(No Model.)

E. H. RYON.

WATCH DIAL ENAMELING MACHINE.

No. 459,968. Patented Sept. 22, 1891.

FIG. 1.

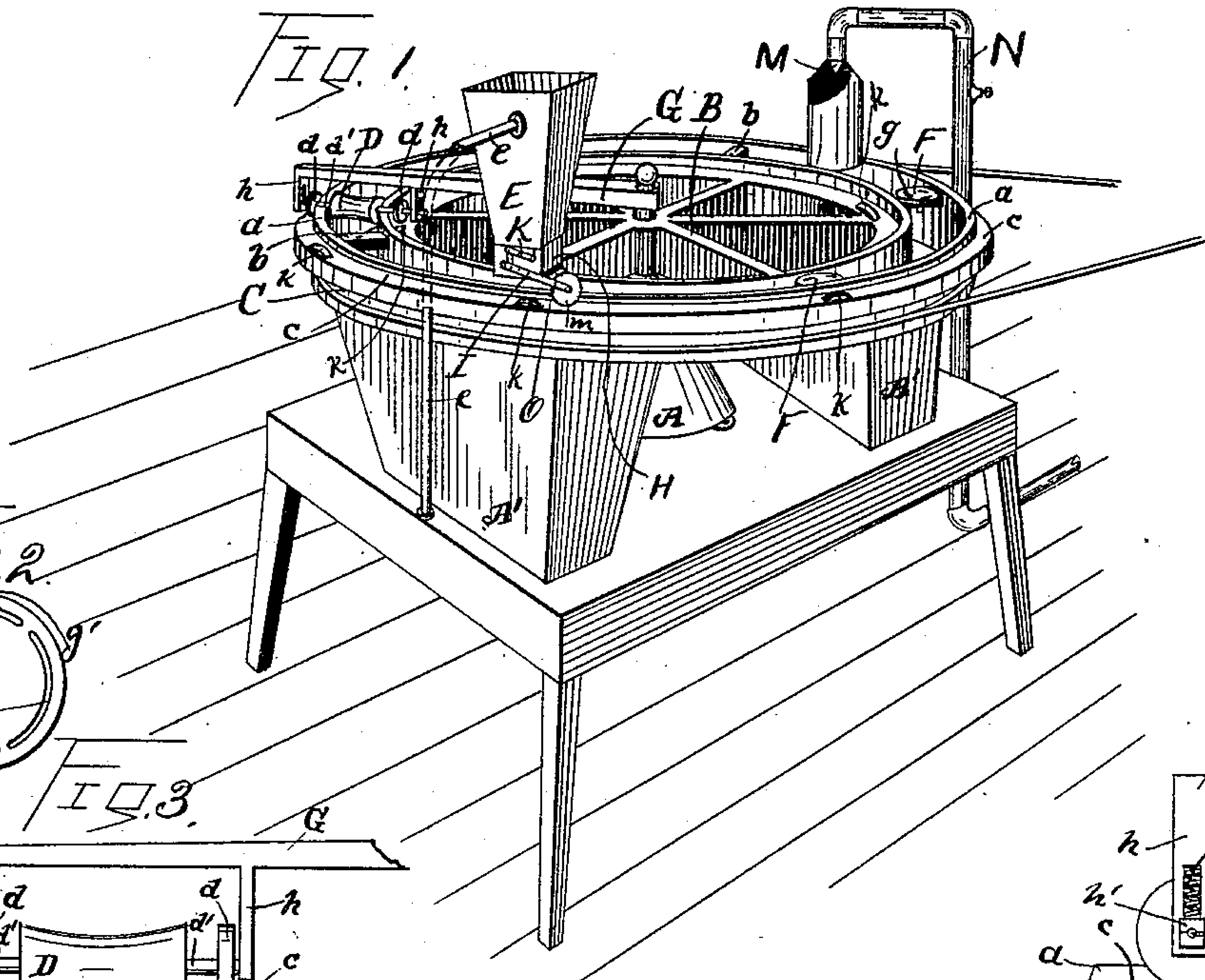


FIG. 2.

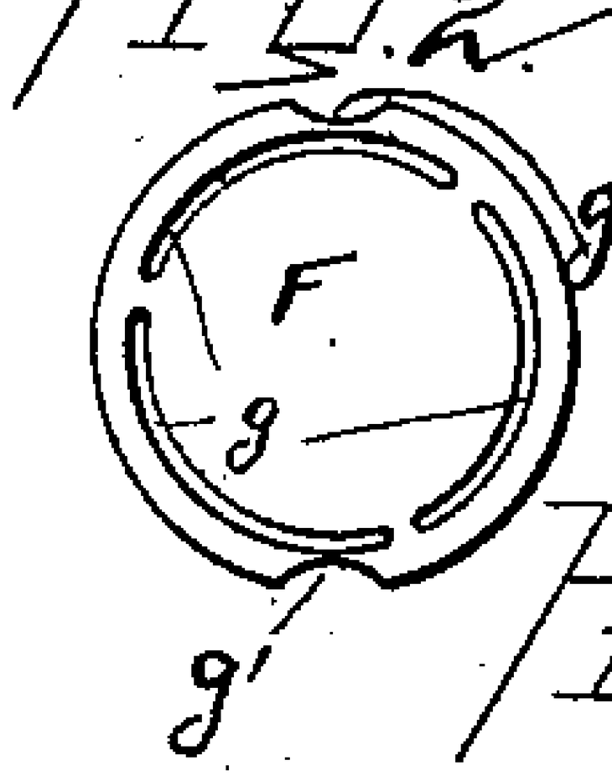
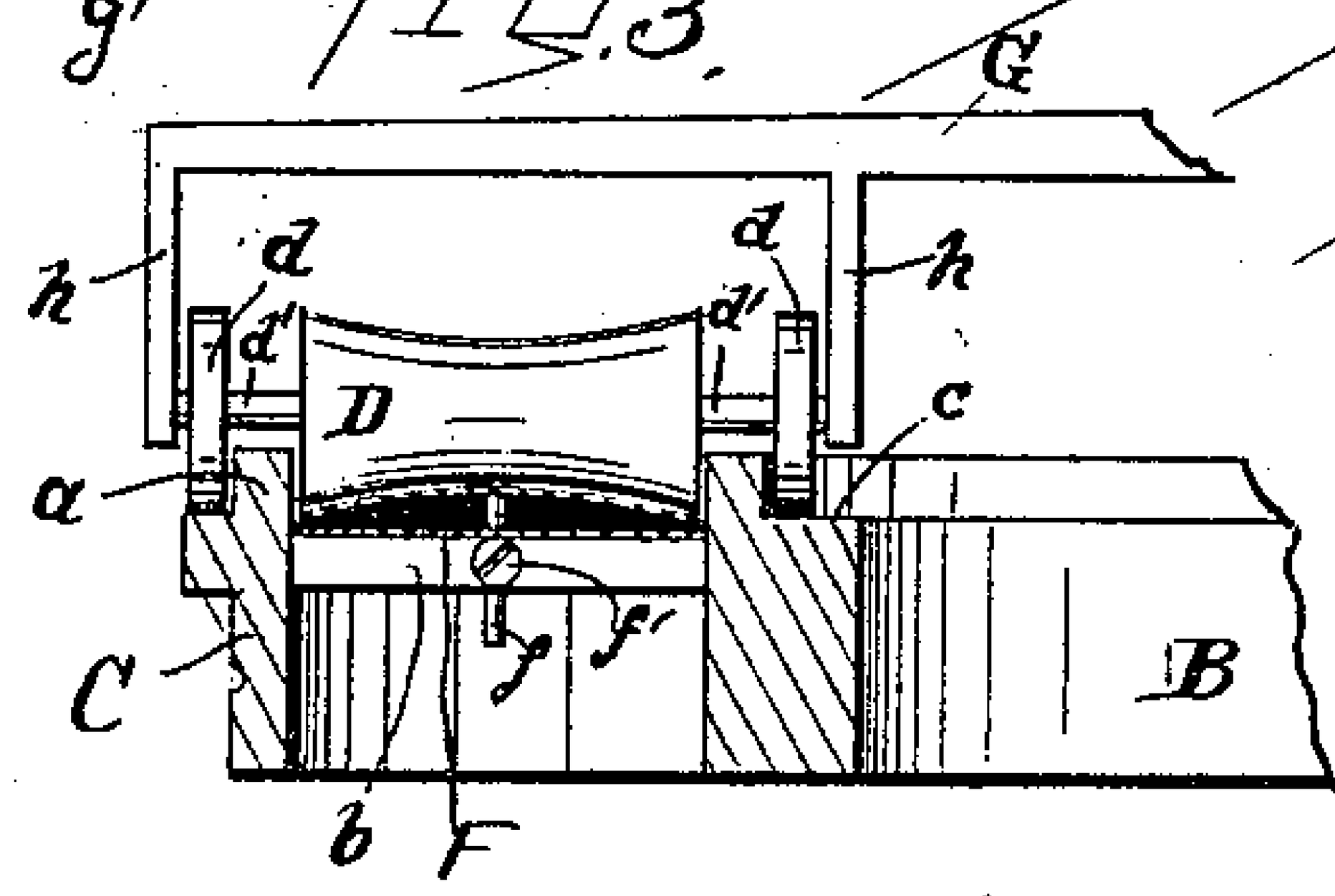


FIG. 3.



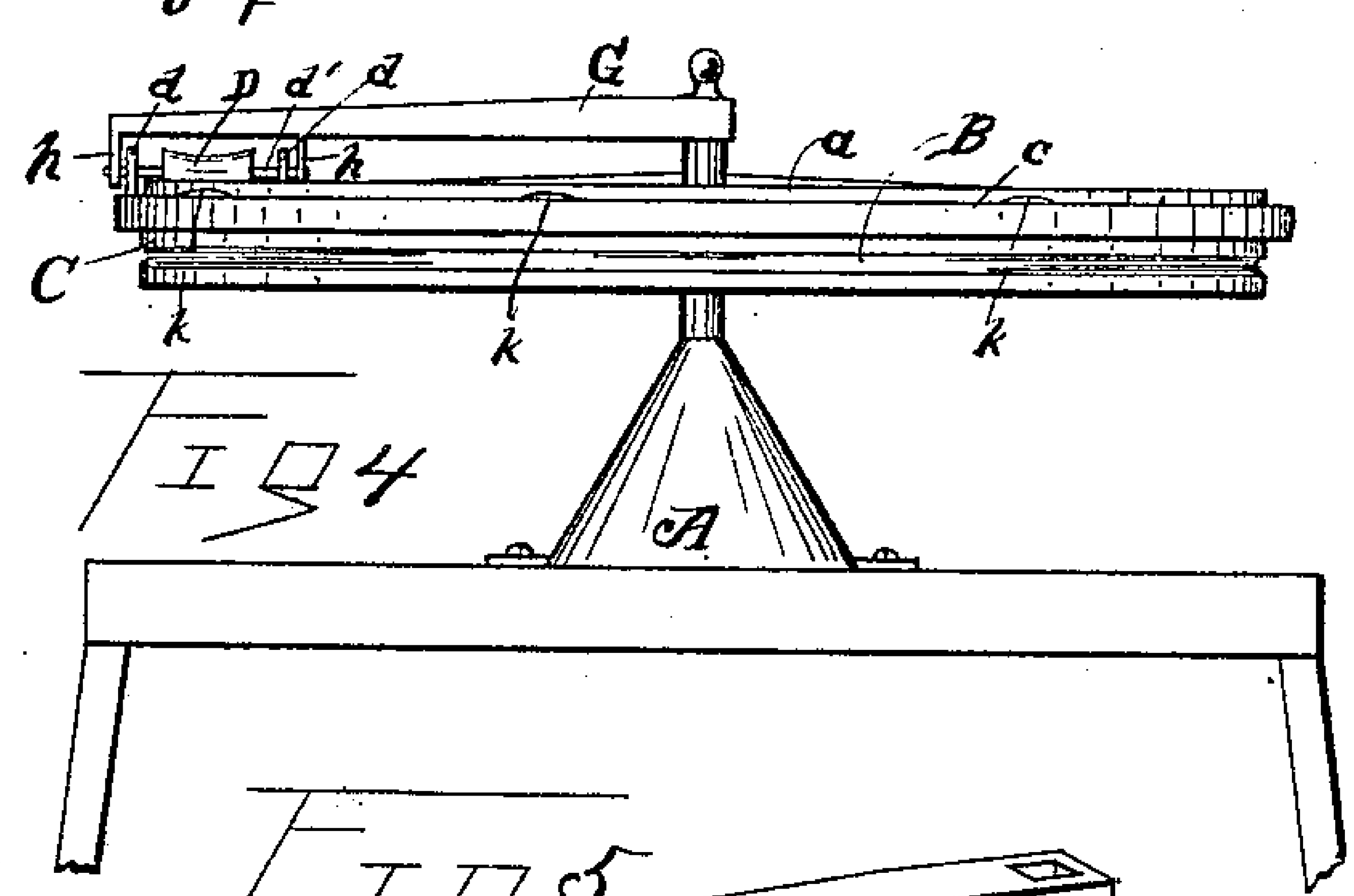


FIG. 4

FIG. 5

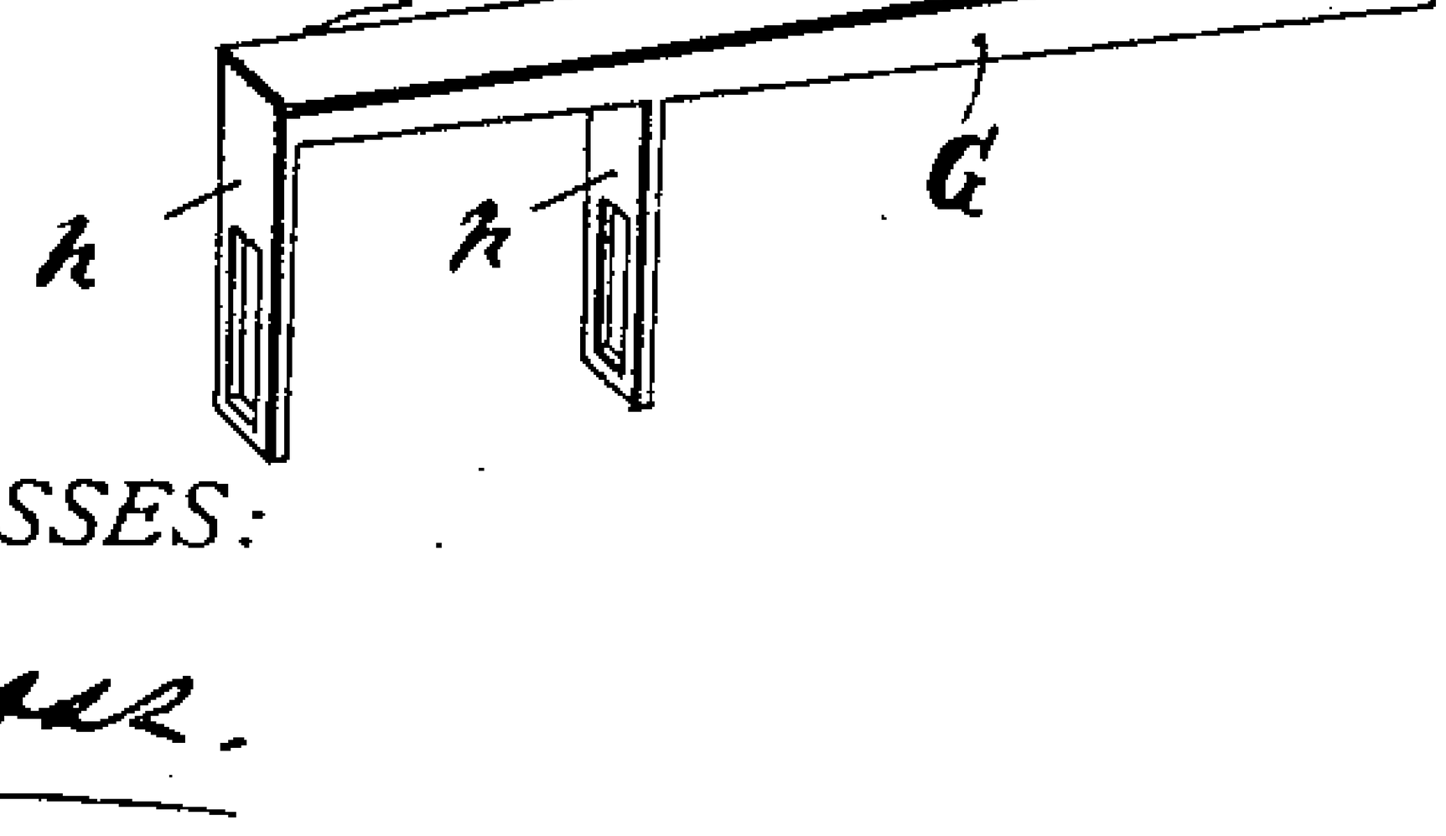


FIG. 6

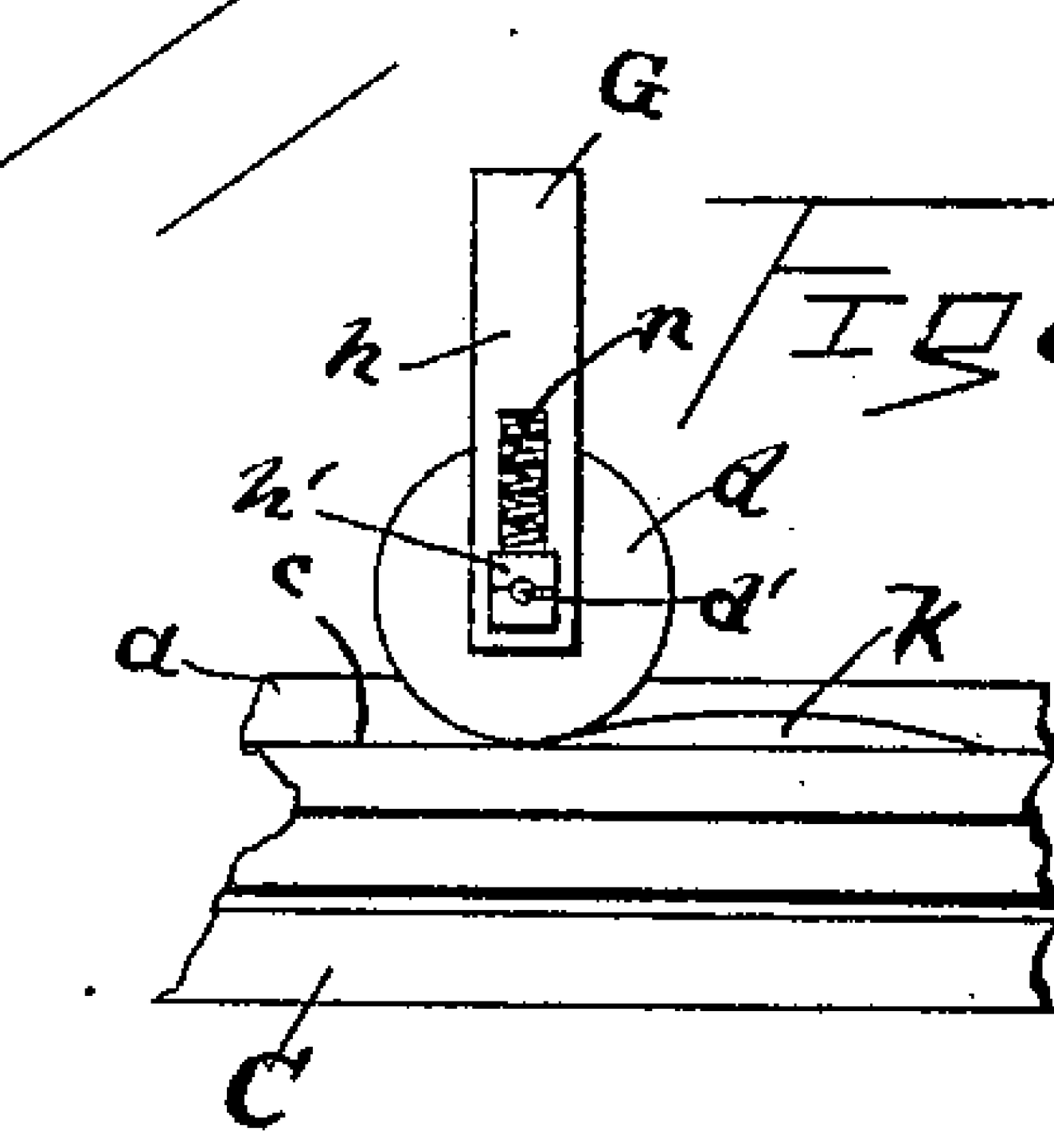


FIG. 7.

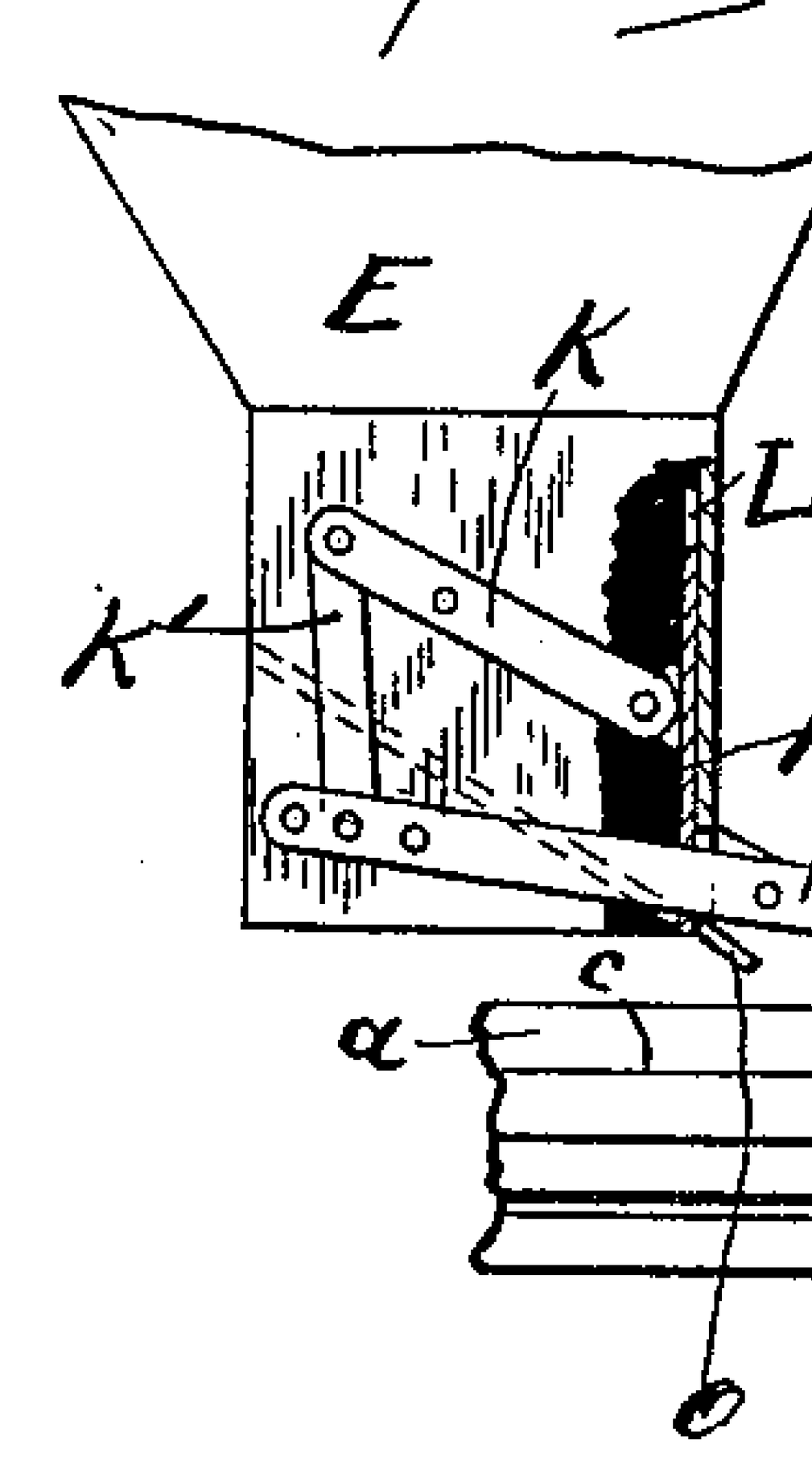
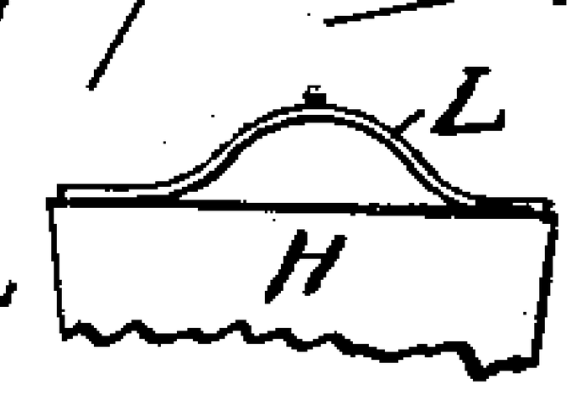


FIG. 8.



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UNITED STATES PATENT OFFICE.

EPPA H. RYON, OF AURORA, ILLINOIS.

WATCH-DIAL-ENAMELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 459,968, dated September 22, 1891.

Application filed April 18, 1891. Serial No. 389,448. (No model.)

To all whom it may concern:

Be it known that I, EPPA H. RYON, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Watch-Dial-Enameling Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a perspective view of the machine. Fig. 2 is a detached view of the dial-plate-holding disk. Fig. 3 is a view of the enamel-roller, showing a portion of its supporting-arm, and a sectional view of a portion of the horizontal wheel. Fig. 4 is an edge view of the horizontal wheel, showing the enamel-roller and its arm, also showing the support for the horizontal wheel. Fig. 5 is a detached view of the enamel-roller-supporting arm. Fig. 6 is a view of a portion of the horizontal wheel, showing the location of one of the enamel-roller-operating wheels. Fig. 7 is a side view of the lower portion of the enamel-hopper, also showing a portion of the horizontal wheel and the mechanism for operating the enamel cut-off. Fig. 8 is a detached view of a portion of the enamel cut-off, showing its spring.

The present invention has relation to watch-dial-enameling machines; and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, A represents the horizontal wheel-support, the bottom or lower end of which is securely attached in any convenient and well-known manner to a table or bench. To the support A is journaled the horizontal wheel B, which is located substantially as illustrated in Fig. 1, and, as shown, the wheel is provided with the vertical flanges *a*, which are for the purpose hereinafter described. The outer flange *a* is formed upon the ring C, which ring forms a part of the horizontal wheel B, and is fixed to said wheel B by means of the connecting-bars *b*. The ring C and the wheel B are provided with the tracks or ways *c*, which are for the purpose of communicating rotary motion to the enamel-roller D by means of the wheels *d* and the shaft *d'*. Between the tracks or ways *c* is located the bottom or lower end of the enamel-hopper E, said hopper extending nearly to said tracks or ways *c* and the vertical flanges *a*. The hopper E is for the purpose of holding the enamel designed to be distributed upon the dial-plates, and it is held in the desired position by means of the arm *e* or its equivalent. To the connecting-bars *b* are adjustably attached the dial-plate-holding disks F by means of the arms *f* and the set-screws *f'*, said dial-plate-holding disks being located between the vertical flanges *a*, as illustrated in Fig. 1. For the purpose of preventing the dial-plates from becoming accidentally displaced after they have been located upon the said holding-disks F the grooves *g* are provided, which grooves are for the purpose of receiving the posts of the dial-plates.

For the purpose of providing a means for easily removing the dial-plates from the holding-disks F after they have been enameled the notches *g'* are provided, which enables the operator to grasp the periphery of the dial with his thumb and finger without interfering with the holding-disk. To the support A is secured the arm G, which arm is located above the horizontal wheel B, as illustrated in Figs. 3 and 4. This arm G is provided with the grooved arms *h*, which arms are for the purpose of receiving and holding the sliding boxes *h'*, said sliding boxes being for the purpose of holding the shaft *d'* and the enamel-roller D in proper position.

It will be understood that any desired number of holding-disks F may be attached to the horizontal wheel B, the number corresponding with the size of the wheel B.

The enamel-roller D is concaved, as illustrated in Figs. 3 and 4, the concavity of said roller corresponding with the convexity of the dial-plate. It will be understood that in the event it is desired to enamel straight dial-plates the roller D should be straight. For the purpose of causing the roller D to move upward as the dial-plate passes under said roller the elevations *k* are provided and are located upon the tracks or ways *c*, one upon each side of the holding-disks F. The curva-

ture of the elevations *k* correspond with the curvature of the dial-plate that is to be enameled.

To the front side of the hopper E is attached the sliding cut-off H, which cut-off may be held in the desired position by means of grooves located in the sides of the hopper E, the manner of holding the cut-off being immaterial. It will be understood that when the cut-off H is elevated the enameling contained in the hopper E will be released and free to fall. For the purpose of automatically elevating the cut-off H the lever I is provided, which is pivoted to the side of the hopper E or its equivalent. One end of the lever I is provided with the wheel *m*, which is so adjusted that it will be elevated by means of the elevations *k*, which in turn elevates the wheel end of the lever I and lowers the opposite end of said lever, carrying with it the inner end of the lever K by means of the link K′, which elevates the opposite end of said lever K and carries with it the cut-off H, said cut-off being pivotally attached to the lever K.

In use the plates designed to be enameled are placed upon the holding-disks F and the wheel B, together with its different attachments, rotated, carrying with it the dial-plates. As the wheel B is rotated the elevations *k* in turn come under the wheel *m*, which elevates the cut-off H, as above described, and allows enamel to fall upon the dial-plate as it passes under said cut-off, after which the plate having the enamel upon it passes under the roller D, which roller gives the enamel the desired configuration. It will be understood that the wheel B may be rotated by hand or power, as desired. For the purpose of automatically closing the cut-off after it has been elevated the spring L is provided, which spring is preferably attached to the hopper E, and its free ends press or bear against the top or upper edge of the cut-off H, as illustrated in Fig. 8. For the purpose of giving the desired amount of pressure to the roller D the sprirgs *n* are provided, said springs being compressed as the elevations *k* pass under the wheels *d*. For the purpose of dampening the enamel after it has been properly distributed upon the dial-plates, the spray M is provided, which may be of any desired construction and is attached to the water-pipe N in any convenient and well-known manner, and is located above the dial-holding disks F, substantially as illustrated in Fig. 1. For the purpose of removing any surplus enamel from the dial-plates the scraper O is provided, and is so adjusted that it will scrape all surplus enamel from the dial-plates as they pass under it. The vertical flanges *a* are for the purpose of preventing the enamel from falling upon the tracks or ways *c*, and thereby keeping said tracks or ways clean. For the purpose of holding the surplus enamel and water the pans A′ or their equivalents are provided, and are so located that they will receive the enamel and water. In Fig. 3 a dial-plate is shown properly placed upon a holding-disk and the position of the roller as it passes over said dial-plate. For the purpose of preventing the dial-plates from tilting as they enter under the roller D, the holding-disks F are formed flat upon their top or upper sides.

In the drawings only one device is shown for elevating the cut-off H; but it will be understood that two sets may be employed, if desired, one set located upon each side of the hopper E.

For the purpose of bringing the enamel to the front side of the hopper E its bottom should be inclined, as illustrated by the dotted lines in Fig. 7. It will also be understood that the scraper O may be located at any desired point between the hopper E and the roller D, as it is immaterial as to the point or place where the enamel is scraped off. The only object in view is to locate the scraper O over one of the pans A′.

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

1. The combination of the wheel B, provided with the ring C, the connecting-bars *b*, the vertical flanges *a*, located between the tracks or ways *c*, the tracks or ways *c*, the disks F, and the hopper E, substantially as and for the purpose specified.

2. The combination of the horizontal wheel B, carrying the holding-disks F, the enamel-hopper E, and the arm G, carrying the roller D, substantially as and for the purpose specified.

3. The combination of the wheel B, provided with tracks or ways *c*, the arm G, provided with the grooved arms *h*, the sliding boxes *h′*, the shaft *d′*, the wheels *d*, the springs *n*, and the roller D, substantially as and for the purpose specified.

4. The combination of the wheel B, carrying the disks F, provided with the tracks or ways *c*, provided with the elevations *k*, the enamel-roller D, and means for rotating said roller, substantially as and for the purpose specified.

5. The combination of a revolving wheel provided with tracks or ways *c*, the elevations *k*, the lever I, the wheel *m*, the link K′, the lever K, and the cut-off H, substantially as and for the purpose specified.

6. The combination of a revolving wheel carrying holding-disks, an enamel-hopper, and means for automatically opening and closing the enamel-hopper, substantially as and for the purpose specified.

7. The combination of a revolving wheel carrying the holding-disks F, the arms *f*, and the set-screws *f′*, substantially as and for the purpose specified.

8. The combination of a revolving wheel provided with tracks or ways *c*, the vertical flanges *a*, the holding-disks F, fixed to and rotating with the revolving wheel, an enamel-

hopper located above the plane of the disk F, the roller D, located above the plane of the disks F, and means for automatically opening and closing the hopper, substantially as and for the purpose specified.

9. The combination of a revolving wheel carrying dial-plate-holding disks, an enamel-hopper, a roller, and a spray, substantially as and for the purpose specified.

10. The combination of the hopper E, the cut-off H, the spring L, and means for elevating said cut-off H, substantially as and for the purpose specified.

11. The combination of the wheel B, carrying the dial-holding plates F, the enamel-hopper E, and the scraper O, substantially as and for the purpose specified.

12. The combination of a revolving wheel carrying the holding-plates F, and the concave roller D, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

EPPA H. RYON.

Witnesses:
E. A. C. SMITH,
F. W. BOND.