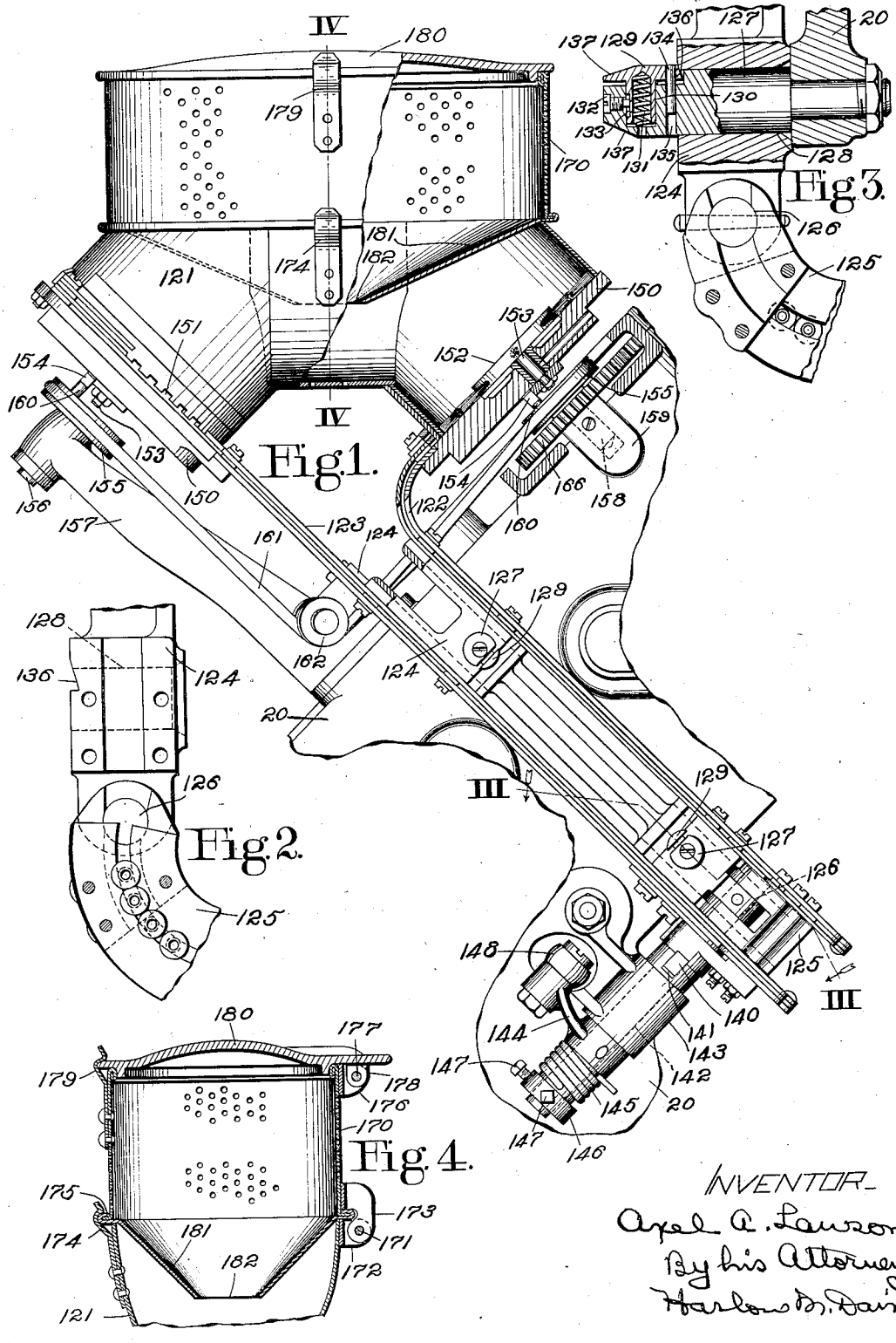
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FASTENER SUPPLYING MECHANISM

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FASTENER SUPPLYING MECHANISM

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7 Claims. (Cl. 218—15.1)

This invention relates to fastener-inserting machines and more especially to automatic mechanism for supplying fasteners to such machines. The present application is a division of my copending application Serial No. 633,973, filed September 20, 1932 in which the subject-matter hereinafter described and claimed is illustrated and described in conjunction with a fastener-inserting machine.

The invention is herein illustrated as embodied in fastener-supplying mechanism of the duplex type wherein a hopper and a raceway comprising two divisions are organized to form a unit that may be readily attached to a fastener-inserting machine of corresponding type. In such machines it is frequently necessary to remove one fastener-supplying unit and substitute another containing fasteners of a different color, size or style, but the removal of one unit and the mounting of another also involves the operating connections between a source of power and devices arranged in the hopper for feeding fasteners from the latter to the divisions of the raceway. In the illustrated construction the fastener-feeding devices are arranged to rotate about axes angularly related to each other, that relation being the most satisfactory, since it insures equalization of the quantities of fasteners delivered to the two divisions of a raceway of the type disclosed.

With the above-described conditions to be dealt with, an object of the present invention is to provide an improved organization in which the elements are so related that the mere act of placing a fastener-supplying unit in cooperative relation to a fastener-inserting machine will establish cooperative relations between angularly related fastener-feeding devices carried by the unit and operating members mounted in or on the machine itself.

Another object of the invention is to provide for regulating the capacity of a hopper and controlling a relatively large mass of fasteners therein so that the weight of the mass will not cause congestion of those fasteners that lie at the bottom of the hopper.

A novel feature relating to this aspect of the invention consists in a hopper comprising a lower section having a mouth at the top and one or more ports for emitting fasteners, and a detachable upper section formed to be seated on and supported by the lower section, the sections being provided with cooperative means for connecting and securing them in that relation, and the upper section having a depressed bottom wall formed and arranged to cover said mouth and enter the lower section and provided with a restrictive opening through which fasteners may be discharged in small volume at a level substantially lower than said mouth. This construction also provides for omitting the upper section of the hopper when the capacity of a fastener-supplying unit is otherwise sufficient for a run of fasteners of a certain size or style, and it provides also for transferring an upper section from one fastener-supplying unit to another so that it can be used with any unit when a relatively large quantity of fasteners of a selected size or style is required. Thus, one or more upper sections may be used interchangeably with any number of fastener-supplying units to increase their individual capacities.

The invention also provides for interchanging an upper section and a lid or closure, and for alternative use of the same means for securing an upper section or the closure, as the case may be, to the lower section. Moreover, each upper section, of which any desired number may be provided, is provided with securing means of the same type and arrangement as those of the lower section. Consequently, a closure designed to be secured to or by the securing means of the lower section may be likewise secured to an upper section. This feature also provides for stacking a plurality of upper sections and securing them, one to another, in exactly the same manner as that of securing one of them directly to the lower section.

Referring to the drawing,

Fig. 1 is a left-side elevation, partly in section, of a fastener-supplying unit mounted on the frame of a fastener-inserting machine a portion of which is included in the figure;

Fig. 2 is a plan view looking down on the jointed or articulated portion of the raceway;

Fig. 3 is a sectional view of one of the raceway-latching devices intersected by the line III—III in Fig. 1; and

Fig. 4 is a vertical section through the fastener-supplying hopper in the plane indicated in the line IV—IV in Fig. 1.

To facilitate reference to my said copending application Serial No. 633,973, the reference numerals used herein to designate elements of the mechanism are the same as those used in my former said application to designate corresponding elements.

The general organization of the fastener-supplying mechanism herein illustrated is similar in many respects to the corresponding mechanism shown and described in U. S. Letters Patent No. 1,900,055, granted March 7, 1933, on application of S. L. Gookin, although the present invention provides certain novel and improved features hereinafter set forth. The construction of the fastener-supplying mechanism with which the present invention is concerned is such that two series of fasteners such as eyelets, may gravitate from a duplex supply hopper 121 to the delivery end of an inclined duplex raceway compris-

ing two divisions 122 and 123 affixed, respectively, to the upper and lower surfaces of an interposed block 124. Moreover, the raceway is divided at an intermediate point of its length to provide a stationary upper section and a movable lower section 125. A pivot-pin 126 connects the two sections of the raceway to form an articulated joint, the lower end of the block 124 and the upper end of the section 125 being mortised one into the other to form the joint through which the pivot-pin extends. All these elements, including the entire raceway structure and the hopper 121, constitute a unit that may be readily attached to and detached from the frame 20 of a fastener-inserting machine to provide for rapid exchange of similarly constructed units whenever it is desired to supply fasteners that differ in size, color or style from those formerly supplied.

The fastener-supplying unit selected for use may be mounted in cooperative relation to the fastener-inserting machine by placing it upon two parallel horizontal supporting studs 127 affixed to and projecting from the left-hand side of the frame 20. These studs preferably embody an improved feature of construction shown best in Fig. 3. The body-portions of the studs are cylindrical and the raceway-block 124 is provided with cylindrical sockets 128 to receive them. The length of the studs is considerably greater than the width of the block 124, and the outer ends of the studs therefore project a considerable distance beyond the block when the latter is mounted thereon in abutting relation to the frame 20. Segments of the projecting ends of the studs are cut away to provide clearance for correspondingly shaped latching devices 129 having hollow shanks or stems 130 arranged to slide in radially extending sockets formed in the studs. Each hollow stem 130 encloses a compression spring 131 by which the latching device is normally projected beyond the periphery of the stud and thereby maintained in latching position. The shanks 130 are retained in their sockets by screws 132 screwed into the outer ends of the studs, the inner ends of the screws projecting into slots 133 formed in the stems. Each latching device 129 is provided with a pin 134 by which it is prevented from turning, the studs 127 being provided with diametrically extending bores 135 in which the pins may slide.

This construction is such that when the latching devices 129 are projected outwardly by the springs 131 they will not pass through the sockets 128 formed in the block 124, but a pressure of a thumb or finger against each of the latching devices is sufficient to force them into flush relations with the studs. The latching devices will then pass through the sockets 128 to permit attaching and detaching the fastener-supplying unit. Preferably, the block 124 and the latching devices 129 are provided with inclined contacting surfaces 136 arranged to cooperate with a wedging or camming effect to maintain the right-hand surface of the block seated against the frame 20, the springs 131 being thus utilized not only to prevent accidental detachment of the unit but also to take up all loose play lengthwise of the supporting studs 127. The left-hand extremities of the studs 127 and of the latching devices 129 are preferably tapered as indicated at 137 to enable the block 124 to be forced over them when mounting a unit, without requiring any special manipulation of the latching devices. Special manipulation of these devices is necessary only when a raceway unit is about to be demounted.

As in the former construction disclosed in said Letters Patent No. 1,900,055, the movable section 125 of the raceway is provided with a tongue 140 (Fig. 1) formed and arranged to slide into a groove 141 as the fastener-supplying unit slides along the supporting studs 127, this groove being formed in the upper end of a rock-shaft 142 by which the section 125 is oscillated to present fasteners successively to fastener-inserting devices not shown herein. The rock-shaft 142 is journaled in a boss 143 formed on the frame 20 and is provided with an arm 144 by which it may be operated. The arm may be pinned or otherwise affixed to the rock-shaft. A torsion spring 145 coiled about the rock-shaft normally maintains the delivery end of the raceway in its fastener-presenting position, the lower extremity of the spring being hooked into a socket in a collar 146 and the upper end being arranged to bear against the frame 20. The collar 146 is secured to the rock-shaft 142 by set-screws 147 and may be adjusted rotatively to put the springs under initial deflection. Refractory movement of the delivery end of the raceway is communicated to the arm 144 by a link 148, the source of such motion being not shown herein.

The hopper 121 is provided with two oppositely inclined bottom walls 150 on which eyelets that stand flange down may slide in process of being emitted through outlet ports 151 to the divisions 122 and 123 of the raceway. Emission of the eyelets is effected by rotary brushes, one of which is indicated at 152 in Fig. 1. These brushes are affixed to angularly related shafts 153 that extend through the walls 150 and are provided with eccentric lugs 154 by which they may be rotated.

The fastener-inserting machine is provided with improved brush-operating mechanism that requires no connecting, disconnecting, or other manipulation to establish driving relations with the feeding devices 152, other than mounting a fastener-supplying unit on the two supporting studs 127 in the manner hereinbefore described. For this purpose, two pulleys 155 are mounted to lie under the walls 150 respectively, the pulley at the left of Fig. 1 being affixed to a shaft 156 journaled in a bracket 157 affixed to the frame 20. The other pulley 155 is mounted on a spindle 158 projecting from a socket 159 formed on the frame 20. The axes of the pulleys 155 are oppositely inclined and so located as to register respectively with the axes of the two brushes 152. Each pulley is provided with an eccentric lug 160 arranged to engage and drive one of the lugs 154. Rotation is communicated to the right-hand pulley from any convenient source by a train of gears one of which, indicated at 166, is mounted on the stem 158 and operatively connected to the adjacent pulley from which rotation is communicated to the other pulley by a belt 161 that runs under idle rolls 162. One of these rolls appears in Fig. 1 but the other is concealed by the intervening bracket 157.

The hopper 121 may be supplemented, if desired, by a detachable superposed section 170 designed to store and supply a relatively great quantity of fasteners and at the same time prevent congestion in the hopper 121. If the section 170 is used it may be arranged to cover the mouth of the hopper and may be attached thereto by a hinge-pin 171 (Fig. 4), the hopper being provided with ears 172 and the section 170 being provided with complemental ears 173 through which the hinge-pin may be inserted. A spring-latch 174 secured to the opposite side of the hop-

per is arranged to snap over a flange 175 projecting from the base of the section 170 to maintain the latter firmly seated upon the mouth of the hopper. The spring-latch permits the section 170 to be raised and swung about the hinge-pin 171 to uncover the mouth of the hopper.

The section 170 is also provided with ears 176 near its upper edge to receive a hinge-pin 177 by which a lid or closure 180 may be attached thereto, the lid having complemental ears 178 through which this pin may extend. A spring-latch 179 secured to the opposite side of the section 170 is formed and arranged to snap over the edge of the lid 180 and thereby maintains the latter firmly seated on the upper edge of this section. This latch permits raising the lid to give access to the section 170. If the operating conditions do not require a capacity for fasteners greater than that afforded by the hopper 121 alone, the detachable section 170 may be omitted and the lid 180 may be attached directly to the ears 172 by inserting one of the hinge-pins through the ears thus brought into cooperative relation, the arrangement of the ears 172 corresponding to that of the ears 176 to render the section 170 and the lid 180 interchangeable for attachment directly to the hopper 121. On the other hand, if it were desired to increase the capacity of the hopper to a greater extent than that afforded by one superposed section 170, two or more such sections could be stacked one upon another and secured in cooperative relation by inserting a hinge-pin through the ears 176 of each section and through the ears 173 of the section next above it. The spring-latches 179 would then be effective to maintain the superposed sections securely in stacked relation. When the lid 180 is attached directly to the hopper 121, its rim will take the place of a flange 175 of a section 170 and will be secured by the spring-latch 174.

Preferably, the upright wall of the upper section 170 is made of perforated sheet metal or other foraminous metal to afford observation of the contents without opening the lid. Moreover, the upper section 170 is preferably provided with a depressed or dished bottom wall 181 formed and arranged to enter the lower section 121. This wall is provided with a central opening 182 substantially smaller and lower than the mouth of the lower section, and through which fasteners may be discharged in small volume between the brushes 152, the function of the wall being to prevent congestion of the fasteners in the lower section which it does by restricting replenishment of the latter to a small proportion of its capacity and by supporting the greater part of the mass of fasteners remaining in the section 170.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fastener-inserting machine comprising a frame, a detachable fastener-supplying unit including fastener-supplying brushes arranged to rotate about angularly related axes, said frame and said unit being provided with cooperative interengaging members for supporting the unit in an operative position, and rotary brush-driving members journaled in said frame to rotate about said axes respectively, said brushes and said driving members being provided with brush-driving lugs arranged to be brought into cooperative relation by arranging said unit in said operative position.

2. A fastener-inserting machine comprising a frame provided with a plurality of laterally projecting raceway-supporting members, a detachable fastener-supplying unit including a raceway, a hopper and a plurality of individually rotatable fastener-supplying brushes journaled in the hopper on separate axes, and a plurality of rotary brush-driving members journaled in said frame to rotate about axes corresponding respectively to those of said brushes, said brush-driving members and said brushes being provided with brush-driving lugs arranged to be brought into cooperative relation by arranging said raceway on said laterally projecting members.

3. A fastener-supplying hopper comprising a lower section having a mouth at the top and one or more ports for emitting fasteners, and a detachable upper section formed to be seated on and supported by said lower section, said sections being provided with cooperative means for connecting them, and the upper section having a depressed bottom wall formed and arranged to cover said mouth and enter the lower section and provided with a restrictive opening through which fasteners may be discharged in small volume at a level substantially lower than said mouth.

4. A fastener-supplying hopper comprising a lower section having ports for emitting fasteners, a detachable upper section formed to be seated on the rim of said lower section, said sections being provided with cooperative means for connecting them, and two fastener-ejecting members arranged in said lower section and spaced apart laterally one from the other, the upper section having a bottom wall provided with a restrictive opening arranged to deliver fasteners into the space between said fastener-ejecting members.

5. A fastener-supplying hopper comprising a lower section, a detachable upper section and a detachable lid, said sections being provided with cooperative hinge-forming portions arranged to receive a detachable hinge-pin, and said upper section and the lid being provided with other cooperative hinge-forming portions similarly arranged to receive a detachable hinge-pin, said hinge-forming portions of the lower section and of the lid being arranged to be cooperatively related to receive a hinge-pin when the upper section is omitted from the assemblage.

6. A fastener-supplying hopper comprising a plurality of separable sections formed to cooperate in stacked relation and having cooperative coupling means by which they may be secured one to another in that relation, the lower section having means for emitting fasteners, and the contiguous section having a depressed fastener-supporting portion formed and arranged to enter the lower section and provided with a restrictive opening through which fasteners may be discharged only in small volumes.

7. A fastener-inserting machine comprising a detachable raceway having a socket open at both ends, raceway-supporting means including a member arranged to extend through and beyond said socket, and a spring-stressed latching device mortised into said member to secure the raceway thereon, the latching device normally projecting from one side of said member and being repressible to flush relation therewith to permit its passing through the socket.

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