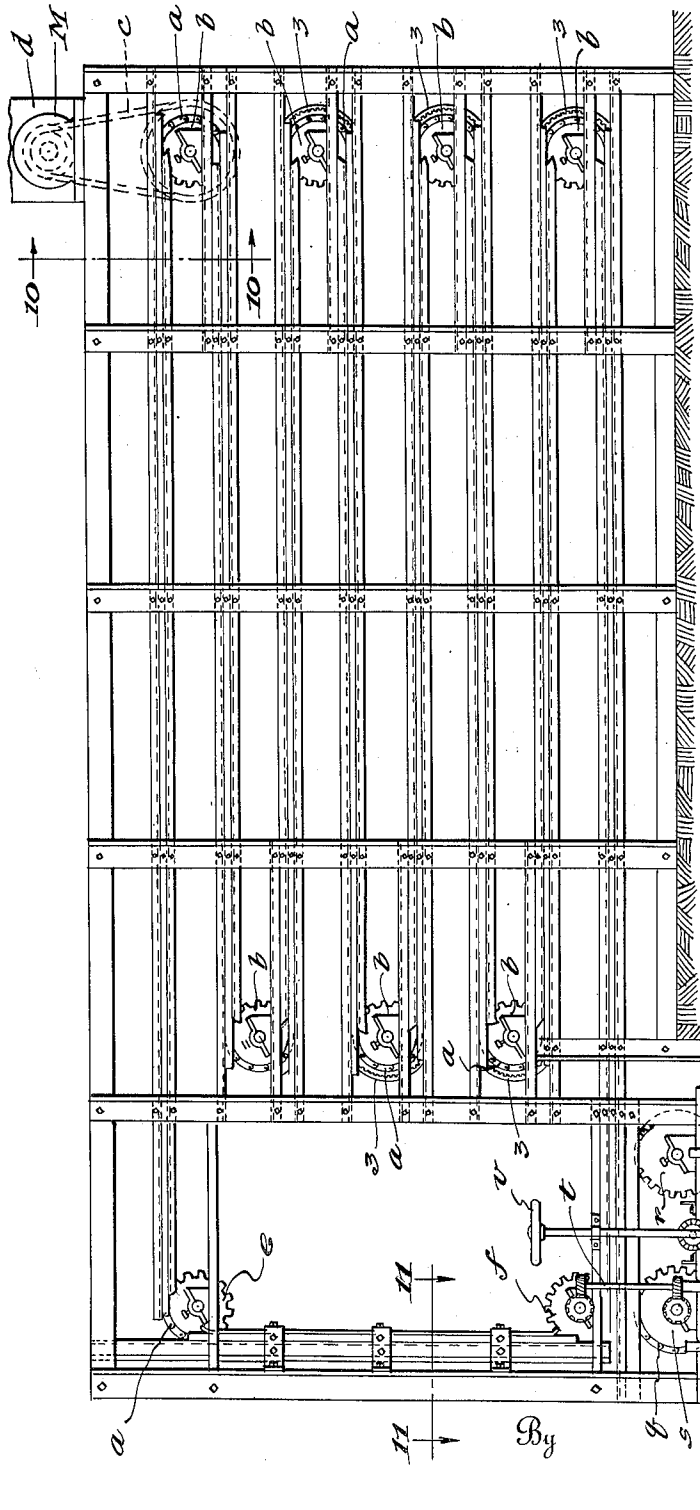


Fig. 1.

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MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES

Filed March 29, 1923 6 Sheets-Sheet 2

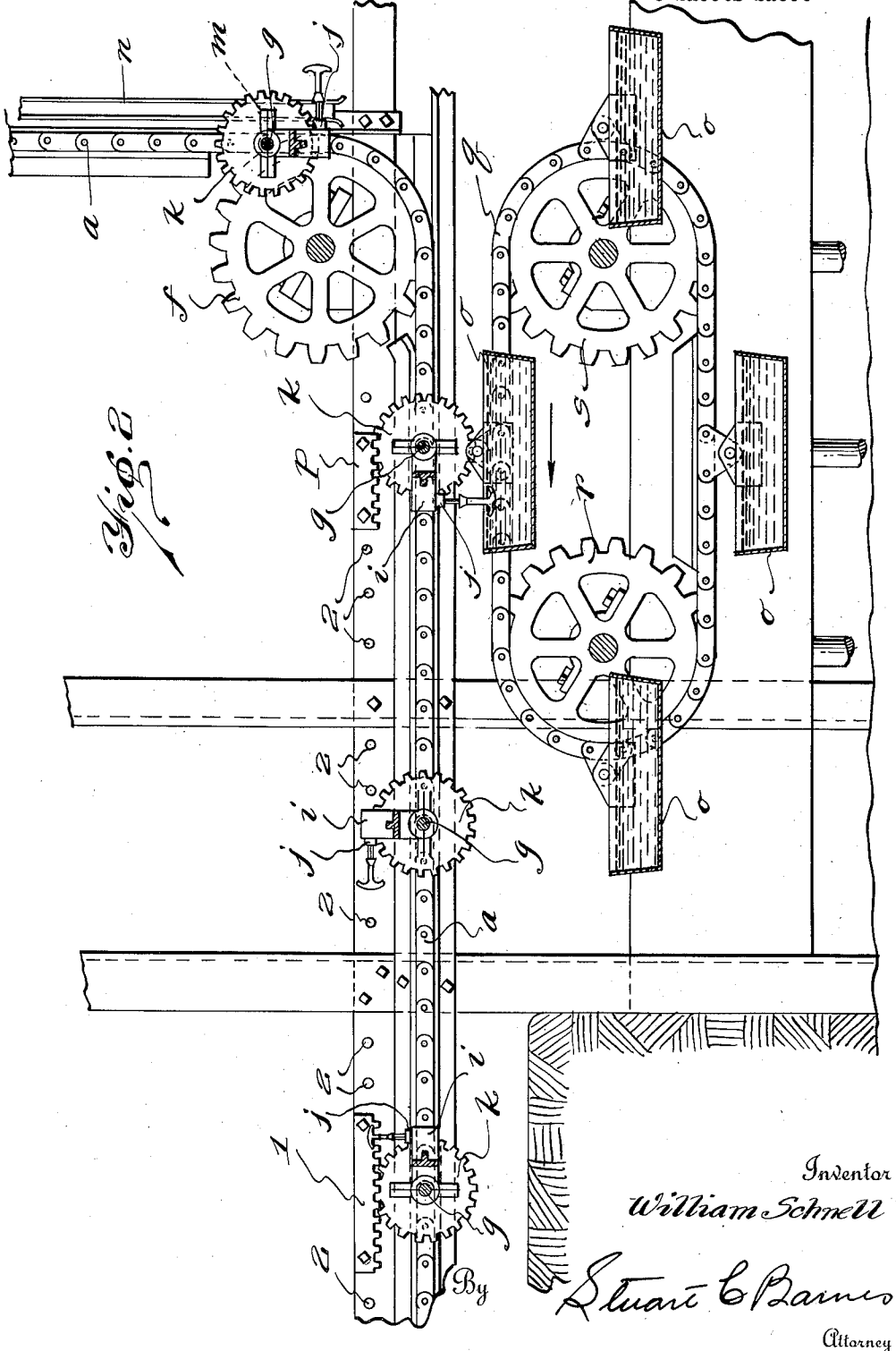


Fig. 2.

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MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES

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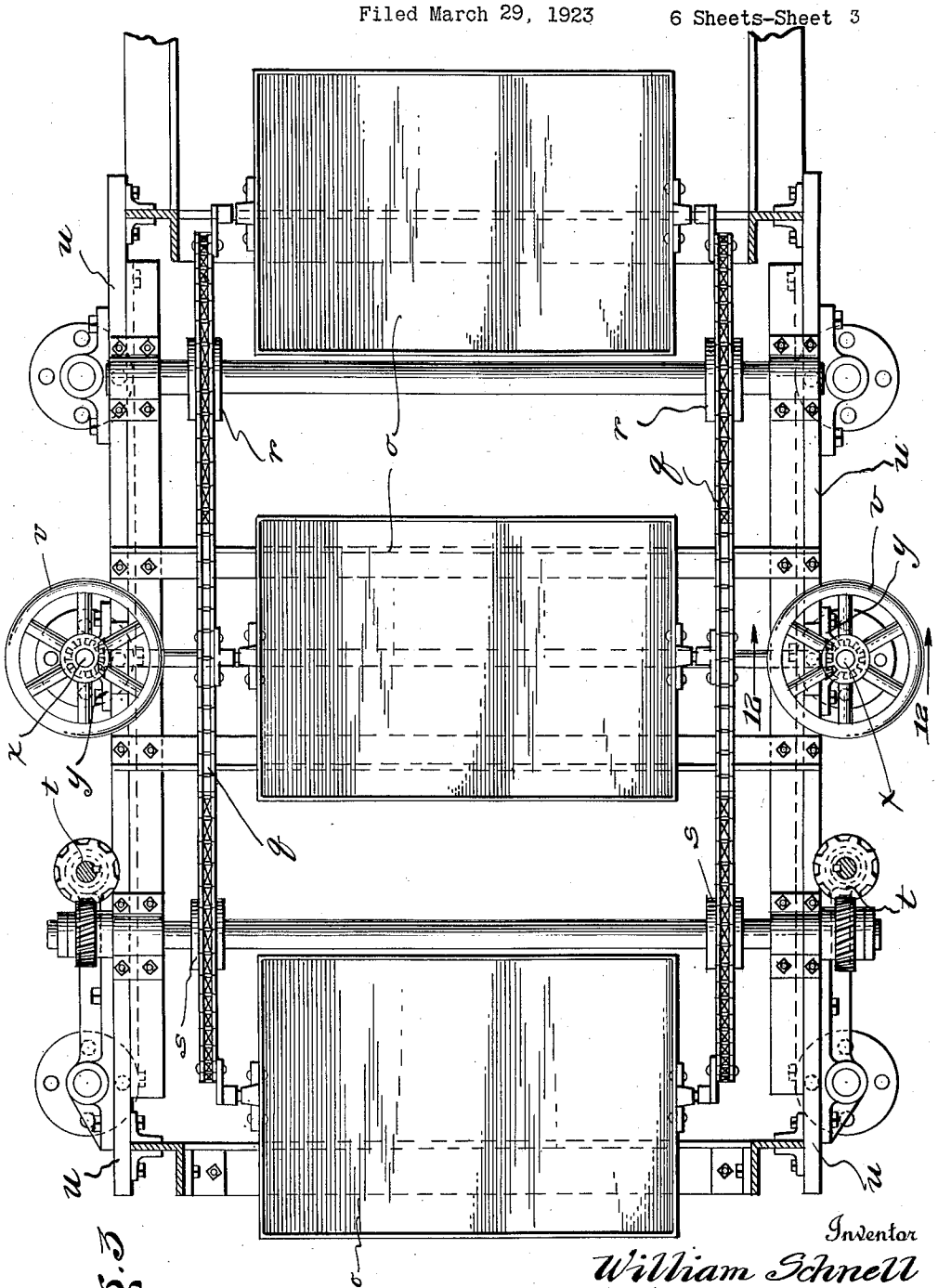


Fig. 3

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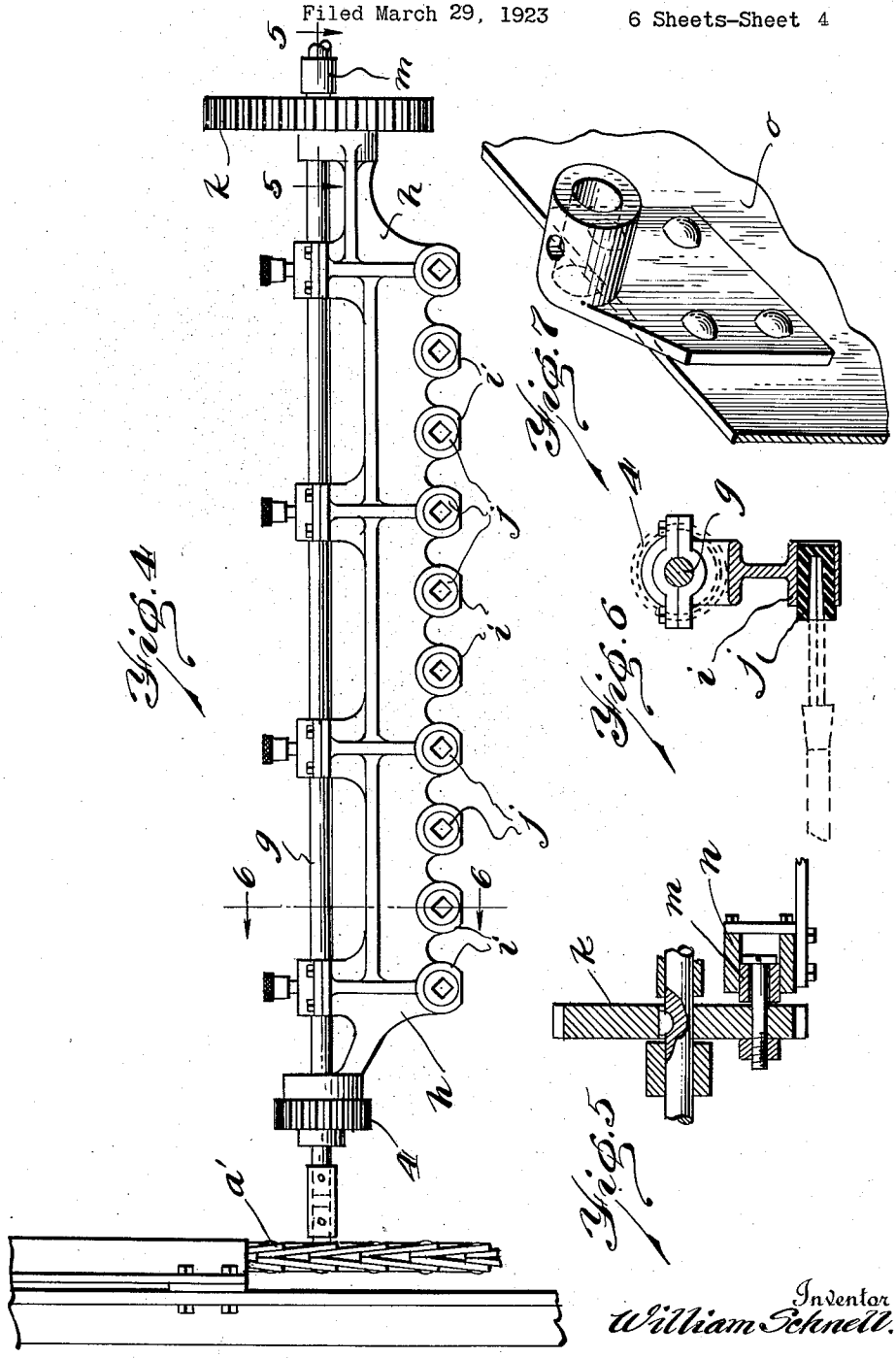
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MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES

Filed March 29, 1923 6 Sheets-Sheet 4




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MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES

Filed March 29, 1923 6 Sheets-Sheet 5

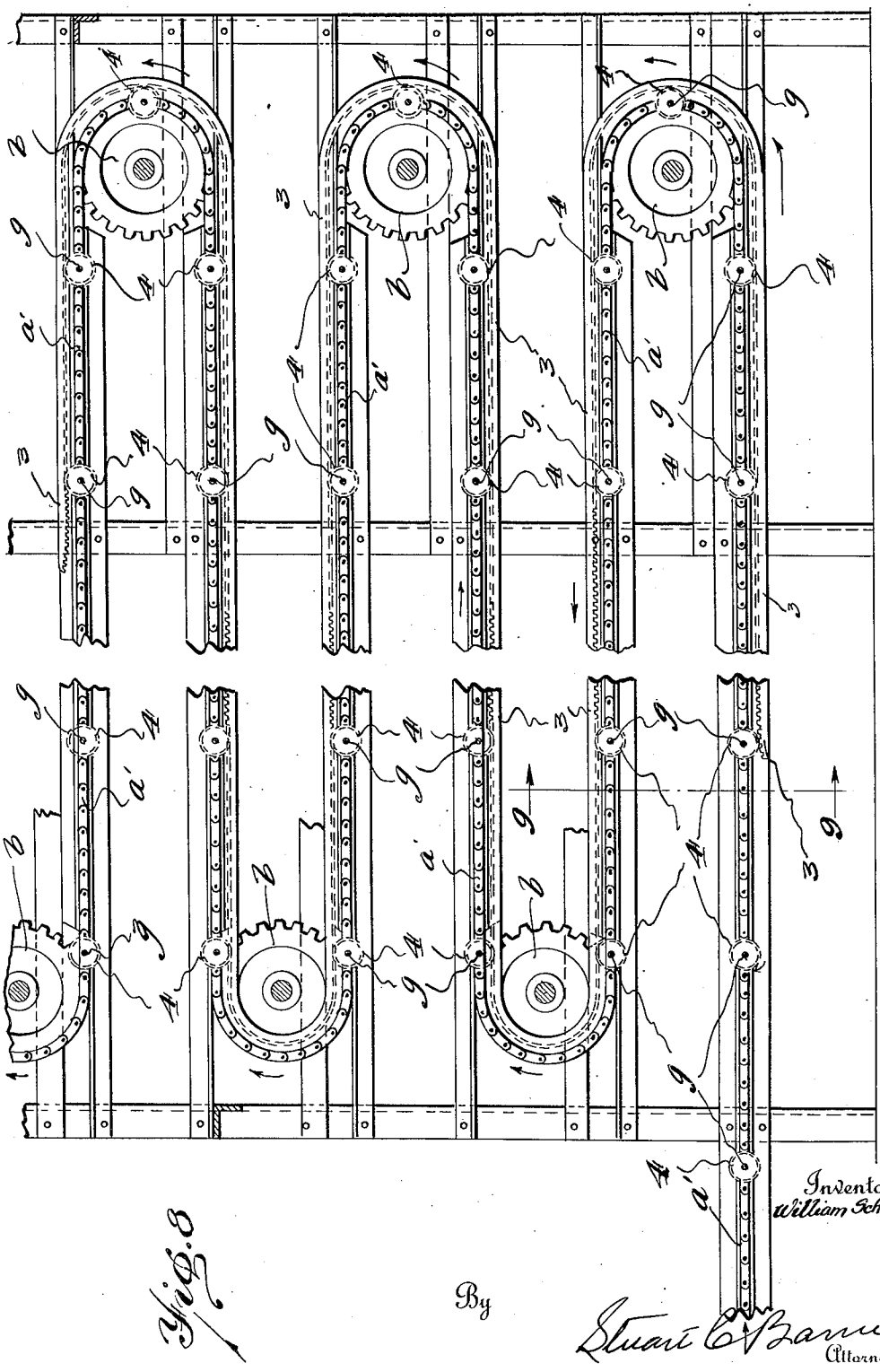


Fig. 8

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By

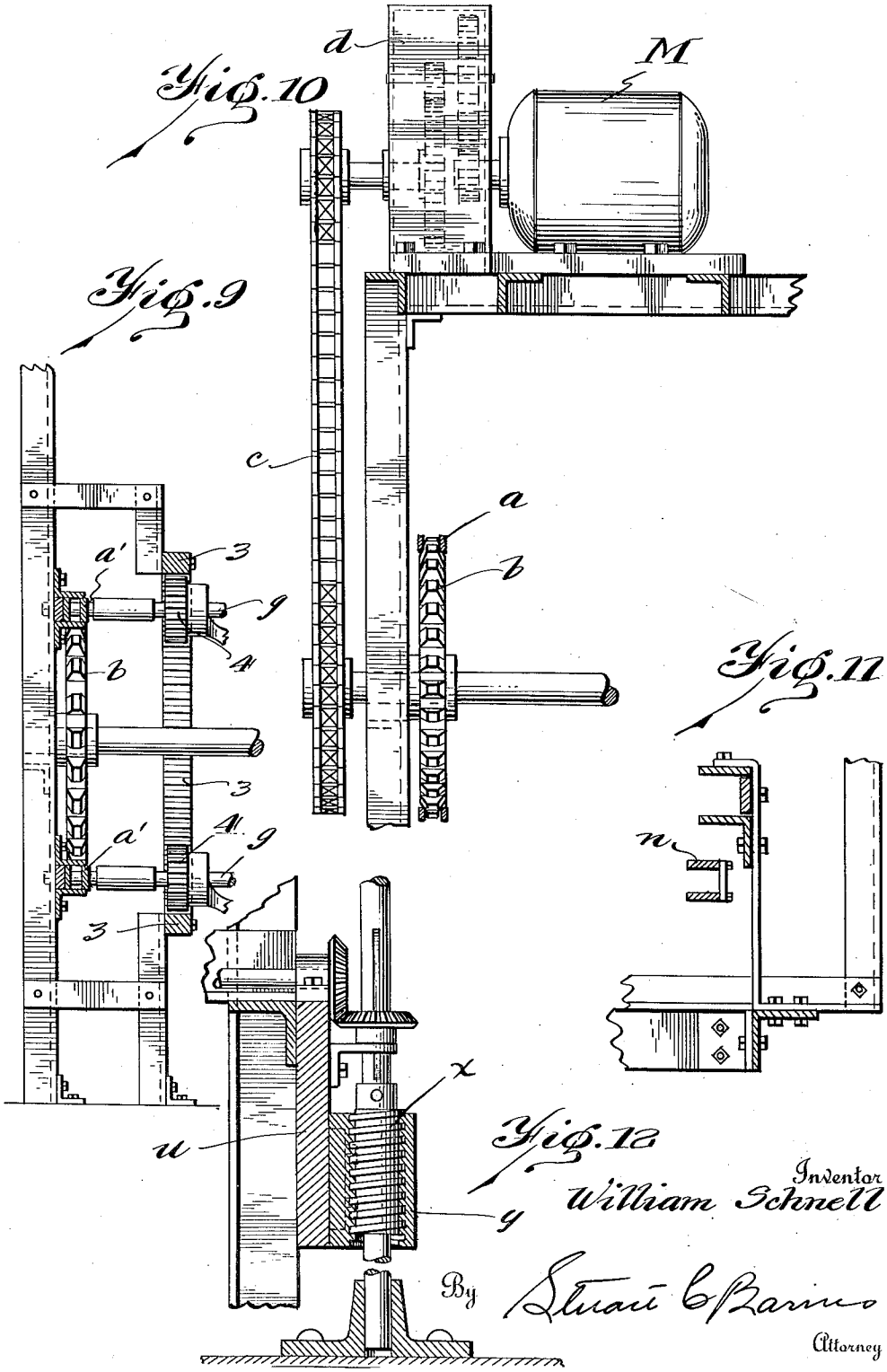
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MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES

Filed March 29, 1923 6 Sheets-Sheet 6




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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR DIPPING AUTOMOBILE DOOR HANDLES.

Application filed March 29, 1923. Serial No. 628,420.

This invention relates to a machine for dipping, distributing and drying articles in enamel, lacquer, or similar coating materials. It has for its object a machine by which gangs of articles such as door handles or grips, can be dipped in lacquer, enamel, etc., and the lacquer caused to be evenly distributed over the dipped surface and dried.

It is quite common to coat the handles of doors, especially closed automobile body doors, with a black coating of moulded and vulcanized rubber. Heretofore this has been done by molding operations which are obviously rather expensive. It is the object of the present invention to afford a machine for coating handles of this kind on a large production scale at a minimum cost and a maximum speed by dipping operations.

In the drawings:

Fig. 1 is a side elevation of a machine to accomplish this purpose.

Fig. 2 is a longitudinal fragmentary section of the machine showing the enameling pans at the front of the machine.

Fig. 3 is a plan view of the enamel pan conveyor unit.

Fig. 4 is a fragmentary view showing one of the carriers of which there are a large number.

Fig. 5 is a section on the line 5—5 of Fig. 4, showing the pin and guide at the front of the machine which holds the gang carrier from rotating as the gang carriers descend at the front of the machine.

Fig. 6 is a section on the line 6—6 of Fig. 4.

Fig. 7 is a fragmentary perspective of the bracket secured to one of the enameling pans.

Fig. 8 is a fragmentary longitudinal section of the lower portion of the machine shown in Fig. 1. This view gives an idea of the number of carriers that is used.

Fig. 9 is a section taken on the line 9—9 of Fig. 8.

Fig. 10 is a section taken on the line 10—10 of Fig. 1.

Fig. 11 is a section taken on the line 11—11 of Fig. 1.

Fig. 12 is a section taken on the line 12—12 of Fig. 3.

Referring to Fig. 1, the chain outline will be seen in side elevation. A conveyor chain *a* runs back and forth over the sprocket wheels *b* which are arranged in vertical staggered relation to cause the conveyor chain to rise one level at each looping over the sprocket. The upper right hand sprocket is driven by a chain *c* from the gear speed-reducing box *d*. (See Fig. 10.) This gear speed-reducing box connects with the motor M. The conveyor chain *a* as it leaves the top extends forward to the advanced sprocket wheel *e*, where it turns and runs down the machine at the front. The lower advanced sprocket *f* turns the chain which then runs back at the lowest level to the vertical stack of chain loops already referred to, afforded by the staggered vertically arranged sprockets *b*.

There are two chains, one on each side; the chain on the right hand side of the machine is designated *a* and is shown in Figs. 1 and 2. The chain on the left hand side of the machine is designated *a'* and is shown on Figs. 4 and 8. Cross rods *g* are riveted to links of the two chains *a* and *a'* at regularly spaced intervals (see Fig. 8). These cross rods support the carriers *h* which are castings provided with a plurality of hubs *i* to receive the sockets *j* that serve to grip the door handles or grips as shown in Fig. 6. These sockets are provided with rubber gripping blocks which will frictionally grip the squared spindle of the door handle when inserted. These carriers *h* are here shown so that each will carry 10 handle grips. The handles are inserted as shown in Figs. 2 and 6. The workman inserting the handles as the carrier advances down the front of the machine from the top advanve sprocket *e* to the bottom advanced sprocket *f*. The movement is relatively slow; in fact ordinarily the machine runs at such speed that it takes about 45 minutes for a gang holder to run once through the machine. Hence it will be apparent that a workman may easily insert the door handles in the sockets as the carrier runs down the front of the machine on the slow moving sprocket chains *a* and *a'*. In order to prevent the carrier from turning as it runs down the front of the machine, the large gear wheel *k* (Fig. 5) is provided with a pin and roller *m* which rides in the vertical guide way *n* so as to prevent the turning of the carrier when the door grips are thrust into the carrier by the operator. This vertical guide *n* is clearly shown in Fig. 2 as is also the roll *m*.

As the carrier leaves this guide *n*, it rounds the lower advanced sprocket *f*. As the carrier rounds the sprocket *f* it approaches one of the enameling pans *o*. The carrier and the handles turn with the chain. This brings the handles down into the enamel bath contained in the tray *o*. The tray *o* is caused to travel along with the handle immersed in the bath due to being carried on the conveyor chains *q* running over the sprockets *r* and *s*. After the tray has traveled some distance with the handle, the large sprocket wheel *k* engages the teeth of the rack *p*. This causes the rack to turn the handle and lift the same out of the bath. The handle will be suspended in a horizontally projected position which will allow it to discharge any excess material by dripping. This position is shown by the middle carrier in Fig. 2. After it has traveled along some distance, the pinion *k* will engage the second rack 1. This will turn over the carrier of the handles and thereby cause the excess enamel collecting at the then lower side of the handle to run to the newly presented lower side of the handle, securing a more even distribution and preventing too much of the enamel dripping off. A plurality of openings 2 are provided along the bar on which the racks 1 and *p* are mounted for adjusting the racks 1 and *p* along the bar to meet with conditions presented by different styles of handles. Hence it will be apparent that the time at which these rotating movements take place may be varied by the adjusting of the racks 1 and *p* along the supporting bar.

There are 4 trays *o* carried on the conveyor chains *q* hence this provides a tray for each carrier appearing on the main carrying chains *a* and *a'*, at the enameling location. The sprockets *r* and *s* are driven by a suitable spiral gear transmission *t* connecting with a shaft on which are supported the lower advanced sprockets *f*. This entire enamel pan conveyor unit is adjustable vertically as a unit on the slide *u* by means of the hand wheels *v*, the screws *x*, and the nuts *y*, bolted to the slide *u*. Hence the depth of submersion in the bath may be altered to suit the handle being treated.

Now referring to Fig. 8 it will be seen that on the left hand side of the machine, at the lower side of the run of chain is a long rack 3. This rack is below the run of chain as the chain travels rearwardly, and above the run of chain as it travels forwardly. This rack also rounds the ends of the sprockets (see Fig. 8). This rack is engaged by the small pinion 4 (see Fig. 4) secured to the left hand side of each carrier. This will reverse the revolving movement of the carriers and speed up the revolution, hence the carriers, each with its load of handles, starts traveling back and forth through the machine, rotating at a slow but constant speed, thereby continually changing the positions of the handle so that any tendency of the fluid enamel to run to one side, end, or portion of the handle, is avoided. In the meantime the coatings of enamel will dry and harden, as it takes anywhere from 30 minutes to an hour to run through the machine. I preferably run the speed of the machine at about 45 minutes per cycle of operations.

Preferably I use a quick drying enamel. At the completion of a cycle of operations of the machine, the pans are removed and a new enamel is substituted in another set of pans. I use the word "enamel" in its board significance to cover any suitable japan, varnish, celluloid or pyroxylin compound. For instance, I find it advisable on most handles to use about 5 coats; the first coat is preferably a priming coat and consists of preferably a liquefied celluloid, that is, celluloid dissolved in suitable solvents and which may be purchased on the market under the trade name of "Pyraline" manufactured by E. I. DuPont de Nemours Co., Inc., of Wilmington, Delaware. The next two coats are the same and are filler coats, using celluloid ⅓ and zinc ⅔ together with solvents and suitable coloring pigment. The fourth coat is the celluloid ⅔ and ⅓ zinc and solvent and suitable pigment. The last coat which is known as the "lacquer coat" is the liquefied celluloid and a black dye. These coats of material are given merely as an illustration of suitable enameling compounds that may be used in a machine of this kind.

I also find it advantageous to turn the handles one quarter of a turn in the sockets at each cycle of operation. This can be done automatically, or in this machine the operator does it by removing them as the carrier runs down the front of the machine, and reinserting each handle turning each a quarter of a turn. This aids in securing the best results in even distribution.

I use the term "orbitary" movement in the claims in the broad sense of in a prescribed path.

What I claim is:

1. In a machine for the purpose specified, the combination of means for affording a bath of enamel to a plurality of articles, automatic means for causing said articles to travel in gangs through and out of said bath, and means for slowly revolving said articles after they emerge from the bath to secure an even distribution of the enamel.

2. In a machine for the purpose specified, the combination of means for automatically giving a plurality of articles an enamel bath, and means for periodically giving the articles a slow revolution after they emerge from the bath.

3. In a machine for the purpose specified,

the combination of means for giving a plurality of articles an enamel bath, means for giving the articles a slow, revolutionary movement as they emerge from the bath, and means for reversing the revolutionary movement, and giving the articles a slow, revolutionary movement in the reverse direction, after the first revolutionary movement has ceased.

4. In a machine for the purpose specified, the combination of means for giving a plurality of articles an enamel bath, means for giving said articles a periodical slow, revolutionary movement as they emerge from the bath, and means for giving them a reverse, slow, revolutionary movement after such periodical movement for distributing the enamel evenly over the surface of the article as the enamel dries.

5. In a machine for the purpose specified, the combination of means for giving a plurality of articles an enamel bath, and means for giving the same a revolutionary movement as they emerge from the bath, the said last mentioned means being adjustable to time such revolutionary movement.

6. In a machine for the purpose specified, the combination of means for giving a plurality of articles an enamel bath, and means for giving the said articles a revolutionary movement as they emerge from the bath at periodical times, the timing of said periodical movements being variable by reason of the adjustability of said last mentioned means.

7. In a machine for the purpose specified, the combination of means for affording an enamel bath, and means for giving the articles to be enameled, an orbitary movement, revolutionary movement, and a reverse revolutionary movement while traveling through said bath and emerging therefrom.

8. In a machine for the purpose specified, the combination of means for affording an enamel bath, and means for giving the articles to be enameled an orbitary movement and also a revolutionary movement of two different speeds as the articles pass through the bath and emerge therefrom, said revolutionary speeds being calculated to compensate the tendency of the enamel to run and gather at one side.

9. In a machine for the purpose specified, the combination of means for affording an enamel bath, and means for giving the articles to be enameled, an orbitary periodical revolving movement, and a reverse higher speed revolving movement as said articles pass through the bath and emerge therefrom, said revolutionary speeds being calculated to compensate the tendency of the enamel to run and gather at one side.

10. In a machine for the purpose specified, the combination of a chain and carrier for giving a plurality of articles an orbitary movement after they have emerged from the bath, and a conveyor having a tray of enamel and operating in an automatic synchronized movement with the articles to submerge them in the enamel bath and travel along some distance with said article while submerged.

11. In a machine for the purpose specified, the combination of a conveyor chain having carriers supporting a plurality of articles revolvably, means by which the carriers may be rotated for distributing the enamel evenly while drying as they take an orbitary movement with the chain, and means for affording the articles carried by said carriers an enamel bath before they are revolved to distribute the enamel evenly in drying.

12. In a machine for the purpose specified, the combination of a conveyor chain, a plurality of carriers supporting a plurality of articles and having both an orbitary movement and a rotational movement, means for affording said rotational movement, and means for affording a traveling enamel bath for said articles as they move in their orbitary movement and revolve.

13. In a machine for the purpose specified, the combination of a conveyor chain, a plurality of rotating gang article carriers supported on said chain to rotate and provided with gear wheels, one or more racks by which the carriers may be rotated after the articles leave the bath by engagement of the gear wheels with the racks as the chain carries the carriers along, and means for affording an enamel bath to the articles mounted on the carriers.

14. In a machine for the purpose specified, the combination of a conveyor chain, a plurality of gang article carriers supported on the conveyor chain to rotate, said carriers provided with gear wheels, a pair of spaced racks supported along the path of travel of the chain whereby the carriers are caused to periodically rotate as they travel along, and means for affording the articles supported by the carriers an enamel bath as they travel along.

15. In a machine for the purpose specified, the combination of a chain conveyor, a plurality of carriers supported on the conveyor to rotate and arranged to support a plurality of articles to be enameled, and a second conveyor supporting a plurality of enamel trays coordinated with the first mentioned chain conveyor to bring an enamel tray into working proximity with each carrier and travel therealong to give the articles supported by said carrier an enamel bath.

16. In a machine for the purpose specified, the combination of a chain conveyor, a plurality of spaced carriers supported on said chain conveyor and arranged to carry a plurality of articles to be enameled, and

a second chain conveyor provided with a plurality of enamel containing trays, said second chain conveyor being coordinated with the first chain conveyor to place a tray of enamel into working proximity with each carrier as it passes the enameling location on the machine and travel along with said carrier.

17. In a machine for the purpose specified, the combination of a conveyor, a plurality of article carriers supported at spaced points along the conveyor, and a second conveyor provided with a plurality of enameling pans coordinated to bring an enameling pan into working proximity with each carrier as the same runs through the enamel location of the machine, and means for adjusting said enamel tray conveyor as a unit to alter the depth of submersion of the articles on the conveyor.

18. In a machine for the purpose specified, the combination of a chain conveyor, rotatable carriers supported on the conveyor, and a channel guide in which a portion of said carriers is engaged to prevent rotation at a certain location on the machine.

19. In a machine for the purpose specified, the combination of a plurality of carriers, each provided with a guide roll, a chain conveyor for supporting the said carriers to rotate, means for affording an enamel bath for said carriers, a channel shaped guide linearly directed on said machine, the said guiding rolls carried by the carriers engaging said guide to prevent the carriers rotating at a certain place on the machine.

20. In a machine for the purpose specified, the combination of a conveyor, a plurality of article carriers supported on the conveyor, a pair of sprockets, a conveyor chain and enamel pans supported adjacent to the first mentioned conveyor for affording the articles on the carriers of the first mentioned conveyor an enamel bath, and means for bodily lifting or lowering the second conveyor and sprockets for the purpose of altering the depth of submersion of said articles in the enamel bath.

21. In a machine for the purpose specified, the combination of means for dipping articles in an enamel bath and means for causing said articles to take a long circuitous path in drying and also to continuously revolve and then return to the enameling point.

22. In a machine for the purpose specified, the combination of means for giving articles an enamel bath, a chain conveyor and a plurality of carriers thereon, said carriers being rotatable on the chains, said chain conveyor arranged to carry the articles through the enamel bath thence through a circuitous path and finally return them to the enamel bath, and means for causing said carriers to slowly rotate in taking such circuitous path of travel after the articles have emerged from the bath.

In testimony whereof I affix my signature.

WILLIAM SCHNELL.