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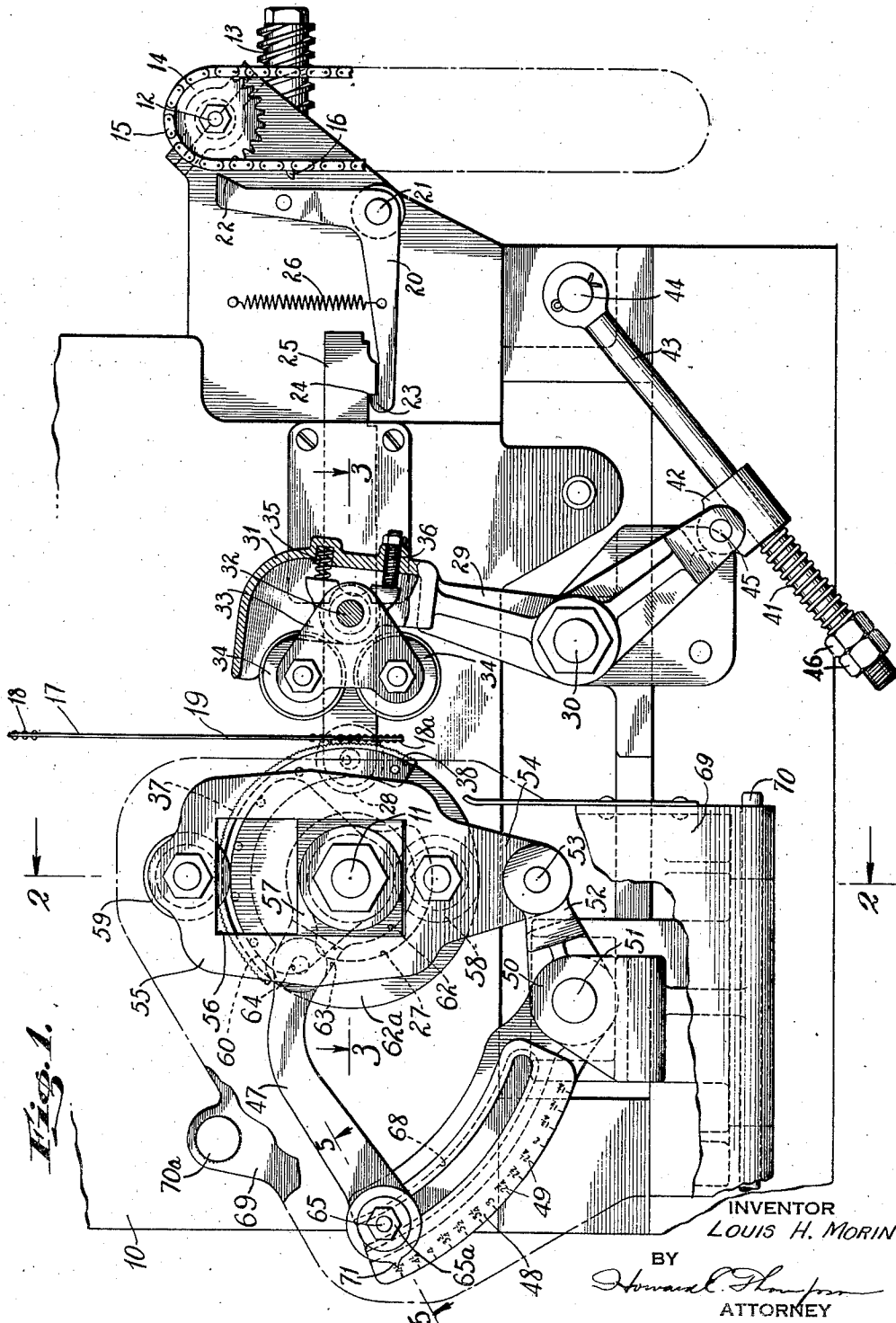
L. H. MORIN

2,228,145

WORKPIECE FEED ATTACHMENT FOR CASTING MACHINES

Filed April 13, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

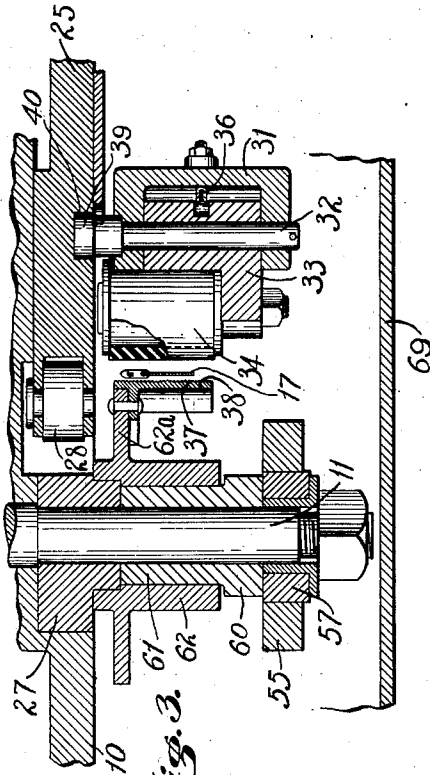


Fig. 3.

Fig. 4.

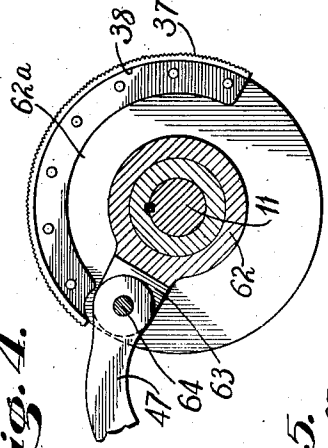


Fig. 5.

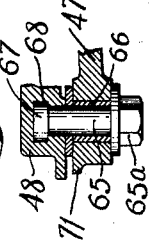
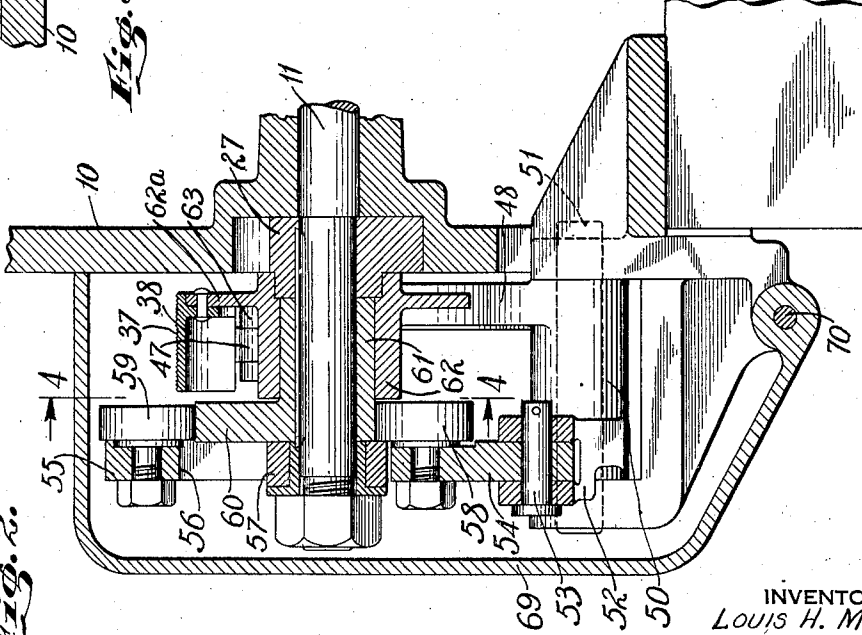


Fig. 2.



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8 Claims. (Cl. 18—1)

This invention relates to attachments for die casting machines for intermittently producing wide spacing of a workpiece or strip as for example the tape of a separable fastener stringer to widely space groups of links on the tape in forming what is commonly referred to as stringer lengths. More particularly the invention relates to an attachment to die casting machines, such for example as the type and kind illustrated in application Serial No. 152,942 filed July 10, 1937, so as to provide in machines of the character described a feeding means which will grip the workpiece or tape when the feed roller of such means is stationary, and which will be released from the tape when such roller is stationary so as to provide a definite feed of a predetermined length of the workpiece or tape. The novel features of the invention will be best understood from the following description and annexed drawings in which one embodiment of the invention is disclosed and in which the separate parts are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a front view diagrammatically illustrating a part of a casting machine showing my attachment applied thereto with parts of the construction broken away and in section.

Fig. 2 is a partial section on the line 2—2 of Fig. 1.

Fig. 3 is a partial section on the line 3—3 of Fig. 1.

Fig. 4 is a partial section on the line 4—4 of Fig. 2, and

Fig. 5 is a sectional detail view substantially on the line 5—5 of Fig. 1.

In Fig. 1 of the drawings I have indicated at 10 a part of the front plate of the machine such as disclosed in the prior application herein before identified. At 11 is shown a shaft protruding from the front plate and driven one revolution to each cycle of operation of the machine through suitable mechanisms thereof. At 12 I have shown a shaft driven from a worm 13 in operative engagement with the drive of the machine for slowly rotating a sprocket 14 on the shaft 12 to control the feed of a link chain 15 having thereon one or more trips 16 for automatically putting the workpiece feed attachment into operation to feed the workpiece for wide spacing of castings thereon; for example in feeding a tape 17 of a separable fastener to space one group of coupling links or scoops 18 from an adjacent group 18a to produce the wide spacing as at 19.

At 20 I have shown the trip lever pivoted as seen at 21, one end of the lever having a pro-

jection 22 adapted to be engaged by the trip links 16. The other end of the lever has a projecting catch 23 for engaging a recess 24 in a sliding bar 25, the lever being held in operative position shown in Fig. 1 by a spring 26. Arranged upon the shaft 11 is a cam 27 cooperating with a roller 28 on the inner end of the sliding bar 25 to control the movement imparted to the bar when released from the lever 20. This construction thus far described is substantially identical with that shown in the application above referred to, the means for operating the shaft 11 and worm 13 being the same as in the earlier machine, and such other mechanisms of the machine, as for example the dies for die casting the links or scoops on the tape 17 are omitted in that they form no direct part of the present attachment.

In the prior application referred to, as well as in other machines of the type under consideration, it has been the practice to provide a wide spacing feed of a workpiece in machines of the character described by engaging the workpiece when the feed roller employed was in rotary operation and to release the tape therefrom while the roller was continuing to operate. The result of this was an inaccurate spacing between groups of castings on the workpiece or tape which brought about many difficulties in connection with the handling of the resulting products in further processing the same for the production of separable fasteners and other types of devices. This was especially true in electroplating the links of the fastener.

It is one of the objects of my present invention to provide a means for feeding the workpiece or tape a definite and predetermined distance. I accomplish this result by bringing the feed roller and backing-up rollers in engagement with the workpiece while the feed roller is stationary or at rest, and disengage the feed roller from the workpiece or tape when said feed roller is at rest. It will thus be seen that in providing means for adjusting the degree of feed travel of the feed roller, accurate spacing of the workpiece or tape between respective groups of castings is made possible.

In carrying my present invention into effect, I provide a lever 29 pivoted to the machine as seen at 30, the upper end of the lever having a housing as at 31 in which is supported a transverse pin 32 on which is mounted a swivel block 33 supporting two rubber or other rollers 34. The swivel mounting is provided by a spring 35 engaging one part of the block 33 and an adjustable screw 36 engaging another part thereof, in the manner clearly seen in Fig. 1 of the drawings, so that the

rollers 34 will find a seat upon the roughened surface 37 of the oscillating drive element or segment 33. The pin 32 extends into and has a roller bearing 39 operating in a recess 40 in the sliding bar 25, sufficient clearance being provided for the swinging action of the lever 29 so that when the bar 25 is released from the catch 23 of the lever 20, the rollers 34 will be moved into engagement with the segment 38 by the action of a spring 41 operating upon a block 42 slidable on a rod 43, pivoted to the frame as seen at 44. The block 42 is pivoted to the other end of the lever 29 as seen at 45. The free end of the rod 43 is provided with two nuts 46 for increasing or decreasing the tension of the spring 41 to provide the desired engagement of the roller 34 with the feed element or segment 38.

It will of course be understood that should the lever 20 be tripped when the protruding part of the cam 27 is in engagement with the roller 23 of the bar 25, the bar will be held in the extended position and the timing of the cam 27 with respect to the control of the feed element or segment 38 will be such as to prevent the movement of the rollers 34 into engagement with the workpiece and surface 37 or out of engagement therewith except when the element or segment 38 is stationary.

With the present construction, the feed element or segment 38 is moved or oscillated back and forth a degree or circumferential distance equal to the length of feed of the workpiece that may be desired. The degree of this movement may be governed by adjusting a link 47 with respect to a quadrant 48 having scale markings thereon as indicated at 49 to indicate the number of inches or fractions of inches it is desired to feed the workpiece. The setting in the accompanying drawings is at a maximum for the scale illustrated, namely $4\frac{1}{2}$ inches.

The quadrant 48 constitutes an arm of a lever 50 pivoted as seen at 51. The lever has a forked end 52 in which is pivoted as seen at 53, a projection 54 on a yoke-shaped cam follower 55 having a rectangular aperture 56 slidable upon a square bearing 57 supported on the shaft 11 and within which the shaft rotates. The follower 55 also carries rollers 58 and 59 which operate upon the surface of a cam 60 keyed to the shaft 11, and upon the sleeve 61 of which a hub 62 of the segment or wheel 33 is mounted to oscillate, as will be clearly seen in Fig. 2 of the drawings. The segment 38 is supported upon a disc 62a of the hub 62, and extending from the hub 62 is a fork-shaped extension 63 within which is pivoted as seen at 64 one end of the link 47. The other end of the link 47 carries a pin or a bolt 65 having an adjusting nut 65a and a swivel mounting in the link as seen at 66. The head 67 of the bolt 65 operates in an undercut channel 68 formed in the quadrant 48 in providing the adjustable mounting of the link 47 in connection with said quadrant. The channel 68 is eccentric with respect to the pivot 64, as plainly shown.

I also preferably provide a cover or housing 69 to enclose the mechanism of the attachment, at least that associated with the intermittent feed mechanism. The general contour of this cover is indicated in dot and dash lines in Fig. 1 of the drawings in which figure a part thereof is illustrated, the cover being pivoted as seen at 70 and suitable means being provided to support the cover or housing in closed position, for example a screw 70a.

In the cycle of operation it will be understood that the shaft 11 including the cam 60 is con-

stantly rotated. During each cycle of operation of the machine in forming each casting on the tape 17, the rotation of the cam 60 will cause the cam follower or yoke 55 to move upwardly and downwardly, the same being shown in the uppermost position in Fig. 1. In the downward movement the lever 50 will be operated to move the quadrant 48 and link 47 to the right, which in turn will cause the feed wheel or segment 38 to oscillate downwardly on the shaft 11. If the rollers 34 are supported in the position shown in Fig. 1 no engagement with the tape or workpiece 17 will be effected.

The above operation will continue until such time as one of the trip links 16 engages the lever 20 to release the catch 23, so that in this cycle of operation, and due to the timing of the cams 27 and 60, the rollers 34 will be first moved into engagement with the segment 38 while the latter is in stationary position, after which the segment 38 is given its downward rotary oscillatory movement through the links and levers as above described. At the end of this downward oscillatory movement, and while the segment 38 is stationary, the rollers 34 are moved away from the segment 38 and the workpiece 17, and the bar 25 is again engaged with the catch 23 after which the segment 38 will be given an upward rotary oscillatory movement to return the same to the position shown in Fig. 1. In this operation it will be understood that the timing of the respective drives in the machine is such that the lever 20 cannot be tripped by the link 16 during the downward movement of the cam follower 55 or what may be termed the feeding movement of the segment 38. However at any other position the lever 20 may be tripped, it being understood that the cam 27 holds the rollers 34 in the position shown in Fig. 1 during the return movement of the segment 38 as will appear from a consideration of Fig. 1 of the drawings.

It will be understood that by moving the end of the link 47 carrying the pin or bolt 65 nearer to the pivot 51, the degree of movement imparted to the segment 38 will be decreased and in accordance with the scale markings illustrated a range of feed from $1\frac{1}{4}$ inches to $4\frac{1}{2}$ inches is possible. It will be understood in this connection, however, that the degree of movement may be regulated by the construction of the attachment to suit various kinds and classes of workpieces, the illustration in the accompanying drawings being primarily adapted for use in connection with the die casting of what are known as separable fasteners wherein it is customary to space the various groups of castings an inch or more apart in forming the desired stringer lengths.

It will be understood that by making just slight changes in the construction of the machine in application 152,942 above referred to, my attachment is readily adapted to the machine without in any way altering the drive mechanism of the machine as a whole, but simply in replacing and reconstructing certain parts of the machine and adding other parts which produce the intermittent operation of the machine as herein set forth. In this connection it will be understood that a backing roller similar to that shown in the earlier application could also be employed instead of the modified backing roller construction herein illustrated.

It will also be understood that it is not absolutely essential that the shaft 11 be constantly driven, as suitable means may be provided to automatically put the shaft in operation slightly in ad-

vance of the actuation of the trip 16. However, such mechanism will only add to the cost of the machine as there is no appreciable wear upon the operative parts of the attachment. Therefore, it is not deemed essential to incorporate such type of mechanism.

It will be understood that whenever it is desired to vary the degree of feed of the workpiece or tape, the cover 69 may be dropped on the hinge 70 and the nut 65a of the pin or bolt 65 loosened so as to adjust the link 47 to bring a pointer or indicator 71 into the desired registering position with the inch scale marks 49 on the quadrant 48.

It will be understood that in operating upon different kinds of workpieces, the facing 37 of the oscillating segment or element 38 as well as that of the rollers 34 may be modified to suit the workpiece. In this connection it will also be understood that instead of feeding the workpiece between the formation of a group of castings, the particular feed employed may be utilized for the positive feed of a workpiece in spacing the respective castings on the workpiece and especially when a relatively wide spacing of the castings is desired. However, in the present illustration it will be understood that the separate castings are spaced one from the other in each group by means known in the art and as disclosed in the application heretofore mentioned. It will be understood that my invention may be used in die casting machines for casting metallic or thermoplastic castings directly upon the mounting member or tape. On the other hand the invention is applicable to machines of any kind or class wherein it is desirable to feed an elongated workpiece with respect to a shaping or forming means and to accurately feed the workpiece a predetermined gaged distance.

It will be understood that the castings in the respective groups 18, 18a are formed on the mounting member or tape 17 at a point above the feed element or segment 38, and the actual spacing takes place adjacent the dies employed for forming the castings on the tape.

Having fully described my invention what I claim as new and desire to secure by Letters Patent, is:

1. A workpiece feed attachment for machines of the character described, said attachment comprising a rotatably supported workpiece feed element, means for intermittently oscillating said element between two stationary terminal positions to feed a workpiece engaged thereby a predetermined distance, means for supporting the workpiece in engagement with said element in the operation of feeding the workpiece, and means whereby the last named means is moved into and out of engagement with the element at the limits of oscillatory movement thereof when the element is in stationary position.

2. A workpiece feed attachment for machines of the character described, said attachment comprising a rotatably supported workpiece feed element, means for intermittently oscillating said element between two stationary terminal positions to feed a workpiece engaged thereby a predetermined distance, means for supporting the workpiece in engagement with said element in the operation of feeding the workpiece, means whereby the last named means is moved into and out of engagement with the element at the limits of oscillatory movement thereof when the element is in stationary position, first named means comprising a cam actuated lever, a link coupling one end portion of said lever with said feed element,

and means on said lever providing for adjustment of the link longitudinally of the lever, the adjustment of said link controlling the degree of rotary movement imparted to said element and the corresponding feed of the workpiece by said element.

3. A workpiece feed attachment for machines of the character described, said attachment comprising a rotatably supported workpiece feed element, means for intermittently oscillating said element between two stationary terminal positions to feed a workpiece engaged thereby a predetermined distance, means for supporting the workpiece in engagement with said element in the operation of feeding the workpiece, means whereby the last named means is moved into and out of engagement with the element at the limits of oscillatory movement thereof when the element is in stationary position, said first named means comprising a cam actuated lever, a link coupling one end portion of said lever with said feed element, and means on said lever providing for adjustment of the link longitudinally of the lever, the adjustment of said link controlling the degree of movement imparted to said element and the corresponding feed of the workpiece by said element, a catch device normally supporting the second named means in inoperative position, and means for automatically controlling the periodic release of the catch device to regulate the intermittent feed of the workpiece by said element.

4. In a machine for forming a series of successive separable fastener stringers on an elongated tape fed through the machine, means engaging the tape for intermittently feeding the same a predetermined distance to provide the wide spacing of the tape between groups of links thereon for subdividing the tape into a series of stringer lengths, said means comprising an intermittently actuated tape feeding element rotatably supported to oscillate between two stationary terminal positions, means for supporting the tape in firm engagement with said element, and means for controlling the last named means and said element whereby the tape is engaged and released at the beginning and end of the feed thereof when said element is in stationary position, thus providing a definite feed of the tape to a degree corresponding to the degree of movement imparted to said element.

5. An intermittent workpiece feed attachment for machines of the class described comprising a rotatable shaft, two cams rotatable with said shaft, a workpiece feed element freely mounted to oscillate about said shaft and having a workpiece engaging segment, means involving a lever in operative engagement with one of said cams and a link adjustably coupled with one end of said lever and coupled with said element for rotatably oscillating said element between two stationary terminal positions, a member for moving the workpiece into and out of engagement with said element when said element is in stationary position, tensional means for moving the member into operative position, and means involving the other of said cams for controlling the movement of the member.

6. An intermittent workpiece feed attachment for machines of the class described comprising a rotatable shaft, two cams rotatable with said shaft, a workpiece feed element freely mounted to oscillate about said shaft and having a workpiece engaging segment, means involving a lever in operative engagement with one of said cams and a link coupled with one arm of said lever and

with said element for rotatably oscillating said element between two stationary terminal positions, said link being adjustable along said arm for controlling the degree of rotary movement of said element, a member for moving the workpiece into and out of engagement with said element when said element is in stationary position, tensional means for moving the member into operative position, means involving the other of said cams for controlling the movement of the member, said last named means including a catch device for supporting the member in inoperative position against the action of said tensional means and in a position rendering the last mentioned cam ineffective to control the operation of said member.

7. An intermittent workpiece feed attachment for machines of the class described comprising a rotatable shaft, two cams rotatable with said shaft, a workpiece feed element freely mounted to oscillate about said shaft and having a workpiece engaging segment, means involving a lever in operative engagement with one of said cams and a link coupling with one arm of said lever and with said element for rotatably oscillating said element between two stationary terminal positions, said link being adjustable along said arm for controlling the degree of rotary movement of said element, a member for moving the workpiece

into and out of engagement with said element when said element is in stationary position, tensional means for moving the member into operative position, means involving the other of said cams for controlling the movement of the member, said last named means including a catch device for supporting the member in inoperative position against the action of said tensional means and in a position rendering the last mentioned cam ineffective to control the operation of said member, said member comprising a swivel block supporting two rollers, and means for regulating engagement of the rollers with said workpiece and element.

8. A mechanism for intermittently feeding an elongated workpiece through a machine, said mechanism comprising a workpiece feed element freely mounted on a uniformly rotated drive shaft, means on said shaft and linked to said element for intermittently oscillating said element between two stationary terminal positions, and means cooperating with said element for moving the workpiece into engagement with the element when said element is stationary and for releasing the workpiece from the element when said element is stationary, whereby the feed of the workpiece takes place between two stop positions of said element.

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