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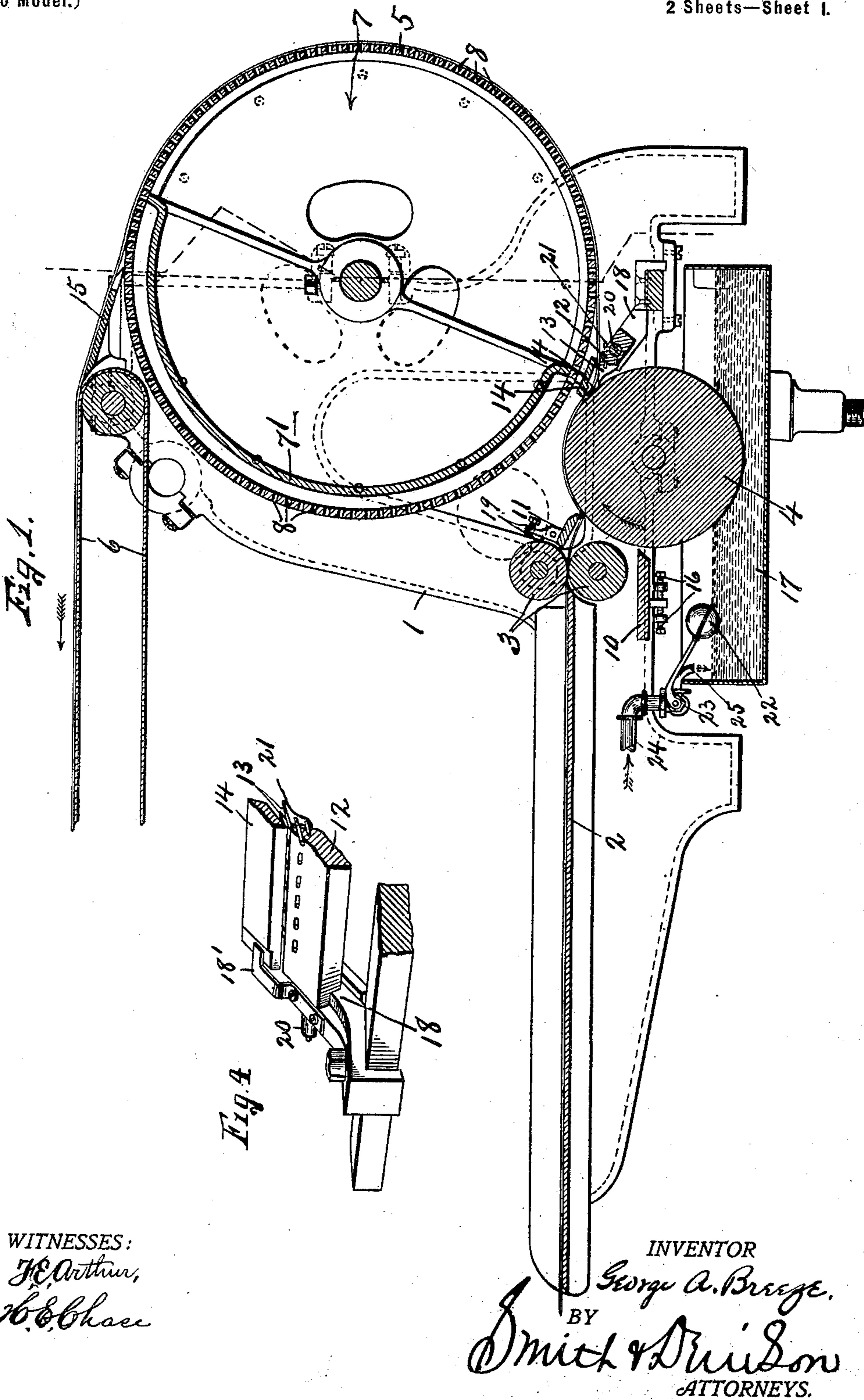
Patented May 6, 1902.

G. A. BREEZE.  
COATING MACHINE.

(Application filed July 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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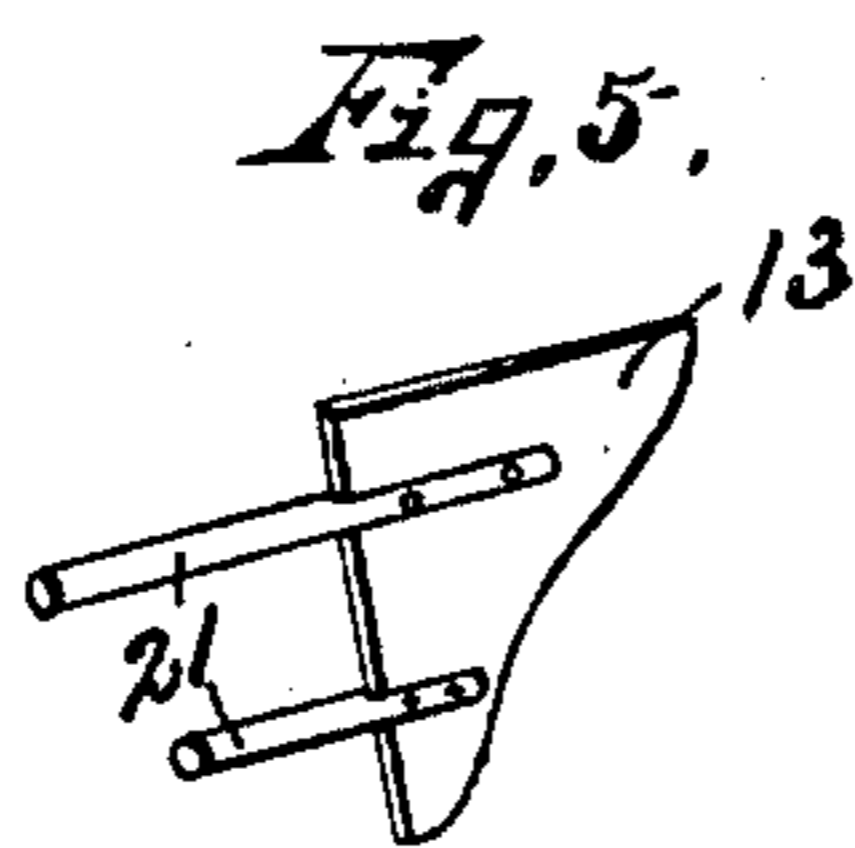
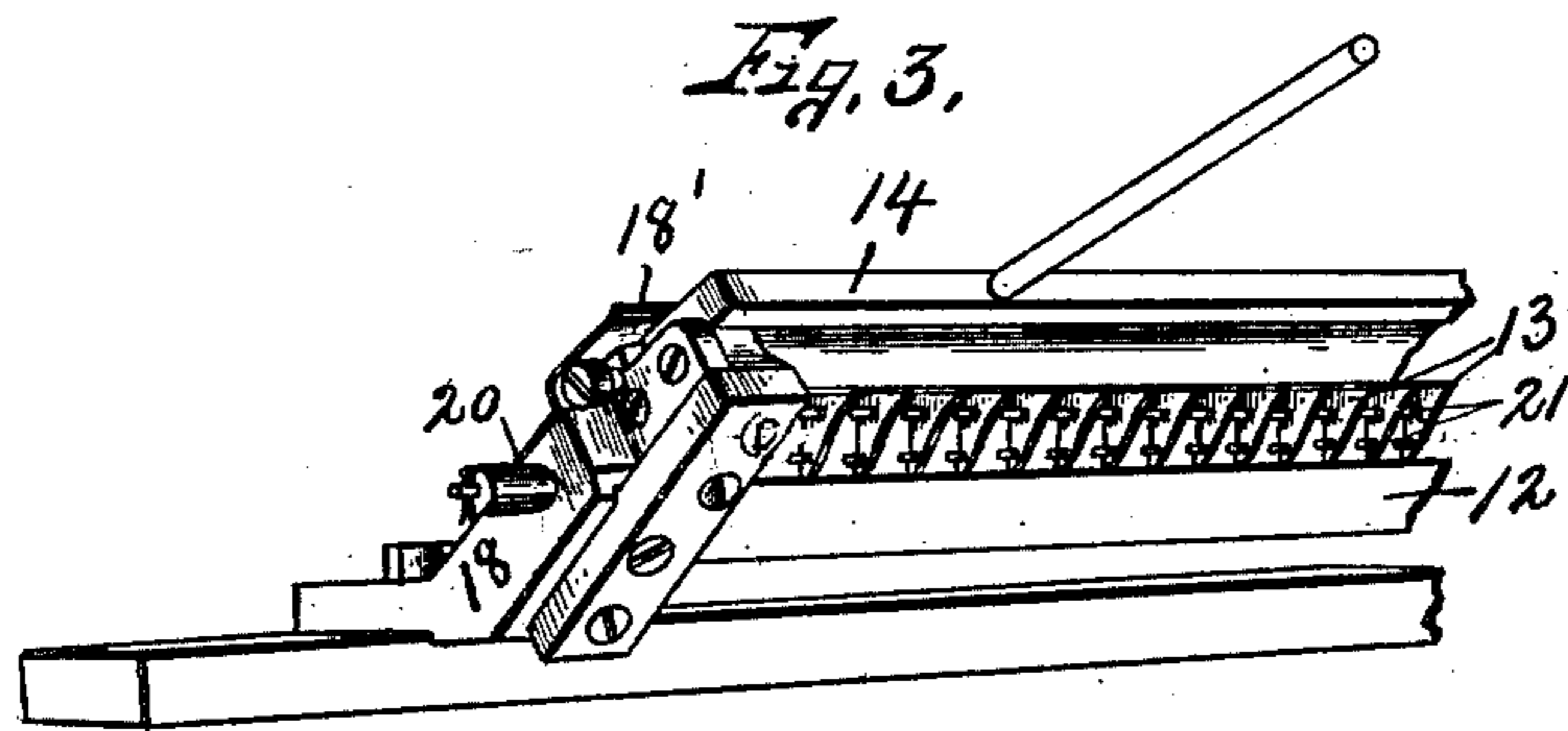
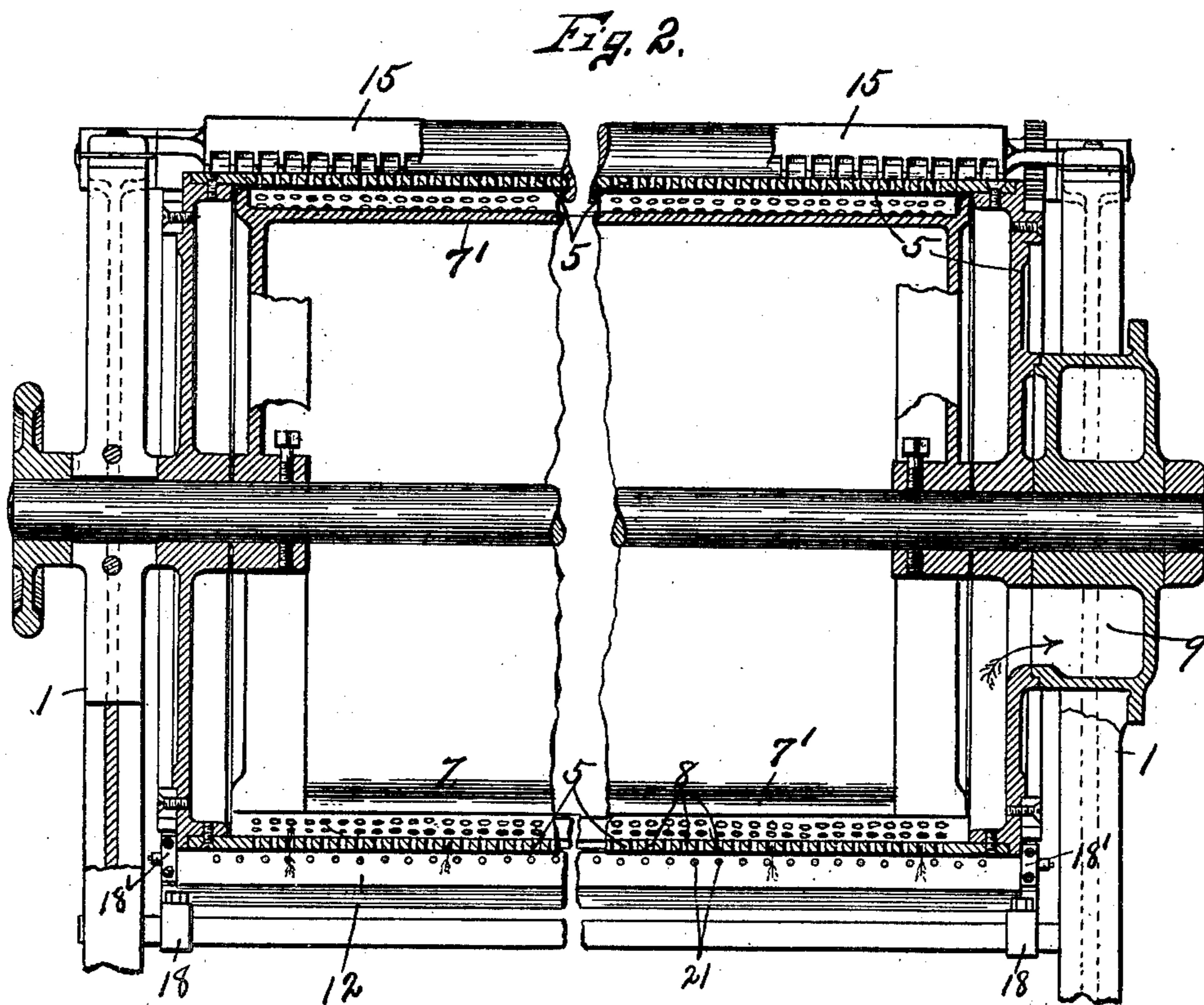
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# UNITED STATES PATENT OFFICE.

GEORGE A. BREEZE, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE  
WHITEHEAD & HOAG COMPANY, OF NEWARK, NEW JERSEY, A  
CORPORATION OF NEW JERSEY.

## COATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 699,612, dated May 6, 1902.

Application filed July 12, 1901. Serial No. 67,963. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. BREEZE, of Newark, in the county of Essex, in the State of New Jersey, have invented new and useful  
5 Improvements in Coating-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in  
10 coating-machines, and refers more particularly to that class of machines which is adapted to coat the surface or surfaces of paper, fabric, or other thin materials either in sheets or continuous sheets or rolls.

15 The object of this invention is to produce means, operating in conjunction with suitable feeding and coating mechanism, whereby the thickness of material adhering to the coating-roller may be uniformly gaged before  
20 being applied to the paper or other article.

Another object is to provide a suitable deflector-plate between the infeed and coating rollers for deflecting the article to be coated into contact with the coating-roller.

25 A further object is to provide suitable mechanism between the coating-roller and outfeed for deflecting the coated article from the coating-roller to the outfeed-roller and for gaging the thickness of the coating upon said  
30 article, the latter mechanism coöperating with a suitable guide or pressure bar for forcing the coated surface of the article against the scraper-gage.

A still further object is to provide a suitable  
35 stripper mechanism for deflecting the coated article from the outfeed-roller to a suitable drying belt or conveyer.

One of the essential requirements in machines of this character is to apply the coating evenly and uniformly throughout the  
40 whole or any part of the surface of the article to be coated and in such thickness or body as may be desired or as may be consistent with the weight or character of the material to  
45 which the coating is applied.

With the machines now in use it has been found extremely difficult to coat sheets or continuous strips of paper uniformly throughout the entire surface for the purpose of producing a smooth even surface in the finished  
50

product. Furthermore, considerable difficulty is experienced in deflecting the paper or other coated material from the coating-roller and also from the outfeeding-drum to the drying belt or conveyer. My improvements are designed to overcome these difficulties, and to this end the invention consists in the combination, construction, and arrangement of the parts of a coating-machine, as hereinafter fully described, and pointed out  
55 in the claims.

Referring to the drawings, Figure 1 is a longitudinal vertical sectional view of a portion of a coating-machine embodying my invention. Fig. 2 is a sectional view taken on line  
60 2 2, Fig. 1, showing particularly one end of the pneumatic outfeed-drum and the air-exhaust chamber connected thereto. Fig. 3 is an isometric view of a portion of the scraper-gage bar and a series of stripper-fingers  
65 mounted thereon. Fig. 4 is a rear view of a portion of one end of the scraper-gage and pressure-bar. Fig. 5 is an isometric view of one of the detached stripper-fingers.

Similar reference characters indicate corresponding parts in all the views.

In Fig. 1 I have shown a portion of a frame 1 of a coating-machine, upon which is mounted a suitable bed 2, feeding-rollers 3, a coating-roller 4, a pneumatic outfeeding-drum 5, and a conveyer-belt 6, all of which parts may be of any desired form, size, or construction for facilitating the feed of the material to be coated to and from the coating-roller and drying the same after said articles have been  
80 coated. Inasmuch as these parts are believed to be well known to those skilled in the art, it is thought that a further description or illustration is unnecessary, it being understood that the infeed and outfeed rollers or drums  
85 are arranged at opposite sides of the coating-rollers and that the conveyer or drying belt 6 is so disposed as to receive the coated articles from the upper face of the outfeeding-drum 5.  
90

The outfeeding-drum 5 is usually hollow for forming an interior air-suction chamber 7 and is provided with apertures 8, leading from the chamber 7 through the periphery of the drum, said air-chamber 7 being connected to a suit-  
95 100

able exhaust-chamber 9, in which a partial vacuum is maintained by any desired form of suction or vacuum pump. (Not shown.) A suitable damper or air-cut-off plate 7' is adjustably supported within the chamber 7, whereby the suction of air is only permitted through the portion of the apertures 8 between the scraper-gage 12 and deflector plate 15, the suction drawing the coated article against the drum as soon as it leaves the scraper-gage 12 and is neutralized for releasing the coated article just before reaching the deflector-plate 15.

Although I have shown a pneumatic out-feed for the coated articles which is adapted to draw the article into engagement with its periphery immediately upon its discharge from the coating-roller and to cut off the suction or neutralize the inequality of air-pressure in the chamber 7 just before reaching the point of deflection to the conveyer-belt, it is obvious that I may employ any other equivalent mechanism for conveying the coated articles from the coating-roller to the drier-belt and that other forms of mechanism may be employed for feeding the paper or other article to the coating-roller and from the drum 5.

My invention consists in providing a coating-machine with a scraper-bar 10, a deflecting-bar 11, a scraper-gage 12, provided with stripper-fingers 13, a guide or pressure bar 14, and a stripper-bar 15, all of which are mounted and arranged as hereinafter described. The scraper-bar 10 may be of any desired material and preferably consists of a thin metal bar mounted on the frame 1 beneath the feed-rollers 3 and adapted to regulate the thickness of the coating material upon the roller 4 before being applied to the article being coated. I therefore provide means, as screws 16, for adjusting the plate or bar 10 toward and away from the periphery of the coating-roller 4, the forward end of said plate or bar being usually beveled downwardly away from the periphery of the roller and serves to break any air-bubbles in the coating material and to force the superfluous coating backwardly into the supply-tank, as 17. This bar 10 is preferably of sufficient length to regulate the thickness throughout the entire length of the coating-roller, and being arranged as above described it is evident that only a predetermined amount of coating material may be conveyed or applied to the surface of the paper to be coated. The deflector-bar 11 may also be of any desired form or size and usually consists of a metallic plate adjustably mounted on the frame between the infeed and coating rollers and is adapted to engage the upper or uncoated surface of the article to be coated.

The infeed-rollers 3 are usually arranged to feed the articles to be coated in a line substantially tangential to the periphery of the coating-roller 4, and the deflector-plate 11 is preferably adjusted to deflect the paper or other article downwardly against the surface

of the coating-roller as said article is fed forwardly, thereby insuring a perfect contact of the paper or other article with said coating-roller, it being understood that this bar is also of sufficient length to insure a perfect contact of the full width of the article to be coated with the coating-roller. Any desired adjusting means, as 19, may be employed for deflecting the plate at any desired angle, and thereby causing more or less lap of the article to be coated upon the coating-roller, and at the same time insuring a perfect contact of said article throughout its entire width.

The scraper-gage 12 is arranged in proximity to the face of the coating-roller opposite to that of the deflecting-plate 11, or, in other words, between the coating-roller and the outfeed-drum 5, this bar being also formed of metal and of sufficient length to scrape the entire coated surface transversely for the purpose of regulating or gaging the thickness of the coating upon the surface of the paper or other article. In order to insure a perfect contact of the coated surface with the scraper-gage 12, I usually provide the pressure-bar 14, which is adjustably mounted on the frame and is movable toward and away from the edge of the scraper-gage for the purpose of varying the thickness of the coating. This gage 12 is preferably mounted upon a spring-bolt 20 for the purpose of holding the scraper-gage in position, said bolt being mounted in brackets 18, which in turn are secured to a suitable cross-bar forming a portion of the frame 1. The pressure-bar 14 is yieldingly supported on said brackets 18 and is forced toward the gage 12 by a spring or springs, as 18', Figs. 3 and 4.

The stripper-fingers 13 are arranged between the coating-roller and scraper-gage 12 and consist of substantially thin pieces of sheet metal arranged in separated relation to each other, each being provided with studs or pins 21, adapted to enter suitable sockets or apertures in the bar 12 for holding the stripper-fingers in position and permitting their removal independently of each other whenever desired. This construction and arrangement of the stripper-fingers permit any superfluous material to fall between the fingers and into the reservoir 17, these stripper-fingers being so arranged as to deflect the coated paper or other article from the coating-roller 4 toward or into engagement with the lower face of the drum 5, by which the coated paper is taken up by suction through the apertures 8 and conveyed to the drier-belt previously mentioned. The stripper-fingers 13 are so arranged relative to the bar 12 as to permit a slight forward-and-backward movement and are generally pointed at their forward ends nearest the periphery of the coating-roller and arranged in close proximity to said periphery for insuring the deflection of the coated article from the coating-roller to the conveyer-drum.

The stripper-bar 15 is also mounted on the

frame 1 between the drum 5 and drier-plate 6, and while I have shown this stripper-plate as consisting of a flat bar having its edges adjacent to the upper face of the drum 5 provided with suitable stripper-fingers formed integral therewith it is apparent that, if desired, I may use fingers similar to those mounted on the bar 12, although it will be noted that the fingers 13 engage the coated surface of the article and that the stripper-bar 15 is adapted to engage the uncoated surface of said article, and it is therefore unnecessary to provide said bar with stripper-fingers, as this bar may consist of a solid plate, its purpose being more to deflect the paper or other coated article from the conveyer-drum 5 to the drier-belt 6, and may be adjustable along the periphery of the conveyer-drum 5; if desired, in order to deflect the coated paper or other article from the drum at about the same time or just after the vacuum or suction is neutralized in the chamber 7.

The reservoir 17 is arranged to supply the coating to the coating-roller 4, said coating-roller having its lower face movable in the body of coating material in said reservoir, which material adheres to the surface of the coating-roller and is conducted thereby to the surface of the article to be coated. Any coating material—such as varnish, shellac, or any cellulose substance—may be applied to the paper or other article to be coated in the manner above described, and in order to maintain a suitable quantity of the coating material in the reservoir 17 I usually provide a float 22, connected to a valve 23 of a supply-pipe 24, whereby when the quantity of the coating material is reduced the valve is opened and discharges through a suitable outlet 25 into the reservoir 17.

In the operation of my invention the articles to be coated are fed along the bed 2 to the feed-rollers 3, from which said article is deflected to the coating-roller 4 and carried thereby to the stripper-fingers 13, which in turn deflects the coated article to the conveyer-drum 5. The suction created through the apertures in the peripheral wall of the chamber 7 of said drum draws the paper or other article against the periphery of the drum, whereby it is conveyed to a point in proximity to the deflector-plate 15. The vacuum being then neutralized, the coated paper is released and on account of the coated outer surface naturally turns outwardly from the drum and is deflected toward and onto the drying-belt 6 by said deflector-plate 15. Prior to this operation the scraper-bar 10 is adjusted to effect the desired thickness of coating to be applied to the articles, and after leaving the coating-roller the scraper-gage 12 and pressure-bar 14 produce an even and smooth surface on the coating preparatory to its being conveyed to and dried upon the belt 6. The operation of my invention will now be readily understood upon reference to the foregoing description and the ac-

companying drawings, and it will be noted that the various elements of my invention are particularly simple in construction and operation, can be manufactured at a minimum cost, and applied to any machine.

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

1. In a coating-machine, a supply-tank and coating-roller movable therein, in combination with an adjustable deflector plate or bar for forcing the article to be coated into contact with the roller.

2. In combination with a supply-tank, coating-roller and means for feeding the article to be coated to the upper face of the coating-roller, an additional roller above the coating-roller for feeding the coated article from the coating-roller, and stripper-fingers for deflecting the coated article from the coating-roller to the latter feeding-roller.

3. In combination with a supply-tank, coating-roller and means for feeding the article to be coated to the coating-roller, additional means for feeding the coated article from the coating-roller and a scraper-gage between the coating-roller and latter feeding means for evening the coated surface of the article.

4. In combination with a supply-tank, coating-roller and means for feeding the article to be coated to the coating-roller, additional means for feeding the coated article from the coating-roller and a scraper-gage between the coating-roller and latter feeding means for evening the coated surface of the article, and a guide or pressure bar for forcing the coated surface of the article against the scraper-gage.

5. In combination with a supply-tank, coating-roller and means for feeding the article to be coated to the coating-roller, additional means for feeding the coated article from the coating-roller and a scraper-gage between the coating-roller and latter feeding means for evening the coated surface of the article, and an adjustable guide or pressure bar engaged with the uncoated surface of said article for forcing the coated surface against the scraper.

6. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, a scraper-gage between the coating-roller and outfeed-roller for scraping the coated surface, and stripper-fingers between the gage and coating-roller for the purpose set forth.

7. The combination with a tank for the coating material, coating-roller having its lower face movable in the tank; feed-rollers arranged to feed the article to and from the upper face of the coating-roller, and independently-removable stripper-fingers beneath said article for deflecting the coated article from the coating-roller to the outfeed-roller.

8. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, a scraper-gage between the coating-roller and an outfeed-roller for scraping the coated surface, and

stripper-fingers adjustably mounted on the scraper-gage for the purpose described.

9. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, a scraper-gage between the coating-roller and an outfeed-roller for scraping the coated surface, independently-movable stripper-fingers between the gage and coating-roller for the purpose set forth, and a guide or pressure bar engaging the uncoated surface for forcing the coated surface against the scraper-gage.

10. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, the outfeed-roller being in a plane above the coating-roller, a deflector-plate for forcing the article downwardly from the infeed against the coating-roller, and stripper-fingers for deflecting the coated article upwardly from the coating-roller to the outfeed.

11. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, the outfeed-roller being in a plane above the coating-roller, a deflector-plate for forcing the article downwardly from the infeed against the coating-roller, and independently-movable stripper-fingers for deflecting the coated article upwardly from the coating-roller to the outfeed.

12. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, a deflector-plate for forcing the article from the infeed against the coating-roller, and stripper-fingers for deflecting the coated article from the coating-roller to the outfeed, and a scraper-gage between the strippers and outfeed-roller for equalizing the thickness of the coating.

13. The combination with a tank for the coating material, a coating-roller having its lower portion movable in the tank, feed-rollers arranged to feed the article to and from the coating-roller, a scraper having a beveled

edge inclining downwardly away from the coating-roller and arranged to regulate the thickness of the coating on the coating-roller before being applied to the article and to break the air-bubbles in the coating, a plate or bar for deflecting the article downwardly from the infeed to the coating-roller, and stripper-fingers for deflecting the coated article upwardly from the coating-roller to the outfeed.

14. The combination with a coating-roller and feed-rollers arranged to feed the article to and from the coating-roller, of a drier belt or conveyer to receive the coated article from the outfeed-roller, and a stripper arranged to deflect the coated article from the latter roller to the belt.

15. A coating-machine comprising a coating-supply tank, means for maintaining a predetermined level of coating material in said tank, a coating-roller having a portion thereof movable in the coating material of the tank, infeed-rollers for feeding the articles to be coated to the coating-roller, an adjustable scraper-bar arranged to regulate the thickness of the coating adhering to the coating-roller before being applied to the article, an adjustable deflector-plate between the infeed and coating rollers for forcing the article into contact with the coating-roller, stripper-fingers for deflecting the coated article from the coating-roller to the outfeed-roller, a scraper-gage for smoothing and regulating the thickness of the coating on the article after leaving the stripper-fingers, a drier-belt, and a second stripper for deflecting the coated article from the outfeed-roller to the belt.

In witness whereof I have hereunto set my hand this 24th day of June, 1901.

GEORGE A. BREEZE.

Witnesses:

L. G. GREEN,  
WM. A. JONES.