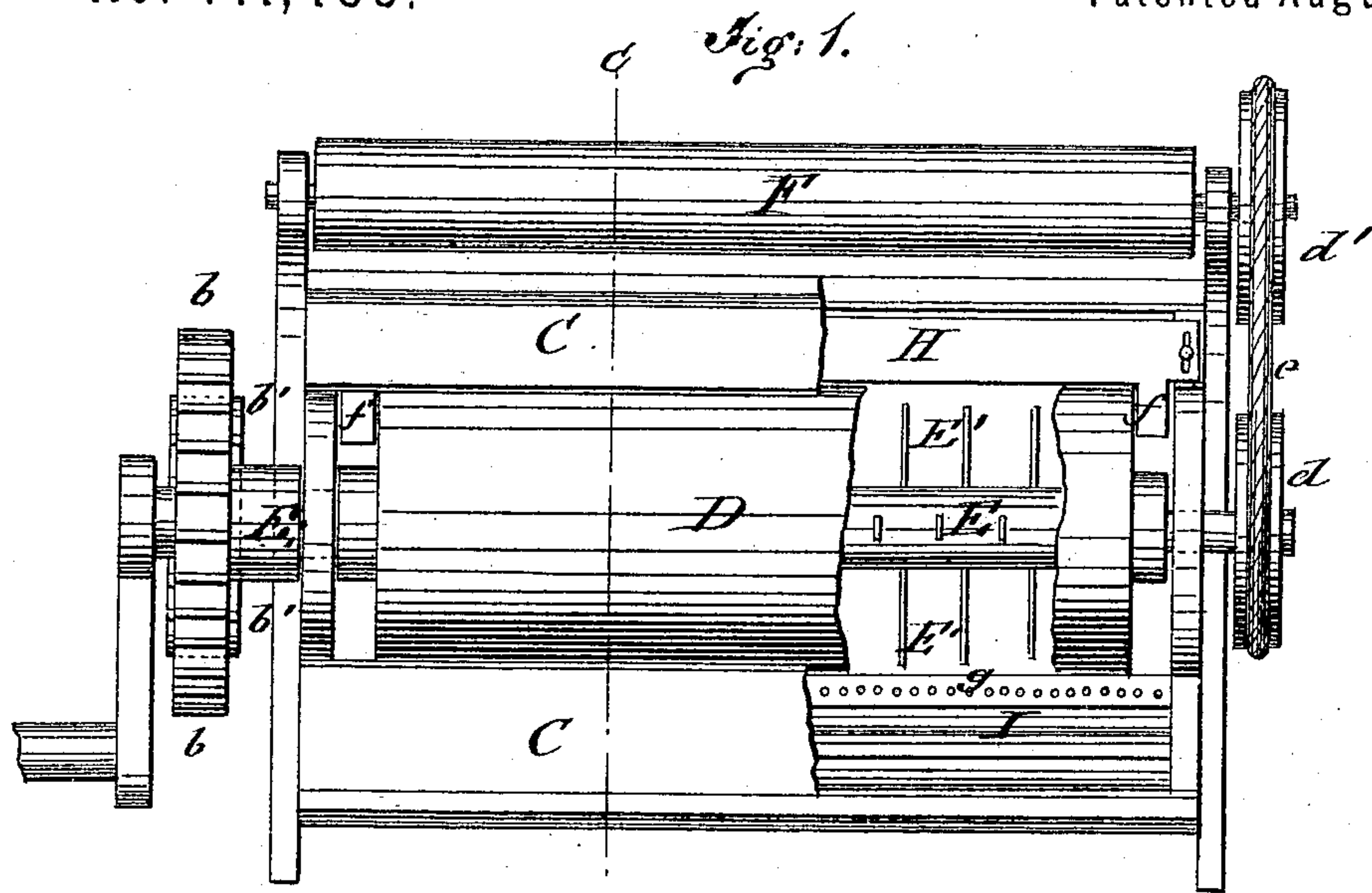


C. F. BONHACK.

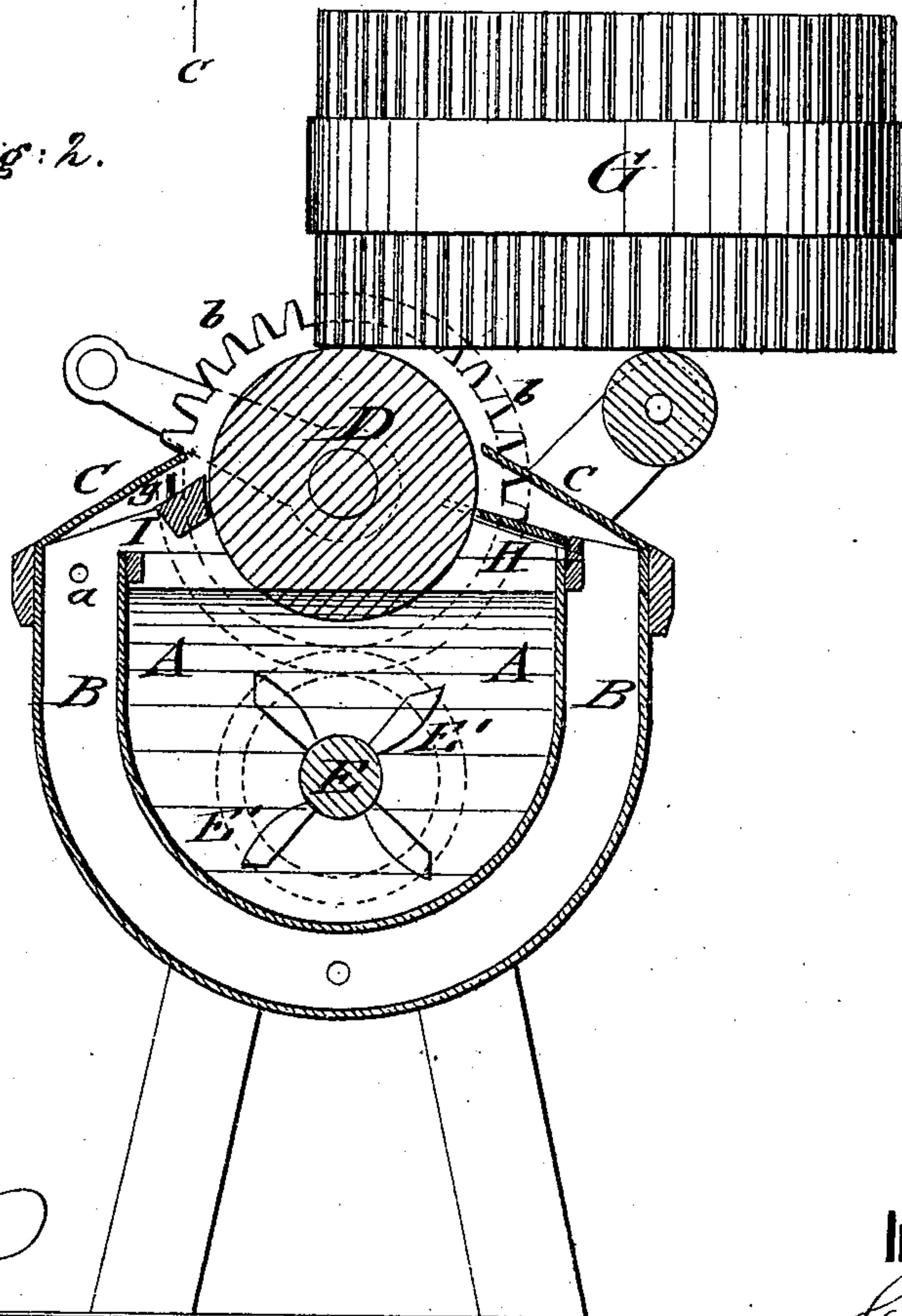
Manufacture of Friction Matches.

No. 141,483.

Patented August 5, 1873.



*Fig: 2.*



Witnesses:

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Per



# UNITED STATES PATENT OFFICE.

CHARLES F. BONHACK, OF NEW YORK, N. Y.

## IMPROVEMENT IN THE MANUFACTURE OF FRICTION-MATCHES.

Specification forming part of Letters Patent No. **141,483**, dated August 5, 1873; application filed June 28, 1873.

*To all whom it may concern:*

Be it known that I, CHARLES F. BONHACK, of the city, county, and State of New York, have invented a new and Improved Match-Dipping Machine, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a top view of my improved match-dipping machine with parts broken off to show interior of the same; and Fig. 2 is a vertical transverse section of the same on the line *c c*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of my invention is to furnish to manufacturers of matches an improved dipping-machine, by which the matches may be dipped quicker and more conveniently than with the machines hitherto in use; and also a more even and complete head of the matches be produced, and the workmen to a great extent protected against the deleterious influence of the phosphoric vapors. My invention consists of the combination of the receptacle for the phosphorous paste and surrounding water-bath with stirrers and transferring-roller, together with regulating and guiding appliances.

In the accompanying drawing, A represents the vessel or receptacle for the phosphorous paste, of semi-cylindrical or other shape, and surrounded by the water-bath B. The whole is supported by suitable legs, and made, by preference, of cast-iron. The water is admitted into receptacle B on the top by lifting one of the hinged covers C, and drawn off by a faucet at the bottom. Through an aperture, *a*, enters the steam into the water-bath, for heating the same to the temperature required to keep the phosphorous paste in receptacle A in a liquid state. The paste-transferring roller D is arranged longitudinally in suitable bearings in the upper part of receptacle A, and driven by suitable motive power. By means of a cog-wheel, *b*, of roller D gearing into wheel *b'* the motion is transmitted to a shaft, E, with stirring-blades E', which are arranged below roller D, in the same direction therewith. The stirring-blades E' keep the

paste continually in motion, and prevent the settling of the same in the lower part of receptacle A. By a pulley, *d*, and belt *e*, which are arranged at the other end of roller D, motion is communicated to a pulley, *d'*, of guide-roller F, which serves as support for the match-frames or bundles G, for carrying the same over roller D, and receiving the heads. Guide-roller F is supported in any suitable manner at about the same height as the uppermost part of transferring-roller D, and gives steadiness to the bundles G, so that a boy, even, may attend to the operation of dipping. An adjustable gage, H, is arranged sidewise along roller D, in connection with receptacle A, to regulate the thickness of the paste on roller D, and to produce thereby heads of even size on the match ends. Projecting parts *f* at both ends of gage H extend between roller D and the sides of receptacle A, and scrape off the paste-drippings at the ends of roller D, conducting them back into the receptacle A, and preventing thereby the soiling of the roller ends and shaft. A stationary scraper, I, is arranged opposite to gage H, and closely to roller D, to scrape off with its sharp edge or blade the paste adhering to roller D, and carrying it over the inclined surface of the gage back to receptacle A. Upright pins or teeth *g* are placed into scraper I to arrest the stray pieces of broken matches, which are from time to time taken out by a suitable cleaning-fork or other arrangement. The transferring-roller D takes up continually newly stirred and heated paste, and offers by its rotation continually a fresh dipping-surface to the match-bundles passed over it. The covers C are held closed over receptacle A, so that the escape of the fumes of the paste is considerably lessened and the health of the attendant less endangered than with the open dipping-boards.

The process of dipping is also greatly accelerated and the paste more evenly and uniformly transferred to the matches.

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

1. The combination of paste-receptacle A,

water-bath B, covers C, transferring-roller D, stirrer E E', gage H, scraper I, and guide-roller F, forming the match-dipping machine, substantially as and for the purpose described.

2. The adjustable gage H, having side extensions *f* for scraping paste-drippings on the roller ends, as described.

3. The scraper I, having upright pins or

teeth *g* for taking the pieces of broken matches and passing the paste between them into receptacle A, as set forth.

CHARLES F. BONHACK.

Witnesses:

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