

May 9, 1944.

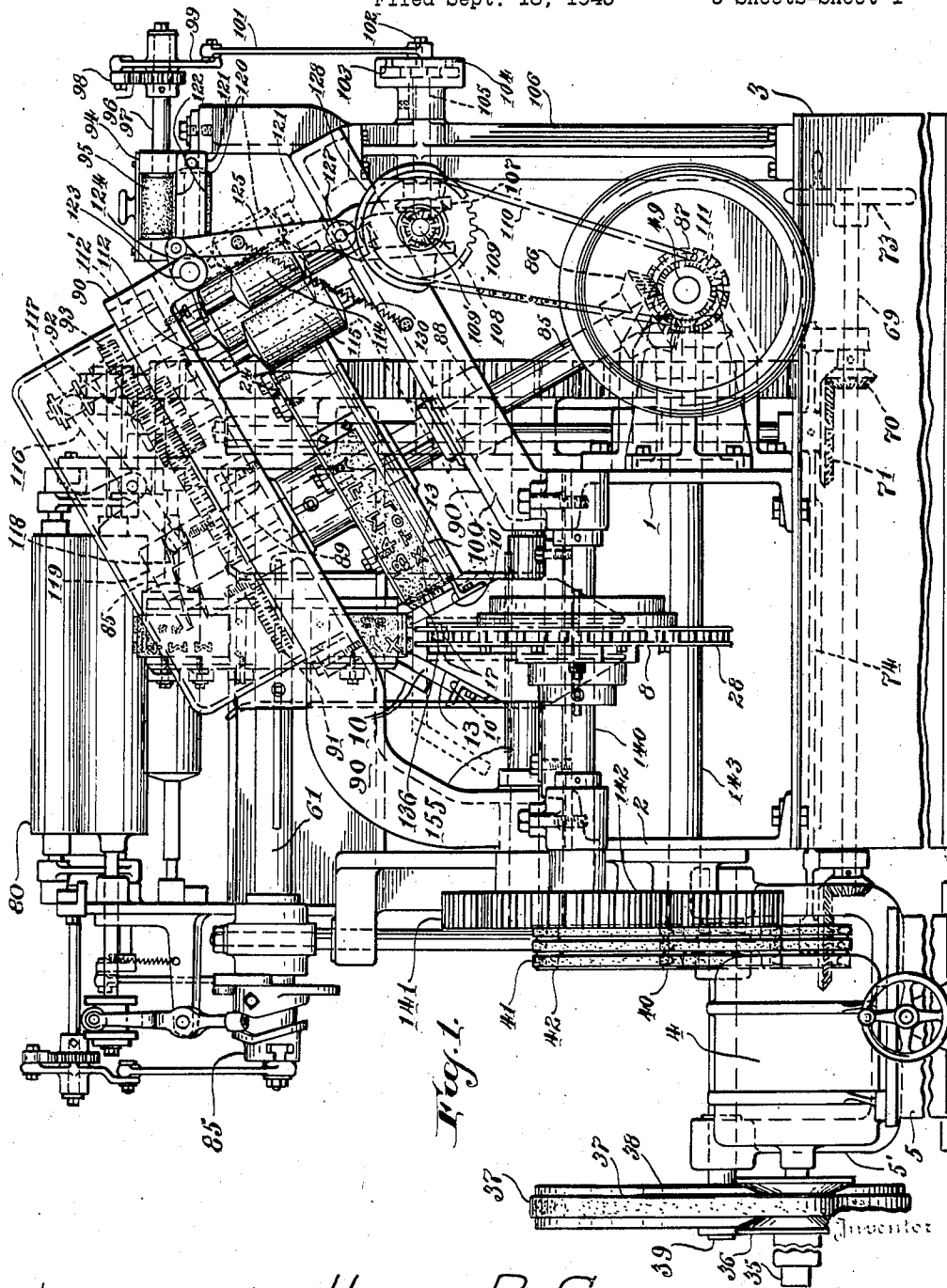
H. B. GREENWOOD

2,348,537

CRATE MARKING MACHINE

Filed Sept. 18, 1943

5 Sheets-Sheet 1



HENRY B. GREENWOOD

334

Edwin T. Samuels

Attorney

WITNESS
T. H. S. Smith

May 9, 1944.

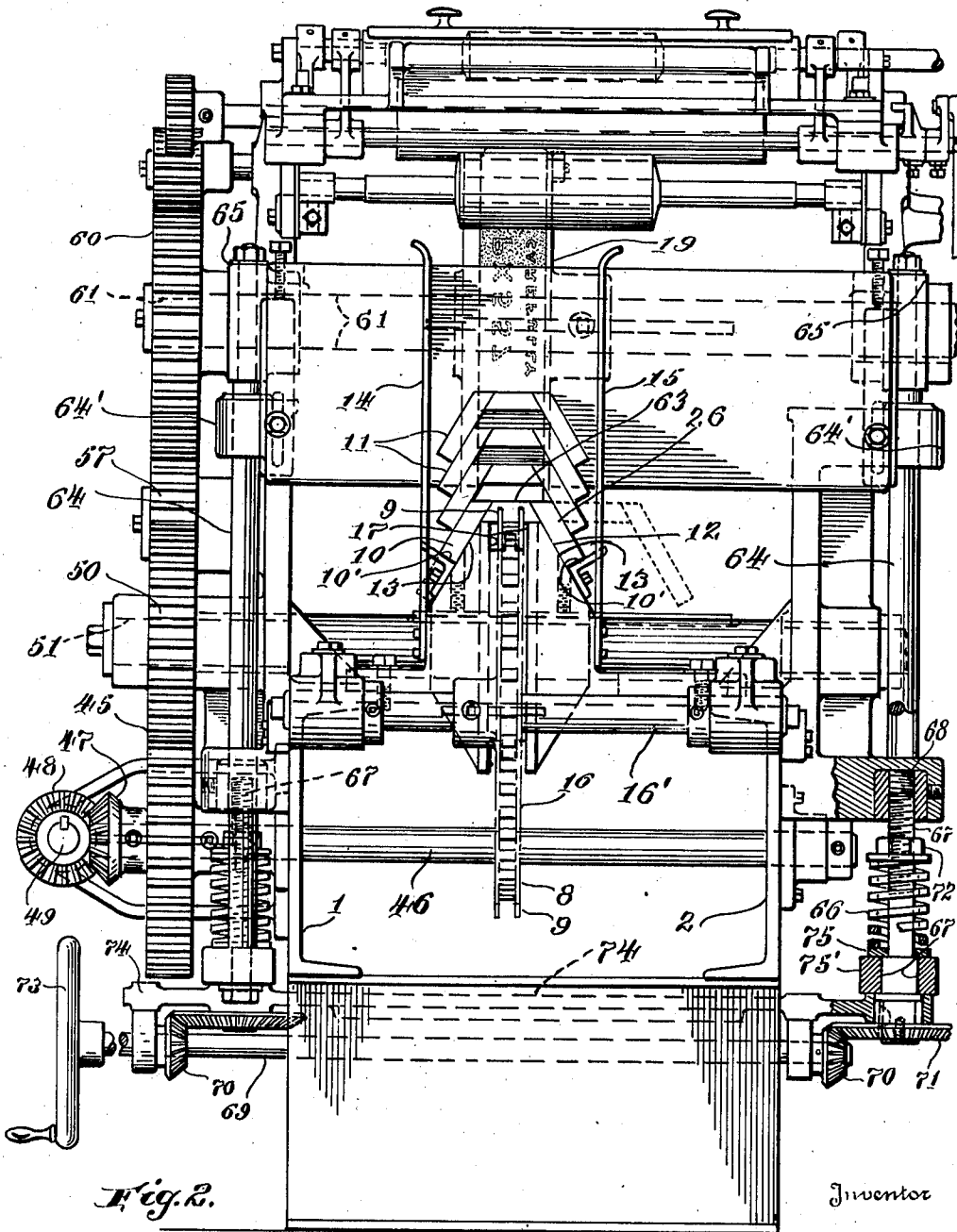
H. B. GREENWOOD

2,348,537

CRATE MARKING MACHINE

Filed Sept. 18, 1943

5 Sheets-Sheet 2



WITNESS
T. R. A. Smith

HENRY B. GREENWOOD.

334
Edwin T. Samuels
Attorney

May 9, 1944.

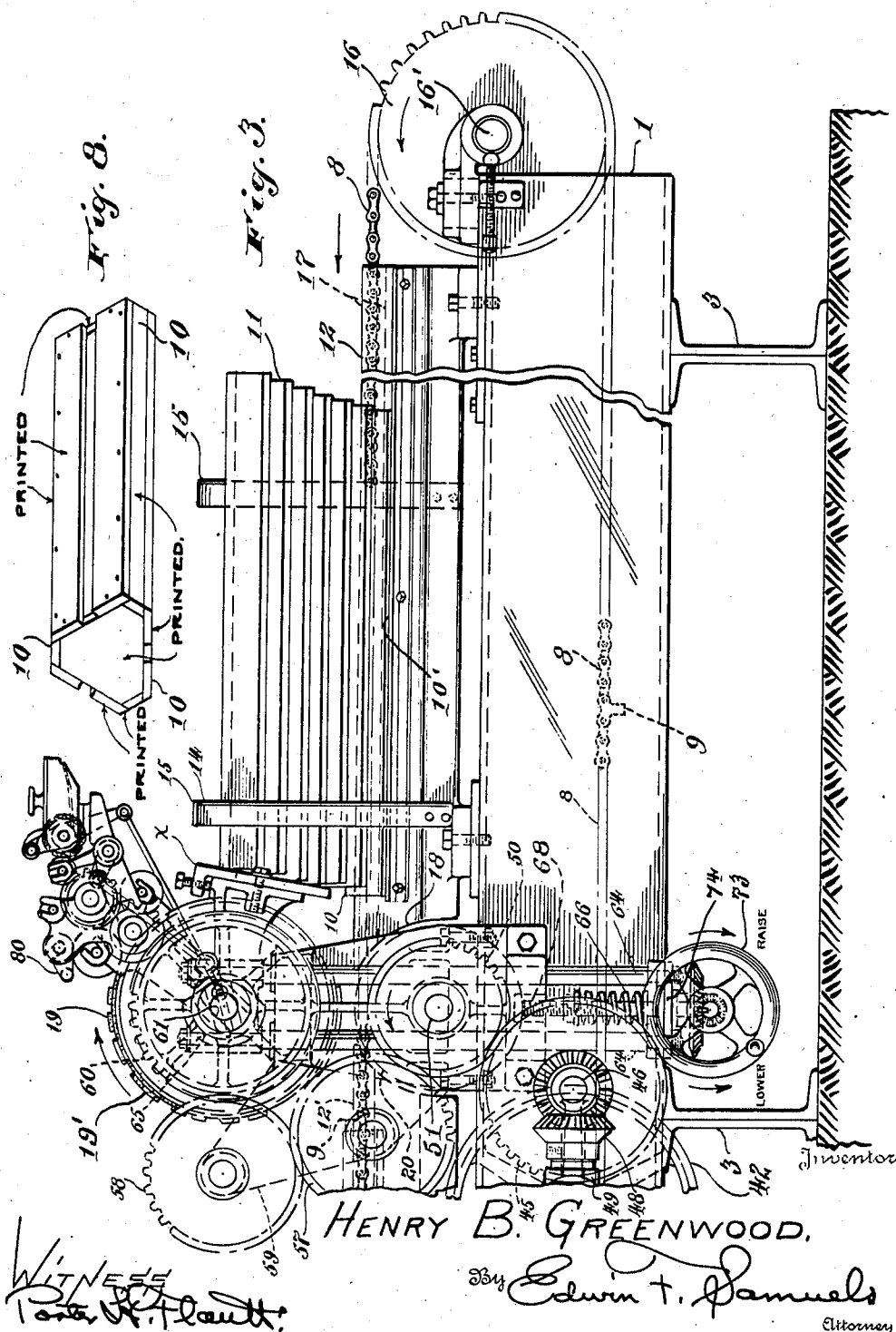
H. B. GREENWOOD

2,348,537

GRATE MARKING MACHINE

Filed Sept. 18, 1943

5 Sheets-Sheet 3



May 9, 1944.

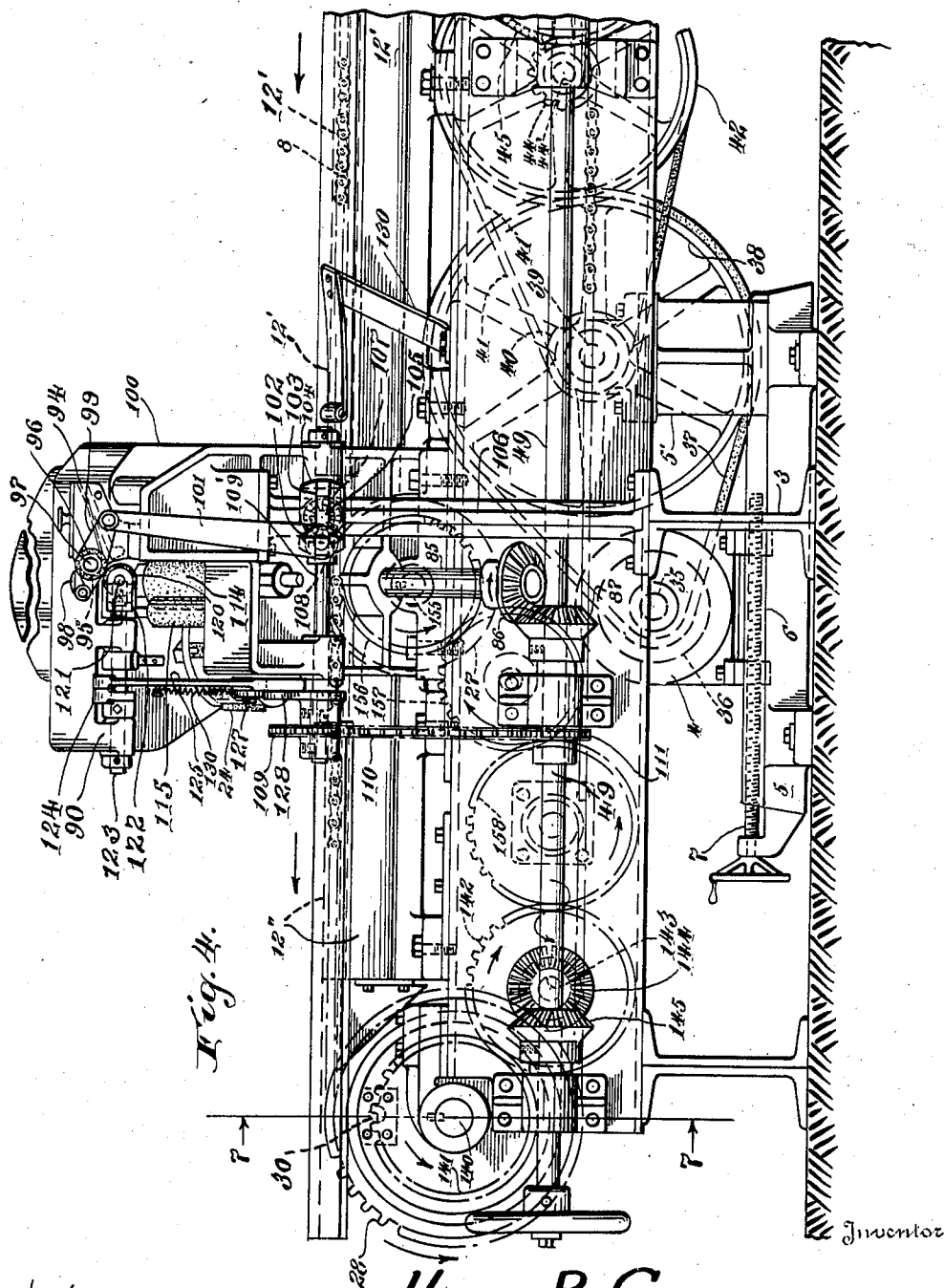
H. B. GREENWOOD

2,348,537

CRATE MARKING MACHINE

Filed Sept. 18, 1943

5 Sheets-Sheet 4



WITNESS
Robert P. Hunt

HENRY B. GREENWOOD

By Edwin T. Samuel
Attorney

May 9, 1944.

H. B. GREENWOOD

2,348,537

CRATE MARKING MACHINE

Filed Sept. 18, 1943

5 Sheets-Sheet 5

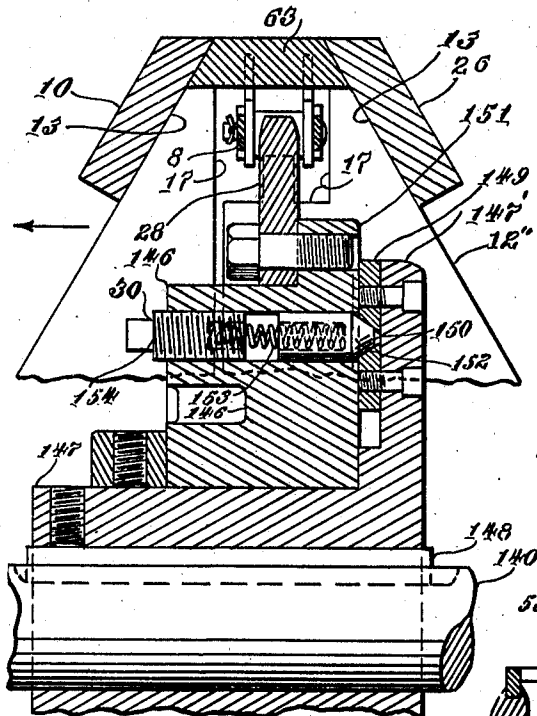


Fig. 7.

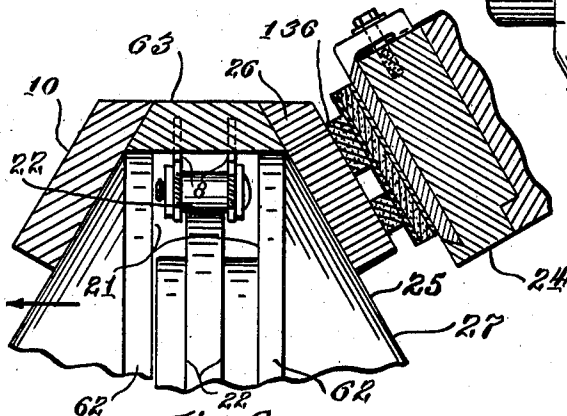


Fig. 6.

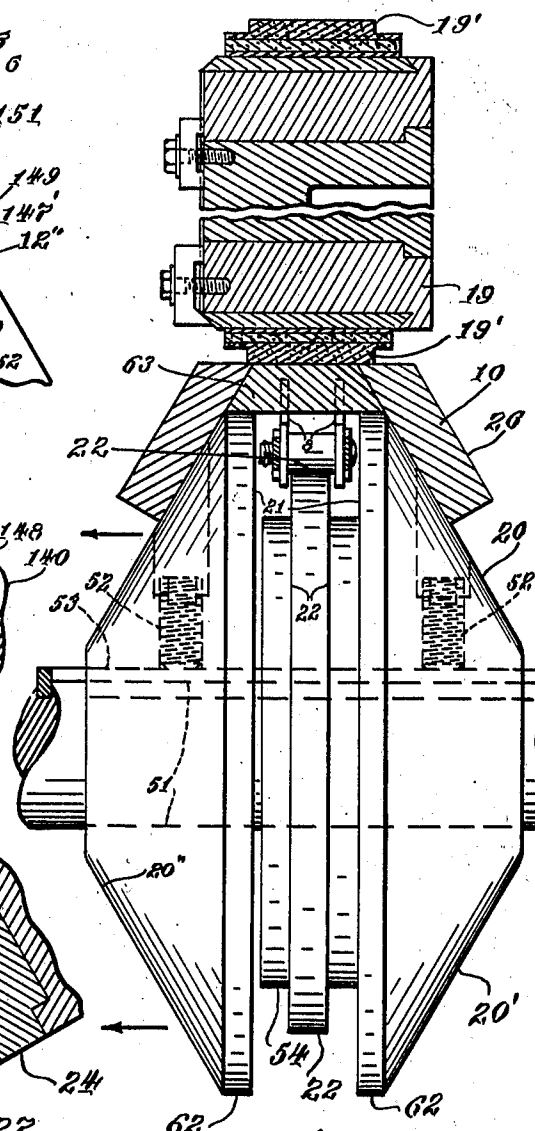


Fig. 5.

Inventor

HENRY B. GREENWOOD.

WITNESS
Robert W. Platt

354 Edward T. Samuel
Attorney

UNITED STATES PATENT OFFICE

2,348,537

CRATE MARKING MACHINE

Henry B. Greenwood, Baltimore, Md., assignor to
F. X. Hooper Company, Inc., Glenarm, Md., a
corporation of Maryland

Application September 18, 1943, Serial No. 502,869

11 Claims. (Cl. 101—37)

The invention relates to the printing of boxes and cartons and the like, the machine of the invention having been developed for use in the printing of troughlike members used in the manufacture of shell crates. These are by government regulation required to be conspicuously marked as to size and type, so that the contained shells can be identified instantly from all sides and directions from which the crate may be seen. This provides for quick selection of the proper shells. The troughlike members are usually of uniform three-sided cross-section, forming the longitudinally extending corners of the crates, each of which consists of two flat hexagonal ends and three of said corner members. In order to serve the purpose outlined as to conspicuous marking visible from all sides, it is necessary that the desired information be printed on the outside of the bottom or center member and one side member of each trough.

The object of the present invention is to provide a machine whereby these corner members may be automatically fed from a stack printed in the manner described and delivered without handling otherwise than as may be necessary to proper stacking of the material.

Other objects of the invention relate to feeding and supporting the corner members for printing both on the flat center portion and on the side portion, and to the arrangement and driving of the feeding elements, and also to the inking of the printing rollers.

Other objects of the invention will more fully hereinafter appear in connection with the description and claims.

The machine embodying the invention in what is at present regarded as the preferred form, is illustrated in the accompanying drawings in which:

Figure 1 is a rear elevation of the machine.

Figure 2 is a front elevation, portions at the rear being omitted and the extreme right being broken away for convenience of illustration.

Figure 3 is an elevation looking from the left side of the machine at the front, i. e. where the operator stands.

Figure 4 is a similar elevation, extending rearwardly from the portion of the machine shown in Figure 3.

Figures 5 and 6, respectively, are detail views of the trough support, and the center and side printing rollers, respectively.

Figure 7 shows the rear supporting roller, together with the chain drive sprocket.

Fig. 8, illustrates the crate.

Referring to the drawings by numerals, each of which is used to indicate the same or similar parts in the different figures, the construction shown comprises side frames 1 and 2, supported on transverse I-beams or channels 3 or in any suitable manner. The moving parts of the machine are driven by means of an electric motor 4 for which a belt or other suitable drive may be substituted. This motor in the form shown is mounted on a separate base 5 which is secured directly to the floor, see Figure 4, the motor being in the form shown supported on ways, 6 in said base and being longitudinally adjustable for belt tightening purposes by means of a screw 7. The shaft 39, to be described, is supported on suitable bearings in uprights 5' on the same base 5.

In the form shown, the feeding of the troughs is accomplished by means of a longitudinal chain 8, provided with projecting members or dogs 9, adapted to engage each bottom member or trough 10 in turn to move the same from beneath the stack 11, feeding it backwardly through the machine, as hereinafter described.

The troughs, including the bottom trough 10, are stacked as at 11 on table 12 at the front, being held between uprights 14 on the left and 15 on the right. The table 12, 12', 12'' to be described is of a cross-section, similar to that of the troughs and adapted to fit freely therein, with the trough edges resting on bottom rail 10'.

The chain 8 passes over an idler sprocket 16 at the front, hence along the table 12 which is grooved for this purpose at 17. Sprocket 16 is on shaft 16'.

The front table 12 is discontinued at a rear edge 18 under the upright printing roller 19, which prints the center or bottom of the troughs on the outside. In the form of the invention shown, the trough which is being printed is supported on a double frustoconical roller 20, best shown in Figure 5. While other supporting means as a continuous table may be employed, this roller is found to afford a satisfactory moving support for the trough during printing. The troughs may be of different sizes, to this end the roller 20 is formed of two outwardly disposed frustoconical members 20' and 20'', which are subject to adjustment, one toward and away from the other, as hereinafter pointed out. The members 20' and 20'' have their large ends or flat surfaces opposed and spaced apart the space being indicated by reference character 21, and this space 21 contains or is provided with a guide disc or support 22 for the chain or

belt 8. While a positively driven chain 8 is preferred, it is conceivable that a belt may be employed.

From the first printing roller 19, the trough moves rearwardly, still propelled by the chain 8 to the second printing roller 24 which as shown, rotates in a plane at right angles to inclined sides 25 of the roller 27 which conform to the predetermined angle of the trough sides 26. During the second printing operation which is performed by the printing roller 24, the troughs are supported, in the preferred form of the invention shown, by frustoconical roller 27, best shown in Figure 6. This in the form shown is similar to roller 20.

In the machine as built, the chain 8 is driven at the rear by means of a sprocket 28 shown in detail in Figure 7, the same being in the form shown, embodied in a hub and collar construction which comprises an escapement device or yielding means 30 to prevent injury to the machine in case the trough members which are usually of wood, and therefore rigid, become jammed.

While the frustoconical rollers 20, and 27 are regarded as convenient and particularly desirable and helpful in the present machine because of their antifrictional function, their omission in favor of a continuous support of cross-section, somewhat similar to that of the table 12 is within the scope of the invention. In this connection it should be understood that there is a table or support 12' between the rollers 20 and 27, and a table 12'' beyond the roller 27 and that the fully printed trough members 10 are discharged from the machine at or beyond the sprocket 28, either dropping on the floor or into a suitable receptacle or being received by a further conveyor.

The drive of the machine and the various elements thereof, and the details of said elements will now be described.

As already pointed out, the machine is driven by the motor 4 shown in Figures 1 and 4. The said motor carries on its shaft 35, a drive pulley 36 which may be of the Reeves type and which drives a V-shaped belt 37 or any suitable belt which engages and drives a larger pulley 38, all of which members are on the right side of the machine, as seen from the front which is remote in Figure 4.

The pulley 38 is secured to the shaft 39 which is mounted on uprights 5' on base 5 and carries secured thereto a small drive pulley 40 which drives a plurality of V-belts 41 as shown in Figures 4 and 1. These belts drive a pulley 42. This pulley 42 carries secured thereto a shaft 44' carrying a small pinion 44 which meshes with and drives a gear 45, mounted on and secured to a transverse shaft 46, see Figure 3.

This shaft 46, as seen at the left in Figure 2, which is a front view, has secured there to a bevel gear 47 which meshes with and drives bevel gear 48 on the longitudinal shaft 49 at the left in Figure 2, whereby said shaft 49 is driven at a predetermined speed in conformance with the speed of shaft 46.

The gear 45 meshes with and drives a toothed gear 50, best shown in Figure 3. This gear 50 is secured to and drives the transverse shaft 51, see Figure 5 on which is mounted the double frustoconical roller 20 and the chain guide 22. This roller 20 consists of two members 20' and 20'', each of which is frustoconical and each is secured by means of a screw 52 and key 53 to the shaft 51. The flat surfaces at the large ends

of members 20' and 20'' are opposed and spaced apart and the member 20' has an inwardly projecting hub 54 on which is mounted the guide 22, which enters into the channel in the chain 8, and guides and supports the same in the manner shown in Figure 5. The member 20'' of said roller 20 may be adjusted to the right along said shaft to conform to the width of any desired form of trough member 10 as shown in broken lines in Figure 1.

The gear 50 already described meshes with and drives an idler 57 which in turn meshes with and drives an idler 58 in any suitable manner. The gear 58 meshes with and drives a gear 60 which is secured to and drives a shaft 61, Figure 3 on which the printing roller 19 is mounted. This shaft is mounted in floating bearings 65 for the purpose of providing an upwardly yielding support for said roller.

The trough members 10 as already pointed out are fed from the bottom of the stack of troughs 11 on the table 12, by means of the chain 8. Said troughs pass rearwardly from the table 12 to the table 12', over the double frustoconical roller 20, the cylindrical edges 62 of which support the center section 63 of the trough in contact with the printing roller 19, whereby the characters appearing on the type blocks 19' on the roller 19 are printed on the center section 63 of the trough, the table partly supporting the troughs.

The troughs are thus fed successively by action of the dogs 9 on the chain 8, and each is printed in turn.

The desired upwardly yielding support or control for printing roller 19 is applied to the shaft 61 of the printing roller 19 by way of four depending rods 64 which engage the bearings 65 of said shaft, a yielding resistance to the lifting of said rods and roller being set up by springs 66 on each side of the machine. The expansion of said springs 66 is limited by depending bolts 67, threaded upwardly into the frame at 68. These bolts support casting 75, on which the spring abutments rest, and thus determine the normal position of rollers 19 as hereinafter described.

Bolts 67 may be rotated by the operator for purposes of adjustment of casting 75 and roller 19 by means of adjusting shaft 69 which carries bevel gears 70, meshing with bevel gears 71 on screws 67. The nuts 72 which serve as the upper abutments for said springs 66 are adjustable along said bolts 67 to vary the tension of the springs, the lower abutments 75 of said springs are supported on bars 75' which rest on casting 74, as shown. This casting 74 extends across the machine and has one of said bars 75' at each end. The bars 75' are thrust downwardly by springs 66, so far as bolts 67 supporting casting 74 will permit. The lower ends of the rods 64 secured in said bars 75' are thrust downwardly by and yield upwardly against the tension of the springs in response to the printing pressure applied to the troughs by way of roller 19, i. e. the printing roller 19 yields upwardly, printing pressure being applied by springs 66. Rods 64 carrying the bearings 65 slide in stationary guides 65' and casting or plate 74 acts as a stop to determine the normal position of the roller 19.

Inking of the type blocks 19' on the roller 19 is performed by an ink pot and roller mechanism which though shown, seem to require no specific description.

From the first printing station beneath the

printing roller 19, the troughs are fed rearwardly by the chain 8, whereby they are brought into printing relation with the inclined printing unit 100 which includes the inclined printing roll or roller 24, best shown in Figure 1 which is a rear elevation.

This printing roller 24 as shown in Figures 1 and 6, rotates in a plane at right angles to the outer surface of the inclined portion 26 of the trough 10, the general purpose of the same being to print the necessary data on one side wall 26 of said trough so that this data as to the contained shells is displayed in every direction from which the crate can be seen. It should be noted at this point that the top and bottom walls of the crates are printed in a different machine. Thus the crate being presented with the shells therein ready for use, the gunner or loading crew is enabled to immediately select and identify the ammunition suitable to any particular gun.

It may be also noted at this point that the double frustoconical roller 27 is similar to roller 20, previously described and therefore need not be specifically described. It supports the trough 10 or assists in connection with the tables 12' and 12'' in supporting the trough during the printing of the side walls 26.

The inclined printing roller 24 in the form of the invention shown is mounted on a shaft 85 which is upwardly and inwardly inclined from the shaft 49, previously described, being essentially at right angle to the plane of rotation of said roller 24 and hence parallel to the inclined side 26 of the trough and the corresponding side of the table 12, 12', 12''. It may be noted that in the form shown, the shaft is inclined at an angle of about 30° from the vertical, the sides of the trough being similarly inclined to conform to the hex type of box, other shapes as octagonal being contemplated.

The shaft 85 carries secured to its lower end, a bevel gear 86 which meshes with and is driven by a corresponding gear 87, mounted on and secured to the shaft 49, and shaft 85 is provided with bearings 88 and 89 formed on or secured to the inclined frame 90 which is rigidly supported on the side frames 1 and 2, as shown or in any suitable manner.

The inclined printing roller 24 as already pointed out is mounted directly on shaft 85 which carries at its upper end, secured in any suitable manner, a gear 91 which drives the inking rollers in any suitable manner as by way of a train of gears 92 and 93. Considerable difficulty was encountered in inking the inclined printing roller 24.

In the form of the invention shown in which the difficulty has been overcome, there is a horizontal ink pot 94, containing a horizontal pick-up or distributor roller 95 which in the form shown is operated by and with a step by step motion or in any suitable manner. In the form shown, there is a ratchet gear 96 on the roller shaft 97 which ratchet is turned by a pawl 98 which pawl is carried by an oscillating lever 99, pivoted on said shaft 97. Said lever 99 is oscillated by means of a connecting rod 101, which is operated by a crank pin 102 which is adjustably secured in a slot 103, which slot crosses the surface of a disk 104, which is mounted on and secured to a rotating shaft 105, mounted in suitable bearings in a stationary upright member 106 on the frame.

The shaft 105 projects through the frame and carries on its opposite end a bevel gear 107 which meshes with and is driven by a bevel gear

108, which is secured to and rotates with a sprocket 109 on a shaft 109', which as shown, is driven by a chain 110. Said chain 110 is in turn driven by a small sprocket 111 mounted on and secured to the shaft 49, all of which is shown in Figures 1 and 4.

Ink is supplied to the printing surface of the printing roller 24 by an ink roller or rollers 115, which receive ink from roller 112, which in turn, receives ink from roller 114. The roller 112 is driven by the gear 93, already described, being preferably reciprocated in the direction of its axis by a lever 116 which engages the shaft 112' of said roller at 117 as by way of the flanges and ball shown. This lever 116 is oscillated in any suitable manner as by means of a cam slot 118 formed in a hub or other suitable member 119 on the end of the shaft 85.

The roller 112 receives the ink from the roller 114 and delivers it to a roller 115 which engages the printing roller 24 and performs the inking function. The latter roller if desired being duplicated. It is driven by contact with the printing roller and with the large inking roller 112, both of which are positively driven.

The spreading roller 114 receives ink from the pick-up roller 95 in the pot 94 by way of a transfer roller 120, shown in broken lines in the ink delivery position and in full lines in the position in which it receives ink from the pick-up roller. In the form shown, the roller 120 is mounted in bearings 121, carried by an oscillating arm 122, secured to a shaft 123, oscillating in suitable bearings on or in the frame 90. The shaft 123 has a crank 124, pivotally connected to a depending rod 125 which as shown is substantially vertical and impelled downwardly by a spring 130.

This rod 125 is forked at its lower end to straddle the shaft 109' or is otherwise suitably guided to move in or substantially in the direction of its length. Motion in this direction is imparted to rod 125 by a follower roller 127 thereon which engages a cam 128 on the shaft 109'. The shaft 109' being rotated in suitably timed relation to and with printing roller 24 and inking roller 112, the said transfer roller 120 is oscillated in time with said rollers 24 and 112 from ink receiving contact with the pick-up roller 95 to delivery contact with applying roller 114, which thus receives ink from roller 120 and thereafter applies it to the longitudinally reciprocating roller 112, which in turn delivers the ink to the type inking roller or rollers 115, thus avoiding the necessity for an inclined ink pot to supply the inclined printing roller 24. The ink is thus applied in a uniform coat on the type carried by roller 24 without leakage or spilling or other difficulties resulting from an inclined ink pot.

After the second printing operation, i. e., after the printing by the inclined roller 24 of the inclined sides of the troughs 10, as at 136, these troughs 10 are carried rearwardly and discharged from the machine by the chain 8 where it passes over the rear sprocket 28. It may be noted that in this second operation, the troughs 10 are engaged by L shaped leaf spring device 130 which assists in holding them in position on the tables 12' and 12'' thus preventing displacement of the members 10 by the printing roller 24, and the troughs are partially supported and their advancement assisted by roller 27 being further supported by table members 12' and 12''. The frustoconical roller 27 is mounted on a transverse shaft 155, Figure 4, which has secured thereto a gear 156 which is driven by a train of transmis-

sion gears 157, 158 and 142, Figure 4, the latter being secured to a transverse shaft 143 at the rear, driven from longitudinal shaft 49 in a manner to be described.

Rollers 20 and 27, preferably project from the table to receive and partially support the printing pressure on the troughs. The tables are preferably of a shape, similar to that of the troughs and thus comprise a center guide, engaging the bottom of each trough and two side guides 13 one at each side, engaging the sides of the troughs.

The chain driving sprocket 28 at the discharge end of the machine is of interest, see Figure 7. This sprocket 28 is mounted on a transverse shaft 140 at the rear end of the machine, and secured thereto in a manner to be described. Said shaft 140 is driven by a toothed gear 141, secured thereto and meshing with a similar gear 142 on the transverse shaft 143 which has secured thereto a bevel gear 144 which meshes with a similar gear 145 on the longitudinal shaft 49.

Referring now to Figure 7, the sprocket 28 is mounted on a collar 146 which is in turn mounted on a hub 147, both being concentric with shaft 140, and the hub 147 being secured to shaft 140 in any suitable manner as by key 148. This hub 147 has a radial flange 147' to which is secured a flat hardened metal plate 149 having therein an axially disposed hole or socket 150 shown as of tapering or conical shape. The sprocket 28 is in the form of a toothed ring, bolted to a radial flange 151 on the collar 146 and the latter collar is connected to the hub 147 by an axially disposed pin 152 having a conical or similar end to fit the socket 150. The pin 152 is mounted to slide in the direction of its length, and is yieldingly advanced by a spring 153, bearing on said pin, and adjustably compressed by screw 154.

It will be apparent from the construction shown that the sprocket 28, and hence the chain 8 may yield relatively to shaft 140 in case the trough members 10 or one of them should become jammed in its passage through the machine. After such yielding the machine may be reset or if the obstruction is removed, it will, if there is but a single pin 152 to fit a single hole 150, reset itself with the parts in properly timed relation.

The new machine is believed to present a considerable accomplishment in the way of the solution of the problems incident to complete and substantially automatic marking of shell and similar crates so that the marking is conspicuously displayed in all directions from which the crates or one of them can be seen.

The accomplishment of the invention further includes the printing of both the flat central and one inclined side of the trough members and the inking of the inclined printing roller from a horizontal or upright well or pot, without loss or leakage of the ink, and without handling of the trough members except in the placing of stacks of said members on the table.

The features and details also include the feeding and supporting of trough members during printing, and the protection of the machine from jamming of the work and other incidents which would tend to cause the breakage of the machine parts and loss of time of the machine and operator.

What I claim as new and desire to secure by Letters Patent is:

1. In a machine for printing the outside surfaces of trough-like members, each having a flat

elongated central portion and two similarly elongated flat sides, inclined outwardly from said central portion, the combination of a table having three elongated guides, including a central guide which is horizontal in transverse section, the other two guides being outwardly disposed at each side of said central guide to conform to and support the sides of said troughs, said table extending backwardly through the machine, means for retaining a stack of said troughs on said table at the front of the machine and means for feeding the troughs from the bottom of said stack along said table and rearwardly through the machine with the central elongated portion of each trough in a plane which is horizontal in transverse section, the inclined sides of said troughs being correspondingly disposed on the sides of said table, a printing roller rotating in an upright plane, in printing relation to the horizontal center portion of the troughs on said table, means for inking said roller and rotating the same in printing contact with the central portions of said troughs as they are advanced and a second printing roller mounted to rotate in a plane at right angles to one inclined side of said table and said troughs as they are advanced, means for rotating said second roller in time with the feed and in contact with said inclined side of each trough and means for inking the inclined roller as it is rotated.

2. In a machine for printing the outside surfaces of trough-like members, having a flat elongated central portion and two similarly elongated flat sides inclined outwardly from said central portion, the combination of a table having three elongated supporting surfaces including a central surface which is horizontal, in transverse section, the other two surfaces being outwardly inclined to conform to the sides of said troughs, said table extending backwardly through the machine, means for retaining a stack of said troughs, on said table at the front of the machine and means for feeding the troughs from the bottom of said stack along said table and rearwardly through the machine with the central elongated portion of the trough in a plane which is horizontal in transverse section, the inclined sides being correspondingly disposed, an upright printing roller said roller being in printing relation to the horizontal center portion of the troughs on said table, means for inking said roller and rotating the same in printing contact with the central portions of said troughs as they are advanced and a second printing roller mounted to rotate in a plane at right angles to one inclined side of said table and said troughs as they are advanced, means for rotating said second roller in time with the feed and in contact with said inclined side of each trough, and means for inking the inclined roller as it is rotated.

3. A machine for printing corner troughs for crates and the like, said trough members comprising, a flat elongated center member and two similarly elongated side members, the latter converging laterally toward and being attached to the longitudinal edges of the center member, means for feeding the troughs through the machine with one of said members substantially horizontal as to its transverse cross-section, and an adjacent member inclined, said machine having a table with a similarly horizontal top and a similarly inclined side for supporting one said inclined member, means for retaining a stack of troughs on said table at the front, means for

feeding the troughs one at a time along the table from the stack, and a plurality of printing rollers, one above said top of the table, and rotating in a vertical plane and having inking means, the other being inclined to the vertical and rotating in a plane at right angles to said inclined side and having inking means, said rollers being located in printing relation to the center member and one side of each trough as said troughs are fed along the table, whereby the outside of the center member, and of one side member of each trough is printed as it passes through the machine.

4. A machine as per claim 3 in which said latter inking means comprises an upright ink pot, a pick-up ink roller in ink receiving relation to said pot, and having its axis horizontal, an ink transfer roller, and means for supporting and continually swinging said latter roller from a position in which its axis is horizontal, its surface being in ink receiving relation with the surface of said pick-up roller, to a position in which its axis is inclined, being parallel to the surface of said inclined printing roller and means for transferring the ink from said transfer roller to the printing surface of said inclined printing roller, and means for rotating said ink rollers.

5. A machine as per claim 3 in which said feeding means comprises a chain, running longitudinally of the machine between the side guides of said table and having dogs projecting above the surface of the table to engage the troughs, driving means for said chain, comprising a releasing connection and means for adjusting said releasing connection to a predetermined tension, whereby injury to the machine incident to jamming of the troughs is prevented.

6. A machine as per claim 3 in which said feeding means, extends longitudinally of the machine within said table and has means projecting from said guides to engage the troughs at their forward ends to move them through the machine, the feed also comprising double frustoconical rollers, one opposed to each of said printing rollers, the frustoconical rollers having their axes transverse to the feed and each comprising two frustoconical members having their large ends opposed at the center and spaced apart to admit the longitudinal feed, said frustoconical members being of an angle to conform to the insides of the troughs and means for rotating said double frustoconical rollers to assist in advancing the troughs.

7. A machine as per claim 3 in which the feeding means comprises a chain with projecting members engaging the troughs and two double frustoconical rollers each comprising two frustoconical members with their large ends inwardly disposed and spaced apart to engage the inner surfaces of the troughs, the chain extending through said space in each said rollers, each of which is opposed to one said printing roller.

8. A machine as per claim 3, in which one printing roller has floating bearings, and a spring in supporting relation to each said bearing and connections for applying the tension of the springs to the printing roller in the direction toward the table to apply printing pressure by way of the printing roller to each trough as it passes.

9. A machine as per claim 3 in which said inking means for the inclined printing roller comprises a horizontal inking roller and an ink pot, therefor and an inking roller parallel to the inclined printing roller and in ink transferring relation thereto and an oscillating ink transfer roller moving from ink transferring contact with one said inking roller into ink transferring contact with the other said inking roller.

10. A machine of the type described for printing the center member, and one side of troughs of the type having an elongated center member and two similarly elongated, outwardly inclined sides members, said machine having a table with a horizontal top and inclined sides extending longitudinally of the machine and fitting the troughs, means for retaining a stack of troughs on said table at the front, means for feeding the troughs along the table from the bottom of the stack and two printing rollers, one above the said top of the table and rotating in a vertical fore and aft plane and the other rotating in a fore and aft plane at right angles to one side of the table, said printing rollers having rotating means and inking means and being located in trough printing relation to the troughs as they pass along the table whereby the outside of the center member and of one side of each trough is printed as it passes through the machine.

11. A machine as per claim 10, having double frustoconical rollers of an angle conforming to the inside of each trough one of said rollers being located in the table beneath and opposite each printing roller and projecting slightly from the table to support pressure applied to the troughs by the printing rollers.

HENRY B. GREENWOOD.