J. H. WEAVER & A. D. WELKER.

MACHINE FOR IMPREGNATING MATCHES.

APPLICATION FILED JAN. 11, 1913.

1,167,323.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 1.

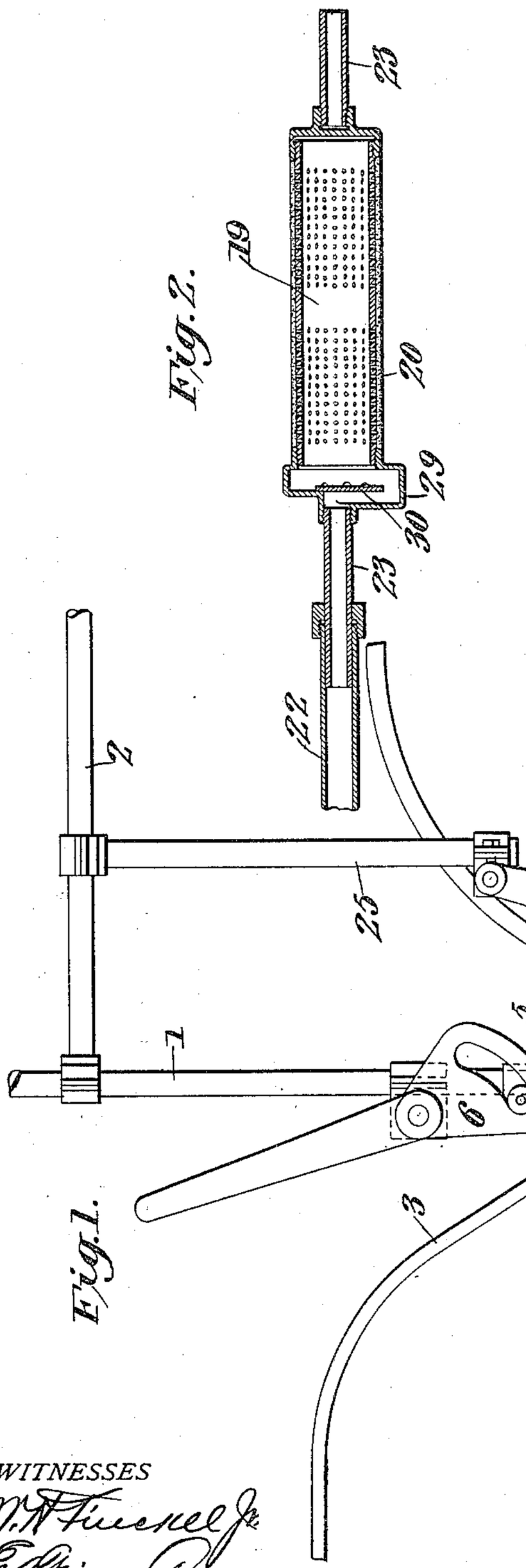


Fig. 2.

Fig. 1.

WITNESSES

W. W. Fincke Jr.

E. L. Fincke

INVENTORS

James H. Weaver

Alvin D. Welker

by Wm. W. Fincke Atty.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

J. H. WEAVER & A. D. WELKER.

MACHINE FOR IMPREGNATING MATCHES.

APPLICATION FILED JAN. 11, 1913.

1,167,323.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 2.

Fig. 3.

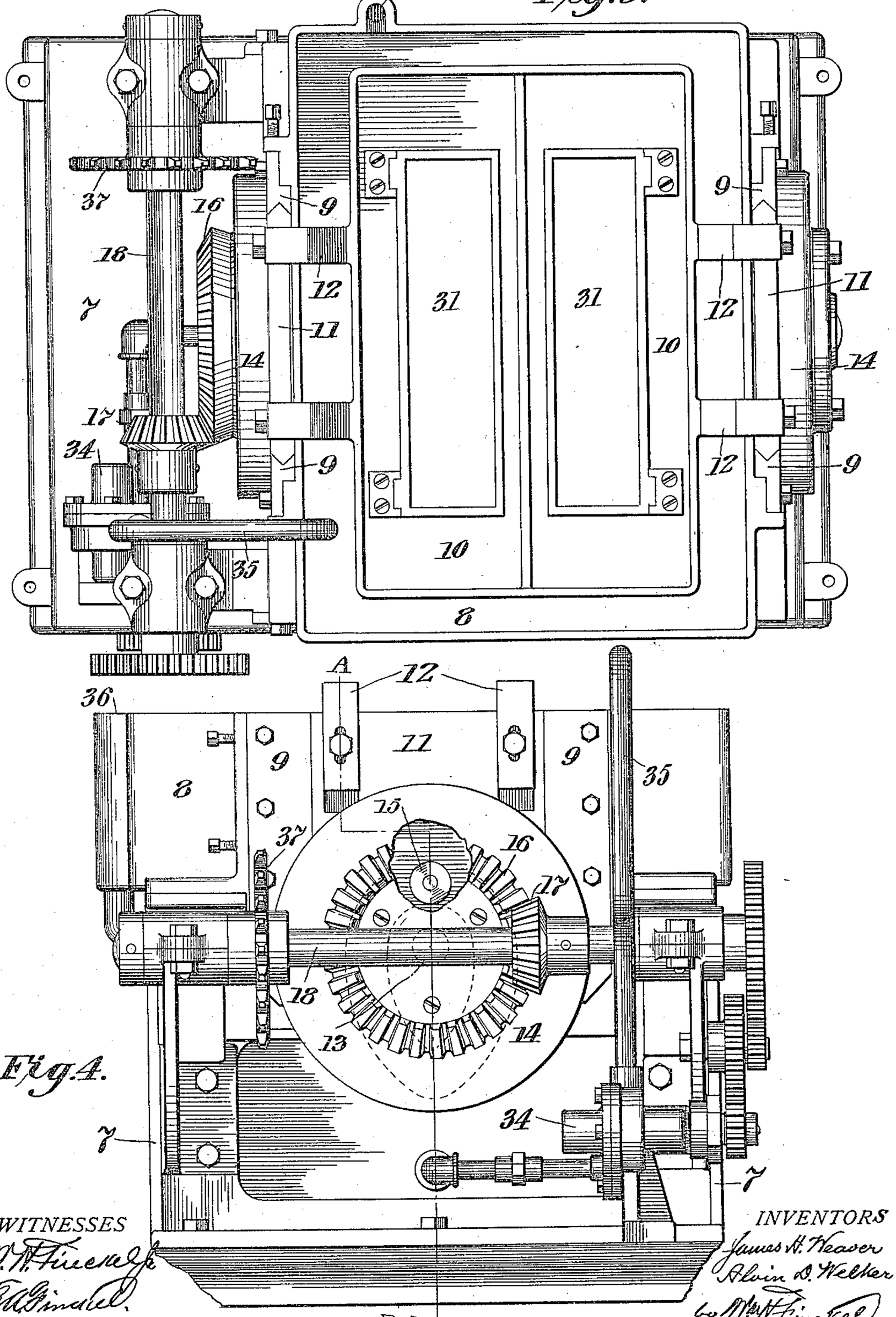


Fig. 4.

WITNESSES

W. H. Finckel Jr.

E. L. Finckel.

INVENTORS

James H. Weaver

Alvin D. Welker

by W. H. Finckel

Atty.

J. H. WEAVER & A. D. WELKER.

MACHINE FOR IMPREGNATING MATCHES.

APPLICATION FILED JAN. 11, 1913.

1,167,323.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 3.

Fig. 5.

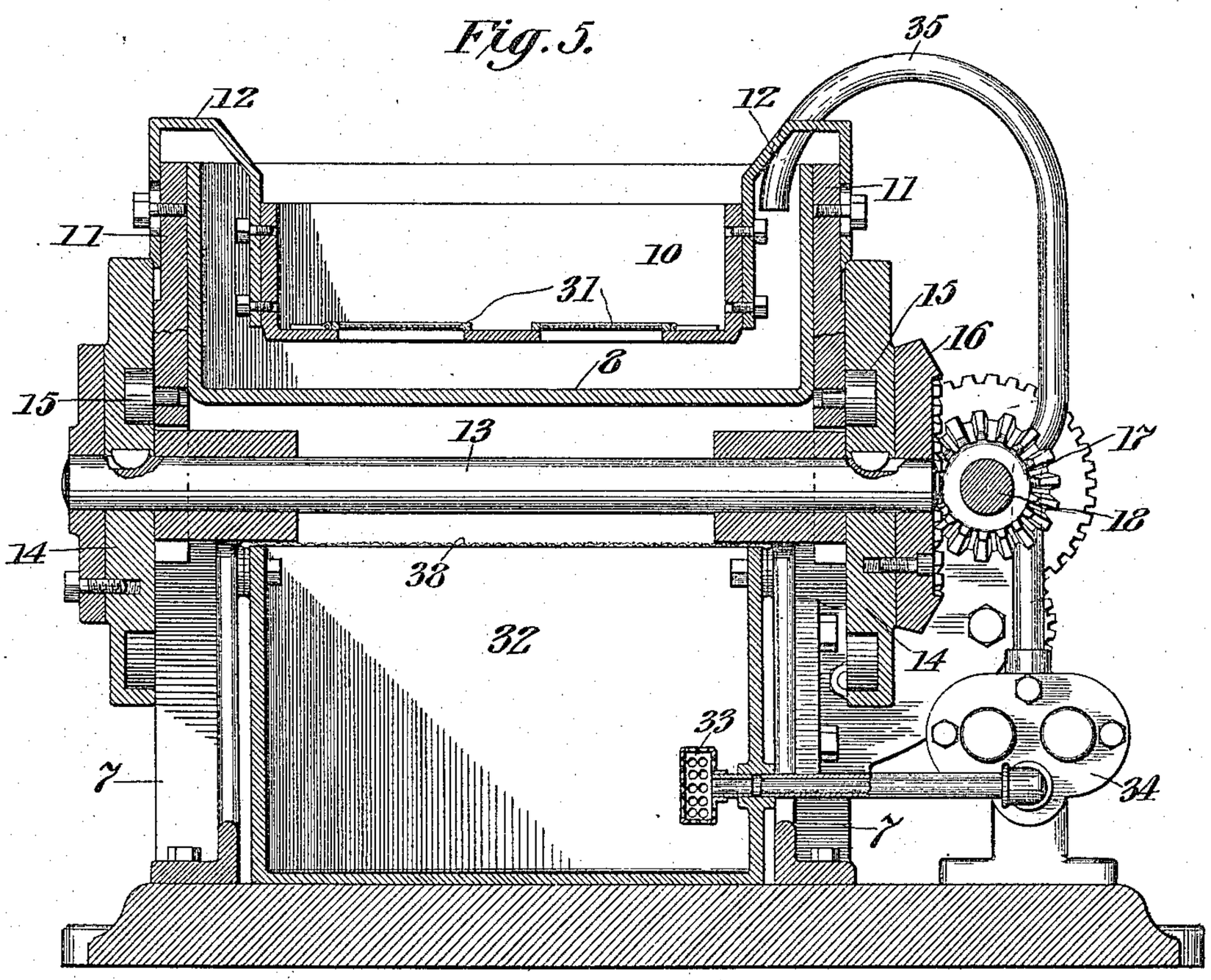
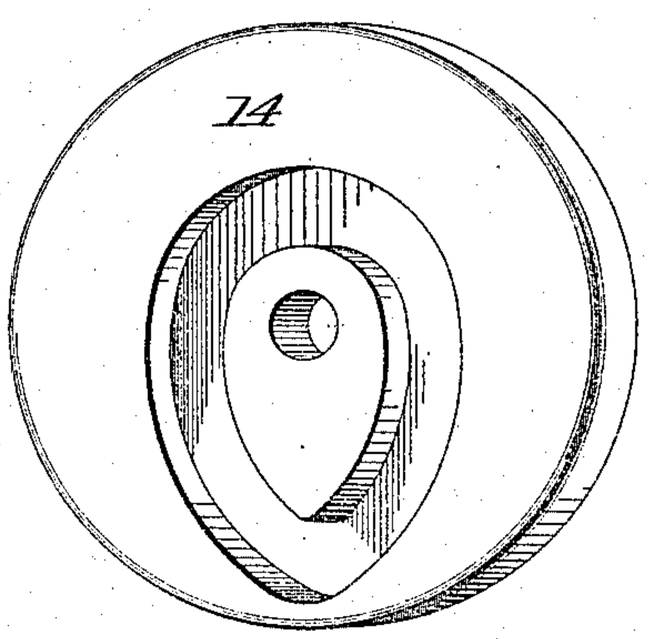


Fig. 6.



WITNESSES

W. W. Finnell Jr.

Ed. Finnell.

INVENTORS

James H. Weaver

Alvin D. Welker

by Wm. W. Finnell

Atty.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES H. WEAVER AND ALVIN D. WELKER, OF WADSWORTH, OHIO, ASSIGNORS TO THE OHIO MATCH COMPANY, OF WADSWORTH, OHIO, A CORPORATION OF OHIO.

MACHINE FOR IMPREGNATING MATCHES.

1,167,323. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed January 11, 1913. Serial No. 741,601.

To all whom it may concern:

Be it known that we, JAMES H. WEAVER and ALVIN D. WELKER, citizens of the United States, residing at Wadsworth, in the county of Medina and State of Ohio, have invented a certain new and useful Improvement in Machines for Impregnating Matches, of which the following is a full, clear, and exact description.

The object of this invention is to provide a convenient and efficient element in a match making machine, for impregnating match splints with a fluid which will prevent their afterglow when the flame is extinguished; the matches so impregnated being commonly described as non-glowing, or impregnated. The purpose of the treatment is to eliminate danger of fires when burnt matches are carelessly thrown away.

While the apparatus of this invention is designed primarily as a part of the connected series of machines for cutting, sticking, dipping and drying matches and known as a match machine, it is to be understood that the invention is not thus limited.

The invention consists of an impregnating bath which is lifted up to the splints, as distinguished from one into which the splints are lowered and through which they are dragged before emergence, thus accumulating an unnecessary quantity of moisture which requires a relatively long time and much heat to dry out before the paraffin can be efficiently applied; our movable bath being combined with an adjacent absorbent pad provided with an exhaust for rapidly removing excess moisture and thereby expediting the drying operation preliminary to the paraffining, as we will proceed now more particularly to set forth and finally claim.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation. Fig. 2 is a longitudinal section of the absorbent pad. Fig. 3 is a top plan view of one form of bath. Fig. 4 is an elevation of the left-hand side of Fig. 3. Fig. 5 is a cross-section taken in the plane of line A B, Fig. 4. Fig. 6 is a perspective view of the lifter cam.

Under the reservation previously noted, we will proceed to explain our invention as a part of a match machine, and without showing the whole of such machine, will assume that it is one of the continuous type, such as used in the match factory of the Ohio Match Company, at Wadsworth, Ohio.

The upright 1, stringer 2, carrier chain guides 3, carrier chain of plates 4 in which the splints are stuck and by which they are carried from the cutter progressively through the machine, may be and are here shown as of known construction; so also is the polygonal roller 5 as to construction, but herein it is given a new use by being located above the impregnating bath to guide and hold the loaded chain plates successively above the bath. A roller-lifting cam lever mechanism 6 of substantially known construction is used for adjusting the roller with relation to the bath.

The bath comprises a frame 7 of suitable construction to receive a stationary tank 8, opposite sides of which are provided with guideways 9. Within the tank is a bath 10, having slides 11 at opposite sides fitted to slide up and down in the guideways 9. These slides may be secured to the bath in any suitable way, as by goose-neck brackets 12.

13 is a shaft mounted in the frame of the machine and carrying at opposite ends similar cams 14 which engage rollers 15 on the slides 11, so that by rotation of the cams the bath 10 is raised and lowered within the tank 8. Rotary motion may be imparted to the cams by any suitable means, such as a bevel gear 16 meshed by a bevel gear 17 on a shaft 18 driven by any suitable means. The point of this feature of the invention is this: In the former constructions, the carrier chain with its load of splints was dragged through the bath, and in its progress it descended into the bath at an incline and then was fully submerged and then arose from the bath at an opposite incline, thereby greatly agitating the bath and saturating the splints to an unnecessary extent, so that the operation of drying the impregnated splints sufficiently to take the paraffin was both time and heat consuming and costly in output. In our invention a plate of splints is presented above the bath, one at a time, on a flat of the roller 5, and the bath containing the impregnating fluid is lifted up to the thus stationed plate and the splints momentarily exposed to the fluid while they are stationary, and then the bath recedes while the

plate of impregnated splints moves on and a fresh plate of splints is presented to the next horizontally positioned flat of the roller. Thus we avoid the immerging, dragging and emerging of the splints and the consequent splashing of the impregnating fluid, and the over-impregnation of the splints, and greatly facilitate their impregnation. As will be seen by reference to Fig. 1, the roller 5 may be maintained at any desired elevation above the bath, and thus additionally aid in insuring the impregnating of the splints to the desired extent and without excessive saturation.

As the impregnated splints are advanced from the impregnating machine to be dried, preparatory to dipping in the paraffin or other similar promoter of ignition, as usual, they come into contact with an absorbent pad, here shown as a hollow perforated roller 19, covered with felt 20 or other moisture absorbing material or substance; and to further expedite the drying of the splints by the removal of excess moisture, this hollow roller or absorbent pad may be connected with any suitable exhaust fan or other apparatus 21, by means of a pipe 22 applied to one of the journals 23 on which the roller turns. The absorbent pad 19 may be suspended in arms 24 suitably supported on columns 25 depending, for example, from the stringers 2 of the match machine frame. The absorbent pad may be positively turned at about the speed of the moving carrier chain, or it may be so mounted as to be turned by the passage of the splints over it. In either case the splints are in such intimate contact with the absorbent pad that they are very quickly deprived of excess moisture and their drying greatly hastened.

The exhaust apparatus 21 may have a pipe 26 by which the fluid extracted from the splints may be returned to the impregnating tank or its reservoir. This exhaust apparatus may be driven by a special motor 27 connected therewith by a belt 28, or it may be otherwise operated.

We have shown the absorbent pad as provided with a head 29 at that end to which the exhaust apparatus is connected, and in order to temper the suction, a baffle plate 30 may be interposed between the inlet to the exhaust pipe 22 and the outlet of the pad.

Impregnating fluid may be supplied to the bath 10 in any suitable way. For example, as shown in Fig. 5, the tank 8 may be supplied with fluid and the bath may be provided with flap valves 31 opening inwardly so that as the bath descends into the tank the flap valves 31 will open automatically and admit the fluid from tank 8 into the bath 10, and then close again automatically as the bath is elevated. The fluid level may be maintained in the tank 8 from a reservoir 32, and this reservoir may be connected by means of a pipe 33 leading into a pump 34, the outlet from which may be in the form of a goose-neck pipe 35 opening into the tank 8. As shown in Fig. 1, the pump 34 may be geared up with shaft 18. Instead of filling the bath 10 through the flap valves 31, the bath may be made without such valves, and the goose-neck 35 may open directly into the bath so as to supply it from the reservoir 32. In that case the tank 8 would serve merely to catch the overflow from the bath, and the bath would move up and down in the tank without splashing the impregnating fluid. The overflow from the bath into the tank would be returned to the reservoir 32 through the overflow 36. If the first described construction is used, this overflow 36 would be located at or near the top of the tank 8, as indicated in Fig. 3 but if the latter arrangement is adopted, then this overflow would be arranged a little above the bottom of the tank. The sprocket wheel 37 on shaft 18 may serve to connect that shaft with any suitable source of power, as, for example, the match machine proper. The reservoir 32 may have any suitable screen 38 over its top to prevent match sticks and other foreign matter from getting into the solution and thus clogging up the holes in the strainer 33. If necessary, the carrier chain may be continued from the absorbent pad through any suitable drying apparatus, or be exposed to any suitable drying atmosphere or medium, before it approaches the paraffining apparatus; or, if desired, the absorbent pad may be omitted, or a substitute used in its stead.

By the apparatus above described, the splints may be impregnated very uniformly and rapidly, and without waste of the impregnating material; and the apparatus may be interposed in the ordinary continuous match machine without any material disturbance of the present installations.

What we claim is:—

1. In a machine for impregnating match splints with a material which will render them non-glowing after the matches have been ignited and extinguished, an endless traveling splint carrier, and a polygonal roller about which the carrier passes and by which the said carrier is momentarily detained over the impregnating bath, combined with the said impregnating bath, means to move said bath toward and away from the detained splints, means to keep the impregnating bath supplied with impregnating material, and an absorbent pad interposed in the path of movement of the carrier as it leaves the bath.

2. In a machine for impregnating match splints with a material which will render them non-glowing after the matches have been ignited and extinguished, an endless traveling splint carrier, and a polygonal

roller about which the carrier passes and by which the splint carrier is momentarily detained over the impregnating bath, combined with the said impregnating bath, means to move said bath toward and away from the detained splints, means to keep the impregnating bath supplied with impregnating material, and a hollow perforated roller covered with moisture-absorbing material interposed in the path of movement of the carrier as it leaves the bath.

3. In a machine for impregnating match splints with a material which will render them non-glowing after the matches have been ignited and extinguished, an endless traveling splint carrier, and a polygonal roller about which the carrier passes and by which the said carrier is momentarily detained over the impregnating bath, combined with the said impregnating bath, means to move said bath toward and away from the detained splints, means to keep the impregnating bath supplied with impregnating material, and a hollow absorbent pad interposed in the path of movement of the carrier as it leaves the bath and having an exhaust mechanism arranged within it for the removal of the impregnating material absorbed by the pad.

4. In a machine for impregnating match splints with a material which will render them non-glowing after the matches have been ignited and extinguished, an endless traveling splint carrier, and a polygonal roller about which the carrier passes and by which the splint carrier is momentarily detained over the impregnating bath, combined with the said impregnating bath, means to move said bath toward and away from the detained splints, means to keep the impregnating bath supplied with impregnating material, a hollow absorbent pad interposed in the path of movement of the carrier as it leaves the bath and having an exhaust mechanism arranged within it for the removal of the impregnating material absorbed by the pad, and means to connect the exhaust with the bath to return the material for reuse in the bath.

In testimony whereof we have hereunto set our hands this 8th day of January A. D. 1913.

JAMES H. WEAVER.
ALVIN D. WELKER.

Witnesses:
WILLARD G. COX,
A. M. BECK.