J. C. DONNELLY.

MACHINE FOR PACKING MATCHES.

APPLICATION FILED OCT. 23, 1912.

1,122,579.

Patented Dec. 29, 1914.

3 SHEETS—SHEET 1.

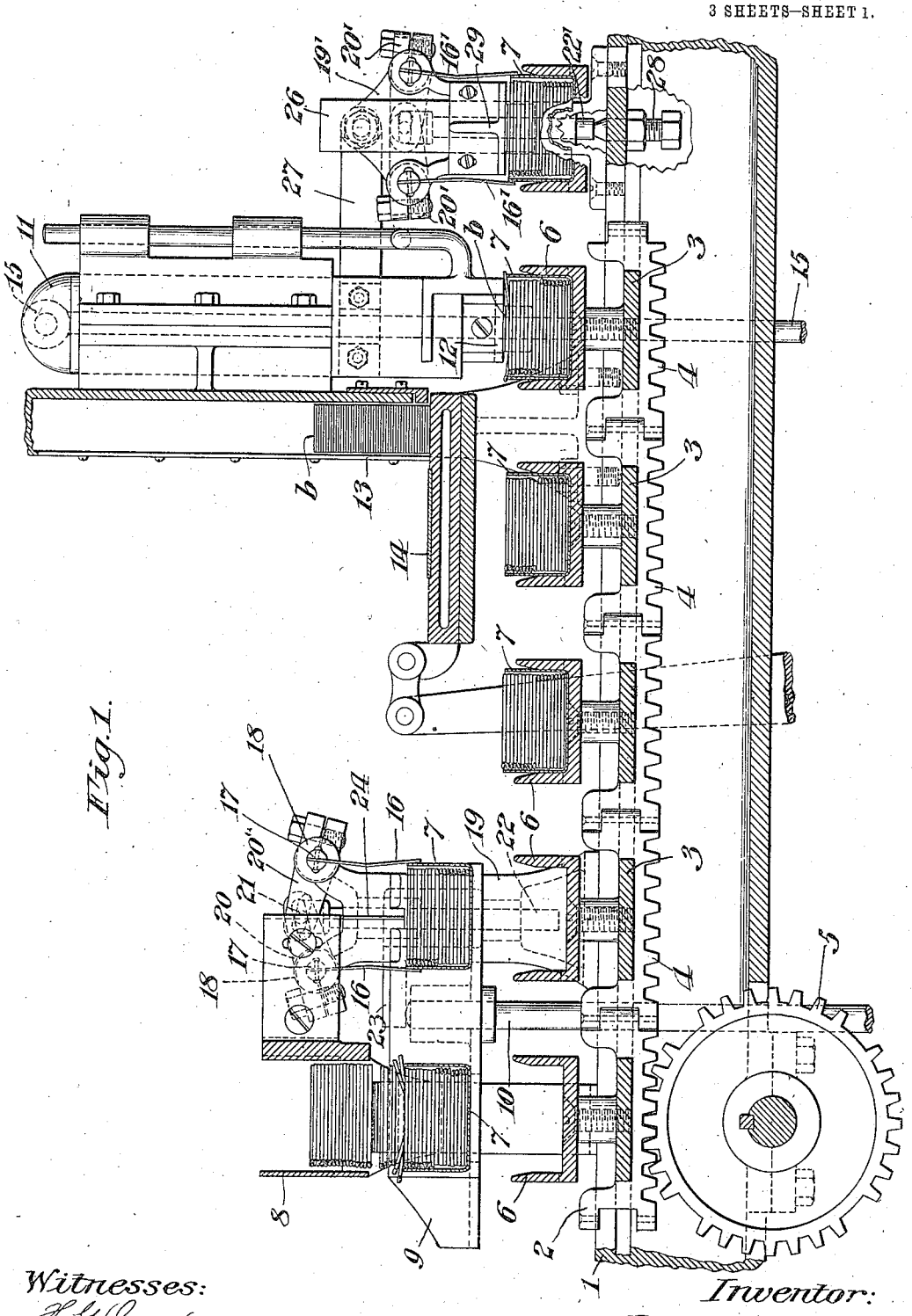


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 4.

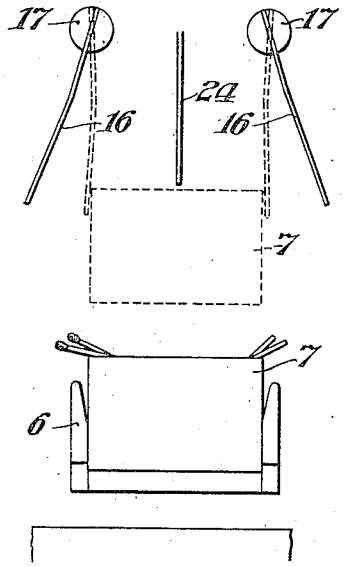


Fig. 2.

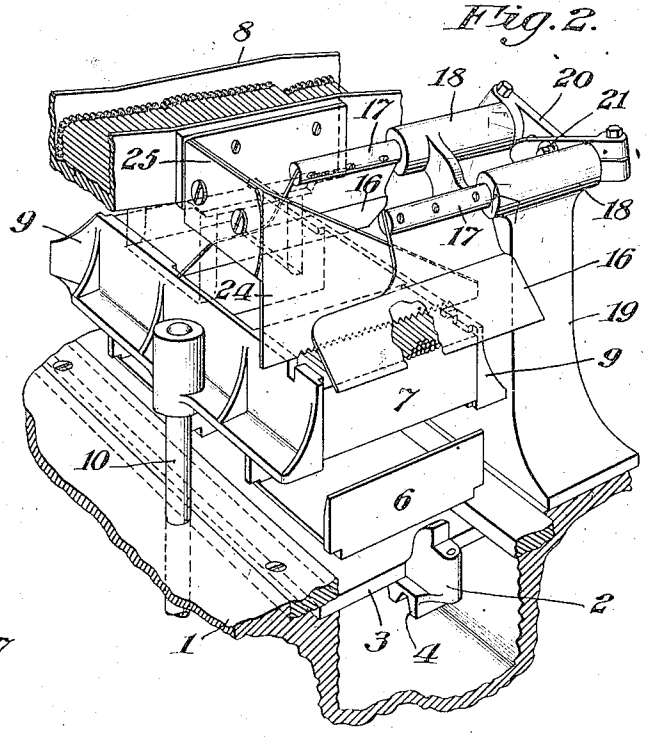


Fig. 3.

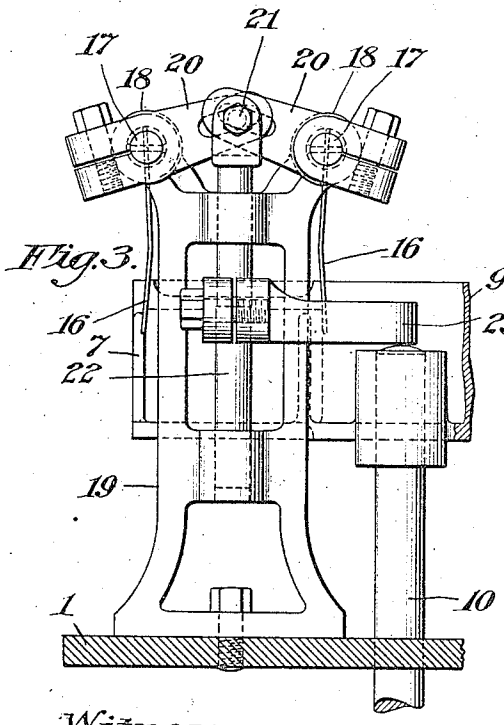
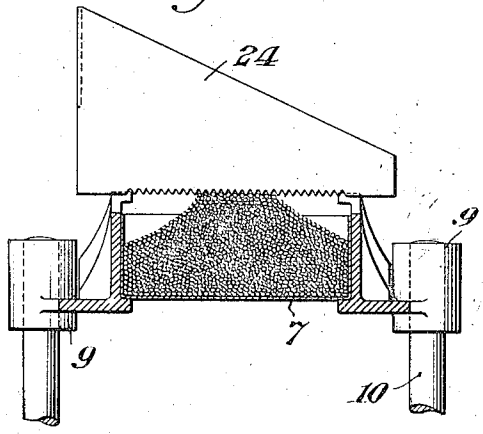


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 8.

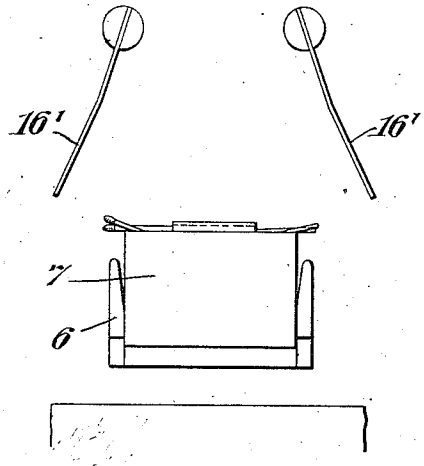


Fig. 6.

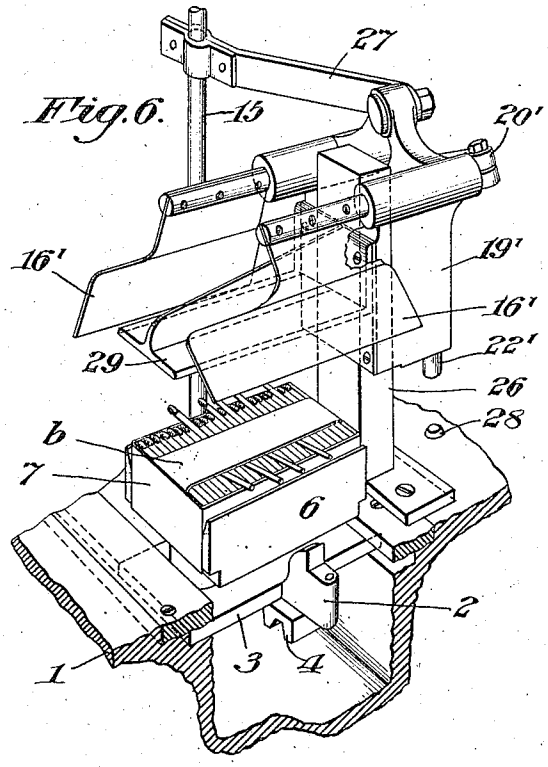


Fig. 9.

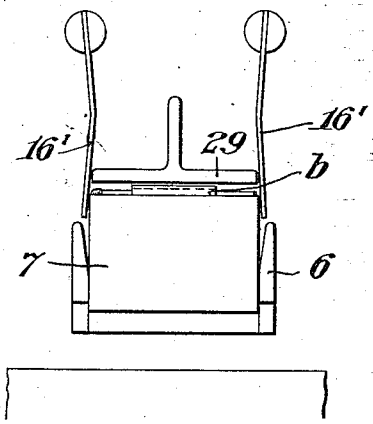
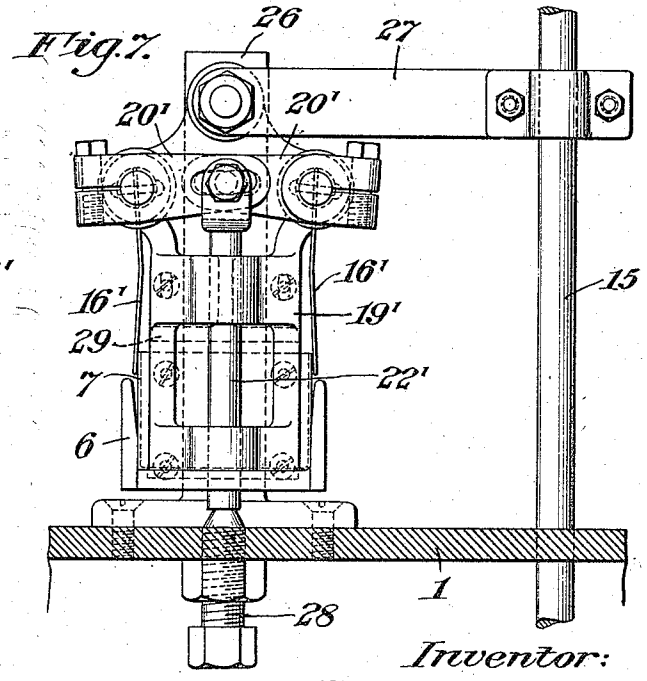


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH C. DONNELLY, OF BARBERTON, OHIO, ASSIGNOR TO THE DIAMOND MATCH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR PACKING MATCHES.

1,122,579. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed October 23, 1912. Serial No. 727,282.

To all whom it may concern:

Be it known that I, JOSEPH C. DONNELLY, a citizen of the United States, and resident of Barberton, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Machines for Packing Matches, of which the following is a specification.

This invention relates to machines for packing matches in boxes, with particular reference to the machine set out in Letters Patent of the United States No. 1,016,436, dated February 6, 1912.

One feature of my invention concerns a modification of the devices shown and described in the said patent for the purpose of positioning within the filled box trays any matches whose ends may be projecting over the sides of the trays; and another feature of my invention concerns the provision of other match-positioning devices which are arranged adjacent the protection-strip applying mechanism and are designed to act upon endwise displaced matches within the trays after the "protection strips" have been formed and applied to the filled trays.

The features of invention just indicated, together with certain match straightening and leveling members coöperating therewith to effect the compact and orderly arrangement of the matches within the box-trays, as will be hereinafter fully described and claimed.

In the drawings—Figure 1 is a vertical section of a portion of the tray-conveyer and adjuncts of a match packing machine embodying my invention, only so much of the machine being shown as is necessary to illustrate the invention. Fig. 2 is a sectional perspective view of the first match positioning devices in closed or acting position and the tray lifters as provided with box trays and elevated. Adjacent portions of the filler trough, main bed plate and tray-conveyer are shown. Fig. 3 is a rear view of the first match positioning devices and their actuating parts, said devices being also shown in closed or acting position. Fig. 4 is a diagram illustrating by full lines the positioning blades as in open position, and the filled box-tray as in down position preparatory to its being raised into the path of the said blades; and illustrating by the dotted lines the box-tray as raised and its projecting matches as engaged and positioned by said blades. Fig. 5 is a transverse section through the tray-lifters and the filled tray thereon, showing the vibratory blade for bearing upon and distributing and straightening the matches within the tray. Fig. 6 is a sectional perspective view of the second match positioning devices and their actuating parts, showing a filled box tray with its protection strip as in position to be acted upon by said devices. Fig. 7 is a rear elevation of the second match positioning devices and their actuating parts, said devices being shown in closed or acting position with respect to the filled tray. Fig. 8 is a diagram illustrating the positioning blades in their elevated open position preparatory to being lowered to engage the projecting matches in the underlying box-tray. Fig. 9 is a similar diagram illustrating the blades as lowered and swung to active position laterally of the box tray. In this view a pressure plate located between the blades is shown as bearing upon the protection strip.

1 designates a part of the bed or table upon which the tray-conveyer 2 is supported and guided. This conveyer comprises an endless chain of links 3 provided on their under sides with gear teeth 4 with which mesh the teeth of the actuating gear wheels, of which one is indicated at 5, and on their upper sides with holders 6 for the box-trays 7.

8 designates a portion of the filler trough through which the matches are directed to suitably-disposed discharge stations above the path of the trays in the conveyer, which trough is rapidly vibrated in a manner to assist the passage of the matches therealong.

9 designates a pair of vertically-reciprocative channeled brackets adjacent the second discharge station of the filler trough. These brackets are designed directly to receive and engage the ends of trays positioned therebetween by the conveyer, and to raise and lower such trays independently of their holders relatively to such discharge station. The brackets are supported by a rising and falling yoke frame 10 under the control of an appropriate cam on a driven shaft of the machine.

The means whereby "protection strips" are applied to the filled trays after they leave the second discharge station, includes a vertically-reciprocative plunger 11 provided at its lower end with jaws 12 beneath

which a blank, as *b*, is projected from an adjacent magazine 13 by means of a horizontally reciprocating slide 14. The plunger in its descent bears upon the blank and presses down the projecting ends of the latter, and upon the retraction of the slide the plunger retains the strip thus produced. In the continued descent of the plunger, the jaws of the plunger, with the confined strip, are pressed into the filled box-tray; and when the plunger is raised the protection strip thus formed and applied remains within the filled tray. The plunger is actuated by means of a vertically-reciprocating rod 15 under the control of appropriate lever and cam devices.

As the mechanisms above referred to are fully shown and described in the Patent No. 1,016,436 aforesaid, they require no detailed illustration or description herein.

In the patented structure the devices for positioning within the filled trays any matches whose ends may be projecting beyond the sides of the trays after they leave the second discharge station, include a pair of yielding diverging plates or blades between which the upper portion of a filled match tray is entered when it is raised by the channeled brackets as above-mentioned, which blades, together with an intermediate depending match settling plate, which bears transversely upon the matches within the tray, are supported by a bracket secured to, and partaking of the longitudinal reciprocations of, the hopper. In the present construction the blades are mounted independently of the hopper, and are arranged to swing toward and from the sides of the box tray in a manner to exert a direct endwise thrust upon match ends projecting laterally of the tray. These blades, indicated at 16, are secured at their upper ends to parallel rock-shafts 17 which are journaled in bearings 18 in a bracket frame 19 rising from the bed, said shafts being appropriately spaced to permit the requisite oscillation of the blades in respect to the filled box-tray raised between the same. The outer ends of the rock-shafts have secured thereto a pair of inwardly extending lever arms 20, the inner ends of which overlap and are pivotally jointed, as by a pin and slot connection 21, with a vertically-movable rod 22 mounted in perforated lugs on the bracket frame, the construction of the parts being such that the rod and its adjuncts tend normally to swing the blades 16 outward or away from each other, and that when the rod is raised the blades are caused to swing toward each other. The rod is provided with a toe 23 which extends into the path of one of the limbs of the vertically movable yoke frame 10 above referred to. This frame in its upward movement effects the elevation of the lifter brackets 9 and the filled match trays engaged thereby, one of the trays being raised toward the discharge station of the filler trough, and the other between the inner depending sides of the blades 16. As the yoke frame approaches the limit of its upward movement these blades extend laterally of and below the top of the tray, and the frame, impinging against the opposing toe 23, effects the inward swinging of the blades, which thereupon bear directly against the ends of the matches projecting over the edges of the tray and push them into the tray. Upon the descent of the yoke frame the filled tray is deposited in its holder on the conveyer, and the blades and their connections resume their normal position by gravity. Arranged midway between the blades is the match straightening plate 24 which is secured to a bracket 25 on the vibratory trough so as to partake of the action of the latter. The lower edge of this plate is serrated, and is so disposed that when the filled tray is raised between the swinging blades 16, such serrated edge bears upon the top of the matches and by its reciprocations thereon serves to distribute and compact them uniformly within the tray, substantially as described in the Patent No. 1,016,436 aforesaid. The tray-conveyer 2 in its travel advances the filled tray to the protection-strip applying means above-mentioned. In the operation of applying the strip the matches contained within the tray are frequently endwise displaced and caused to extend over the upper lateral edges of the tray as indicated in Fig. 6, thus causing a further disarrangement of the matches when the filled tray is forced into the box shuck or cover. To obviate this difficulty I provide the second match positioning devices immediately in rear of the strip-applying means. These devices are practically the same in construction as the first described positioning devices, the difference being that instead of the trays being raised and lowered in the region of the oscillatory blades 16′ the frame 19′, which supports the blades and their connections, is raised and lowered in the region of the filled tray. This frame is slidingly fitted to a vertical guide post 26 rising from the bed, and is connected at its upper end by means of an arm 27 with the vertically-reciprocating rod 15 of the protection-strip applying devices so as to partake of the movement of said rod. Suitably disposed in the bed 1 is a screw 28 which performs the function of an adjustable stop for the lower end of the blade-actuating rod 22′ when the frame is lowered, the blades 16′ at that time extending laterally of and below the top of the filled tray. Consequently in the further downward movement of the frame the rod 22′ effects the upward movement of the overlapping jointed ends of the lever arms 20′ and

causes the blades 16′ to swing toward each other and push the opposing projecting matches into the tray. In the upward stroke of the frame the blades and their connections resume by gravity their normal position for operation upon the next succeeding box-tray. To obviate all liability of disturbance of the protection strip within the tray by the quick action of the oscillating blades 16′ on the projecting ends of the matches, I attach to the frame 19′ a plate 29 which extends between the blades, and is so arranged that as the frame reaches its lowermost position the plate bears upon the protection strip and the mass of matches within the filled tray. Thus the protection strip is held in place and at the same time the matches are pressed down to permit the final operation of properly entering the filled tray into the shuck or cover.

I claim—

1. In a machine for packing matches, the combination with means for feeding match receptacles, of a pair of blades laterally movable relatively to each other, a support therefor, and means whereby the said blades are moved toward and from the sides of the receptacles successively so as to push back any matches projecting endwise over the sides of the receptacles.

2. In a machine for packing matches, the combination with means for feeding match receptacles, of a pair of blades laterally movable relatively to each other, a support therefor, means for effecting a relative vertical movement between said receptacles and blades, and means whereby the said blades are moved toward and from the sides of the receptacles successively so as to push back any matches projecting endwise over the sides of the receptacles.

3. In a machine for packing matches, the combination with means for feeding match receptacles, of a pair of blades laterally movable relatively to each other, a support therefor, means whereby the said blades are moved toward and from the sides of the successive receptacles, a pressure member for the contents of the underlying filled receptacle, and means for effecting a relative vertical movement between said receptacle and pressure member.

4. In a machine for packing matches, the combination with means for feeding match receptacles, of a supporting element, means for vertically moving said element adjacent the path of the receptacles, a pair of blades mounted to oscillate on said element and adapted in the down stroke of the latter to embrace an underlying filled receptacle, means for oscillating said blades, and a pressure member on said element adapted to bear upon the contents of said receptacle.

5. In a machine for packing matches, the combination with means for feeding match receptacles, of a pair of blades laterally movable relatively to each other, a support therefor, lever arms connecting said blades, a rod pivotally connected with said arms, and means for actuating said rod to move the blades toward and from the sides of receptacles presented therebetween.

6. In a machine for packing matches, the combination with a support for box-trays, and means for applying protection strips to the filled trays, of a pressure member for bearing upon the top of the strip in an underlying filled tray, and means for pushing back any matches projecting endwise over the sides of the tray.

7. In a machine for packing matches, the combination with a support for box-trays, and means, including a vertically-reciprocating element, for applying protection strips to the filled trays, of a vertically-movable frame adjacent said means, a connection between the said element and frame, a pair of blades mounted on said frame so as to be laterally movable relatively to each other, and adapted in the down stroke of the frame to embrace an underlying filled tray, and means whereby the blades are moved toward and from the sides of said tray.

8. In a machine for packing matches, the combination with a support for box-trays, and means for applying protection strips to the filled trays, of a vertically-movable frame, means for actuating the same, a pair of blades mounted on said frame so as to be laterally movable relatively to each other, and adapted in the down stroke of the frame to embrace an underlying filled tray, a pressure member on said frame arranged to bear upon the top of the strip in said underlying tray, and means whereby the blades are moved toward and from the sides of such tray and thus caused to push back any matches projecting endwise over the sides of the tray.

Signed at Barberton, in the county of Summit and State of Ohio this 21st day of October A. D. 1912.

JOSEPH C. DONNELLY.

Witnesses:
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SABINA PARKS.