

(No Model.)

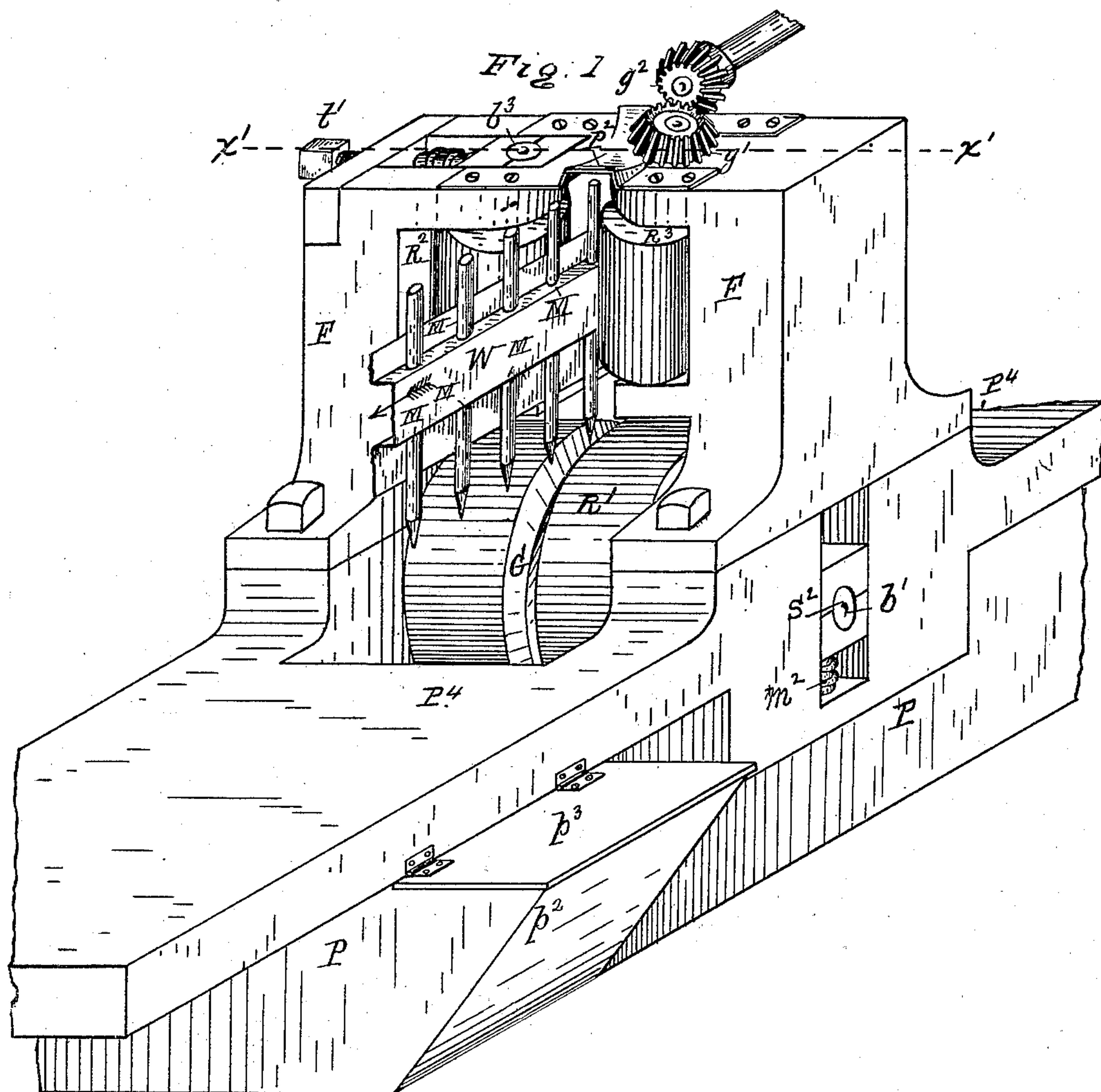
2 Sheets—Sheet 1.

W. E. HAGAN & G. E. NORRIS

APPARATUS FOR DIPPING MATCHES.

No. 331,129.

Patented Nov. 24, 1885.



WITNESSES:

Stanley M. Holden.

Charles S. Buntzall

William E. Hagan

George E. Norris

BY

W. E. Hagan

INVENTORS

ATTORNEY

(No Model.)

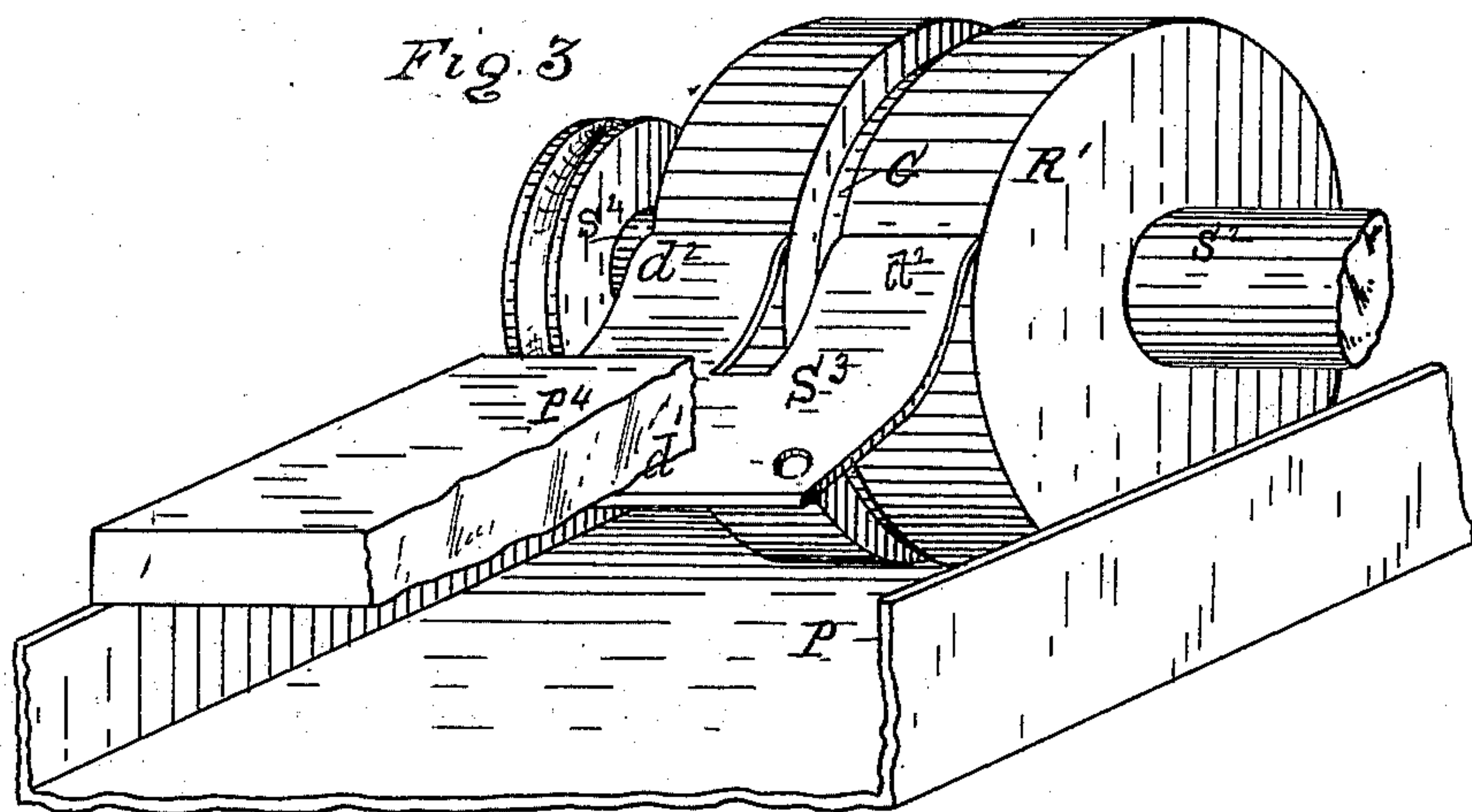
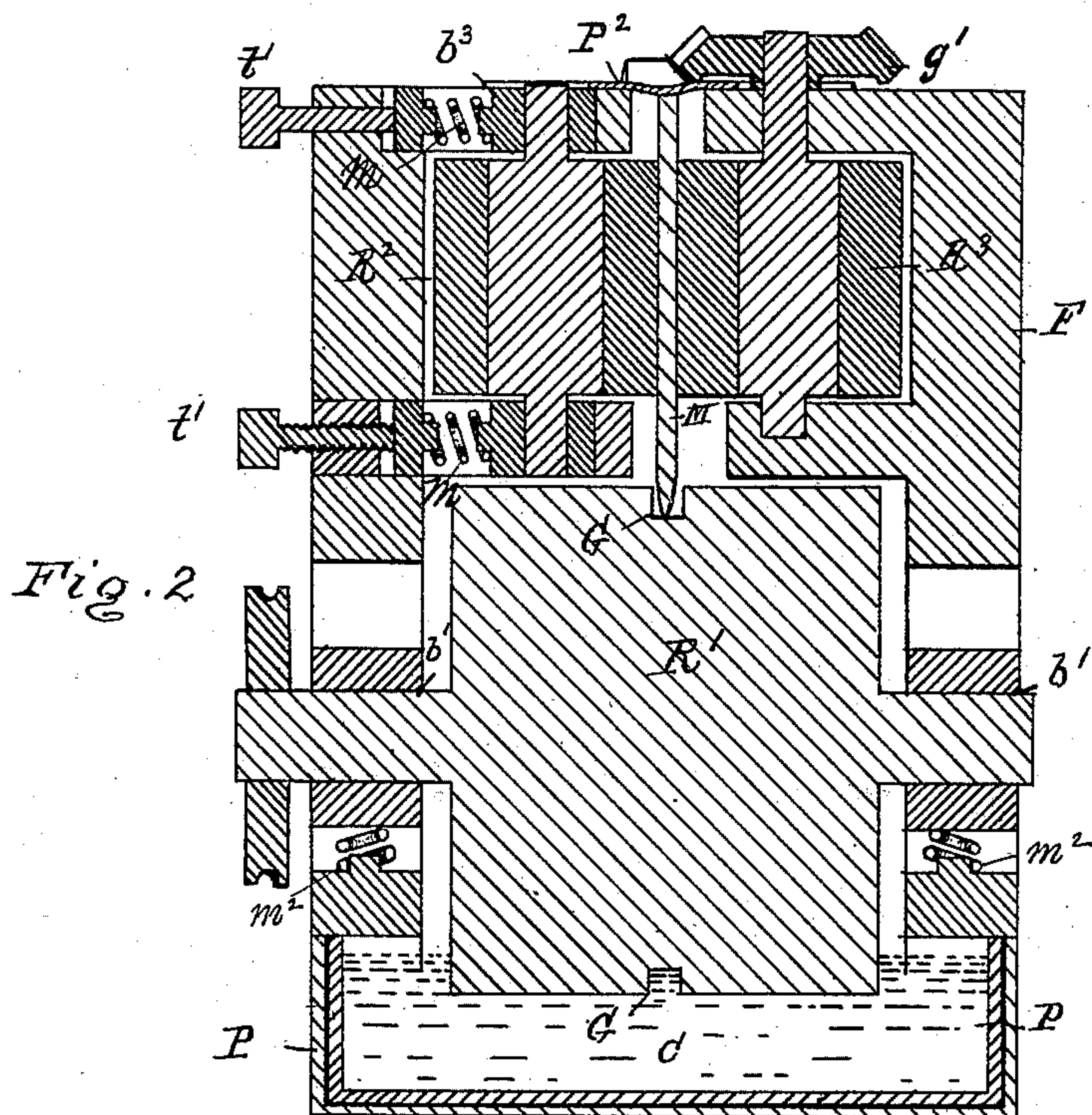
2 Sheets—Sheet 2.

W. E. HAGAN & G. E. NORRIS

APPARATUS FOR DIPPING MATCHES.

No. 331,129.

Patented Nov. 24, 1885.



WITNESSES:

Stanley M. Holden,

Charles S. Buntinall

William E. Hagan

George E. Norris

BY

W. E. Hagan his ATTORNEY

INVENTORS



# UNITED STATES PATENT OFFICE.

WILLIAM E. HAGAN AND GEORGE E. NORRIS, OF TROY, ASSIGNORS OF ONE-THIRD TO JAMES K. P. PINE, OF LANSINGBURG, NEW YORK.

## APPARATUS FOR DIPPING MATCHES.

SPECIFICATION forming part of Letters Patent No. 331,129, dated November 24, 1885.

Application filed May 22, 1885. Serial No. 166,375. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM E. HAGAN and GEORGE E. NORRIS, both of the city of Troy, county of Rensselaer, State of New York, have jointly invented a new and useful Improvement in Mechanism for Dipping Matches, of which the following is a specification.

Our invention relates to mechanism for dipping match-splints that are held or retained in a web, and more particularly for dipping splints that have been inserted within a web in the manner shown in an application for a patent made by us, and filed in the United States Patent Office May 13, 1885, the object of our invention being to dip the splints by a continuous operation, and to have the splints in a vertical position when being dipped.

Our invention consists, as will be more fully described hereinafter in connection with its illustration, in the combination, with a receptacle or vessel adapted to be heated and to contain an ignition composition, of a roller operated to turn with its lower surface in said composition, a groove made in the said roller-face circumferentially to the roller-axis, a scraping mechanism adapted and arranged to remove from the cylindrical face of the roller (before the splints enter said groove) the adhering composition, excepting where it is within the groove, and two rubber rollers having vertical shafts, between which rollers the web and splints are passed while the latter are having composition put on their lower ends by the composition-applying-roller; and our invention consists, as will be detailed hereinafter in the claims, in the sub-combination of the parts where performing specific function.

Accompanying this specification, to form a part of it, there are two plates of drawings, containing three figures, illustrating our invention, with the same designation of parts by letter-reference used in all of them.

Of these illustrations, Figure 1 shows a perspective of the mechanism, with the end covering removed and its delivery end turned toward the sight. Fig. 2 shows a cross vertical section taken on the line  $x' x'$  of Fig. 1. Fig. 3 is a perspective of the composition-

distributing roller, the pan, and the scraper, all shown as detached from the other mechanism, with their receiving end parts turned toward the sight.

The several parts of the apparatus thus illustrated are designated by letter-reference, and the function of the parts is described as follows:

The letter P designates a pan or receptacle adapted to be heated and to contain an ignition composition, and  $p^2$  an offset made in the side of the pan, provided with a cover,  $p^3$ , the latter being to furnish access to the pan for examination or for replenishing it.

The letter R' designates a roller having a shaft,  $S^2$ , and bearings  $b'$ , that are vertically adjustable by means of springs  $m^2$ .

The letter G designates a groove made circumferentially in the face of the roller R', the function of which groove is to deposit the ignition or other composition upon the ends of the splints while within the said groove.

The letter S<sup>3</sup> designates a scraper, which is preferably located within the pan P, immediately beneath where the web enters the machine. This scraper is attached to the under side of the pan-top  $P^4$ , as indicated at  $d'$  of Fig. 3, with its other end,  $d^2$ , in contact with the surface of the roller R', so as to remove from the cylindrical face of the latter (excepting where within the groove G) all the adhering composition, so that it will return to the pan thereat.

The letters R<sup>2</sup> and R<sup>3</sup> indicate two rubber rollers, having vertical shafts and bearings, the roller R<sup>2</sup> having bearings  $b^3$ , that are laterally adjustable by means of set-screws  $t'$  and springs  $m$ .

The letter  $g'$  designates a beveled gear-wheel on the shaft of the roller R<sup>3</sup> for receiving power from another gear-wheel,  $g^2$ , when the said rollers R<sup>2</sup> and R<sup>3</sup> are actuated to move the web. The function of these rollers R<sup>2</sup> and R<sup>3</sup>, in the main, is to hold the splints and passing web between their cylindrical faces while the lower ends of the splints are having composition applied thereto by means of the roller R'.

The operation of the mechanism thus arranged is as follows: When the roller R' is made with the groove G, the scraper S<sup>3</sup> is used



to remove from the cylindrical face of the said roller all the adhering composition that is not within the groove G, and then, as the splints are held between the rotating surfaces of the rollers  $R^2$  and  $R^3$ , the lower ends of the splints are within the groove G and receive composition therefrom. When the roller  $R'$  is made without the groove G, then the scraper is not used, and as the rollers  $R^2$  and  $R^3$  in their rotation hold the splints the lower ends of the latter receive composition from the surface of the roller  $R'$ , taken up by the latter during its rotation, with its lower surface within the composition C. Thus the functions of the rollers  $R^2$  and  $R^3$  and the roller  $R'$  are the same whether the groove G is used or not. From the dipping mechanism the web passes to a drying mechanism, which forms no part of the invention herein described.

Preferably the roller  $R'$  is made of porcelain or earthenware, and when combined with the rollers  $R^2$  and  $R^3$ , arranged to operate substantially as shown, it may be made without the groove G, and used without the scraper  $S^3$ .

While we have shown and described the rollers  $R^2$  and  $R^3$  as actuated to draw the web through the mechanism, and as their function to hold the splints when the body of the latter were being dipped would be the same, whether said rollers were operated to draw the web through the mechanism or the web was operated to be moved by other means beyond said rollers, and thus to produce the tension on the web, we do not limit our invention of the rollers  $R^2$  and  $R^3$ , when combined with the dipping-roller, to the condition that said rollers  $R^2$  and  $R^3$  shall move the web through the machine.

As the roller  $R'$ , made with the groove G, when combined with the pan P, would perform a specific function in applying composition to the ends of the splints, where arranged to be within the groove, and this function would be the same whether the rollers  $R^2$  and  $R^3$  were used to hold the splints while being acted upon by the grooved dipping-roller  $R'$  or other mechanism was employed to hold them, we do not limit our invention of the grooved dipping-roller, when combined with the pan P, to their combination with the rollers  $R^2$  and  $R^3$ .

Preferably the rollers  $R^2$  and  $R^3$  are made of rubber; but they may be made of any kind of material wherein their function would be the same as we describe it.

The pan P may be made of any well-known material, and be adapted to be heated in any well-known manner. When used to contain such composition as can be kept liquid by steam, it may be surrounded by the steam-jacket. Where used to contain melted sulphur, other methods of heating it may be employed.

While we have shown the splints made with pointed ends and the groove G made with straight sides, the groove when used may be made to have angular sides corresponding to the bevel of the splint-points, and the

groove made as shown may be used to dip splints having straight and unpointed ends.

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

1. In a machine for dipping match-splints that are held in a web, the combination, with a pan adapted to be heated and contain match composition, of a roller made with a groove in its cylindrical face circumferential to its axis, and said roller constructed to be rotated with its lower surface, where the latter will be immersed in composition contained within the pan, substantially in the manner as shown and described.

2. In a machine for dipping match-splints that are held in a web, the combination, with a pan or receptacle that is adapted to be heated and to contain match composition, of a roller made with a groove in its cylindrical face circumferentially to its axis, said roller being constructed to rotate with its lower surface immersed in match composition when within the pan, and a scraper adapted to remove from the cylindrical face of the roller the adhering composition, excepting that portion of the latter which is within the groove, substantially in the manner as and for the purposes set forth.

3. In a machine for dipping match-splints that are held in a web, the combination, with the pan or receptacle P, adapted to be heated and to contain match composition, of the roller  $R'$ , constructed to be rotated with its lower surface immersed in match composition contained within said pan, and the rollers  $R^2$  and  $R^3$ , having vertical shafts, and arranged with reference to said roller  $R'$ , substantially as and for the purposes set forth.

4. In a machine for dipping match-splints that are arranged in a web, the combination, with the pan P, constructed to contain match composition, of the roller  $R'$ , made with the groove G, and the guide-plate  $P^2$ , said parts being constructed and arranged to operate substantially in the manner as and for the purposes set forth.

5. In a machine for dipping match-splints that are arranged in a web, the combination of the pan P, made to contain match composition and adapted to be heated, the roller  $R'$ , arranged to rotate with its lower surface in the match composition contained in said pan, the rollers  $R^2$  and  $R^3$ , constructed to be actuated as described, and the guide-plate  $P^2$ , arranged with reference to the web and splints, substantially in the manner as and for the purposes set forth.

6. The combination of a web, W, having match-splints inserted therein, as shown, and actuated to be moved horizontally with the splints in a vertical position, as described, the rollers  $R^2$  and  $R^3$ , adapted to hold said web and the splints in an impressed contact while the said rollers are rotating with the web and splints passing between them, a dipping-roller,  $R'$ , adapted to be rotated with its lower surface in match composition, and its upper sur-



face to apply the same to the lower end of the splints, and the pan P, constructed to contain match composition, and arranged with reference to the roller R', as shown and described.

- 5 7. The combination of the web W, having match-splints inserted therein, as shown, and actuated to move horizontally with the splints in a vertical position, the pan P, adapted to contain match composition, the roller R', adapted to be rotated with its lower surface within  
10 match composition in said pan, and its upper surface in contact with the lower end of the

splints, and the guide-plate P<sup>2</sup>, with its under surface in contact with the upper end of the splints, as and for the purposes set forth.

Signed at Troy, New York, this 15th day of May, 1885, and in the presence of the two witnesses whose names are hereto written.

WILLIAM E. HAGAN.  
GEO. E. NORRIS.

Witnesses:

CHARLES S. BRINTNALL,  
STANLEY M. HOLDEN.