H. W. WINTER & B. J. CONLON.

MACHINE FOR SETTING HEEL AND SOLE PROTECTORS FOR BOOTS AND SHOES.

APPLICATION FILED JAN. 14, 1901.

959,984.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

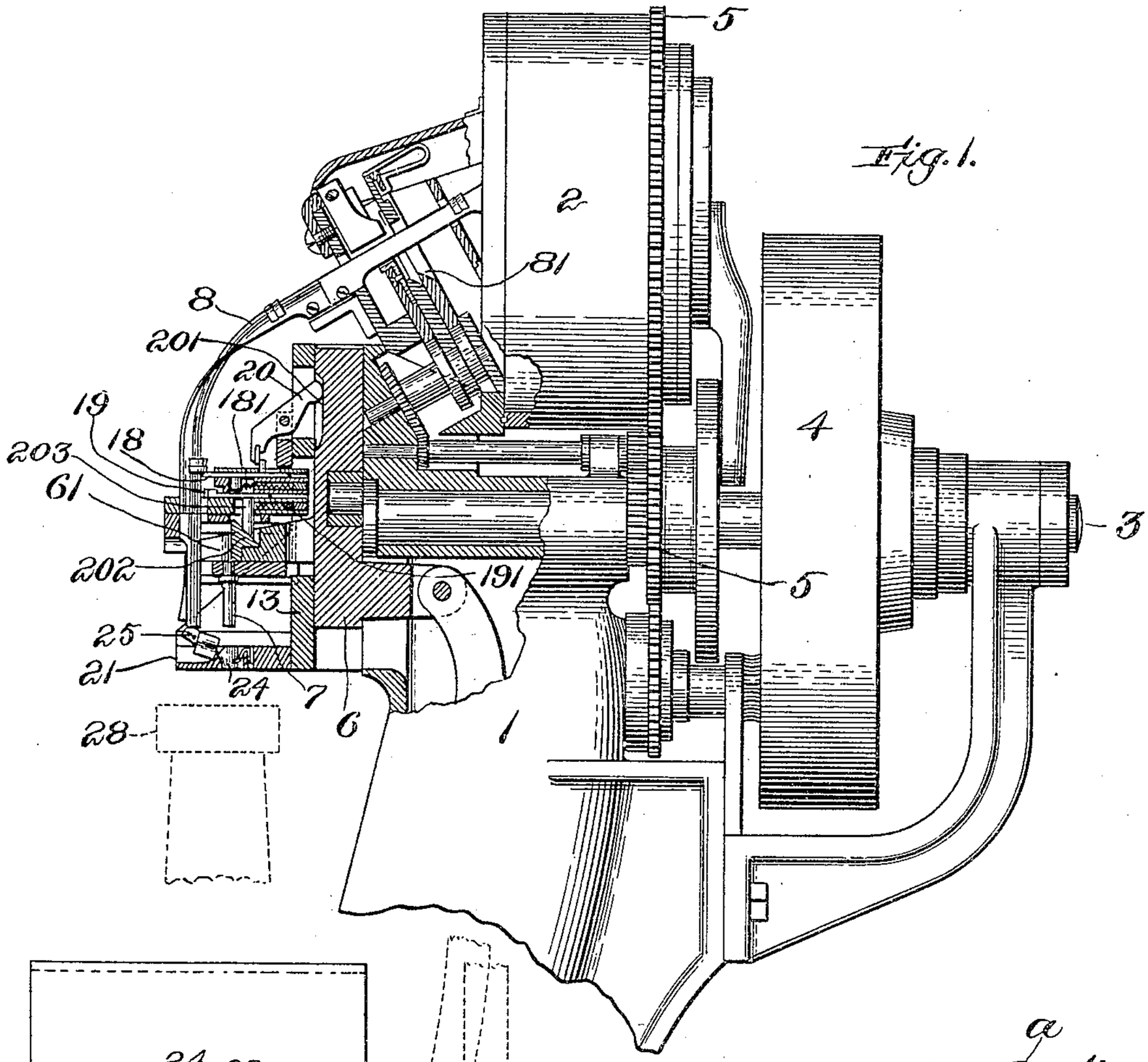

Fig. 1.

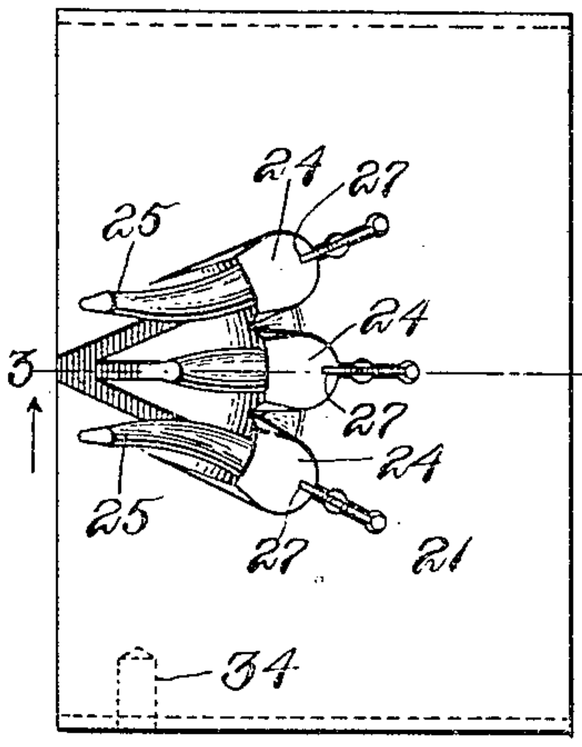

Fig. 2.

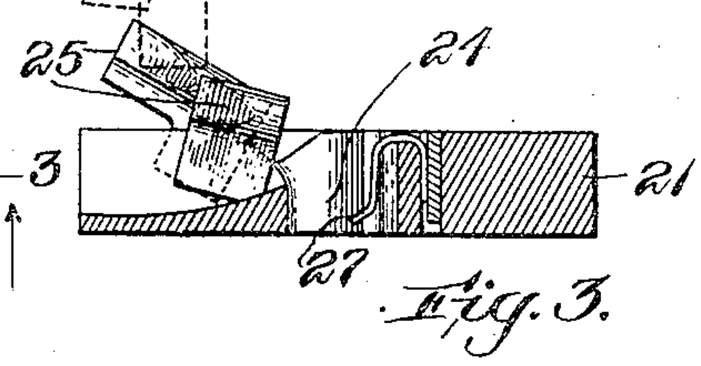

Fig. 3.

Fig. 4.

Fig. 5.

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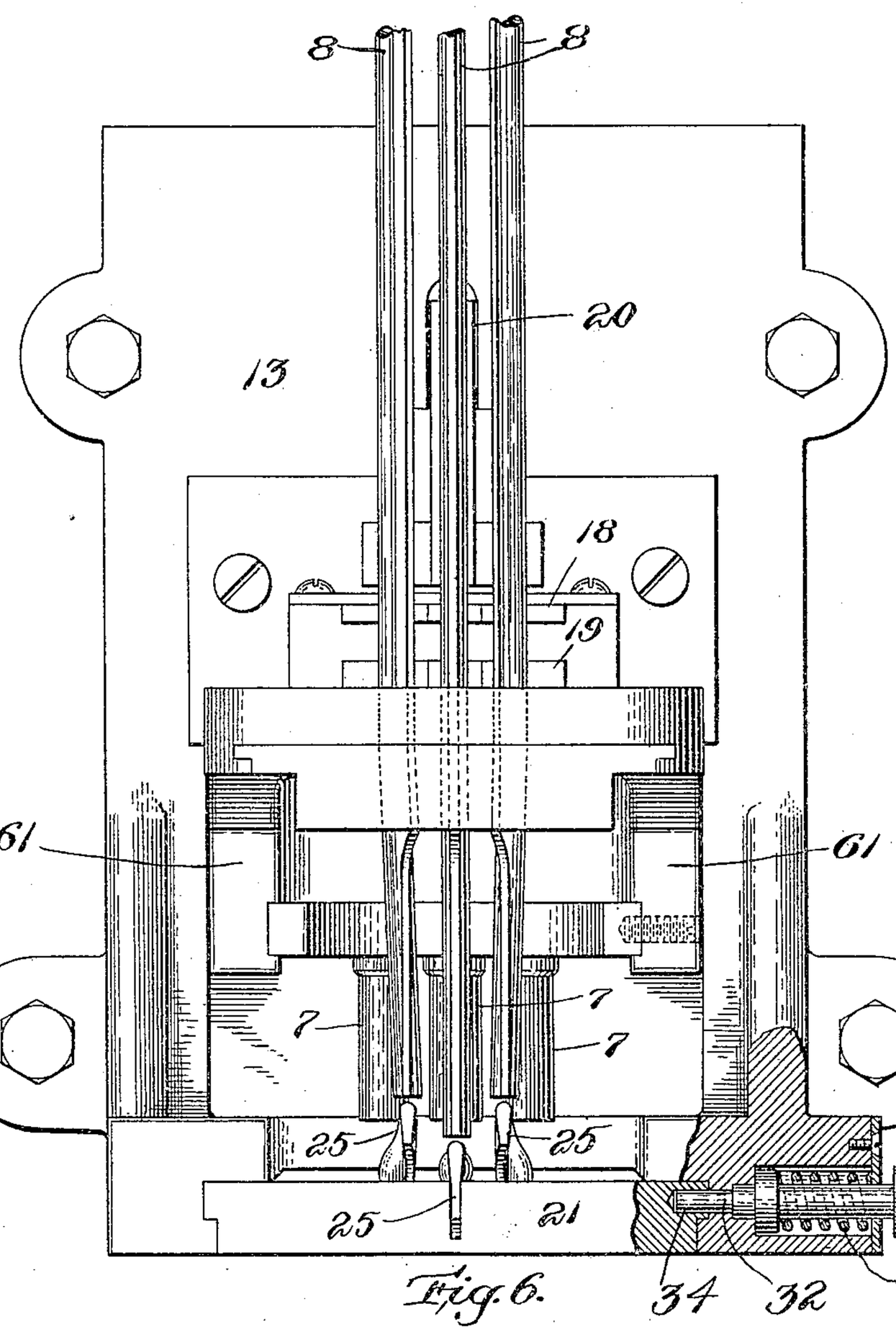

Fig. 6.

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UNITED STATES PATENT OFFICE.

HENRY W. WINTER AND BARTHOLOMEW J. CONLON, OF LAWRENCE, MASSACHUSETTS, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR SETTING HEEL AND SOLE PROTECTORS FOR BOOTS AND SHOES.

959,984. Specification of Letters Patent. **Patented May 31, 1910.**

Application filed January 14, 1901. Serial No. 43,108.

To all whom it may concern:

Be it known that we, HENRY W. WINTER and BARTHOLOMEW J. CONLON, citizens of the United States, residing at Lawrence, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Machines for Setting Heel and Sole Protectors for Boots and Shoes, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to machines for driving or setting metallic reinforces or protectors into the heels and soles of boots and shoes, for the purpose of retarding and equalizing the wear thereof.

In practice, extensive use is made of reinforces or protectors which are formed of strips of metal bent into U-shape, or substantially horse-shoe shape, these being applied by being driven edgewise into the leather of the sole or top-lift of a heel until the edges of such protectors remaining visible are flush with the outer surface of the sole or top-lift, or substantially so. Protectors of the general class to which reference has been made above may be termed winged protectors. The shape thereof may vary more or less.

The invention consists in improvements in machines for driving U-shaped or winged protectors, as we now will proceed to explain with the aid of the accompanying drawings.

In the drawings, Figure 1 shows in side elevation, with some parts in vertical section, the upper portion or head of a machine embodying the present invention. Fig. 2 shows the foot-plate of the said machine, in plan, on an enlarged scale. Fig. 3 shows the said foot-plate in transverse section on the vertical plane that is indicated by the dotted line 3 3, Fig. 2, looking in the direction that is indicated by the arrows adjacent the ends of such line in the latter figure. Fig. 4 shows in horizontal section a raceway with a protector thereon. Fig. 5 shows views of one form of protector which our machine is adapted to drive. Fig. 6 is a front elevation of portion of the head of the machine.

Having reference to the drawings,—the protector, *a*, which is shown separately in Fig. 5 and shown applied to a raceway in Fig. 4, is of the form above referred to, that is to say, it is essentially horse-shoe shape in plan, the free ends of its wings being inclined slightly toward each other. In the machine shown in the drawings, protectors on the order of that shown at *a*, supplied in mass to a hopper, are placed automatically in line upon one or more raceways, and by the latter are guided to the point in the machine where the driving is effected, means being provided for feeding the protectors singly along each raceway, and for delivering the protectors in position beneath the drivers in readiness for being forced or set into the stock which is held in readiness to receive such protectors.

1 designates the supporting post or frame of the machine. 2 is a hopper for protectors, mounted suitably at the upper end of said post or frame. 3 is a driving shaft, mounted in a suitable bearing or bearings provided in the said post or frame, and 4 is a band-pulley on the said driving-shaft. Part of a train of gearing for rotating the hopper from the said driving-shaft is shown at 5 5.

6 is a slide or plunger for operating the drivers 7. The number of drivers may vary in practice, but inasmuch as usually in the case of the top-lift of a heel three protectors are driven in a group, the present machine is provided with a group of drivers, three in number, in order to drive a corresponding number of protectors at once. The said slide or plunger is actuated by means of a crank on the end of the said driving-shaft 3, as shown in Fig. 1. It moves vertically in guides or ways which are provided in the head of the machine. At 61 is shown an arm projecting forwardly from the slide or plunger 6, *i. e.*, to the left in Fig. 1, and to which the drivers 7 are attached.

8 8 designate a series of raceways or roadways leading forward and downward from the hopper 2 for the purpose of conveying the protectors from the hopper toward the place where the driving is to be effected. The said raceways or roadways are thin or blade-like, to enable them to be straddled by the protectors, and preferably are enlarged or beaded along one edge thereof throughout the lower portion of their length, as shown in Fig. 4, for the purpose of preventing the escape or dislodgment of the

protectors after having advanced onto such portion. This longitudinal enlargement or bead of the strip-like raceway or roadway is embraced by the slightly converging wings of the protectors, and the protectors cannot pass transversely off such enlargement or bead. The number of raceways or roadways employed in practice will vary according to the number of protectors which it is desired to drive simultaneously. Herein provision is made for driving three protectors simultaneously, as indicated by the number of driver-passages shown in Fig. 2 and the number of drivers already mentioned, and consequently a corresponding number of raceways or roadways is employed, together with the same number of drivers. By the rotation of the hopper 2, the protectors within the same become lifted and dropped on to the upper edges of the top-portions of the blade-like raceways 8 8, each of the said portions having its width arranged in a vertical plane. The downward inclination of the upper portions of the raceways 8 8 causes the protectors to slide forwardly along the raceways. At 81 are shown selecting devices which are employed for the purpose of discharging from the raceways protectors which happen to be presented on the raceways wrong edge foremost. These selecting devices are provided when protectors are used on the order of that shown in Fig. 5, namely having a thin entering edge and a thicker wear-resisting edge, or otherwise having the top and bottom edges thereof differeing in character. The lower portions of the raceways are nearly vertical. The beaded portions of the raceways make a half-turn, as indicated in Fig. 1, so as to bring the closed or rounded side (back) of a protector to the rear (right hand side in Fig. 1).

With the lower portions of the raceways are combined escapement devices, or other suitable means of regulating the feed of the protectors to the drivers. Herein, the escapement devices comprise plates 18, 19, which are located at a distance apart vertically corresponding substantially with the height of a protector on one of the raceways. These plates have combined therewith expansion springs 181, 191, tending to force the same into position to arrest the advance of the protectors downward along the raceways. The upper plate or plates 18 are retracted, in the descent of the slide or plunger 6, through the agency of a lever 20, which last is actuated by a cam-shaped portion 201 of the said slide or plunger. This allows the protectors, previously supported by the said plate or plates 18, to descend along the raceways until they are arrested by the bottom protectors coming to bear on the plate or plates 19. In the next ascent of slide or plunger 6 the cam 201 thereon is carried upward away from lever 20, leaving plate or plates 18 free to be projected by the spring or springs 181 pertaining thereto so as to pass in between the bottom protector on each raceway and the protector next above the same. The cam 202 carried by arm 61 of the slide or plunger then acts against the pin or pins 203 projecting downward from the plate or plates 19, thus retracting the said plate or plates and freeing the protectors engaged thereby, allowing the latter to descend toward the driver-passages. The subsequent descent of the slide or plunger 6 carries the cam 202 downward from pin or pins 203, and allows the spring or springs 191 to project the plate or plates 19 into position to engage with protectors subsequently allowed to descend by the retraction of the upper escapement plate or plates 18.

The driver-passages 24 24 24 are formed in a foot-plate 21, which latter is mounted on the fixed part of the head of the machine, as clearly indicated in Fig. 1. Each driver-passage 24 is in the shape of a simple passage or hole through the driver-block, and corresponds closely in size and shape with the exterior of a protector. The wall of the said driver-passage constitutes an outside guide for the protector which, by its contact with the said exterior, guides the protector in being driven, and determines the position which it shall assume in the stock into which it is driven. The three driver-passages in Fig. 2 are set at a slight inclination with relation to one another, as required in order to position the respective protectors in a group adjacent the curved outer edge of the sole or top-lift into which the said group is driven or set. For the purpose of preventing the protectors from dropping entirely through the driver-passages after entering the latter, yielding holding means, herein constituted by spring detents 27, 27, are employed in connection with the said passages. By the descent of the drivers, the protectors are driven from the driver-passages into the work held in position against the underside of the foot-plate 21. The said spring-detents yield as the drivers pass downward through the driver-passages, forcing the protectors ahead of them. For holding the work during the driving, a work-rest or horn 28 of suitable character is provided.

As a protector descends along its raceway from the escapement-devices toward the corresponding driver-passage, the friction between the sides of the protector and the sides of the raceway, combined with the greater weight of the closed side or back of the protector and the resulting greater momentum which such closed side or back acquires during the descent of the raceway, operate to occasion a tendency of the protector to tilt

forward so that the closed side or back shall descend first. While on the raceway, the protector is restrained in great part by the manner in which it is fitted to the raceway, but on leaving the latter the protector is free to assume the position which its lack of balance and the momentum of its closed side or back tend to give it, and hence might drop into the driver-passage on its closed side or back instead of presenting its entering edge squarely to the surface of the stock into which it is to be driven. Should this occur, the result on the descent of the driver would be a failure to insert the protector properly into the work or stock, the said work or stock would be damaged, and injury to the machine, including breakage, might take place. In order to prevent the protector from entering closed side or back first into the driver-passage, we provide for partially reversing the moving protector at a point adjacent the driver-passage. This we accomplish by impeding or retarding the closed side or back thereof so as to overcome the excess of acquired momentum of such portion. To this end, we employ at the discharging end of each raceway a deflecting raceway-section 25 over which the protector passes before entering the driver-passage. On arriving at the said deflecting raceway-section, the path of the moving protector makes a change of direction, the effect of which is to cause the closed side or back of the protector to press downward against the upper edge of the said section. This pressure retards or checks the momentum of the closed side or back of the protector while the sides or wings of the latter are not retarded, the effect being that the said sides gain on the closed side or back and the protector being thereby partially reversed in position. While the protector is on the deflecting raceway-section its rounded closed side or back is upturned, but as the protector leaves the end thereof the greater momentum of the said side or back causes the latter to turn forward so that the protector enters the upper end of the driver-passage with its entering edge and therefore its wings horizontal or substantially so. When the moving protector flies off the deflecting raceway-section the closed side or back thereof in regaining its superior momentum rights the protector, so that when the protector lands in the driver-passage the edge of the same which is to enter first into the stock will occupy a position which will insure correct entrance of the protector into the stock. Preferably, but not necessarily in all embodiments of the invention, the deflecting raceway-section 25 is formed separate from the corresponding raceway 8, the group of sections 25, 25, 25, being attached to the foot-plate 21. The said foot-plate is applied removably to the foot of the face-plate 13 of the head of the machine, it having the opposite side-edges thereof fitted to horizontal slideways or guides in the opposite side-portions of the said foot, as indicated in Fig. 6, and being secured in place by means of a bolt 32, the latter having an actuating spring 33 and being applied to one of the side-portions of the foot, its inner end being caused by the action of the said spring to enter a hole 34 in the adjacent edge of the foot-plate. This construction permits the foot-plate and the deflecting raceway-sections 25, 25, 25, to be removed whenever necessary for inspection, repairs, or other reasons. The upper edge of each of the deflecting raceway-sections 25, 25, 25, immediately in line with the feet of the raceways 8, 8, 8, is thin enough to permit the wings of a protector to descend on opposite sides of the said raceway-section, so that the protector may straddle the said section. The succeeding portion of the said edge is enlarged or beaded in order to prevent accidental dislodgment of a protector as it passes along the section.

The herein-described arrangement of fixed deflecting raceway-sections, which do not in all cases require to be separate from the raceways 8, 8, 8, enables us to dispense with the use of inside guides for the protectors in connection with the driver-passages for the purpose of causing the protectors to enter properly into the stock, rendering it possible to use solid or ungrooved drivers, which is important because such drivers are cheaper than the grooved drivers that are required to be used when the inside guides are employed. The ungrooved drivers are practically free from liability to breakage or injury in the use of the machine, and hence rarely, if ever, require to be replaced.

While we have been particular to describe quite fully the details of the mechanism in connection with which our invention is embodied, it should be understood that we have done so merely to aid in the understanding of the nature and relations of the actual invention.

We claim as our invention:—

1. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for feeding protectors singly in succession, of a momentum-check which retards the weightier side of a protector during the flight of the protector toward the said driver-passage and thereby causes the wings of the protector to assume a horizontal position when fully within the driver-passage.

2. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, devices for feeding the winged protectors singly in succession, and a raceway along which a protector thus delivered makes flight by gravity toward the driver-passage, of a momentum-

check which retards the weightier side of the protector in the said flight and thereby throws the wings of the protector into a horizontal position within the driver-passage.

3. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for causing protectors to make flight singly toward said driver-passage, of means to reverse the lead of the weightier side of a protector during the flight of the latter to throw the wings thereof into a horizontal position within the driver-passage.

4. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, devices for delivering protectors singly in succession, and a raceway along which a protector thus delivered descends by gravity toward the driver-passage, of means to reverse the lead of the weightier portion of the protector in its flight as it enters the driver-passage and thereby cause the wings of the protector to assume a horizontal position within the driver-passage.

5. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for causing protectors singly to make flight to the driver-passage, of a deflecting raceway-section by which in the flight of a winged protector the lead, due to momentum, of the weightier portion of the protector is overcome and the wings of the protector are caused to assume a horizontal position within the driver-passage.

6. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, devices for causing protectors singly to make flight to the driver-passage, and a raceway for the winged protectors, of a deflecting raceway-section adjacent the driver-passage by which in the flight of a protector the lead, due to momentum, of the weightier portion of the protector is overcome and the wings of the protector are caused to assume a horizontal position within the driver-passage.

7. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for causing protectors singly in succession to make flight to the driver-passage, of means engaging with the protector in its flight to correct the tendency of the weightier portion of the protector to lead.

8. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for causing protectors singly in succession to make flight to the driver-passage, of a deflecting guide by which the lead of the weightier portion of a winged protector in its flight is reversed to cause the protector to assume a correct position within the driver-passage.

9. In a machine for setting winged protectors, in combination with a driver, a foot-plate having a driver-passage, and devices for feeding protectors singly in succession, of a deflecting raceway section adjacent the driver-passage by which the lead of the weightier portion of a winged protector is reversed and the protector thereby caused to assume a horizontal position within the driver-passage.

10. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for causing protectors singly in succession to make flight to the said driver-passage, of means external to said driver-passage whereby the partial overturning of a protector due to superior momentum of its weightier side in its flight is corrected so that the protector occupies in the driver-passage the proper position for being driven.

11. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, and devices for causing protectors singly in succession to make flight to the driver-passage, of means engaging with the closed side of a protector in the flight of the latter to thereby correct the lead of the weightier portion of the protector and throw the wings of the protector into a horizontal position within the driver-passage.

12. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, a raceway for the winged protectors, and feeding devices operating to permit protectors to pass singly along the said raceway, of a deflecting raceway intermediate the raceway aforesaid and the driver-passage and by which the lead of the weightier portion of a protector in its flight is partly reversed momentarily, whereby its wings are thrown into a horizontal position within the driver-passage.

13. In a machine for setting winged protectors, the combination with a driver, a foot-plate having a driver-passage, a protector-detent in connection with such driver-passage to retain a protector in place after it discharges from the raceway, a raceway for winged protectors, and devices for feeding protectors singly, of a deflecting raceway for partially reversing the lead of the weightier portion of the protector in its passage from the raceway aforesaid to the driver-passage.

14. In a machine for setting winged protectors for boots and shoes, in combination, a driver, a foot-plate having a driver-passage, a raceway adapted to be straddled by protectors to be driven, and an oblique or inclined deflecting raceway-section alined

with the foot of said raceway, relatively fixed with respect to said driver-passage, discharging a protector into said driver-passage, and causing the protector to turn into a horizontal position as it enters the driver-passage, substantially as described.

15. In a machine for setting winged protectors for boots and shoes, in combination, a driver, a foot-plate having a driver-passage, a guide for protectors, and a fixed deflecting guide located at the foot of said first named guide and discharging into said driver-passage, and causing a protector to turn into a horizontal position as it enters the driver-passage, substantially as described.

16. In a machine for setting winged protectors for boots and shoes, in combination, a driver, a foot-plate having a driver-passage, and a raceway adapted to be straddled by protectors and having at the foot-end thereof a deflecting raceway-section relatively fixed with respect to the driver-passage, also adapted to be straddled by the protectors, discharging the protectors into said driver-passage, and causing the protectors to turn into a substantially horizontal position as they enter the driver-passage, substantially as described.

17. In a machine for setting protectors, in combination, a driver, a foot-plate having a driver-passage, a raceway located at one side of the path of the driver a deflecting raceway-section in fixed relation with said raceway and driver-passage, registering with the driver-passage and causing a protector to turn into a substantially horizontal position as it enters the driver-passage, and feeding devices in advance of the said deflecting raceway-section delivering the protectors successively to the latter.

18. In a machine for setting protectors, in combination, a driver, a foot-plate having a driver-passage, a raceway located at one side of the path of the driver, devices in connection with such raceway operating to feed the protectors successively from the same, and a deflecting raceway-section in fixed relation with said raceway and driver-passage, from which a protector discharges by momentum into the driver-passage and causing the protector to turn into a substantially horizontal position as it enters the driver-passage.

19. In a machine for setting winged protectors, in combination, the driver, a foot-plate having a driver-passage, a raceway located at one side of the path of the driver, devices in connection with such raceway to feed the protectors successively from the same, and means engaging with a protector as it moves from the delivery end of the raceway to the driver-passage to retard the closed side of the protector during the advance of the latter and prevent such side from descending first into the driver-passage.

20. In a machine for setting winged protectors, in combination, the driver, a foot-plate having a driver-passage, a raceway located at one side of the path of the driver, devices in connection with such raceway to feed the protectors successively from the same, and a guide located intermediate the feeding devices and said driver-passage serving to discharge into the driver-passage a protector which has been delivered to the guide by the feeding devices and causing the protector to turn into a substantially horizontal position as it enters the driver-passage.

21. In a machine for setting winged protectors, in combination, the driver, a foot-plate having a driver-passage, a raceway located at one side of the path of the driver, devices in connection with such raceway to feed the protectors successively from the same, and a guide located intermediate said feeding devices and the driver-passage serving to discharge into the driver-passage in a horizontal position a protector which has been delivered to the guide by the feeding devices and constituting an interior guide for the protector which engages with the closed side of the latter.

In testimony whereof we affix our signatures, in presence of two witnesses.

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BARTHOLOMEW J. CONLON.

Witnesses:
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