

No. 801,769.

PATENTED OCT. 10, 1905.

G. H. CONNELL.  
WHEEL PAINTING APPARATUS.

APPLICATION FILED JAN. 26, 1905.

3 SHEETS—SHEET 1.

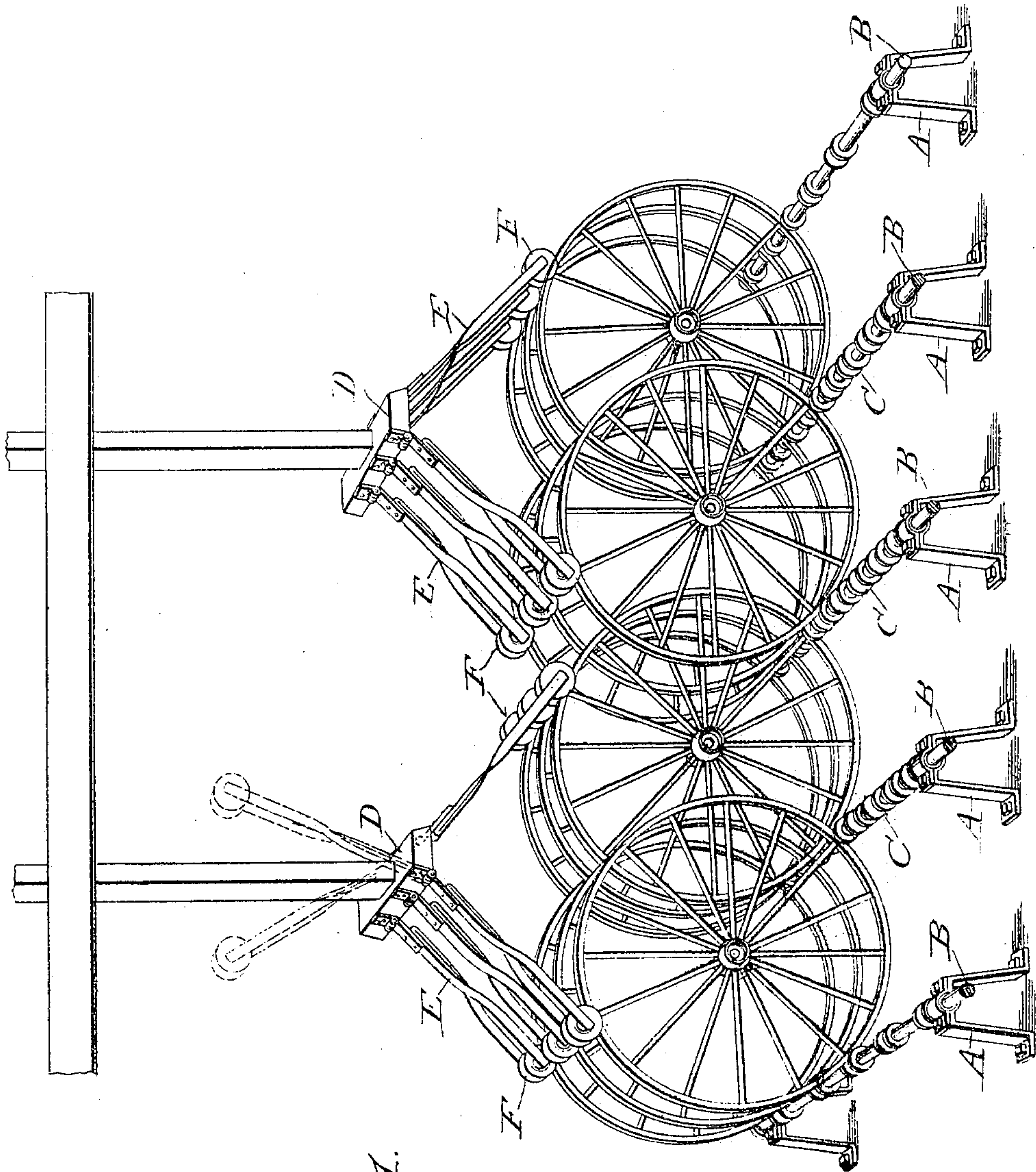


Fig. 1.

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Witnesses

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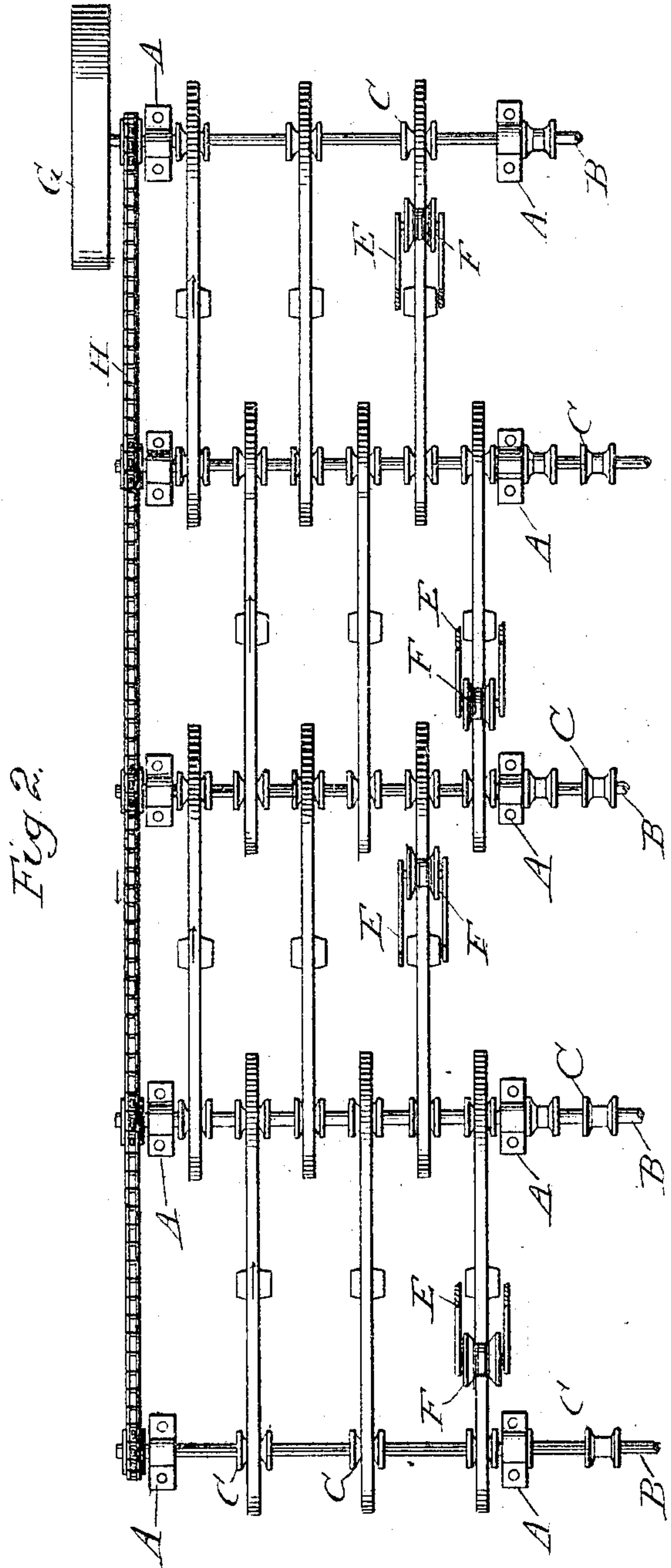


Fig. 5.

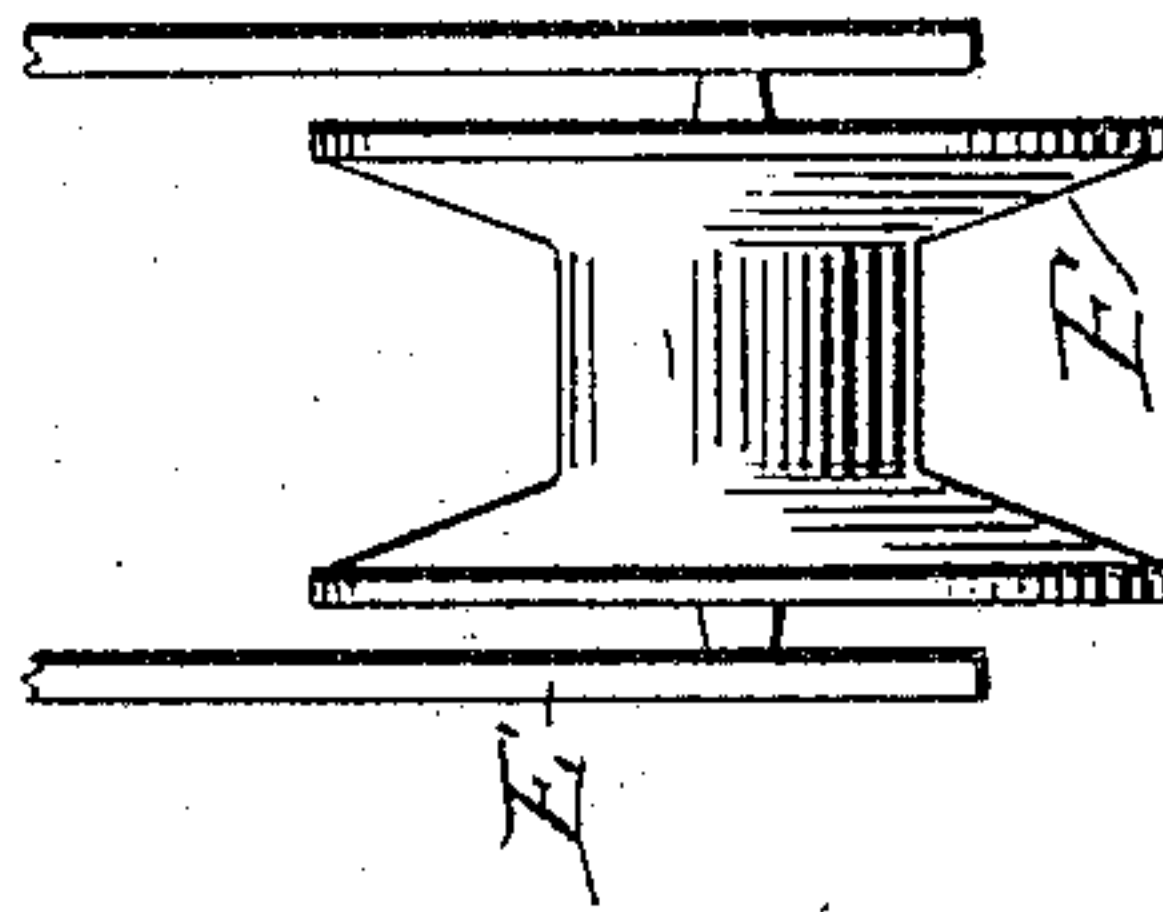
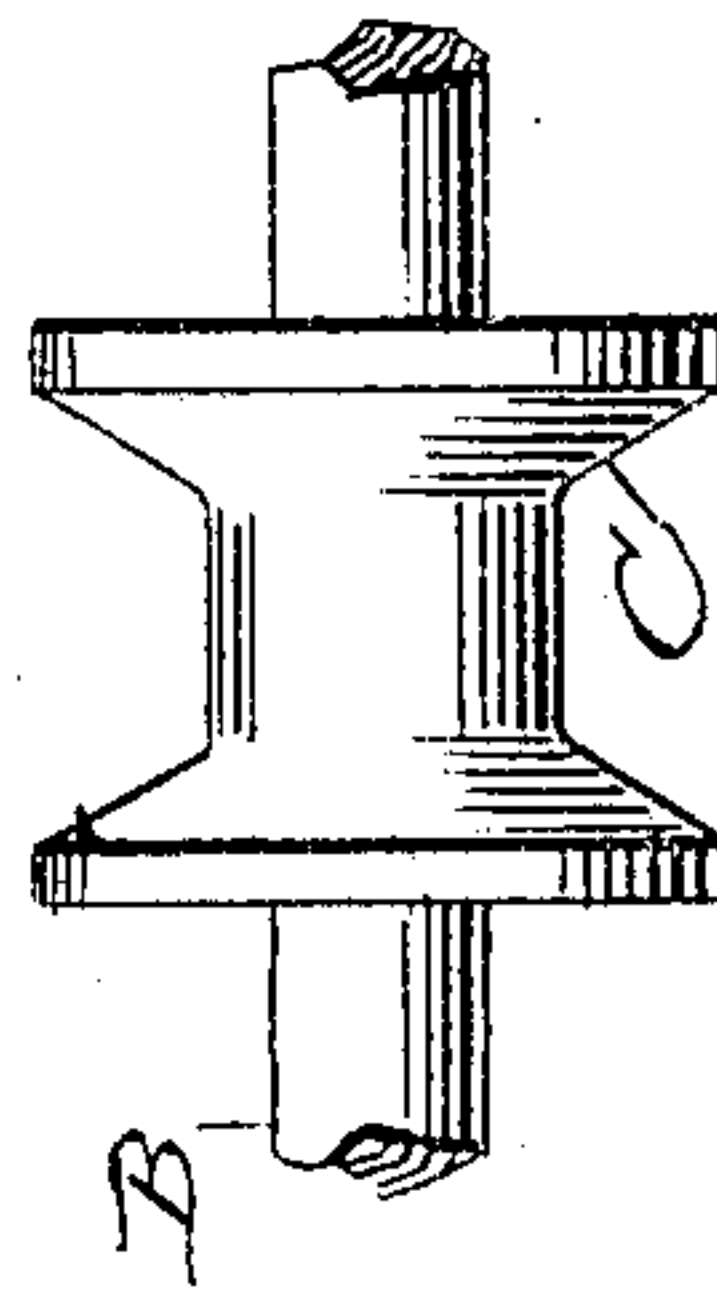


Fig. 4.



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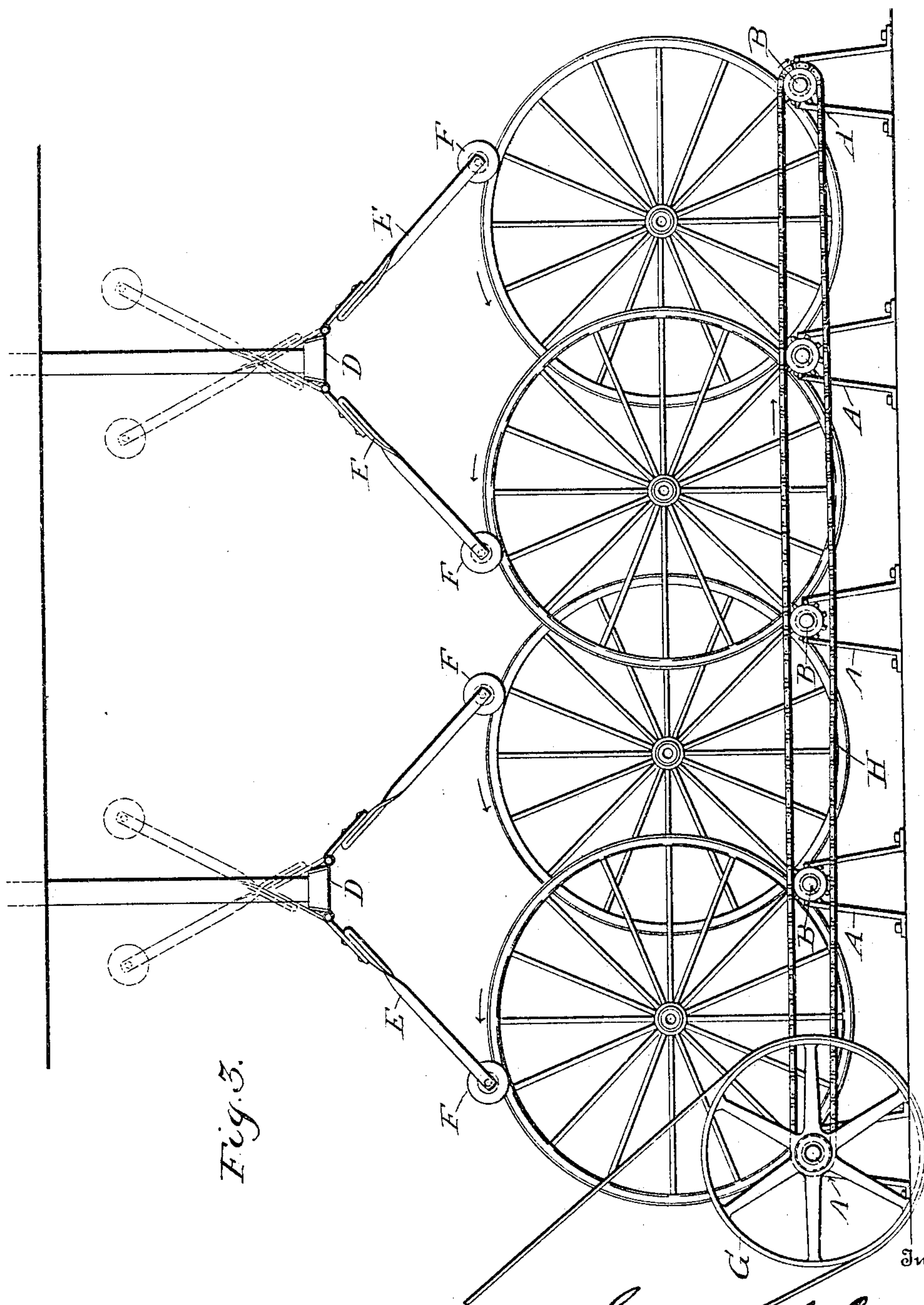
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## WHEEL-PAINTING APPARATUS.

No. 801,769.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed January 26, 1905. Serial No. 242,772.

*To all whom it may concern:*

Be it known that I, GEORGE H. CONNELL, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Wheel-Painting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Heretofore the process of putting the last coat of varnish on vehicle-wheels has been accompanied by great drawbacks and difficulties. This coat of varnish, which is called the "finishing-coat," has always been applied by hand, and it has been necessary to put it onto the wheel with great care and to work it with a brush for a long time in order to get out the air-bubbles and to be certain that the varnish was applied evenly all over the wheel, so that when it should harden it would present a smooth surface without "beading" or "crinkling" or "running." In the case of high-grade buggies or vehicles the work expended on finishing the wheels with their varnish coats was very tedious and expensive. One workman would be obliged to devote half a day to the finishing of a set of four wheels, and even then the varnish might "run" or "crinkle" or "bead" and have to be rubbed down and another coat applied before obtaining a satisfactory job. In connection with the manufacture of cheap buggies or vehicles, where hundreds of wheels are needed daily and where so great an amount of time and care is not warranted by the cost received for the finished job, the question of devising an inexpensive and effective method of handling this finishing-coat of varnish was considerably more serious. From the nature of the case a workman could spend only a few minutes on each wheel, it being out of the question to consume anything like half a day for the finishing up of one set of wheels. The difficulties of the work were increased by reason of the shape of the wheel, comprising a central hub and radiating spokes. If the varnish was applied to a wheel and the whole set away to dry, the varnish at the upper part of the rim and upper spokes would gradually run down the spokes and toward

the hub and become thin at the top and thick at the hub and would crinkle and bead and be generally uneven. On the lower spokes the reverse would take place, the varnish running from the hub toward the rim. On either side the varnish would run to the lower sides of the spokes and be thin at the upper sides. This has made it necessary prior to my present invention for all wheels to be treated as follows: first to have the finishing varnish coat applied as carefully as possible and then to place the wheel on a horizontal spindle and from time to time as the varnish was drying to give the wheel a half or quarter turn, so that the tendency of the varnish would be to run as evenly as possible over the wheel; but even with this care and the devotion of a large amount of time necessary for finishing high-grade work the results were practically unsatisfactory and frequently the wheels had to be sent out with an imperfect finish or else the work had to be done over. The use of these spindles has also been far from satisfactory, involving an expensive outfit, extensive factory-space, impossibility of clustering the varnished wheels closely together, and a great loss of time in putting the wheels on and taking them off the spindles, much greater care being requisite than for the ordinary mounting of a dry wheel on its spindle, owing to the fresh condition of the varnish coat. Apparatus have been devised employing such spindles and mechanism for rotating them, with a view to imparting a slow rotation to the wheels to cause even running of the coat of paint or varnish; but such apparatus have been impracticable not only because of the objections incident to the employment of spindles, as noted above, but also because of the expense and more or less complicated mechanism involved, the power requisite to operate the same for any great number of wheels, and, further, because of uncertainty and irregularity of action due to the turning of the spindles in the hubs of the wheels. It may be mentioned further that the only apparatus of this character hitherto devised, so far I am aware, has been entirely impracticable for rotating the wheels the requisite length of time to allow the drying of the varnish.

My present invention, which comprises a novel, effective, and practicable apparatus for



supporting the wheels on their rims and imparting slow regular rotation thereto without the use of spindles, makes it possible with a minimum amount of time and labor to attain results which are practically absolutely perfect. In brief, with this apparatus the process of finishing the wheel consists in applying the varnish coat with more or less care, then placing the wheel in the machine, which rotates it regularly and very slowly for three or four hours, and it is to be stated here that with the apparatus in question it is entirely unnecessary to do anything except to put the varnish onto the wheel in what would usually be considered a very ordinary and careless manner. Once applied with the brush, even in this ordinary way and in a manner so imperfect as would make it absolutely impossible with the usual method of handling wheels to obtain a perfect one in a hundred, the varnisher's work is at an end, except to place the wheel in the machine, which finishes the work and produces a wheel of perfect finish. A desirable velocity of rotation under ordinary conditions is from one to three revolutions per minute, although the exact speed is to be regulated by the temperature of the room, the humidity of the atmosphere, the quality of the varnish, its consistency, and like matters which affect the conditions. The slow regular rotation of the wheel causes the varnish to flow slowly and regularly in every direction and in this way to correct any unevenness that may exist in the coat as applied by the workman. If the varnish is thick at at one place—for example, on the spoke—the constant or successive change of position due to the slow and regular revolution of this spoke will cause the varnish to flow evenly over the work and in every direction, thus avoiding all beading, crinkling, and running. In practice it is found that the wheels require so little done by hand under the operation of this machine that the price for finishing the wheels can be materially cut down and the workman will still make higher wages than before and with less effort.

Having thus explained the nature of the invention and the advance in the art of finishing or coating wheels which is attainable thereby, I shall now proceed with a description of the accompanying drawings, which form a part of this specification, such drawings illustrating a simple and practicable embodiment of the invention well adapted for use in factories where a large number of wheels must be handled in the most economical manner and arranged compactly together in the smallest possible room, while convenient access must be had to the individual wheels for placing them in or taking them out of the machine. The invention, which is not limited to the specific embodiment and construction shown, will then be particularly pointed out,

and defined in the claims at the end of this description.

In said drawings, Figure 1 is a perspective view of a machine or apparatus embodying my invention, showing a number of wheels in place. Fig. 2 is a top plan view. Fig. 3 is an end view. Fig. 4 is a detail view of one of the spools on the wheel-supporting shafts. Fig. 5 is a detail view of one of the spools for resting on the upper rims of the wheels.

A particular explanation of the illustrated machine is as follows: Upon the floor of the shop brackets A are located, and in these brackets are journaled any number of parallel shafts B at such distances apart that any pair of adjacent shafts will support a wheel resting upright upon them without letting the rim or bottom of the wheel touch the floor. These shafts are equipped with spools C, fast on the shafts and preferably having their collars or shoulders inwardly beveled or inclined to avoid contact with the felloes of the wheels, which set in the spools and retain their position by gravity. Thus the spools hold the rims of the wheels, permitting the wheels to set in proper position and preventing them from moving longitudinally.

In handling a large quantity of wheels they are set as closely together as possible upon any adjacent pair of shafts, but at such spaces apart as to keep their hubs from contacting, the spools being properly disposed for this purpose, and other wheels may be similarly supported upon either one of the same shafts and the next adjacent shaft by arranging them intermediately of the wheels on the first-mentioned pair of shafts, as shown in the drawings. In other words, the wheels are arranged closely side by side in rows, the wheels of each row interlapping with those of every adjacent row. This is the most compact arrangement conceivable, and at the same time it allows full space for every individual wheel to rotate without danger of contacting with any other wheel, rotation of the wheels being caused by turning of the shafts. To permit such an arrangement of the wheels, the spools should of course be set at corresponding positions on all the shafts, though the two outermost shafts of the group may have only half as many spools as the intermediate ones, since the wheels of each row set in every alternate pair of spools; but where such compactness is not required this arrangement of the spools is not needed, it being only essential that every wheel should rest in confronting spools on adjacent shafts.

In order to prevent the wheels from tipping over sidewise, longitudinal racks or hangers D are supported above the wheels, and hinged arms E are attached to these racks, the lower ends of these arms carrying rotatable spools F, which receive the upper parts of the wheel-rims. There is weight enough in these arms



and spools to keep the wheels from losing their upright positions, while yet the wheels are held lightly in place. A single rack will serve for two rows of wheels by having such  
 5 spool-carrying arms depending from opposite sides or in opposite directions. The arms E are so hinged to the racks that they may be swung up and rest against the racks to hold the spools out of the way while the wheels are  
 10 being placed in or taken out of the machine. The collars or flanges of the spools F are preferably inwardly beveled or inclined, like those of spools C, to avoid contact with the felloes of the wheels.

15 A slow regular rotation is imparted to the wheels by the turning of the shafts B, which may be driven by any suitable mechanism. It is obvious that any pair of adjacent shafts holding a row of wheels must turn in the  
 20 same direction. Hence in the illustrated arrangement, where every two adjacent rows of wheels are supported upon three shafts, as already explained, the three shafts must rotate in the same direction. I have therefore shown  
 25 in Figs. 2 and 3 a driving-pulley G on one of the outer shafts for application of power by a belt and a sprocket-chain H running from said shaft and engaging sprocket-chains on  
 30 all the other shafts, rotating the whole group of shafts all in the same direction.

The speed of rotation of the wheels can be regulated, of course, by the driving mechanism to the desired point, and it is an easy matter to obtain the slow speed desired, since ob-  
 35 viously the supporting-shafts must rotate a great number of times in order to cause a complete rotation of the wheels. A slow and regular speed is desirable for giving the best results. The speed of rotation of the wheels  
 40 should never be high enough to bring into effect centrifugal action, which would tend to throw the varnish toward the rims of the wheels. The purpose is to have the wheels revolve so slowly that gravity successively  
 45 acting in different directions upon the varnish will cause it to flow evenly in every direction. A high speed, probably above from ten to twenty revolutions per minute, would probably introduce the element of centrifugal force  
 50 and destroy the desired results.

With the mechanism shown it is observable that the wheels can be quickly and easily put into and taken out of the racks. As before  
 55 stated, after applying the finishing-coat of varnish in an ordinary manner the workman simply puts the wheel in the machine, which rotates it slowly and regularly several hours, more or less, or as long as may be required, and at the end of the operation a wheel of  
 60 beautiful finish has been produced.

Heretofore it has been practically impossible to put a heavy coat of finishing-varnish on a wheel because of its running and distributing of itself unevenly over the surface.

With the present invention, however, a very 65 thick coat of varnish can be applied, if desired, and it will be distributed evenly and beautifully over the surface and form a much better finish than has ever before been accomplished. The superior results are very 70 marked, for an inexperienced observer can readily pick out machine-finished wheels as superior to the hand-finished work. Furthermore, the economy resulting from the use of the machine is such that the cost of 75 putting on the finishing-coat of varnish can be reduced at least twenty-five per centum.

The invention may of course be applied not only to the finishing of wheels in connection with the last coat of varnish, but also in con- 80 nection with any other coat of paint or varnish that it is desired to apply. It may be stated, however, that the necessity for such treatment does not arise in connection with the priming-coat, or the coat of lead, as these 85 coats are all sandpapered down smooth after they become dry, and the irregularities are thus removed in that way. The paint coats dry quickly, and the treatment is not essential for them; but the color-varnish coat, and 90 especially the finishing-varnish coat, can be most advantageously handled by the treatment described. Hence the invention applies generally to the coating of wheels, particularly to the finishing of wheels which take 95 varnish, especially vehicle-wheels which need a high finish.

It is understood that the foregoing description of the illustrated machine is not restrictive of the broad invention, the essence of 100 which is operative and practicable means for supporting the wheels by their rims and imparting thereto a slow and regular rotation, which may continue as long as necessary for producing the proper results. It is evident 105 that the principle of the invention may be contained in various embodiments. For examples, the wheels may rest on rollers and be revolved by application of friction upon their rims or may be supported and moved by a 110 series of power-driven rollers or the like, these illustrations being, in fact, embraced within the present showing and description.

I claim as my invention and desire to secure by Letters Patent of the United States— 115

1. A wheel coating or finishing machine having, in combination, wheel-supporting means singly adapted to hold either a wheel or a plurality of wheels by the rim or rims thereof, driving mechanism, and means actuated thereby for imparting to the wheel or wheels for any continuous length of time as desired a regular rotation at a speed low enough to avoid centrifugal action on the var- 120 nish or coat on the wheels.

2. A wheel coating or finishing machine having, in combination, a roller-support for the rim of a wheel adapted to hold the same up- 125



right, and means acting frictionally upon the rim of the wheel for causing rotation thereof.

3. A wheel coating or finishing machine having, in combination, a wheel-rim support or bearing consisting of driven rollers, means for holding a wheel upright thereon and power mechanism for driving said rollers.

4. A wheel coating or finishing machine having, in combination, a roller-bearing adapted for supporting a wheel resting upright thereon in constant position, and mechanism for rotating at least one roller of said bearing to impart slow rotation to the wheel.

5. A wheel coating or finishing machine having, in combination, a roller-bearing adapted to support a wheel resting upright thereon, mechanism for rotating at least one roller of said bearing to impart slow rotation to the wheel, and means acting upon the rim to hold the wheel upright upon the said bearing.

6. A wheel coating or finishing machine having, in combination, a rim-support for holding a wheel or wheels in upright position, and mechanism for causing movement in said support which transmits slow rotation to the wheel or wheels.

7. A wheel coating or finishing machine having, in combination, a wheel-holder comprising a plurality of annularly-grooved rollers for engaging the rim of an upright wheel at different points of its circumference, and means for acting frictionally upon the rim of the wheel to rotate the same in its holder.

8. A wheel coating or finishing machine having, in combination, a wheel-holder comprising a plurality of rollers having circular grooves for engaging the rim of an upright wheel at different points of its circumference, and mechanism for rotating at least one of said rollers for imparting rotation to the wheel.

9. A wheel coating or finishing machine having, in combination, a roller-bearing for supporting a wheel upright thereon, means for rotating the wheel so supported, and means for holding the wheel in upright position.

10. A wheel coating or finishing machine having, in combination, a roller-bearing for supporting a wheel upright thereon, means for rotating the wheel so supported, and a spool or grooved roller adapted to rest upon the upper rim of the wheel and hold the same in upright position.

11. A wheel coating or finishing machine having, in combination, a roller-bearing for supporting a wheel upright thereon, means for rotating the wheel so supported, and a swinging arm carrying a spool or grooved roller adapted to rest upon the upper part of the wheel and hold the same in upright position.

12. A wheel coating or finishing machine having, in combination, parallel rotary shafts for supporting a wheel or wheels upright between them in constant relation, and power mechanism for driving said shafts.

13. A wheel coating or finishing machine having, in combination, parallel rotary shafts for supporting a wheel or wheels upright between them, power mechanism for driving said shafts, and means for holding the wheels in upright position upon the shafts.

14. A wheel coating or finishing machine having, in combination, parallel rotary shafts equipped with spools for holding wheels between adjacent shafts, and power mechanism for driving said shafts.

15. A wheel coating or finishing machine having, in combination, parallel rotary shafts equipped with spools for holding wheels between adjacent shafts, power mechanism for driving said shafts, and swinging arms carrying spools adapted to bear upon the rims of the wheels to hold them upright.

16. A wheel coating or finishing machine having, in combination, means for supporting on their rims a row of wheels side by side, driving mechanism, and means actuated thereby for imparting to all the wheels for any continuous length of time as desired a regular slow rotation.

17. A wheel coating or finishing machine having, in combination, a support adapted for holding a plurality of wheels upon their rims, and means for imparting slow rotation to all the wheels resting upon such support.

18. A wheel coating or finishing machine having, in combination, a supporting apparatus adapted for holding a plurality of rows of wheels arranged with the rims of adjacent rows of wheels interlapping, and means for causing rotation of all the wheels while so arranged and supported.

19. A wheel coating or finishing machine having, in combination, a plurality of parallel rotary shafts equipped with wheel-supporting spools at corresponding locations, power mechanism for rotating all of said shafts in the same direction, and swinging arms carrying spools or rollers adapted to bear upon the rims of the wheels supported by said shafts and keep them in upright position.

20. A wheel coating or finishing machine having, in combination, means for supporting a wheel by its rim, there being no positive connection between the rim and supporting means, driving mechanism, and means actuated thereby for imparting rotation to the wheel.

21. A wheel coating or finishing machine having, in combination, means for supporting a wheel by its rim, driving mechanism, and means actuated thereby for imparting rota-

tion to the wheel, there being no positive connection between the wheel and the supporting means nor between the wheel and the driving mechanism.

5 22. A wheel coating or finishing machine having, in combination, means for supporting a wheel by its rim, and means for rotating the wheel, there being no positive connection

between the wheel and the means for rotating it. 10

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE H. CONNELL.

Witnesses:

CHARLES H. POPE,  
FRED H. COOPER.