No. 822,578. PATENTED JUNE 5, 1906.

C. L. BURDICK.

COLORING MACHINE.

APPLICATION FILED NOV. 10, 1904.

3 SHEETS—SHEET 1.

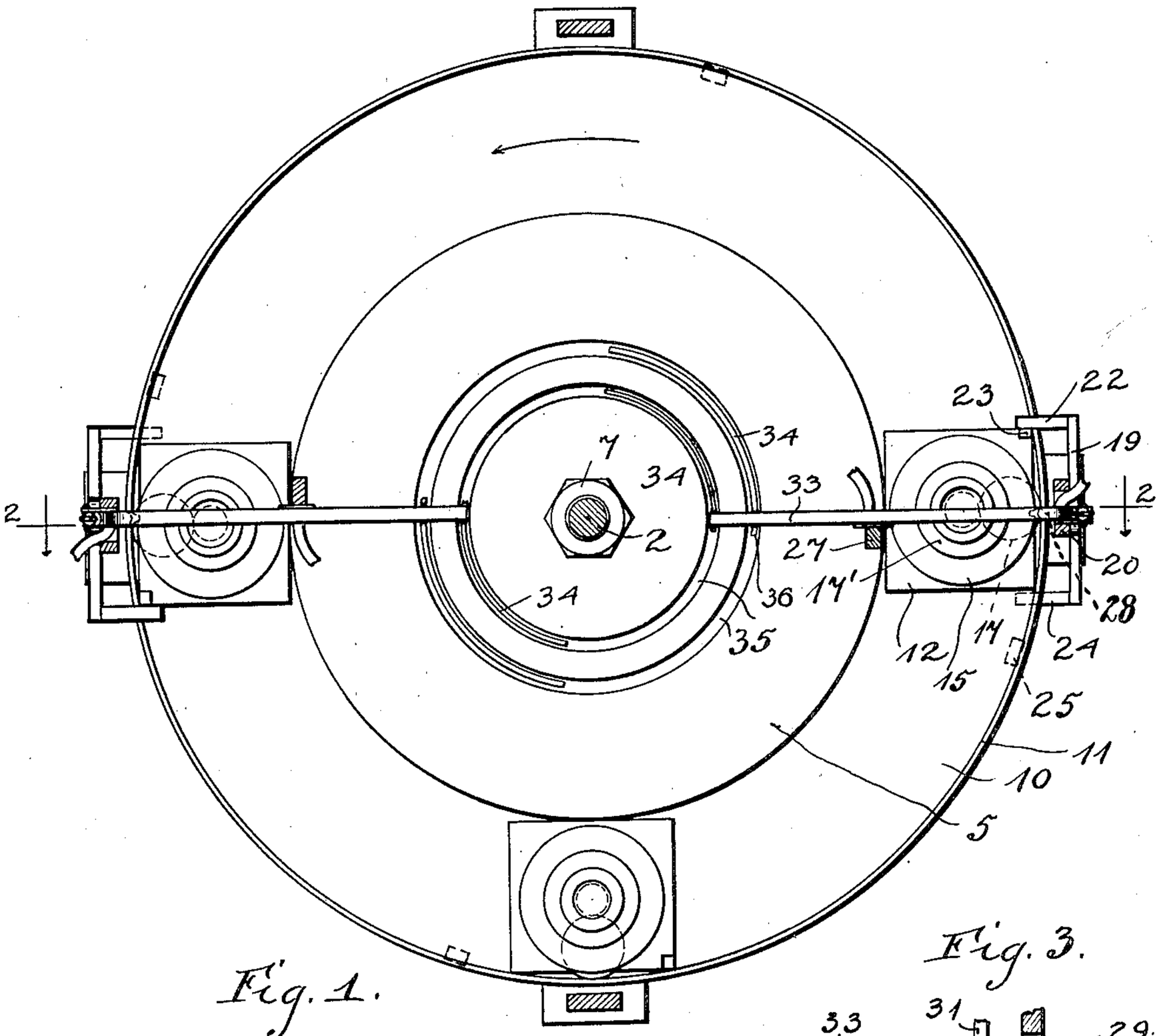
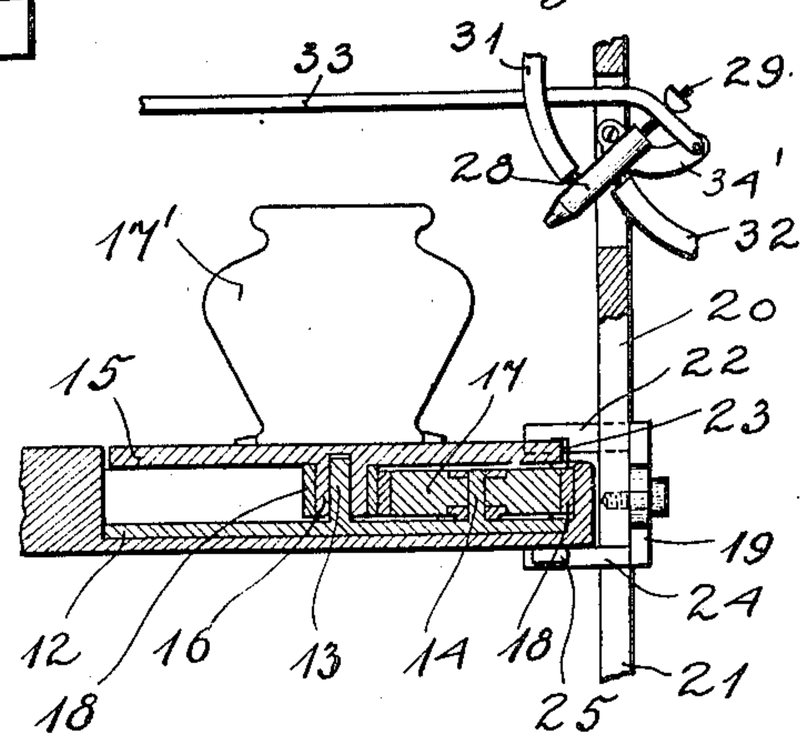


Fig. 1.

Fig. 3.



Witnesses:

Arthur H. Boettcher,

Charles J. Schmidt.

Inventor

Charles L. Burdick

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3 SHEETS—SHEET 2.

Fig. 4.

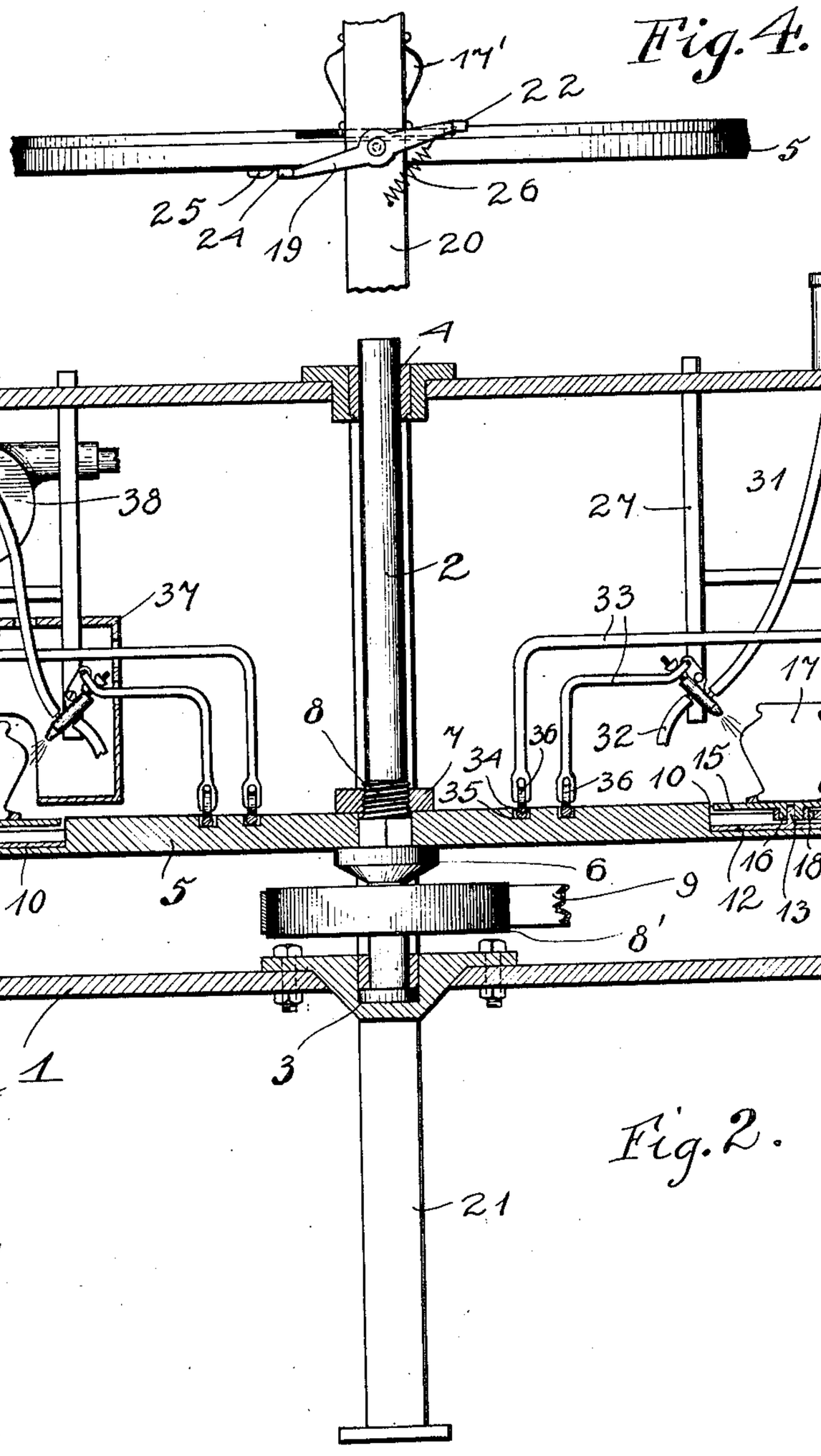

Fig. 2.

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3 SHEETS—SHEET 3.

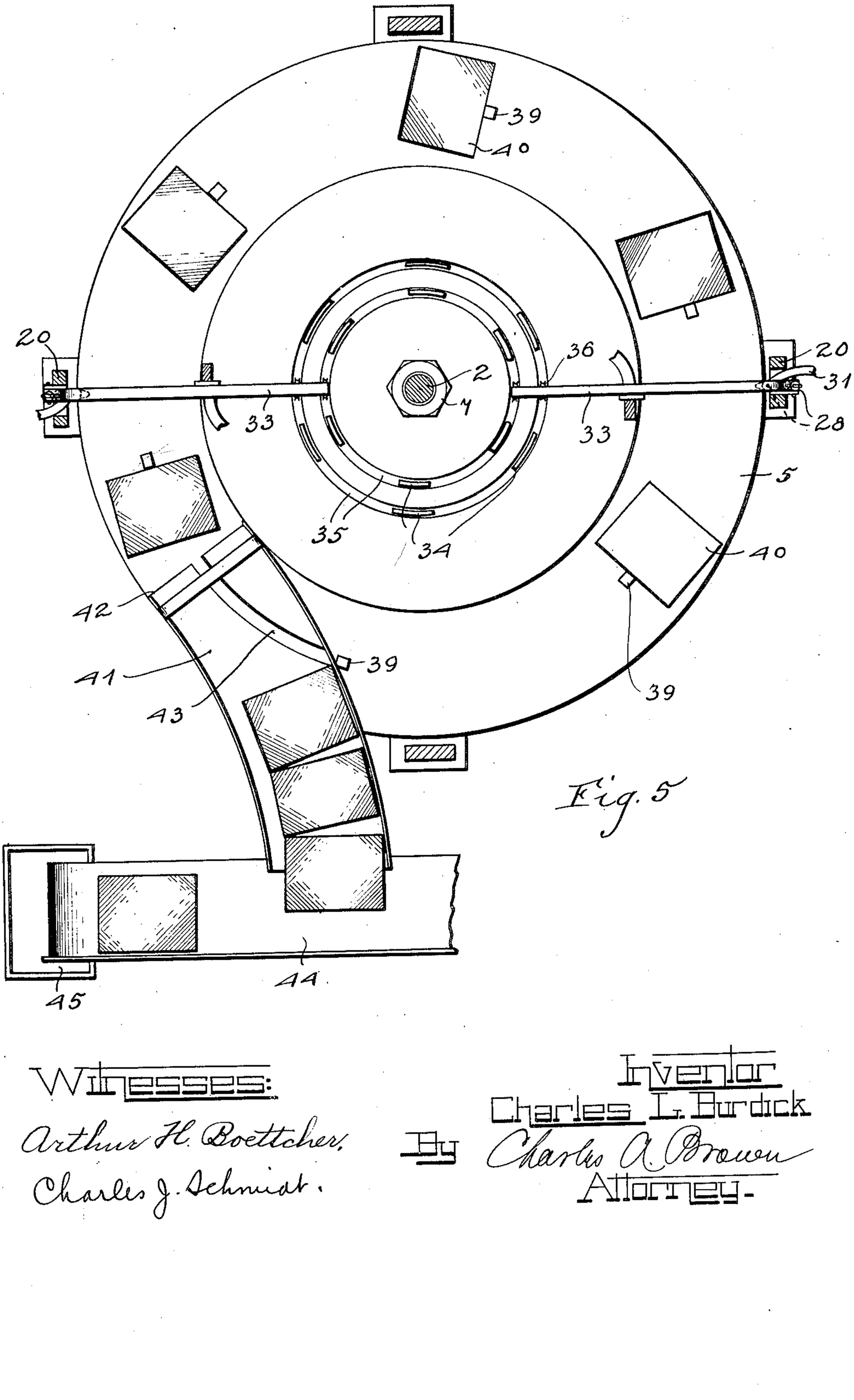

Fig. 5

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UNITED STATES PATENT OFFICE.

CHARLES L. BURDICK, OF LONDON, ENGLAND.

COLORING-MACHINE.

No. 822,578. Specification of Letters Patent. Patented June 5, 1906.

Application filed November 10, 1904. Serial No. 232,129.

To all whom it may concern:

Be it known that I, CHARLES L. BURDICK, a citizen of the United States, residing at London, in the county of Middlesex, England, have invented a certain new and useful Improvement in Coloring-Machines, (Case No. 4,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to painting and coloring machinery; and its object is to provide a machine of improved construction and design for putting color or glaze, or both, on tiles, porcelain, glass, earthenware, or other articles and which may also be used for coloring or painting such articles as wood blocks, cards, and the like, the object being to secure greater uniformity in the work and greater rapidity than has heretofore been obtained. To accomplish this, I provide a machine with means for carrying the objects to be colored into the field of sprayers, which direct their spray against the object, and I also provide means for rotating or spinning the object while in the field of the sprayers. The object to be colored may be carried through several of such sprayer-fields until the desired color or paint is applied thereto.

My invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 shows a plan view of a machine; Fig. 2, a vertical cross-sectional view thereof, taken on line 2 2 of Fig. 1; Fig. 3, an enlarged sectional view, taken on line 2 2 of Fig. 1, of the spinning-table mechanism; Fig. 4, a side view of trip-lever mechanism for releasing the spinning tables; and Fig. 5, a plan view of a modified construction of the machine adapted for painting or coloring wood blocks, cards, tiles, or the like.

Like characters of reference refer to like parts throughout the various figures.

A supporting-framework 1 supports a vertical shaft 2, which is carried in a lower step-bearing 3 and in an upper guide-bearing 4. A circular table 5 is rigidly supported from the shaft 2 in any convenient manner and is shown as being clamped to the shaft between a shoulder 6 and a threaded flange 7, engaging the threaded portion 8 of the shaft. A belt-wheel 8′ is secured to the shaft at any convenient part thereof, and by means of a belt 9 the shaft, with the circular table, may be driven from any motive source. The table is provided near its periphery with an annular groove or channel 10, and a rim or flange 11 surrounds the peripheral edge of the table. Within this annular channel the spinning apparatus is placed, this apparatus consisting of a rectangular base 12, provided with a central spindle 13 and a second spin dle 14. A circular spinning table 15 is piv oted over the spindle 13, and the hub 16 of this spinning table is engaged by a pinion 17, pivoted on the spindle 14, this pinion having engagement with the inner face of the flange or rim 11. Thus upon relative movement between the base 12 and the table 5 rotary motion will be transmitted to the spinning table 15 and to the object thereon, such as a vase 17′. The hub 16, the pinion 17, and the flange 11 may be provided with gear-teeth or may be provided with frictional surfaces, being shown provided with a layer 18 of some frictional substance, which may be leather or rubber.

To prevent movement of the spinning-table bases at fixed positions about the machine, I provide trip-levers 19. These trip-levers are U-shaped and are pivoted to uprights or standards 20 20, which standards may be extensions of the legs 21 21 for supporting the machine. One limb of the levers is disposed over the rotating table and normally in the path of posts 23, extending from each of the rectangular bases 12. The other end 24 of the levers is disposed below the circular table 5 and in the path of cam-lugs 25, which may be secured to the under side of the table 5. A spring 26 for each lever normally tends to maintain the limb 22 in the path of the posts 23 and the limb 24 in the path of the cam-lugs 25. As a base 12, carrying a spinning table, passes into position before a trip-lever it will come to rest upon the post 23 thereof, engaging the limb 22 of the trip-lever. The circular table 5, however, continues its motion, and this motion is transmitted, through the friction-pinion 17, to the table 15, causing rotation or spinning thereof. As a cam-lug 25 now approaches the trip-lever it will engage the limb 24 of the lever to cause oscillation of the lever to raise the locking-limb 22 from the path of the post 23, and the member 12, with its spinning table, will be released, and upon such release the base 12 will be carried with the table 5, and there being no relative movement between the two rotation of the spinning table 15 will cease. After passage

thereby of the cam-lug 25 the trip-lever will assume its normal position in the path of the posts 23, and the next spinning apparatus will be held in position in the same manner as the spinning mechanism just released. Any number of trip-lever mechanisms and corresponding positions of spinning of the objects carried by the tables 15 may be provided about table 5. Near each of these spinning positions I provide one or more sprayers 28, which may be positioned to direct their spray to any part of the object carried by the spinning tables. Some of these sprayers may be conveniently mounted on the standards 20 above the corresponding trip-lever mechanism, and other sprayers may be mounted in other positions—for instance, on supporting-rods 27. These sprayers may be of any construction, and the sprayers shown consist of a body portion 28, from which extend valve-stems 29, which terminate in valves for controlling the outlet of the sprayer. Tanks 30, containing the coloring fluid, may be mounted on the machine in any position, and the coloring-matter may be conducted by pipes or hose 31 to the various sprayers, while pipes or hose 32 may be connected with a source of compressed air. These sprayers are preferably all controlled to emit spray only when the object to be colored is in the proper position in the field of the sprayer—that is, when the trip-levers hold the bases 12 in position and the spinning table is actuated. This control of the sprayers I accomplish automatically, and each sprayer is provided with a valve-arm 33, pivoted at one end to an extension 34′ from the sprayer-body and at its other end engaging a cam-surface. The lever at an intermediate point has adjustable engagement with the valve-stem 29 of the sprayer, and the object of the cam is to actuate the valve-arm to cause the sprayer to emit coloring-matter only when the object to be treated is in the proper position. The cams for actuating the valve-arms are shown in the shape of strips or wires 34 34 laid in annular grooves 35 35, these strips or wires being preferably tapered at their ends to allow ready engagement therewith of the ends of the valve-arms, which are preferably provided with cam-rollers 36, as shown. The length of these cam-strips and their position in the grooves are such that the corresponding valve-lever is raised when the spinning mechanism comes into position within the field of the sprayers and is released to close the sprayers as the spinning mechanism leaves the field of the sprayers.

The cam strips or wires may be sprung into the grooves, which will securely hold them therein, or they may primarily be bent into the proper shape and secured to the surface of the table 5.

To prevent accumulation of coloring-matter which flies from the sprayers and which is not applied to the object to be colored, I provide a housing 37 about the sprayers, surrounding each position, through which housing the vase or other object to be colored passes. These housings may be secured in any convenient manner to the machine-frame, and a fan 38 may be connected with the housing for withdrawing and conveying therefrom the loose particles of coloring-matter.

It will readily be seen that any number of painting positions may be provided about the table 5, and thus one object carried from one definite coloring operation on to another before being finished and removed from the table. The sprayers of the different positions may also be limited to deposit their spray on different parts of the object, being, as before described, maintained a certain length of time within each field of sprayers and caused to be rotated only when within said fields.

The form of machine just described is best adapted for coloring or painting objects such as vases or the like, while in Fig. 5 I have shown a modified construction and arrangement more suitably adapted for the coloring of flat objects, such as wood blocks, cards, and the like. For coloring such objects a spinning table is not necessary and the different coloring effects can be readily accomplished by a suitable disposition and direction of the sprayers. The outer rim or flange 11 may be omitted from this construction and the table 5 provided with legs or posts 39 39, against which the objects 40 to be colored are placed. Each sprayer is here also provided with a valve-arm 33, adapted to be engaged by actuating-cams 34, so arranged that the corresponding sprayers are actuated only when an object to be colored passes through the coloring-field. Each set of cams is therefore placed radially opposite a corresponding position of the object on the table. I provide automatic means for collecting the colored and finished objects from the table and for conveying them from the machine to a receptacle. I therefore provide a chute or guide-trough 41, whose end 42 is disposed against the table in a position to receive the objects thereon after having been colored. A circular slot 43 is provided in the trough, through which slot may pass the posts 39, these posts serving to push the card engaged thereby along the trough, as shown, each succeeding object engaging the object last received on the trough, and thus the objects are successively moved along the trough, from which they fall to a conveyer-belt 44, which carries them to a receptacle 45. In this construction also the sprayers may be surrounded by housings connected with fans for removing the surplus coloring-matter.

I thus provide an improved machine which

will rapidly and with great uniformity apply coloring-matter to objects of any shape and upon which an object to be colored may be placed and successively carried through any number of coloring-fields and delivered in a finished condition.

I do not wish to be limited to the arrangement and construction of the machine as shown and described, as many other constructions could be designed which would carry out the same principle without departing from the spirit of the invention.

I claim as new and desire to secure by Letters Patent—

1. In a machine for applying coloring-matter to objects, the combination with a rotating table for carrying objects to be treated, of sprayers disposed about the table to direct coloring-matter to the objects as they are carried through the sprayer-fields by said rotating table, automatic means for allowing application of coloring-matter only when the objects are in the fields of the sprayers, and means for rapidly rotating the objects when in the sprayer-fields.

2. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables pivoted thereon for holding objects to be colored, sprayers disposed about said main supporting-table, said main supporting-table being movable to carry the objects on the smaller tables into the fields of the sprayers, means for causing rotation of the smaller tables when the objects thereon are in the sprayer-field, and means for causing actuation of said sprayers only when the objects are in the fields thereof.

3. In a machine for applying coloring-matter to objects, the combination with a rotating main supporting-table, of sprayers disposed about said main table, smaller tables mounted on said main table for holding objects to be colored and normally adapted to travel with said main supporting-table, whereby the objects thereon are carried into the fields of the sprayers, and means for preventing said smaller tables from traveling with the main supporting-table when the objects are in the fields of the sprayers.

4. In a machine for applying coloring-matter to objects, the combination with a rotating main supporting-table, of sprayers disposed about said main table, smaller tables mounted on said main table for holding objects to be colored and normally adapted to travel with said main supporting-table whereby the objects thereon are carried into the fields of the sprayers, means for preventing said smaller tables from traveling with the main supporting-table when the objects are in the fields of the sprayers, and means for causing said sprayers to be actuated only when the objects are in their fields.

5. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of sprayers for directing coloring-matter disposed about said table, smaller tables mounted on said main table for holding the objects to be colored, means for causing rotation of said main supporting-table to carry the objects into the fields of the sprayers, said smaller tables being normally adapted to travel with said main table, means for preventing said smaller tables from traveling with said main table when said objects are in the fields of said sprayers, and means associated with said smaller tables and said main supporting-table for causing said smaller tables to rotate when they are prevented from traveling with said main table.

6. In a machine for applying coloring-matter to objects, the combination with a main supporting rotatable table, of sprayers for directing coloring-matter disposed about said main table, smaller tables mounted on said main table for holding the objects to be colored, means for causing rotation of said main table to carry the objects into the fields of said sprayers, said smaller tables being normally adapted to travel with said main supporting-table, means for preventing said mutual travel when the objects are in the fields of the sprayers, and driving means interposed between said main supporting-table and said smaller tables for causing rotation of said smaller tables upon actuation of said preventive means.

7. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of sprayers disposed about said table for directing coloring-matter to objects to be treated, smaller supporting members carried by said main support, supporting-tables pivoted to said smaller supporting members, means for causing rotation of said main support to carry the objects into the fields of said sprayers, said smaller supporting members being normally adapted to travel with said main support, detent mechanism for engaging said smaller supporting members to prevent motion thereof when the objects are in the fields of the corresponding sprayers, and means upon rotative motion between said main support and said smaller supports for causing rotation of said supporting-tables and the objects thereon.

8. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of sprayers disposed about said table for directing coloring-matter to objects to be treated, smaller supporting members carried by said main support, supporting-tables pivoted to said smaller supporting members, means for causing rotation of said main support to carry the objects into the fields of said sprayers, said smaller supporting members being normally adapted to travel with said main support, detent mech-

anism for engaging said smaller supporting members to prevent motion thereof when the objects are in the fields of the corresponding sprayers, means upon rotative motion between said main support and said smaller supports for causing rotation of said supporting-tables and the objects thereon, and means for releasing said smaller supports after an interval to allow continued travel thereof with said main support.

9. In a machine for applying coloring-matter to objects, the combination with a circular main support provided with an annular groove and a peripheral flange, of smaller supports adapted to move in said groove, supporting-tables pivoted to said smaller supports for holding the objects to be colored, sprayers disposed about said main support for applying coloring-matter to the objects, means for causing rotation of said main support to carry the objects into the fields of the sprayers, said smaller supporting members being normally adapted to travel with said main support, means for preventing movement of said smaller supports when the object on the corresponding supporting-table is in the field of the corresponding sprayers, and friction-wheels interposed between said peripheral flange and said supporting-tables whereby rotative motion between said flange and said smaller supporting members causes rotation of the supporting-tables.

10. In a machine for applying coloring-matter to objects, the combination with a circular main support provided with an annular groove and a peripheral flange, of smaller supports adapted to move in said groove, supporting-tables pivoted to said smaller supports for holding the objects to be colored, sprayers disposed about said main support for applying coloring-matter to the objects, means for causing rotation of said main support to carry the objects into the fields of the sprayers, said smaller supporting members being normally adapted to travel with said main support, means for preventing movement of said smaller supports when the object on the corresponding supporting-table is in the field of the corresponding sprayers, and friction-wheels interposed between said peripheral flange and said supporting-tables whereby relative motion between said flange and said smaller supporting members causes rotation of the supporting-tables, whereby said rotation ceases and said objects are carried from the fields of the sprayers.

11. In a machine for applying coloring-matter to objects, the combination with a circular main support provided with an annular groove and a peripheral flange, of smaller supports adapted to move in said groove, supporting-tables pivoted to said smaller supports for holding the objects to be colored, sprayers disposed about said main support for applying coloring-matter to the objects, means for causing rotation of said main support to carry the objects into the fields of the sprayers, said smaller supporting members being normally adapted to travel with said main support, means for preventing movement of said smaller supports when the object on the corresponding supporting-table is in the field of the corresponding sprayers, friction-wheels interposed between said peripheral flange and said supporting-tables whereby relative motion between said flange and said smaller supporting members causes rotation of the supporting-tables, cam mechanism associated with said main support for causing actuation of said sprayers only when an object is in the field thereof.

12. In a machine for applying coloring-matter to objects, the combination with a rotatable supporting-table for carrying objects to be colored into the field of sprayers mounted about said supporting-table, of means for causing actuation of said sprayers only when an object is in the field thereof, and means for automatically removing the finished objects from said supporting-table.

13. In a machine for applying coloring-matter to objects, the combination with a rotatable supporting-table for carrying objects to be colored into the field of color-applying mechanisms disposed about said supporting-table, of means for causing actuating of said color-applying mechanism only upon the presence of an object in their fields, and a guideway for receiving the colored objects and for guiding them to conveying mechanism.

14. In a machine for applying coloring-matter to objects, the combination with a rotatable supporting-table for carrying objects to be colored into the field of sprayers disposed about said table, of projections from said table for holding the objects in position thereon, means for causing actuation of said sprayers only upon the presence of an object in their fields, and a guideway for receiving the finished objects from said table and for leading the objects to a conveying mechanism, each projection serving to carry the accompanying object into and along said guideway.

15. In a machine for applying coloring-matter to objects, the combination with a rotatable supporting-table for carrying objects to be colored into and through the fields of sprayers disposed about said table, cam mechanism for causing actuation of said sprayers only upon the presence of an object in their fields, projections from said table for holding the object in position thereon, a guideway disposed in the path of the finished object to receive said objects and to lead them to a conveying mechanism, a slot through said guideway through which said projections may pass, these projections serv-

ing to carry the accompanying object into said guideway and upon its passage through said slot serving to move the corresponding object along said guideway.

16. In a machine for applying coloring-matter to objects, the combination wtih a rotatable supporting-table for carrying objects to be colored into the field of sprayers mounted about said supporting-table, of means for causing actuation of said sprayers to apply coloring-matter to the objects as they travel with the supporting-table, and means for automatically removing the finished objects from said supporting-table.

17. In a machine for applying coloring-matter to objects, the combination with a continuously-traveling supporting-table, of smaller tables carried by said main table for holding objects to be colored, sprayers disposed about said main supporting-table, detent means for preventing movement of the smaller tables with the main supporting-table within the field of the sprayers, and means after application of coloring-matter to the objects for releasing the smaller tables.

18. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables mounted thereon for holding objects to be colored, sprayers disposed about said main supporting-table, said main supporting-table being continuously movable to carry objects on the smaller tables thereon into the fields of the sprayers, means when an object arrives in the field of the sprayer for stopping its travel with the main table, means for automatically causing actuation of the corresponding sprayer to apply coloring-matter to the detained object, and automatic means for releasing the smaller table carrying the colored object.

19. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables for holding objects to be colored, means for causing continuous travel of the main table, said smaller tables being movable with relation to the main table but normally traveling therewith, sprayers disposed about the main supporting-table for directing coloring-matter, means for preventing further movement of a smaller table when the object thereon is carried into the field of a sprayer, means automatically actuated by the moving main table for causing actuation of the sprayers only when objects are in the field thereof, and means automatically actuated by the traveling main table for causing release of the detained smaller table after the object thereon has received sufficient coloring-matter.

20. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables thereon for holding objects to be colored, means for causing continuous travel of the main table, sprayers disposed with the traveling main table, the objects being normally carried on the smaller tables with the main table, a detent-frame disposed in the path of the smaller tables to prevent further travel of the object thereon when the object thereon arrives in the field of a sprayer, means for causing actuation of a sprayer when an object arrives in its field, and means controlled by the traveling main table for automatically releasing the detent-frame from the smaller table to allow further travel thereof with the main table.

21. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables thereon for holding objects to be colored, means for causing continued travel of said main table, sprayers disposed near the main table for directing coloring-matter toward objects carried on the smaller tables, a detent-lever disposed to prevent travel of successive smaller tables as they arrive in the field of the sprayers, means for causing actuation of the sprayers to apply coloring-matter to the object on the detained table, and cam mechanism associated with the traveling table for causing actuation of the detent-lever to release the smaller table with the colored object thereon whereby said smaller table may again travel with the main supporting-table.

22. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables thereon for holding objects to be colored, sprayers disposed near said main table, means for causing continued travel of the main table, said smaller tables being normally caused to travel with the main table by virtue of only their frictional engagement therewith, a detent-lever normally disposed in the path of the smaller tables to prevent movement thereof when the object thereon arrives in the field of a sprayer, and means automatically controlled by the traveling table for moving the detent-lever from the path of the smaller tables whereby said smaller tables may again travel with the main table.

23. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of smaller tables carried thereon for supporting objects to be colored, sprayers disposed about the supporting-table, means for causing continued travel of the main table, detent means for preventing travel of a smaller table with the main table when the object of said smaller table arrives in the field of a sprayer, means upon stopping of the smaller table for causing rapid rotation of the object thereon, and means for automatically releasing the smaller table after sufficient coloring-matter has been applied to the object.

24. In a machine for applying coloring-

matter to objects, the combination with a main supporting-table having a groove, of smaller rectangular tables disposed in said groove for carrying objects to be colored, sprayers disposed near the main table, means for causing continued travel of the main table, said smaller tables being carried with the main table by virtue of their frictional engagement only to carry the objects into the fields of the sprayers, cam mechanism automatically actuated by the traveling main table for causing actuation of the sprayers only when an object is in the field thereof, detent means for preventing movement of the smaller table with the main table when coloring-matter is being applied, and means automatically controlled by the main table for releasing the detent means after the application of coloring-matter to the object.

25. In a machine for applying coloring-matter to objects, the combination with a main supporting-table, of a groove therein, smaller rectangular tables disposed within said grooves, a circular disk pivoted on each smaller table for supporting an object to be colored, sprayers disposed near the main table, means for causing continuous travel of the main table to normally carry the smaller tables by virtue of frictional engagement only, detent means for engaging the rectangular tables when the object thereon arrives in the field of a sprayer, cam mechanism controlled by the traveling table for causing actuation of the sprayers when the object arrives in the field thereof, means for causing rapid rotation of the object when the detent mechanism becomes effective, and means automatically controlled by the traveling table for releasing the detent means whereby rotation of the object ceases and whereby the rectangular table is again carried with the main table.

26. In a machine for applying coloring-matter to objects, the combination with a main supporting-table for supporting the objects to be colored, sprayers disposed about said table, means for causing movement of said main table to carry the objects into the field of the sprayers, means for preventing travel of the objects while coloring-matter is being applied, a casing surrounding the object upon application of coloring-matter thereto, and fan means for withdrawing surplus coloring-matter from about the object within said casing.

27. In a machine for applying coloring-matter to objects, the combination with a main supporting-table for carrying the objects, a casing disposed above the table, sprayers within said casing for directing coloring-matter, said main table serving to carry the objects into said casing, means for preventing further travel of the objects when in said casing, means controlled by the traveling table for causing actuation of the sprayers when the object arrives within said casing, and fan mechanism for removing surplus coloring-matter from about the object within the casing.

In witness whereof I hereunto subscribe my name this 26th day of October, A. D. 1904.

CHARLES L. BURDICK.

Witnesses:
H. D. JAMESON,
F. L. RAND.