May 6, 1958 C. J. HUEBER 2,833,386

EMBOSSING MACHINES

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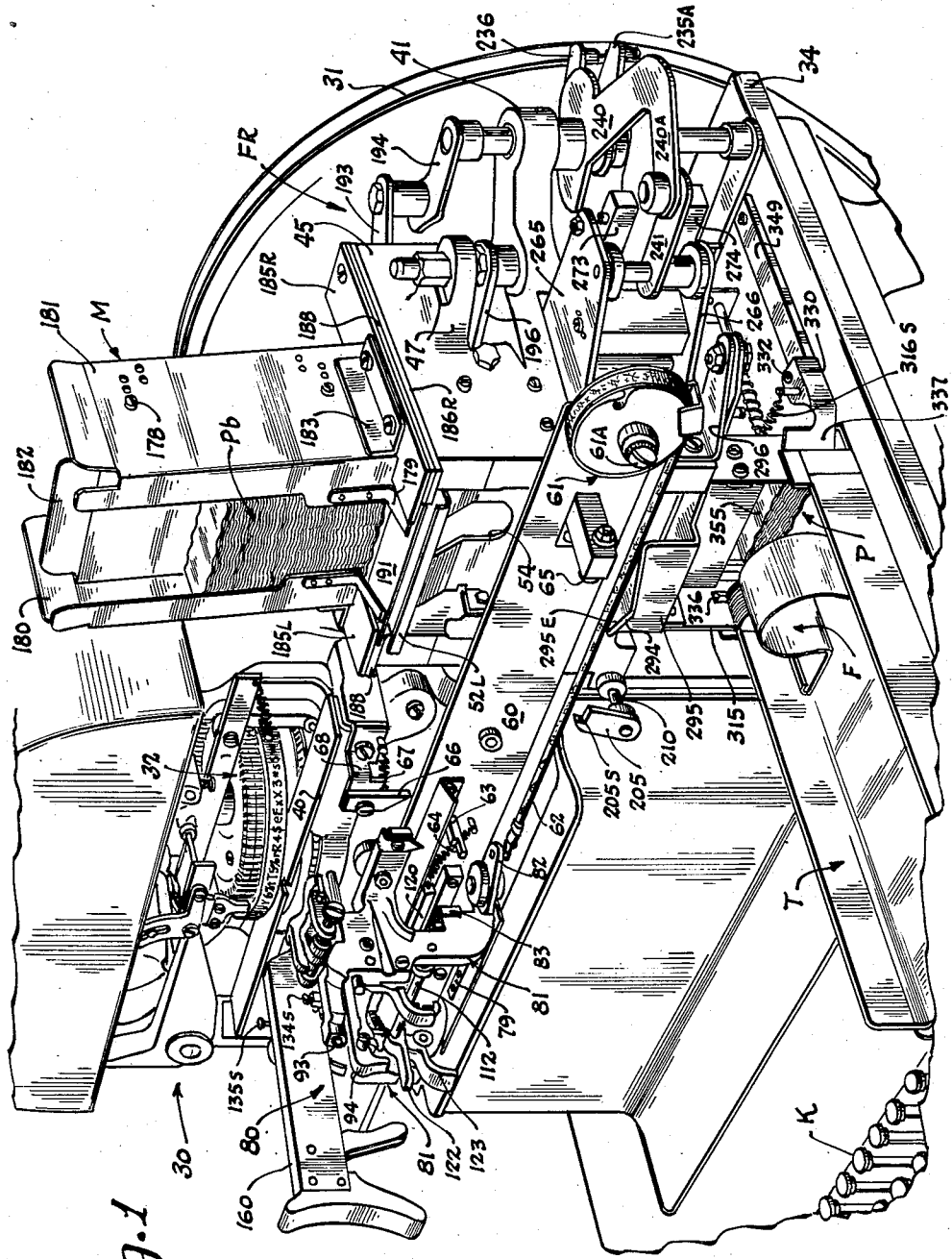



Fig. 1

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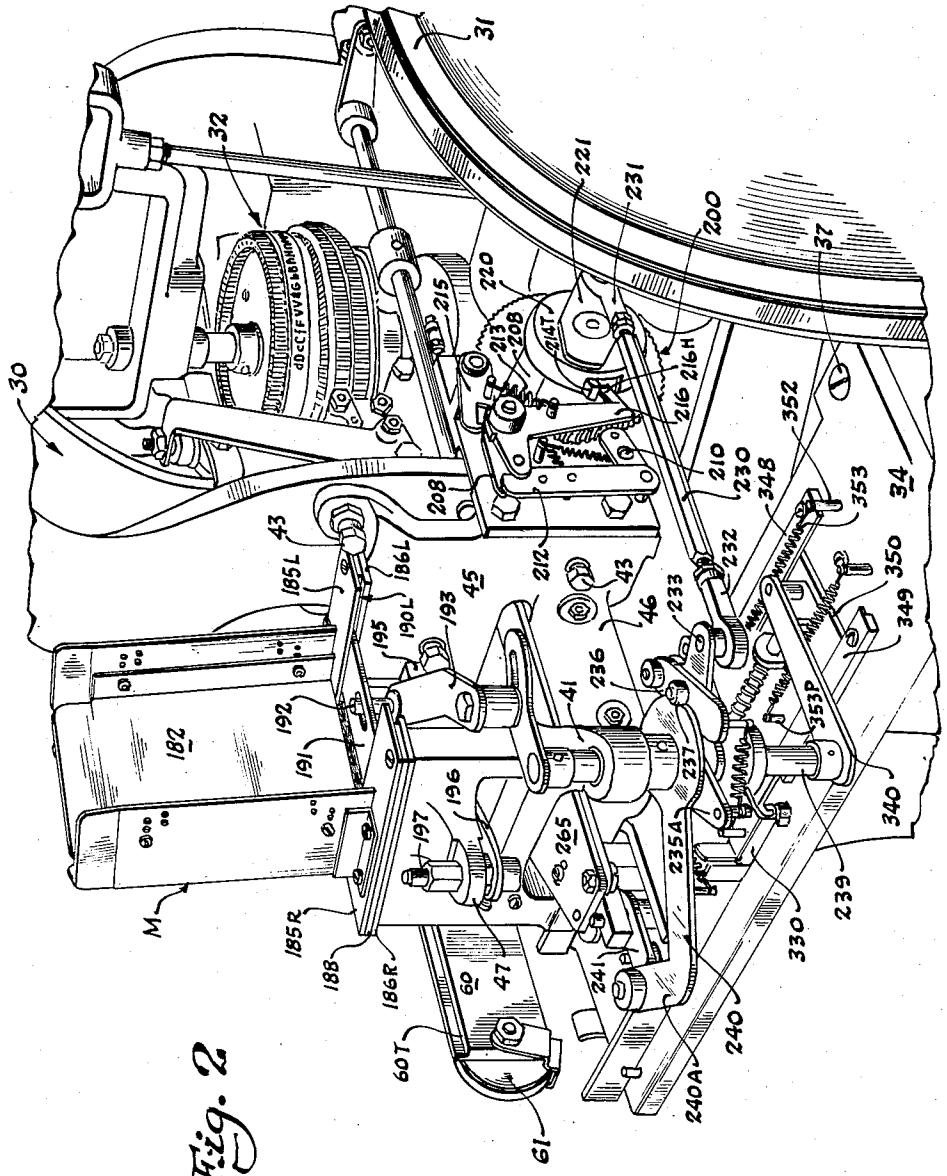



Fig. 2

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EMBOSSING MACHINES

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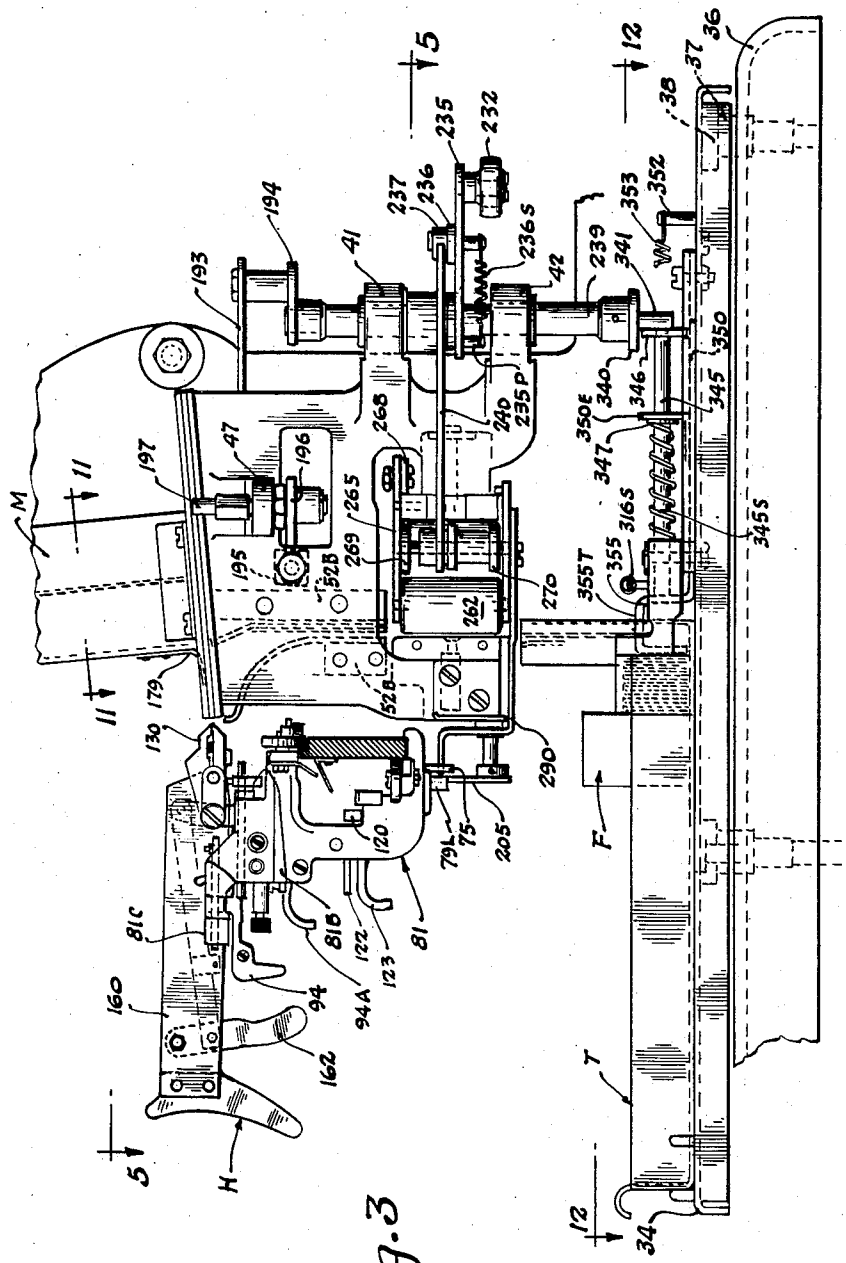



Fig. 3

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EMBOSSING MACHINES

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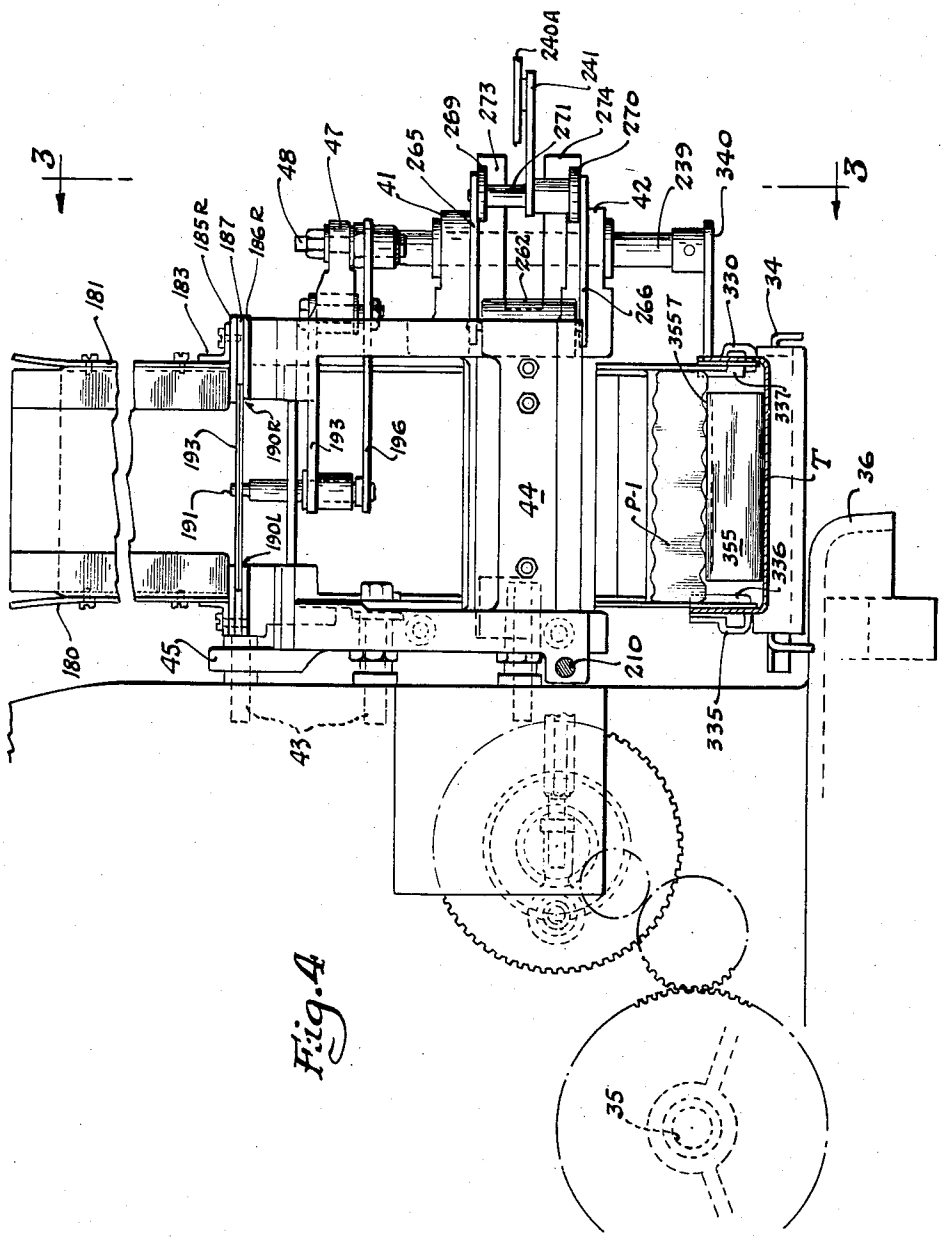



Fig. 4

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EMBOSSING MACHINES

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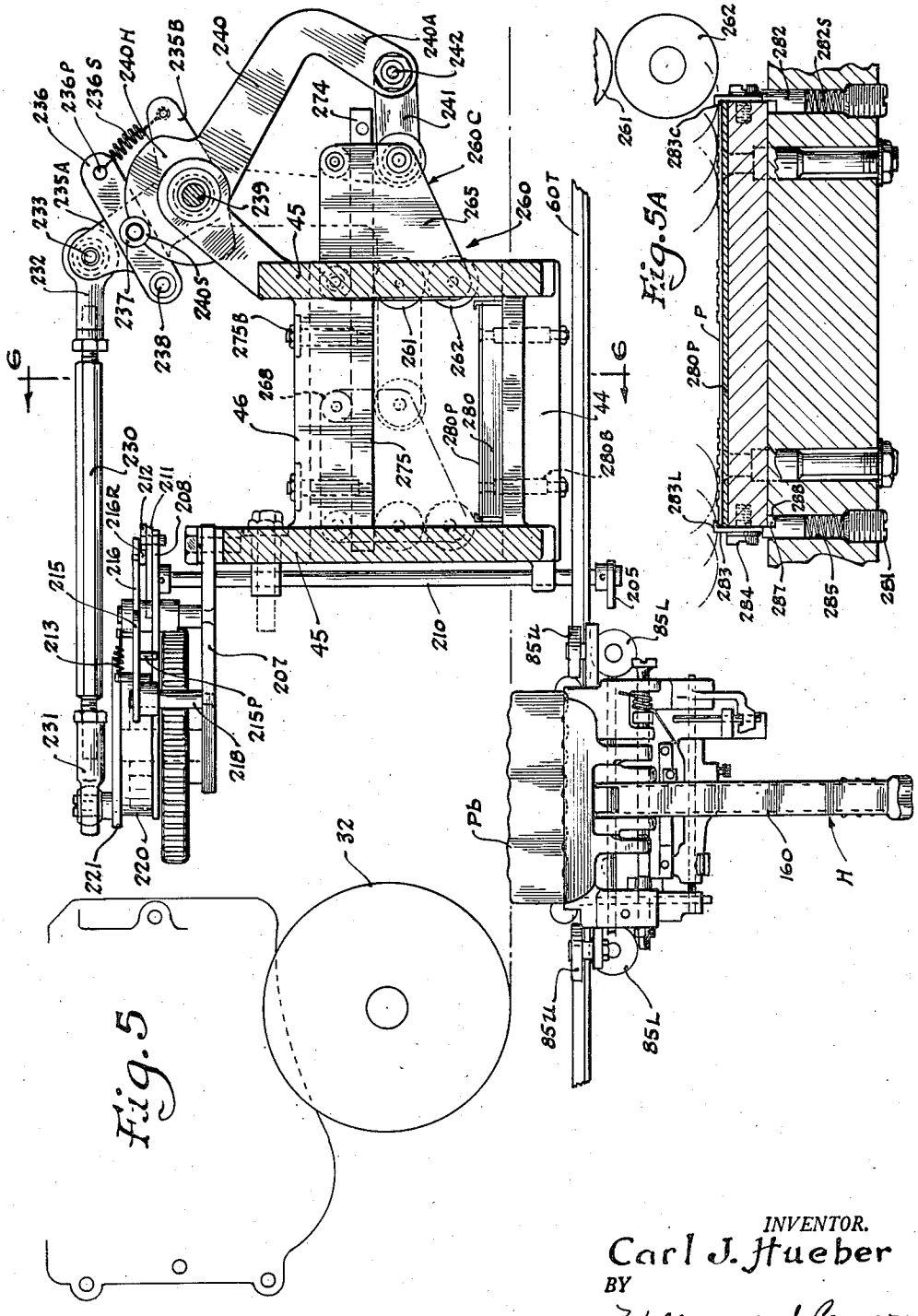


Fig. 5



Fig. 5A

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EMBOSSING MACHINES

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Fig. 6A

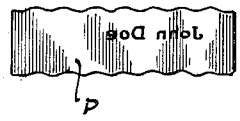



Fig. 7

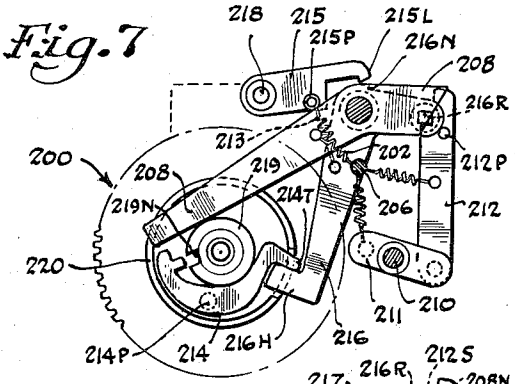



Fig. 6

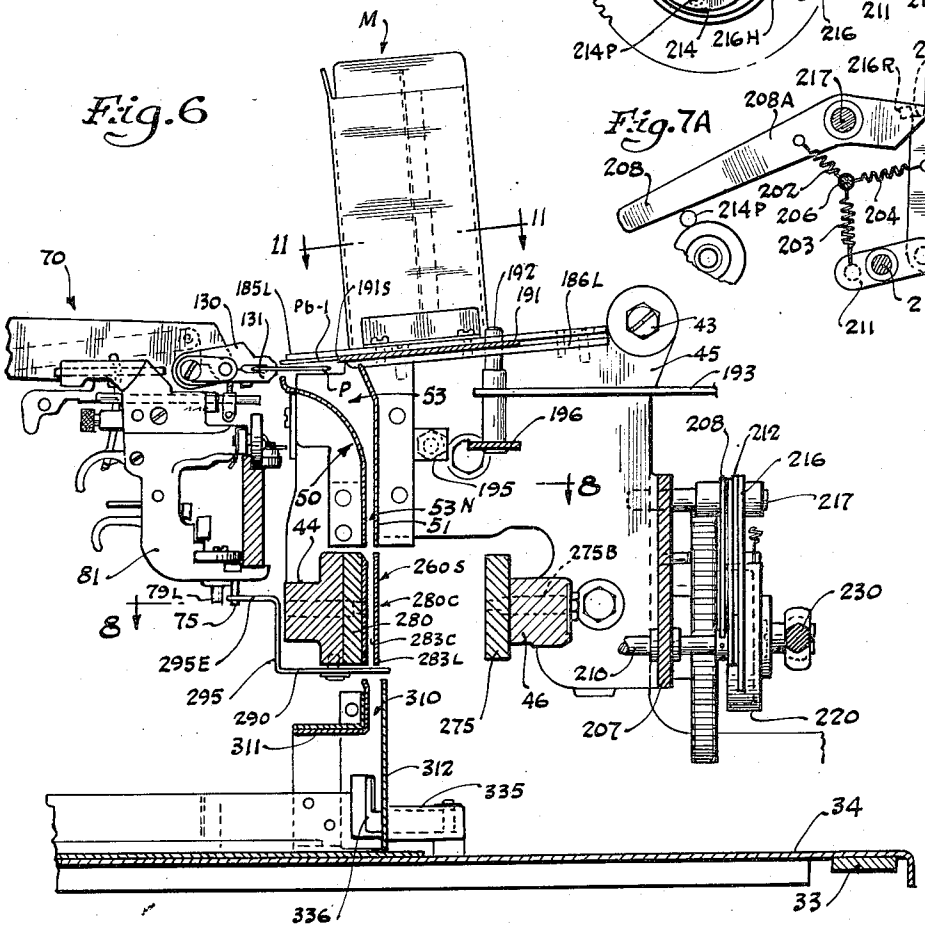



Fig. 7A




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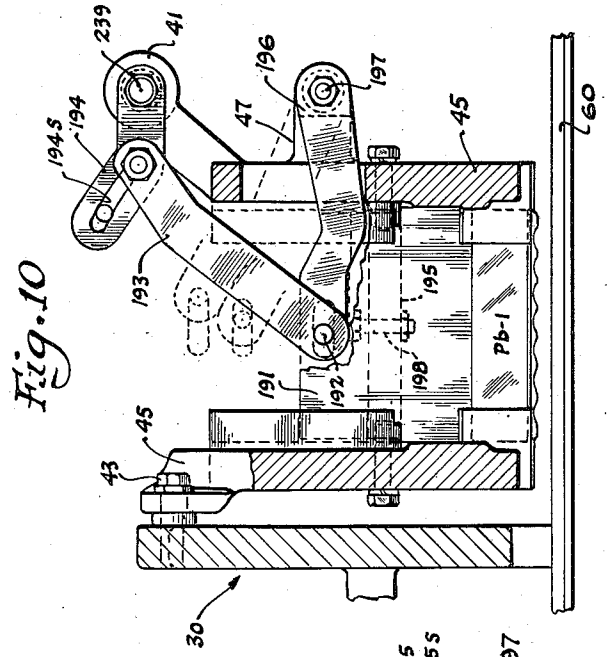



Fig. 10

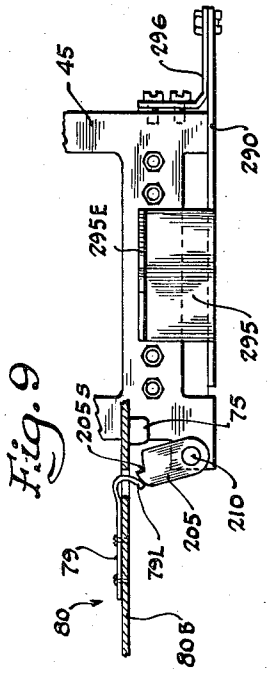



Fig. 9

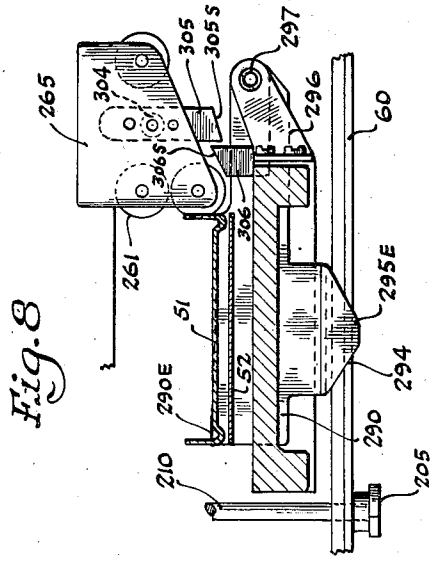



Fig. 8

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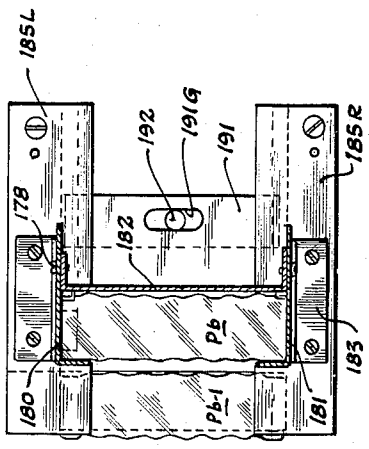



Fig. 11

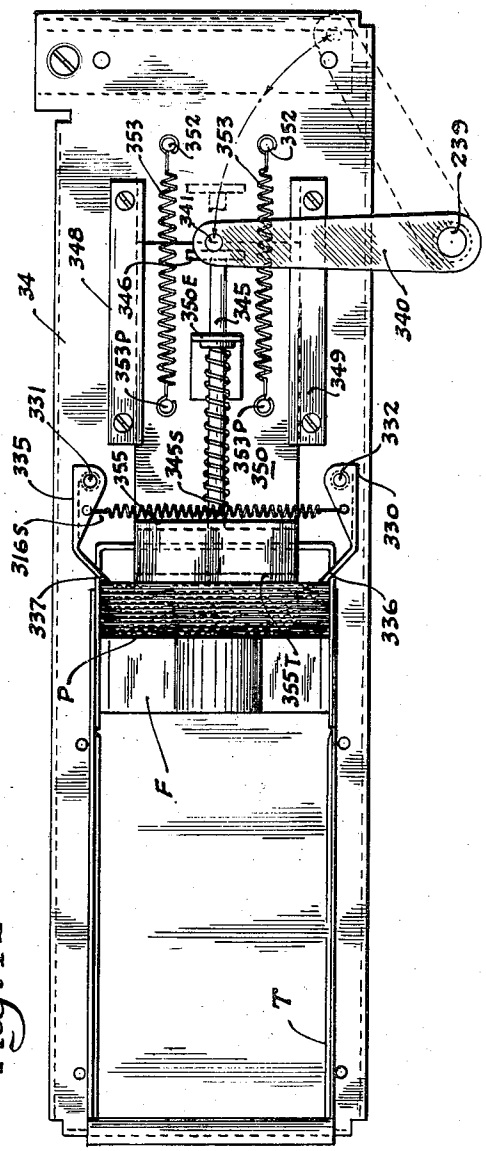



Fig. 12

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EMBOSSING MACHINES

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Fig. 13

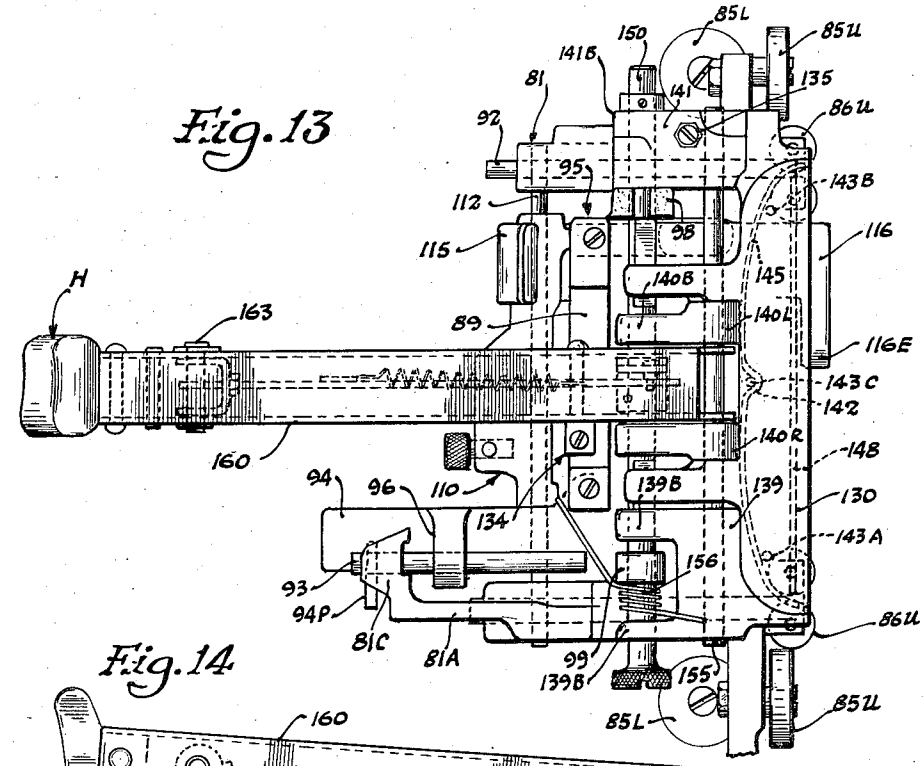



Fig. 14

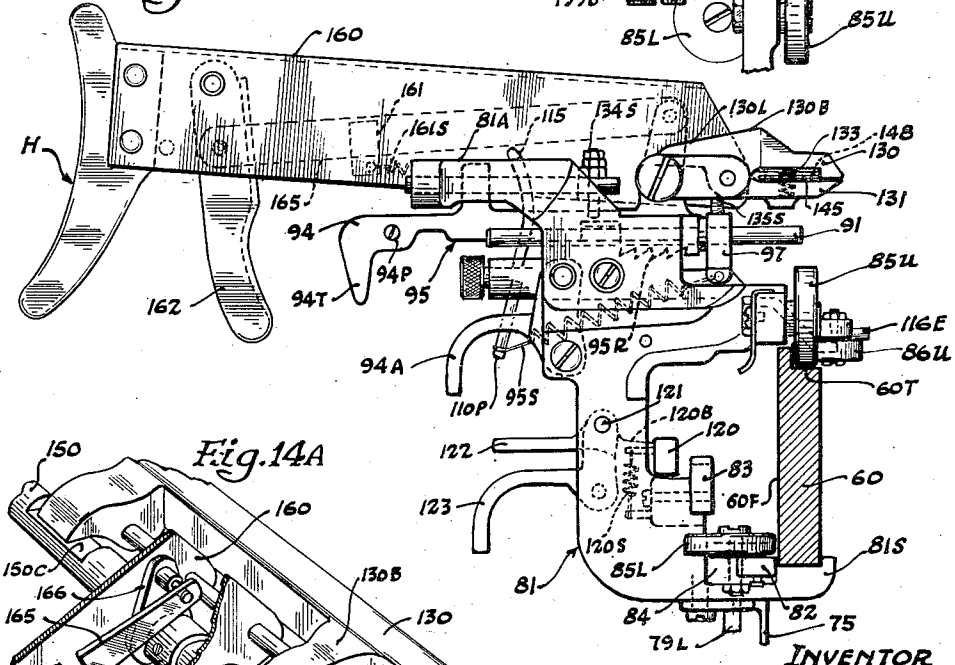



Fig. 14A




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United States Patent Office

2,833,386

Patented May 6, 1958



2,833,386

# EMBOSSING MACHINES

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Application February 24, 1953, Serial No. 338,341

29 Claims. (Cl. 197—6.6)

This invention relates to certain mechanism that is adapted to be used with embossing machines such as the type used to provide embossures on the face of deformable articles such as embossable address plates. More particularly, the present invention relates to mechanism for handling and operating on these address plates both prior and subsequent to the embossing operations that are performed thereon.

Embossing machines of the above type are usually provided with a movable carriage which is adapted to hold and position the address plate relative to the punches and dies that operate in the embossing machine to form embossures on the face of the plate, and recently it has been proposed to combine a magazine type loader with the embossing machine whereby a supply of the plates to be embossed may be stacked at a station along the path of the movable carriage and selectively fed to the carriage by a means that dispenses with the need for having the operator perform this positioning operation while holding the embossable plate in his hand.

The embossing pressure in the machine is maintained uniform for all characters, and therefore those embossures represented by the smaller or thinner characters are somewhat deeper or sharper than in the case of wider characters, as for instance the difference that might exist between an embossed "i" and an embossed "m." That is, a particular line or grouping of embossed data may exhibit some lack of uniformity relative to embossure depth, and consequently the impressions made by these data during a subsequent printing operation will be correspondingly uneven with respect to ink transfer. One method for remedying this condition has been to support the embossed plate at its back (the raised parts of the embossures defining the face of the plate) while running a roller with substantiall pressure across the exposed face of the plate, this rolling out operation serving to bring the raised embossures to a common plane, and the primary object of the present invention is to permit this rolling out operation to be performed on an embossed plate of the foregoing type by means of an arrangement which is also effective to advance an unembossed plate from a loading magazine adjacent the embossing machine to a position whereat the plate may be loaded onto and picked up by a movable carriage of the aforesaid type.

In the present instance, the mechanism that is effective to roll across the face of the embossed plates to even out the embossures operates automatically at a high speed, and the pressure of the roller is substantial, so that it is preferable that it be unnecessary for the operator to attempt to remove from the rolling station, by hand, an embossed plate that has been subjected to a rolling operation. Accordingly, it is another object of this invention to arrange for automatic removal of the embossed plates from the rolling station as the plates are each rolled to a finished, even condition, and to arrange for the accommodation of a progressively increasing stack of such removed plates adjacent the rolling station, so that there is no necessity for directly handling the finished plate at or near the station where the plates are rolled.



A further object of the present invention is to provide a single mechanism for performing each of the foregoing operations in timed relation one to another, and to permit this mechanism to be mounted in operative combination with an embossing machine of conventional type.

As will be described in detail below, one of the aspects of the present invention is the loading and unloading of, respectively, unembossed and embossed plates in the carriage that moves between the plate loading station and the embossing station. In the present instance, these loading and unloading operations take place without need for the operator to directly handle the plate, and further objects of the present invention are to facilitate these operations and the transportation of an unembossed plate from the loading station to the embossing station, and to improve upon the plate carriage means.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof and what I now consider to be the best mode in which I have contemplated applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a perspective view of the front of an embossing machine showing the device of the present invention arranged in combination therewith;

Fig. 2 is a perspective view looking into the back of the machine as shown in Fig. 1;

Fig. 3 is a side elevation, partly in section, taken substantially along the line 3—3 of Fig. 4;

Fig. 4 is a front elevation, partly in section, of the device of the present invention as mounted on the embossing machine, the track 60 being partly broken away;

Fig. 5 is a vertical sectional view taken substantially on the line 5—5 of Fig. 3;

Fig. 5A is a detail sectional view taken through the plate roller station;

Fig. 6 is a sectional view taken substantially on the line 6—6 of Fig. 5;

Fig. 6A is a plan view of the embossed face of a printing plate;

Fig. 7 is a detail elevational view partly in section of the clutch used in the present instance;

Fig. 7A is a view similar to Fig. 7 showing the clutch in a different stage of operation;

Fig. 8 is a detail sectional view looking down into the plate roller station and taken substantially on the line 8—8 of Fig. 6;

Fig. 9 is a fragmentary detail view, in elevation, of the front of the plate rolling station showing how the clutch lever is tripped;

Fig. 10 is a detail sectional view taken on the line **10—10** of Fig. 6 of the means effective to feed the printing plates from the supply magazine;

Fig. 11 is a sectional view taken on the line **11—11** of Fig. 6;

Fig. 12 is a plan view taken substantially on the line **12—12** of Fig. 3 and showing details of the plate packer mechanism;

Fig. 13 is a plan view of the plate holding carriage;

Fig. 14 is a side elevation of the carriage shown in Fig. 13, and

Fig. 14A is a detailed perspective view, broken away, of the upper plate holding jaw and the cam mechanism for controlling the same.

*General description*

The present invention is illustrated in Figs. 1 to 14 as used with an embossing machine **30** having a rotating embossing head **32** in which are located oppositely disposed and paired punches and dies which are adapted to be selected according to a keyboard K at the front of the machine to emboss a deformable article located in the machine. This type of embossing machine is generally well known in the art, and is described and covered in detail in prior United States patents such as U. S. Patent Nos. 921,600, 955,116, 1,518,904 and 1,831,103. In this connection, attention is also directed to Seward Reissue Patent 23,508, relating to embossing machines, and with respect to which the present invention, in part, is an improvement.

The embossing machine **30** is adapted to emboss thin deformable articles such as address printing plates P of the type illustrated in Fig. 6A, and to this end the embossing machine includes a carriage **80** arranged to travel on a track **60**, Fig. 1, that extends transversely across the front of the embossing machine. This carriage is adapted, as will be described in more detail below, to advance unembossed plates as P*b*, Fig. 1, along a narrow guide or platform **40**, Fig. 1, that extends past the embossing head **32**. These blank address plates P*b* are first loaded on to the carriage **80** from the bottom of a supply magazine M which is located at the right hand end of the track **60**, and then the carriage is advanced by the operator to the left toward the embossing machine until the carriage is stopped at a fixed location which defines generally the initial embossing relation between the plate P*b* which is to be embossed and the embossing head **32**. In respect to advancement of an unembossed plate from the magazine M to embossing position, the carriage **80** in its operation resembles that of the Seward Reissue Patent 23,508. The plate to be embossed is supported on the platform **40** under such conditions, and embossing operations are then carried out by the operator who depresses the selected key on the keyboard K corresponding to the embossed character which is to appear on the face of the plate. Depression of the selected key on the keyboard K, as is described in detail in the above listed United States patents, is effective to cause a punch and die set corresponding to the depressed key to be shifted from normally retracted positions within the die head **32** and to impinge with vertically directed forces upon opposite sides of the plate so that a raised character is formed on the upper side or face of the plate as viewed in Fig. 1.

In order that successive embossures may be formed in a single row on the plate, as well as line spacing movements in the event that the plate being embossed is to contain more than one row of embossed data, the carriage **80** embodies means for performing character spacing and line spacing movement. These are movements that are well known in the art and the first spacing movement, that is the character spacing movement, is provided for in the form of an escapement mechanism which includes a rack **83**, Fig. 1, secured to the back side of the carriage **80** at the bottom thereof. This rack extends parallel to the track **60** and is normally engaged by a pair of dogs (not shown) which cooperates first to lock the carriage **80** against movement while an embossure is being formed, and then to permit the carriage **80** to feed or shift through a character spacing movement after the formation of the particular embossure and before the selection and operation of the punch and die set corresponding to the next embossure.

As can be observed from Fig. 6A, the faces of the printing plates P embossed in the machine **30** are characterized by raised characters in mirror reverse, progressing from right to left across the face of the plate. Consequently, it will be appreciated that the character spacing movement of the carriage **80** during embossing operations will be from left to right in the machine as viewed in Fig. 1 for instance. To account for such movement of the carriage **80**, a spring-tensioned drum **61**, Fig. 1, is located on the track **60** at the right hand end thereof, and this drum is tensioned to turn counter clockwise on an axle **61**A under the action of a corresponding spiral spring that is coiled inside the drum. A tape **62** is wound on the drum **61**, and this tape is connected at its free end to an ear **82** which projects horizontally toward the drum **61** at the bottom of the carriage **80**. From this it will be recognized that the drum **61** is normally effective to pull the carriage **80** from an advanced position at the left of track **60**, as viewed in Fig. 1, to the right, and this is effective, when the feed dog of the aforesaid character spacing escapement is moved out of engagement with the rack **83**, to advance the carriage **80** a short distance along the track **60** from left to right until the feed dog is automatically re-engaged in a known manner with the rack **83** to again arrest the carriage at the end of a predetermined character spacing movement. This operation is described fully in Duncan Patent No. 921,600 and the Seward Reissue patent and further description herein is therefore deemed unnecessary.

Under and in accordance with the present invention, a unit FR for handling the plates, both prior to and subsequent to the embossing operation, is located at the right hand side of the machine **30** as viewed in Fig. 1. This plate handling unit includes a supply magazine M in which plates P*b* to be embossed are arranged in a vertical stack. The unembossed plates are fed from the bottom of the magazine toward loading position in a forward direction out beneath a pair of upper guide plates **185**L and **185**R, Fig. 1, toward the track **60**, and when this feeding operation is completed, to locate the particular plate at loading position, the front edge of the unembossed plate that is thus fed from the magazine M projects a short distance outwardly beyond the respective guide plates **185**L and **185**R. This relationship is best shown in Fig. 6 for an unembossed plate P*b*–**1**.

The magazine M is supported in generally vertical relationship at the top of a main casting **45** which is secured to the right hand side of the machine **30** as by bolts **43**. This casting houses and supports the major parts of the plate handling mechanism FR which embodies the principles of the present invention. The mechanism FR includes a roller station **260**S, Fig. 6, where embossed printing plates are subjected to a rolling operation. A carriage **260**C, Fig. 5, is mounted at the right hand side of the casting **45** immediately beneath the magazine M and is arranged for reciprocal movement along a horizontal track in the roller station **260**S. The carriage **260**C supports a pair of rollers **261** and **262**, Fig. 5, and is effective to drive this pair of rollers across the face of an embossed plate such as a plate P, Fig. 6A, located at the station **260**S with pressure to bring the embossures on the plate P into a common plane. As will be described in more detail below, movement of the plate roller structure, as well as the feeding of the plates from the bottom of the magazine M, is controlled in such a manner that a plate as P*b* to be embossed is fed from the magazine M and the printing plate as P that was last embossed by

the machine 30 is operated on by the roller structure in a single cycle of operation.

The embossed plate which is to be evened out by the rollers 261 and 262 is positioned accurately at the roller station 260S by a means which includes a swinging gate 290, Fig. 8, and the opening and closing of this gate is controlled by the combined movements of the carriage 80 and the roller structure. Thus, the opening and closing of this gate is controlled so that the gate is opened immediately after a rolling operation on an embossed plate is completed. When the gate is thus opened, the embossed plate that was just rolled out drops onto the top of a packer 355, Fig. 6, and in the next cycle of operation the packer is operated to push the finished embossed plate into a tray T, Fig. 1.

As shown in Fig. 1, the embossed plates P in the tray T are arranged in a horizontal stack. The tray T is open at the top and at both ends and is supported on a table 34 disposed at the right side of the machine 30. To this end, the machine 30 is provided with a ledge 36 that extends from rear to front along the right side as shown in Fig. 6. Supporting bars 33, Fig. 6, project from the ledge 36 and support the table 34, bolts as 37 and 38 serving to secure the table and supporting bars to the ledge 36.

*The plate holding carriage and jaws*

The carriage that is used to transport plates as P*b* to be embossed from the magazine M to the embossing station in the embossing machine 30 is indicated at 80 in Fig. 1 and is best shown in Figs. 13 and 14. As noted hereinabove, the carriage 80 is adapted to slide back and forth along the track 60 at the front of the machine, and to this end the carriage comprises a main casting 81, Fig. 14, on which a pair of spaced apart upper rollers 85U are located at either side of the carriage. These rollers 85U are journaled to the back of the casting 81 at the top thereof and are disposed in position to travel along a horizontal rail 60T formed in the track 60. Spaced slightly inwardly of each of the rollers 85U and associated therewith are opposite sets of similar upper rollers 86U suitably journaled at the back of the casting 81, and these rollers are arranged to ride along the vertical face of the track 60T. As shown in Figs. 13 and 14 another pair of rollers, lower rollers 85L, are journaled at the bottom of the casting 81 in position to engage the forward face 60F of the track 60, and this lower section of the carriage 81 is formed with a pair of opposite and spaced apart shoes 81S that engage the underside or lower edge of the track 60 and serve to stabilize the carriage 80 on the track 60. By this arrangement of rollers, it will be seen that the carriage 80 is securely mounted on the track 60 and is adapted to freely move therealong in a horizontal direction.

The carriage 80 is automatically fed to the right toward the magazine M and along the track 60 step-by-step during embossing operations a character space at a time, and this movement is afforded by a feed dog and locking dog (not shown) which are arranged on the front of the track 60 to engage a toothed rack bar 83, Figs. 1 and 14, which rigidly interconnects opposite sides of the casting 81 at the bottom. This character spacing escapement mechanism is fully described in Duncan Patent No. 921,600 to which attention is directed for further description in this regard, reference being made herein to this character spacing movement simply for the purpose of supplementing the present disclosure to this extent. However, it may also be pointed out that in order to render the character spacing escapement mechanism inoperative to permit the carriage 80 to be moved at will in either direction along the track 60, an escapement release bar 120, Figs. 1 and 14, is extended along the rear of the carriage 80. A pivot pin 121 extends between the opposite sides of the casting 81 in parallel relation to the release bar 120, and the release bar is formed with a set of spaced apart bearing arms 120B which embrace and are free to turn on the pin 121. The left bearing arm 120B is provided with an extension in the form of a thumb release tab 122 and a grip 123 for the operator's forefinger is secured to the inside of the left member of the casting 81 in position to facilitate manual movement of the thumb tab 122. As indicated in Fig. 14, a spring 120S is connected at one end to a pin on the forward side of the release bar, and at its other end this spring is connected to a pin fast on the front of the escapement rack bar 83 at the left end thereof. The spring 120S holds the escapement release bar 120 down in an ineffectual position as shown in Fig. 14, but when a downward force is applied to the thumb tab 122 by the operator this causes the escapement release bar 120 to pivot on the pin 121 in a counterclockwise direction as viewed in Fig. 14, and this movement lifts the aforementioned feed dog out of engagement with the character spacing rack bar 83 so that the carriage 80 can be advanced at will along the track 60. It might also be mentioned that the finger grip 123 which is stationary on the carriage 80 serves as a handle for moving the carriage on the rail 60 and for holding the carriage against the pull of the barrel spring assembly 61.

The plate to be embossed is held on the carriage by a pair of jaws 130 and 131, Fig. 14, and the arrangement is such that these jaws are mounted on the carriage 80 for character spacing movement therewith to accordingly locate the plate held thereby in a proper embossing relation in the die head 32. These jaws, in addition to being mounted for character spacing movement on the carriage 80, are independently mounted on a cross slide 95 for line spacing movements so that several lines of data can be embossed on the plate held in the jaws 130 and 131. As shown and described in detail in the aforesaid Duncan Patent No. 921,600, this cross slide is mounted on the carriage 80 between the opposite sides of the casting 81, and is adapted to advance along a set of guide rods during line spacing movements. Thus, the casting 81 in the present instance is formed with enlarged upper side sections as 81B, Fig. 3, and spaced apart guide rods 91 and 92, Fig. 13, are mounted in these sections of the casting. To complete the guide rod assembly for the carriage 95, the right side of the casting 81 is also formed with a forwardly extending section 81A, Figs. 13 and 14, and another guide rod 93 is securely mounted in an arm 81C at the front of this forward extension 81A. As shown in Fig. 13, the guide rods 91, 92 and 93 are each mounted parallel to one another and extend from front to rear in the carriage 80 thus serving as a guide for the cross slide 95.

Formed on the cross slide 95 to correspond to the guide rod 93, and to the paired set of guide rods 91 and 92, is a forward bearing 96 and a pair of oppositely spaced apart rear bearings as 97. The bearings 97 are located on opposite sides of the cross slide 95, whereas the bearing 96 is located in a forward extension 94 of the cross slide 95.

In order to permit the cross slide to be advanced at will along this set of three guide rods, the forward extension 94 is provided with a depending tab or thumb lug 94T which may be pressed by the operator to exert advancing forces in a line spacing direction to the cross slide 95. For normally resisting such advancing forces, a spring 95S, Fig. 14, is connected at one end to the rear of the cross slide 95, as shown in Fig. 14, and at its other end is connected to a pin 110P so that the spring 95S tends to locate and hold the slide 95 in what may be termed an initial or established line position.

From this it will be recognized that the guide rods 91, 92 and 93 constitute a direct connection between the main casting of the carriage 80 and the cross slide 95 so that the cross slide is carried with the carriage 80 during character spacing movements. On the other hand, a line spacing movement of the cross slide 95 as may be instituted by the operator applying sufficient advancing force to the bar 94 through the thumb tab 94T, is manifested

in an advancing movement of the forward bearing **96** and the two rear bearings as **97** along the respective guide rods. To assist in advancing the cross slide **95** in a line spacing direction, a finger grip **94A** is attached to the right side of the carriage **80** just below the thumb tab **94T** as shown in Fig. 1.

The jaws **130** and **131** which are adapted to grip and hold a plate to be embossed in the carriage **80** are mounted on the cross slide **95** in a manner to be described presently, but it should first be pointed out that the extent of a line spacing movement is determined by the spacing between the teeth of a pair of spaced apart racks as **95R**, Fig. 14, located at opposite sides on the bottom of the cross slide **95**. As described in the aforesaid Duncan Patent No. 921,600, these racks as **95R** face downward, and a corresponding pair of feed dogs are operatively arranged therewith to regulate and control line spacing movements. Accordingly, and as shown in the aforesaid Duncan Patent No. 921,600, a pair of spaced apart dogs are mounted on corresponding arms on a carrier **110**, Fig. 13, and these arms are arranged in spaced relation so that the dogs are positioned directly beneath the oppositely disposed racks **95R**. The carrier **110** is free to pivot on a pivot shaft or pin **112** which extends between the opposite sides of the casting **81**.

The carrier **110** for the line spacing dogs is spring biased so that the dogs are normally firmly held in engaged relation with the corresponding racks. It will be recalled in this connection that attention was earlier directed to a pin **110P**, and it will be observed in Fig. 14 that this pin projects from the underside of the carrier **110** so that the same spring **95S** which tends to resist line spacing movements of the cross slide **95** also serves to pivot the carrier **110** in a counterclockwise direction about the shaft **112** as viewed in Fig. 14 to hold the feed dogs on the carrier **110** in engagement with the teeth on the racks **95R**.

As shown in Fig. 13, a pin **94P** projects laterally from bar **94** of the cross slide **95**, and the projected path of this pin is aligned with the guide pin **91** as can be seen in Figs. 13 and 14. As the cross slide **95** advances along the guide rods during line spacing movements, pin **94P** eventually engages the forward end of the guide rod **91** so that the cross slide **95** can no longer be advanced, and in this manner pin **94P** serves to define the limit of line spacing movement for the cross slide **95**.

To permit the cross slide **95** to return to its zero or initial position, and also to permit this cross slide to be moved through line spacing movements at will, the carrier **110** is provided with a manual release by which the operator can pivot the feed dogs for the racks **95R** out of engagement therewith and hold the feed dogs in a released position if desired. This manual release in the present instance is in the form of a vertically extended lever **115**, Figs. 13 and 14, which is secured to the underside of the carrier **110**. It will readily be recognized that the carrier **110** can be turned in a clockwise direction as viewed in Fig. 14 simply by pressing in on the lever **115**, and this will be effective to lower the feed dogs out of engagement with the feed racks **95R** against the action of the springs **95S**, whereupon the cross slide **95** will undergo a snap return movement from any advanced position in the guide rods **91**, **92** and **93**.

As shown in Fig. 13, the release lever **115** extends all the way beneath the carriage **80** to the rear thereof whereat the release lever **115** is formed with a right angled extension **116** which is disposed in a generally horizontal plane. This extension **116** has a downwardly bent end **116E**, and as will be pointed out below, constitutes part of a means for automatically releasing the cross slide as the carriage **80** is moved to the right along the track **60**.

The jaws **130** and **131** which are effective to locate the plate in proper relation in the die head **32** are carried at the rear of the cross slide **95** in a manner to be pointed out below, and these jaws can be opened and closed as desired by means including a trigger **162** and a link **165** which are operatively connected and arranged in a forwardly extending barrel **160** which is also mounted on the carriage **80** for movement therewith.

The jaws **130** and **131** are mounted for movement as a body on the cross slide **95**, and to this end a shaft **150** is mounted in a pair of spaced apart bearings **98** and **99** which are formed on the cross slide **95** in an upright relation. In this manner shaft **150** will move with the cross slide **95**. The lower jaw **131** is mounted on the shaft **150** and in turn carries a hinge pin that affords a connection between the two jaws **130** and **131** so that they can move as a body. Thus, the lower jaw **131** is provided at one end with a yoke-like bearing member **139** from which project a pair of spaced apart bearing lugs **139B**, and the openings in these bearing lugs are adapted to receive shaft **150**. At its other end, the lower jaw **131** has another bearing member **141** in which the opposite end of the shaft **150** is journaled. Located on the lower jaw between the two bearing members **139** and **141** are a pair of central bearing lugs **140L** and **140R** at the ends of which are bearings as **140B**, and the openings in these bearings as **140B** also journally receive the shaft **150**. In this manner, the lower jaw **131** is mounted on the cross slide **95**, and at the same time shaft **150** is free to turn in the five bearings that are afforded by the lower jaw **131**.

As shown in Fig. 13, the hinge pin **155** for the upper jaw is carried in the bearing members **139**, **140** and **141** of the lower jaw, and this hinge pin passes through a pair of spaced apart bearing openings formed in bearings **136**, Fig 14A, that depend from a pair of spaced apart bearing lugs **130B** of the upper jaw **130**.

The upper jaw is relatively elongated, as shown in Fig. 13, and is shaped generally complementary to the lower jaw so that these jaws together will cooperate to properly grip an unembossed plate disposed therein. The bearing lugs **130B** in the upper jaw extend back toward shaft **150**, the lugs **130B** have flat under sides **130F** which constitute the cam followers of a cam action afforded in the present instance to permit the jaws **130** and **131** to undergo an opening movement. As shown in Fig. 14A, sections of shaft **150** corresponding to the cam follower surfaces **130F** are flattened at **150C** to provide corresponding cam sections. The relationship is such that the rear edge portions **130E** of the follower surfaces **130F** normally rest on the forward edges of the cam surfaces as **150C** with these cam surfaces sloping downward at an angle to the follower surfaces **130F**. As will be pointed out below, the jaws **130** and **131** open when shaft **150** is turned to dispose the cam surfaces **150C** in parallel relation to the followers **130F**, and in this respect the jaws are similar in operation to those disclosed in the aforesaid Seward Reissue patent.

The jaws **130** and **131** are normally held in a closed relation by the cam shaft **150**, and in order that the jaws will automatically open when the position of the cam shaft **150** is altered accordingly, a coil spring **133**, Fig. 14, is seated in the lower jaw. Thus, the spring **133** normally tends to force the upper jaw in an opening direction counterclockwise about the pivot pin or shaft **155**. The manner in which the cam shaft **150** is turned to permit the action of the coil spring **133** to take place will be described below.

From the above it will be recognized that the relationship between the shaft **150** and the plate holding jaws is such that the latter are carried by the cross slide **95** and are normally held closed. The jaws are, however, free to turn or pivot as a body on the shaft **150**, and in order that the jaws will be normally disposed in a characteristic location relative to the carriage **80**, a torsion spring **156**, Fig. 13, is coiled about the portion of shaft **150** which is located between bearing **99** on the cross slide **95** and bearing **139B** projecting from the lower jaw **131**. One end of this spring **156** is tensioned on the top side of the cross slide **95** and the other end of the spring is

tensioned on the yoke-like bearing lug **139** of the lower jaw **131** so that the torsion spring **156** is effective to urge the jaws downward as a body. A screw and lock nut assembly generally indicated at **135**, Fig. 13, is mounted in the bearing lug **141** of the lower jaw **131**, and the screw **135S** of this assembly projects (Fig. 14) from the underside of the bearing lug **141** so as to be positioned above and normally in engagement with a rear end portion of the cross slide **95**. This screw **135S** is adjustable in the bearing lug **141** and constitutes a stop which holds the jaw assembly in a proper horizontal position under the influence of spring **146**. As will be described below, the jaw assembly can be pivoted in an upward or counter-clockwise direction as viewed in Fig. 14 against the action of the torsion spring **156**, and this movement is also limited by a screw and lock nut assembly **134** which is mounted in a block at the side of the barrel **160** as can be seen in Figs. 13 and 14. For this purpose there is provided a relatively narrow plate **89** mounted on the cross slide **95** so as to extend transversely from one side to the other. The plate **89** is disposed immediately beneath the screw and lock nut assembly **134** so as to constitute an abutment for engaging the screw **134S** to limit the upward pivoting movement of the jaw assembly about shaft **150**.

Opening and closing of the plate holding jaws is dependent upon movement of the shaft **150** and a trigger **162** which controls the turning of this shaft. The barrel **160** for the trigger is of a generally flat shape, and is formed hollow in order to accommodate a relatively long link **165**, Fig. 14, which is connected at one end to the trigger **162**. The link **165** is connected at its other end, as best shown in Fig. 14A, through a suitable pin to an ear **166** carried by a collar **167** which is fast on the cam shaft **150**. A small plate **161** is secured to the link **165**, and a spring **161S** is connected at one end to the plate **161** and at its other end to a pin **161P**, Fig. 14A, which extends between opposite sides of the barrel. The spring **161S** is effective to place the trigger **162** under tension and hold the trigger in the position shown in Fig. 14. It will be seen that a pull exerted on the link **165** by means of the trigger **162**, as viewed in Fig. 14A will be transmitted to shaft **150** through the collar **167**, and accordingly the flat cam surfaces **150C** will be turned clockwise, as seen in Fig. 14A, to register with the follower surfaces **130F**. This turning action by the cam shaft **150** permits the coil spring **133** to be effective to force the upper jaw in a similar or opening direction about the hinge shaft **155** until a fully open position for the plate holding jaws is realized just as the cam surfaces and follower surfaces arrange themselves in parallel relation to one another. A handle H at the end of the barrel **160** permits an effective pull to be exerted on the trigger **162** when it is desired to open the plate holding jaws.

When it is desired to locate a plate as Pb in the carriage **80**, the latter is simply advanced to an accessible position and the jaws **130** and **131** are opened by pulling the trigger **162** against the action of its spring **161S**. Having located a plate to be embossed in the carriage **80**, the carriage can then be advanced to the left along the track **60** to present the plate to the embossing head **32**. Character spacing movements of the carriage occur as an incident to embossing operations, but in the event that it is desired to release the carriage from the character spacing escapement thumb tab **122** is depressed and held down until the tape **62** has moved the carriage the desired distance to the right along the track **60**. Line spacing is a manual operation that occurs through the cross slide **95** by pressing in on the thumb tab **94**, and of course the plate holding jaws and the barrel **160** advance together with the cross slide.

For a purpose that will appear below, the plate holding jaws are adapted to forcibly eject any plate gripped thereby when the trigger **162** is operated to open the jaws. Insofar as the ejection or unloading operation itself is concerned, the same is practically identical to that disclosed in Seward Reissue Patent 23,508, and thus the ejector in the plate holding jaws is in the form of a relatively long and narrow spring **145**, Fig. 13, which is somewhat C-shaped in outline and which extends from one end of the plate holding jaws to the other. The distance between the ends of the spring **145** corresponds substantially to the length of one of the printing plates from the magazine M, and when such a plate to be embossed is located in the plate holding jaws of the carriage **80**, this is done in such a manner that the spring **145** is placed under tension, and when the jaws are closed on the plate this tensioned condition is maintained. On the other hand, when the jaws open, the spring **145** is released and acts against the plate to forcibly eject the same from its location between jaws **130** and **131**. Thus, the spring **145** in its untensioned condition is illustrated in Fig. 13, and is formed with an indentation **142** at its midpoint, this indentation corresponding to a small mounting pin **143C** mounted in the lower jaw **131**. Other mounting pins **143A** and **143B** are arranged in spaced apart relation in the lower jaw **131**, and these latter two side pins together with the center mounting pin **143C** serve to retain the spring **145** in position on the top side of the lower jaw **131**. A somewhat long but small bead **148** is formed on the upperside of the lower jaw **131** in parallel relation to the lip of the jaw and is spaced back from the lip of the plate to be gripped between the jaws. The ends of the spring **145**, as shown in Fig. 13, extend out in front of the bead **148** a slight distance such that when a printing plate is located in the jaws against the bead **148**, these ends of the spring **145** are pressed back and the spring thereby placed under tension. When the trigger **162** is released to permit the jaws **130** and **131** to grip the printing plate along the marginal edge thereof between the lip and bead of the lower jaw, the tensioned condition of the spring **145** is maintained. Accordingly, when the jaws **130** and **131** are opened the printing plate therein is no longer gripped and the spring **145** releases and springs back to forcibly eject the printing plate.

At the completion of an embossing operation, the carriage **80** is advanced from the embossing position in the machine to the plate loading position at the right of the machine so that the embossed plate positioned in the plate holding jaws may be ejected from the carriage **80** and a new or unembossed plate Pb located in the plate holding jaws.

In order that this ejection action may take place and a new or unembossed printing plate may be loaded on to the carriage **80**, the cross slide **95** must be in its zero or first line position shown in Figs. 13 and 14. To thus assure that this condition may prevail in the carriage **80**, an automatic release dog for cooperating with the rear extension **116** of the cross slide release lever **115** is located at the front of the machine **30**. The dog **66** lies in the path of the lever end **116**, being mounted on a bracket **68**. The dog is free to pivot on its mounting pin clockwise, as viewed in Fig. 1, against the action of a return spring **67** associated therewith. However, the dog **66** cannot move counter-clockwise out of the position shown in Fig. 1, and consequently it engages the end **116E** of the release lever **115** as the carriage **80** moves past in its travel to the right along the track **60**, and this, of course, assures that the cross slide **95** is in its zero position as the carriage **80** approaches loading position at the front of magazine M.

At embossing position, on the other hand, a stop is afforded to limit movement of the carriage **80** during character spacing action to the right along the track **60**, and when it is desired to have the tape **62** move the carriage **80** all the way to the plate loading position near magazine M, it is necessary that this stop be cleared. Thus a stud **63**, Fig. 1, projects from the track **60** at the front thereof in a normal relation, and this stud is provided at its forward end with a notch **64**. The stud

63 is aligned with bar 120 which permits manual release action for the character spacing mechanism as above described, so that the end of stud 63 which is provided with shoulder 64 is normally engaged by the corresponding end of the bar 120 at the end of a particular character spacing movement. This engaged relationship serves to define the right hand limit position of the carriage 80 during embossing operations, but by pressing down on the thumb tab 122, bar 120 is elevated to its release position, and at the same time is lifted into alignment with the notch 64 so that the bar 120 can clear the stud 63 and permit the carriage 80 to advance in a right hand direction along the track 60.

The action of the spring-urged tape 62 is relatively strong, and once bar 120 has cleared stud 63, the operator applies a braking action so that the carriage 80 is yieldingly urged along track 60 until the carriage is stopped by another stud 65 on the track 60 just below the plate loading magazine M. The stop 65 is accurately located on the track 60 so that the plate holding jaws can be accurately positioned relative to a chute 50, Fig. 6, into which any embossed plate carried by the carriage 80 at this time may be ejected or unloaded to drop into the roller station 260S, Fig. 6.

This unloading position for the carriage 80 also coincides generally with the plate feeding path leading from the magazine M. Thus, it can be observed in Fig. 1 that when at its right limit position on the track 60, as defined by the stud 65, the carriage 80 is immediately in front of the magazine M. As best shown in Figs. 3 and 6, the plate holding jaws on the carriage 80 will be disposed horizontally at the bottom of the supply magazine, and of course it becomes necessary that the jaws be tilted up somewhat in order to grip the plate P*b* last fed from the magazine M. However, further description in regard to this upward tilt of the jaws 130 and 131 toward the supply magazine M will be had later in connection with the unloading of a printing plate carried by the carriage 80, and the description to follow immediately will be restricted to the manner in which an unembossed plate is loaded on to the carriage 80.

*The plate feed means and the clutch 200*

The magazine M is mounted at the top of the casting 45, and is inclined or tilted in a generally forward direction for a purpose that will be described later. It will be noted that the magazine M is arranged in a generally vertical direction and includes opposite sides 180 and 181 and a rear side 182. Brackets 183 secure the side members in position, and the rear side member 182 is adjustably supported between the side members 180 and 181, adjusting screws as 178, Figs. 1 and 11, being registered in corresponding slots in the rear member 182 to permit the latter to be adjustably located to accommodate plates P*b* of different widths.

During the course of operation, plates as P*b* are automatically fed from the bottom of the vertical stack in the magazine out toward loading position, and the means whereby this is accomplished includes a reciprocable feed plate 191 which is adapted to slide back and forth beneath the stack of printing plates in a guideway which is inclined forwardly to the same degree that the magazine M is inclined forwardly. Thus, a pair of spaced apart slots 190L and 190R, Fig. 4, constitutes guides for the corresponding marginal edges of the feed plate 191. These guides are afforded by arranging guide plates 185L, 186L and 185R, 186R at the left and right sides respectively at the top of the casting 45. The inner edges of the upper plates 185L and 185R overhang the inner edges of the plates 186L and 186R, and the sets of plates are separated by spacer plates as 187, Fig. 2, to thus define the opposite guide slots 190L and 190R. As shown in Fig. 1, the spacer plate at the left of the casting 45 terminates short of the forward end of the associated guide plates 185L and 186L. This leaves a side space or guide slot 188 at the front of the magazine M through which an unembossed plate may be carried to the left by the carriage 80 toward the embossing head 32.

To feed the lowermost unembossed plate from the bottom of the stack, the feed plate 191 advances in the direction of the carriage 80 at the front of the magazine M. The feed plate 191 is relatively long, as can be seen in Fig. 6, and constitutes the bottom of the magazine M; that is, the feed plate 191 in its forwardmost position, as shown in Fig. 6, supports the stack of unembossed plates in the supply magazine. The feed plate is formed with a cut away portion at its forward section, so that a shoulder 191S, Fig. 6, extends across the feed plate at the front thereof and from one side to the other. This cut away portion and shoulder 191S are of such depth as to permit a plate such as an unembossed plate P*b*–1, shown in Fig. 6, to be located on and at the front of the feed plate 191, and the relationship is such that when the feed plate 191 reciprocates rearwardly in the guides 190L and 190R a point is reached whereat the shoulder 191S slides just to the rear of the rear edge of the lowermost unembossed plate P*b* in the magazine, whereupon this lowermost plate drops into the aforementioned forward or cut away section of the feed plate. The movement of the feed plate 191 is timed so that this dropping movement of the lowermost plate coincides with the rearwardmost position of the feed plate 191, and in its next advancing movement in a forward direction this unembossed plate is carried in to the position shown for the plate P*b*–1 whereat the front edge of the unembossed plate next to be loaded on to the carriage 80 projects just beyond the forward ends of the guide plates 185L and 185R. This constitutes the forwardmost advanced position of the feed plate 191, and the feed plate 191 remains in this position until the unembossed plate located at the front section thereof is picked up by the plate holding jaws in the carriage 80 and until after the latter commences its return movement along the track 60 toward embossing position. On the other hand, during a particular cycle of operation when the feed plate is actuated the feed plate reciprocates to the rear, picks up an unembossed plate and then immediately reciprocates back to the position in Fig. 6.

The reciprocable action of the feed plate 191, and also of the roller structure 260, as will appear below, is under the control of a clutch 200, Fig. 2, which, in turn, is controlled by the movement of the carriage 80 passing beyond a certain point on the track 60 during its movement from right to left to carry an unembossed plate from the plate loading station or position to embossing position. This point on the track 60 whereat the clutch 200 is engaged to drive the feed plate 191 and the roller structure 260 is defined by a clutch engaging lever 205, Fig. 1. This lever 205 is formed with a vertical shoulder 205S which is adapted to be engaged by the depending lip 79L, Fig. 9, of a spring plate 79 attached to the bottom 80B of the carriage 80, the relationship being such that an opening is afforded in 80B for the lip 79L. The lever 205 has a one-way action so that the spring lip 79L simply rides across the top of lever 205 as the carriage 80 moves toward plate loading position at the front of magazine M, whereas on the other hand the lip 79L is effective to engage the shoulder 205S and trip the lever 205 during return movement of the carriage 80 back to embossing position along the track 60. The lever 205 is mounted at one end of a clutch control shaft 210 which extends in a generally rearward direction to the back of the machine, as best shown in Fig. 5. Tripping of the clutch actuating lever 205 is accompanied by a counter clockwise turning of the shaft 210, as viewed in Fig. 1, and this causes the clutch 200 to engage, whereupon the feed plate 191 is driven from its forwardmost advanced position best shown in Fig. 6 back beneath the stack of unembossed plates P*b* and then in a forward or return direction back again to its advanced position to feed a new plate from the magazine M and

locate the same as indicated in Fig. 6 in position to be picked up by the carriage **80**. It will be recognized from this that the normal location for the feed plate **191** is at the front of the guideways **190L** and **190R** (as shown in Fig. 1) and that the rearwardmost position of the feed plate **191** is an actuated or transient one.

The clutch **200** is adapted to be driven from the main source of power in the machine which is supplied by a constantly driven fly-wheel **31**, Fig. 2. The driven element of the clutch **200**, in the form of a sleeve **219**, is driven through a gear train, Fig. 4, which, in turn, is driven from a main drive shaft **35** that is turned by the fly wheel **31**.

The clutch **200** is of the one-revolution type illustrated in United States Patent No. 2,359,850 and thus includes an intermittently driven element in the form of a flanged disc **220**, Fig. 2. For coupling the driven to the driving element, a clutch dog **214** is pivotally mounted on a pin **214P** carried on the inside of the driven element. The clutch dog has a tooth as **214T** at either end, and the driving tooth of this set is adapted through a spring (not shown), to operatively engage a corresponding notch **219N** formed in the driving element when the clutch engages. The stop tooth **214T** at the other end of the clutch dog projects out through an opening in the driven member **220**, Fig. 2, where it is normally held in such a manner as to maintain the clutch engaging tooth out of engagement relative to the notch **219N** in the driving element. For this purpose lever **216** is pivotally mounted on a shaft **217** that projects from the rear face of a mounting plate **207** secured to the back of the casting **45**. A spring **213**, Figs. 2 and 7, is connected to a pin on the lever **216** so as to be effective to hold the catch **216H** at the lower end of the lever **216** in toward the stop tooth **214T** of the clutch dog, and in this manner lever **216** is effective to maintain the clutch **200** in a normally disengaged relation, as best shown in Fig. 2.

It will be seen that if the lever **216** is rocked counter-clockwise as viewed in Figs. 7 and 7A so that the clutch **216H** is moved away from stop tooth **214T**, the clutch dog **214** will release and the clutch **200** will engage. This is accomplished by a linkage arrangement which includes a relatively small horizontal link **211** fast on the end of the clutch operating shaft **210** opposite the clutch actuating lever **205**. This link **211** is normally held in the position shown in Fig. 7, where the clutch **200** is disengaged, by a spring **203** tensioned between one end of the link **211** and another pin **206** projecting from the rear face of the mounting plate **207**. A vertical link **212** is connected at the other end of link **211**, and the upper inner edge of this link is formed with a notch that affords a horizontal shoulder **212S**, Fig. 7A.

The lever **216** is somewhat in the form of a bell-crank and carries a square pin **216R** at its outer end. The shoulder **212S** on the link **212** is normally held in against this pin **216R** by a spring **204** so that when the link **212** is forced up by a counter-clockwise turning of shaft **210**, as viewed in Figs. 7 and 7A, shoulder **212S** is effective to pivot the lever **216** in a similar direction away from the catch tooth **214T** on the dog **214**. In other words, as will be recognized from the above, when carriage **80** is moved from its loading position in front of magazine M to the left along track **60**, the stud **79** eventually trips the lever **205**, turning shaft **210** counter-clockwise as aforesaid, and causing the clutch **200** to engage as the result of the catch **216H** being moved away from tooth **214T**.

In order to assure that the clutch **200** is maintained engaged for a single cycle of rotation of the driving element **219**, means are afforded to latch and hold the lever **216** in its clutch engaging position. This means includes a latch arm **215** pivotally mounted on a pin **218** which projects from the rear face of the plate **207**. This latch arm has a latching tooth **215L** at one end and is normally held down by a spring **213**, Fig. 2. The top edge of the arm of lever **216** which carries pin **216R** is formed with a notch **216N** near the shaft **217** on which lever **216** pivots, and when the latter is forced in a clutch engaging direction by upward movement of link **212**, the latch tooth **215L** and the corresponding notch **216N** engage, and in this manner spring **213** is effective to hold lever **216** with its catch **216H** out of the path of the catch tooth **214T** on dog **214**.

Disengagement of the clutch **200** at the end of a single revolution of the driven member **219** is effected by another lever **208**, Figs. 7 and 7A, which is operated by the driven member **220** of the clutch and which has opposite arms extending from the shaft **217** on which the lever **208** is free to pivot. Lever **208** is urged in a counter-clockwise direction as viewed in Figs. 7 and 7A by a spring **202** which is attached to the pin **206**. One arm of the lever **208** has a nose portion **208N** that projects into the path of a pin **212P** carried on the vertical link **212** adjacent the shoulder **212S**, and a pin **215P** projecting from the back of the latch arm **215** normally rests on the top side of the other arm **208A** of the lever **208**.

The pin **214P** which is effective to mount the dog **214** on the driven element of the clutch is adapted to engage the underside of arm **208A** during the course of rotation of the driven element **220**, thus causing the lever **208** to pivot in a general clockwise direction as viewed in Fig. 7. This movement of the lever **208** causes the latch arm **215** to be pivoted upward away from notch **216N** by arm **208A** pressing on pin **215P**, and at the same time the nose portion **208N** of lever **208** engages pin **212P** and shifts the vertical link **212** out of the path of the pin **216R**. Since the lever **216** is unlatched and the shoulder **212S** moved away from the pin **216R**, lever **216** shifts clockwise on the shaft **217** under the influence of the spring **213**, and the catch **216H** advances into the path of the stop toe **214T** which is being carried clockwise with the driven element **220** as viewed in Figs. 7 and 7A. Engagement of the stop toe with catch **216H** causes the clutch **200** to disengage, and it will be seen from this that the clutch **200** is a one-revolution clutch in that clutch disengaging actions occur within the same cycle of revolution in which the clutch engages.

The driven member **220** of the clutch carries a plate **221** which rotates therewith, and to this rotatable plate **221** is secured one end **231**, Fig. 5, of a connecting rod **230**. The connecting rod is adapted to impart driving movements to the feed plate **191** and to the roller structure **260**, and accordingly a vertically extended drive shaft **239** is mounted for rotation in a pair of spaced apart arms **41** and **42** which project from the rear right hand corner of the casting **45**, as viewed in Fig. 1. At a generally central location on the vertical driving shaft **239** is an arm **235**, Fig. 5, which is formed with three lobes. The first lobe **235A** affords a connection between the arm **235** and the other end **232** of the connecting rod **230**, as shown in Fig. 5. At the other end of the arm **235** is a second lobe **235B**, and a third lobe intermediate the first two lobes carries a pin **238** to which is pivoted a relatively small drive arm **236**.

As best shown in Fig. 5, a relatively large crank-like lever **240** is formed at one end with an enlarged head **240H** that is rotatably mounted on the vertical drive shaft **239** just above the multi-lobed arm **235**. The lever **240** is adapted to be driven directly by the small arm **236**, and to this end the head **240H** is formed with a notch **240S** which is normally engaged by a drive pin **237** mounted centrally on the arm **236**. A strong spring **236S** is connected at one end to the arm **236** and at its other end is attached to the forward lobe **235B** of the arm **235**. Spring **236S** is of sufficient strength to assure that the drive pin **237** drivingly engages in the notch **240S** so that as the connecting rod **230** is effective to carry arms **235** and **236** clockwise about shaft **239**, as

viewed in Fig. 5, the driving pin **237** forces the head of the lever **240** in a clockwise direction about shaft **239**. The lever **240** has a right angled arm **240A** which is adapted to drive the roller structure **260** in a manner to be described below, and it may also be pointed out that the manner in which the link-like arm **236** is pivotally mounted on the lobed arm **235** affords an overdrive release in the event of jamming at the roller station.

The vertical drive shaft **239** constitutes the main drive means for the feed plate **191** which slides back and forth at the bottom of the magazine M, and linkages are afforded to translate the rotary rocking movement of the drive shaft **239** into linear reciprocal movements for the feed plate **191**. Thus, the lobed arm **235** which is driven directly by the connecting rod **230** is fast on the drive shaft **239** so that the latter is rocked back and forth in the supporting arms **41** and **42** of the frame casting **45** during the course of reciprocal movement of the connecting rod **230**. To this end, an intermediate drive arm **194** is secured to the upper end of the drive shaft **239** and is provided with an arcuate slot **194S**, as shown in Fig. 10. A main drive arm **193** extends from the intermediate arm **194** in toward the feed plate **191**, as best shown in Fig. 2, where a vertically disposed drive pin **192**, carried at the corresponding end thereof, is seated in a slot **191G**, Fig. 11, at the back of the feed plate **191**. The other end of the main drive arm **193** is also provided with a pin, and this pin is mounted in the slot **194S** in the intermediate arm **194**. It will be seen that the arms **193** and **194** are effective to translate the rocking movement of the shaft **239** into reciprocal back and forth movements of the feed plate **191**.

As was noted hereinabove, the feed plate **191**, which is effective to advance unembossed printing plates one by one in the bottom of the magazine M, is normally located in a forwardmost at-rest position relative to its guide slots **190L** and **190R**. This position of the feed plate **191** corresponds to a disengaged condition of the clutch **200**, and this relationship is shown in Figs. 1 and 2. Engagement of the clutch **200** causes the connecting rod **230** to be reciprocated in the direction of the vertical drive shaft **239**, and this, of course, drives the arm **235** clockwise, as seen in Fig. 2, and the shaft **239** is driven or rocked thereby in the arms **41** and **42** in a similar direction. This clockwise turning of the shaft **239** causes the intermediate arm **194** to be carried to the rear, pulling the drive arm **193** in a similar direction to carry the feed plate **191** back beneath the stack of unembossed plates P*b* in the magazine M. Continued rotation of the driven element **220** of the clutch **200** carries the connecting plate **221** thereon past its half cycle position, whereupon the connecting rod **230** reciprocates away from the vertical drive shaft **239**, as seen in Fig. 2, and this is effective to turn the vertical drive shaft **239** in the opposite or counter-clockwise direction to force the driving arms **193** and **194** in a forward direction. When the clutch disengaging lever **216** is automatically released by the latch arm **215** to cause the clutch **200** to disengage, the feed plate **191** will again be located at its forwardmost advanced position in the guide slots **190L** and **190R**.

It will be seen from this in a single cycle of operation of the clutch **200**, the feed plate **191** shifts from an advanced forward position rearwardly beneath the lowermost unembossed plate in the magazine M and at the end of its rearward stroke advances in a forward direction to carry this unembossed plate to the loading position.

In order to adjust the effective stroke of the drive arm **193**, a bar **195**, Figs. 3 and 6, is mounted in a transverse relation on the inside of the casting **45** below the magazine M. The drive pin **192** mounted at the forward end of the drive arm **193** extends downward through the drive arm **193**, as best shown in Fig. 4, and affords a connection to one end of another arm **196**. The arm **196** which is attached to the drive pin **192** projects through an opening in the right side of the casting **45**, as seen in Fig. 1, and is journaled on a pin **197** which, in turn, is supported in a vertical relation on a mounting arm **47** projecting from the casting **45**. It will be recognized that the arm **196** will shift back and forth with the drive arm **193**.

An adjustable screw **198**, Fig. 10, is mounted on the bar **195** so as to lie within the path of the inner end of the arm **196**. Accordingly, the screw **198** can be adjusted to stop the arm **196** in its forward movement with the drive arm **193**, as viewed in Fig. 11, and this, in effect, also stops the drive arm **193**. When the drive arm **193** is thus stopped by the screw **198**, the feed plate **191** is located in its forwardmost position in the guide slots **190L** and **190R**, the slot **194S** in the intermediate drive arm **194** being of a length sufficient to permit an overdrive between the arms **193** and **194**.

*Loading and unloading operations with the carriage 80*

At the plate loading station defined generally by the magazine M, the carriage **80** not only picks up a new plate to be carried to embossing position but also is adapted to eject the plate that was last embossed and which is located in the plate holding jaws **130** and **131** with its edge abutting the bead **148**, Fig. 13, in the lower jaw **131**, as above described. Thus, it will be appreciated that an embossed plate as P, Fig. 6A, located in the jaws **130** and **131** must first be ejected before the new or unembossed plate is to be picked up by the carriage, and for the moment it can be assumed that such ejecting action has occurred through the releasing action of spring **145** in the lower jaw **131** and that the plate holding jaws are therefore conditioned for the positioning therein of a new plate to be embossed. This new plate will, of course, be represented by a plate such as the plate P*b*–**1** in Fig. 6 which has been advanced forward by the feed plate **191**. This plate as P*b*–**1** is held down on the feed plate **191** by spring fingers **179** at the front of the magazine M, Fig. 1, the forward marginal edge portion of the plate projecting just slightly beyond the forward edge of the feed plate **191** as is best shown in Figs. 10 and 11, and it is this exposed marginal edge of the unembossed plate which constitutes the portion to be gripped by the plate holding jaws **130** and **131**. Once the plate as P*b*–**1** is located in the plate holding jaws of the carriage **80**, it will be recognized that the next movement of this unembossed printing plate will be with the carriage **80** to the left along the track **60** toward the embossing head **32**, and to permit this movement to be executed the guide plates **185L** and **186L** are arranged, as best shown in Fig. 1, to provide a feed slot **188** at the left side of the magazine M through which the unembossed plate located in loading position at the front of the magazine M can be moved. The feed slot **188** has a downward tilt that corresponds to the downward tilt of the magazine M and the feed mechanism associated therewith.

The disposition, with respect to horizontal, of the plate holding jaws in order to properly eject the plate last embossed and held therein is illustrated in Fig. 6, and it will be noted that under such conditions the jaws are effective to locate this embossed plate P in a true horizontal plane immediately beneath the aforesaid unembossed plate as P*b*–**1** which is next to be picked up by the plate holding jaws. Accordingly, it will be recognized that after the plate P has been ejected, the jaws **130** and **131** will need to be tilted slightly upwardly and then advanced a slight distance directly toward the direction of the magazine M in order that the forward exposed marginal edge of the plate next to be embossed may be gripped and located in the carriage **80**. This tilting action of the jaws **130** and **131** is accomplished by the operator forcing the barrel **160** down about the pivot therefor that is afforded by the shaft **150** which is mounted in the cross slide **95**, Fig. 13. This tilting movement continues for an instant until the bottom of

the adjustable screw 134S engages the stop plate 89, Fig. 13, screw 134S having an adjusted position such that the limit of upward tilt of the jaws 130 and 131 places the latter immediately in front of the exposed marginal edge of the unembossed plate which is located at loading position. When the jaws 130 and 131 are thus disposed in a plate gripping relation in this manner, the operator then actuates the trigger 162 to present the jaws in an opening relation to the forward edge of the unembossed plate, and at the same time the barrel 160 is pressed forward to thereby advance the line spacing cross slide 95 and the jaws 130 and 131 together as a unit toward the edge of the unembossed plate at loading position. It should be pointed out in this connection that the line spacing cross slide 95 has some lost motion to the extent that the line spacing racks 92 and the corresponding dogs therefor can slide relative to one another, against the action of the cross slide return spring 95S, without a line spacing movement occurring, at least so long as this sliding movement is insufficient to advance the particular tooth on the line spring rack beyond the point where the feed dog engages a new tooth.

Therefore, after an embossed plate has been ejected from and when a new plate is to be located in, the carriage 80, the jaws at loading position are tilted up, opened and moved toward the exposed marginal forward edge of the plate last fed from the magazine M. This movement of the jaws toward the magazine M in a loading direction is a forced one and ceases when the forward edge of the new plate abuts against the mounting bead 148 in the lower jaw 131, whereupon the trigger 162 is released to cause the jaws to grip the plate. The carriage 80, having the new plate located therein, is then advanced to the left along rack 60 to carry the plate through the side guide slot 188 toward the embossing head.

The reason for the downward inclination of the magazine M, the plate feed mechanism and the feed slot 188, will now be apparent as being conducive to a proper removal of an unembossed plate from loader position. Thus, for the jaws 130 and 131 to grip such a plate, it is necessary that they be tilted up from horizontal, about 5° in actual practice, and the unembossed plate at loading position is given a similar inclination to facilitate its unencumbered movement to the left out through the side guide slot 188.

As the carriage 80 travels along the track 60 from loading position, the downwardly projecting spring lip 79L at the bottom of the carriage eventually engages and trips the clutch actuating lever 205 to rock the clutch actuating shaft in a counter-clockwise or clutch engaging direction. Accordingly, the clutch engaging lever 216 is withdrawn from its locking position relative to the clutch dog 214 whereupon the clutch 200 engages and the feed plate, from which the unembossed plate last fed from the magazine M has just been withdrawn to the left through the guide slot 188, reciprocates to the rear of the magazine, receives a new unembossed plate and advances immediately in a forward direction to locate this unembossed plate at loading position at the front of the magazine M.

As was noted hereinabove, an embossed plate located in the plate holding jaws at loading position at the front of the magazine M must first be ejected or unloaded from these jaws before the printing plate next to be embossed can be loaded on to the carriage 80. In accordance with the present invention, such an embossed plate is ejected or unloaded into a roller station 260S, Fig. 6, where forces are effective to improve the printing qualities of the plate, and the ejector mechanism, comprising the spring 148 in the lower jaw 131, is effective to perform this operation as described above. The loading and unloading positions for the carriage 80 are coincident one with the other, as will be recognized from the foregoing description, and the unloading operation for the plate last embossed is characterized by ejecting such a printing plate into a vertically disposed chute 50, Fig. 6, located directly beneath the magazine M. The chute 50 has a generally straight-up-and-down back section 51, and the section 52 of the chute 50 extends from the bottom of the chute vertically upward in spaced parallel relation part way with the back 51 where it is flared out in a forward direction so that the top of the chute 50 is relatively wide as can be seen from Fig. 6. The front section 52 of the chute 50 is formed with a vertical lip 52L on its top edge, Fig. 1, and is also formed with a relatively large opening 54 through which the interior of the chute 50 can be inspected by the operator at the front of the machine. These front and back sections of the chute 50 are mounted to the inside of the casting 45 by means such as brackets 51B and 52B, Fig. 3.

The forwardly flared arrangement for the front section of the chute 50 affords a relatively wide throat 53, Fig. 6, into which an embossed plate as P is first directly ejected or unloaded by the ejector of the plate holding jaws. This throat 53 narrows into a narrow vertical portion 53N where the front and back sections 51 and 52 are disposed in spaced parallel relation to one another, and it will be seen that as an embossed plate is ejected from the carriage 80 into the chute 50 the plate will assume a vertical position with its long side transverse to the throat 53 as it drops by gravity down into and through the narrow throat section 53N. It will also be understood that the face of the embossed plate on which the raised characters are disposed will face to the rear as viewed in Fig. 6, and this relationship is necessary in order that a proper rolling action may be had on this face of the embossed plate to even out embossures, as will be shown below.

*The plate rolling station and related mechanism*

The chute 50 opens at its bottom directly into the rolling station 260S, Fig. 6, whereat the printing plates are each treated to be made more perfect, and it might be mentioned herein that the opening 54 in the front side of the chute 50 referred to above permits an inspection of the interior of the chute 50 to determine if any jamming has occurred in the chute and whether or not the ejected plate dropped all the way down through the chute 50 into the plate rolling station 260S.

The arrangement at the roller station 260S between the anvil 280 and the yieldable guide channel members 283 is shown in detail in Fig. 5A. The anvil itself constitutes a rigid and unyielding structure and includes a face plate 280P rigidly secured thereto by studs 280B which extend through the forward cross brace 44 of the casting 45. The guide channel members are slotted and shiftably mounted on corresponding studs 284 located at either side of the anvil 280. The distance between these members 283 corresponds, of course, to the length of the printing plate. The guide channel members are in the form of shiftable plates provided with overhanging lips 283L that define vertically extending channels 283C, and these lips are adapted to overlap the corresponding marginal portions of the embossed plate located in the roller station to hold the plate against the anvil 280. The channels 283C are preferably somewhat wider than the thickness of a printing plate to permit the latter to easily seat therein, and are each aligned with the throat 53N of the chute 50 so that an embossed plate at the roller station is positioned accurately in a vertical plane between the guide channels 283C as shown in Fig. 5A. Under this condition, the back of the embossed plate is disposed against the face plate 280P of the back-up anvil 280.

The guide channel members 283 are shiftably mounted at the ends of the anvil 280 so that they may be shifted back to permit the embossures on the face of the embossed plate to be evened out. Thus, mounting openings 285 are formed in the cross brace 44 on which the anvil 280 is mounted, and these openings serve to locate shiftable heads 282 by means of which the guide channel

members **283** are shiftably related to the anvil **280**. The heads are each formed with shoulders as **288** which are adapted to engage complementary shoulders **287** provided in the mounting openings, and the heads are biased by springs **282S** so as to normally locate the guide channels **283C** in front of the face plate **280P** a sufficient distance to receive the embossed printing plate. Therefore, any forces applied to the guide channel members **283** in the direction of the anvil **280** will cause the guide channel members to shift back toward the face plate **280P**, and when this force takes the form of the roller **262**, the channel members **283** are shifted back to let the roller **262** pass across the face of the embossed plate on the gate **290**.

The structure which is effective to roll across the embossed faces of the embossed plates at the roller station is generally indicated at **260** in Fig. 5 and this structure includes a reciprocating carriage **260C**. The rolling station itself is generally indicated at **260S**, Fig. 6, and is defined by a vertically disposed anvil **280**, at the bottom of which is located a swinging gate **290**. This gate is adapted to swing in opening and closing directions relative to the roller station and thus is pivotally mounted on a pin **297**, Fig. 8, which in turn is mounted in a bracket arm **296** that is secured to the casting **45** just beneath the spring drum **61** as best shown in Fig. 1. The gate **290** is operated from the carriage **80** and the roller carriage **260**, and this operation will be described below.

As best shown in Fig. 5A, a pair of yieldable guide channels are disposed at either side of the anvil **280** and these guide channels are aligned generally with the vertical throat section **53N** of the chute **50** so that as an embossed plate drops by gravity down through the chute **50**, it exits from the latter directly into the roller station **260S** where it is stopped in this downward travel by the gate **290**. The travel of the embossed plate from its initial unloading position in the wide portion of the throat **53** into the plate roller station **260S** is relatively short, as can be appreciated from the drawings, and this coupled with a forcible ejection from the plate holding jaw permits the embossed plate to come to rest at the plate roller station almost instantly following its ejection from the carriage **80** at unloader position. In any event, relatively long prior to the time that a new plate is gripped by the plate holding jaws, the embossed plate which was last positioned in the plate holding jaws, is at rest at the roller station with its bottom longitudinal edge resting on the gate **290**. Consequently, advantage is taken of this condition to actuate the roller structure which includes the reciprocating carriage **260C** simultaneously with the plate feeding operation that is characterized by reciprocable movement of the feed plate **191** at the bottom of the magazine M, and from this it will be recognized at once that the plate feeding operations and the plate rolling operations are each controlled by the same clutch actuating lever **205**. As will be shown below, the gate **290** remains closed until the carriage **260C** has reciprocated from its normal at rest position, indicated in the drawings, to the left and then back as viewed in Fig. 5, and immediately as the carriage **260C** comes to its normal position at the end of a plate rolling operation, the gate **290** is opened and the embossed plate on the roller station **260S** drops vertically downward to a packer which is effected subsequently to arrange this embossed plate in a horizontal stack.

The carriage **260C** comprises a pair of vertically spaced plates **265** and **266**, Figs. 1 and 4, which serve to rotatably mount and support a pair of pressure rollers **261** and **262**, the latter which is adapted to roll directly across the raised embossures on the face of the embossed plate at the roller station. In its reciprocable movements, the carriage **260C** is guided on a track which includes a pair of vertically spaced rails **273** and **274**, Figs. 1 and 5. These tracks **273** and **274** project from the right side of the casting **45** as can be best seen in Fig. 1 and extend into the casting **45** in transverse relation there to where they are secured to a rear anvil **275** mounted on the transverse casting brace **46** by means as studs **275B**, Figs. 5 and 6. The rear anvil **275** and the rails **273** and **274** thus constitute a relatively rigid track along which the carriage **260C** may move, and at the same time the anvil **275** represents an unyielding back for the rollers **261** and **262** so that the latter may effectively even out the embossures on the face of the embossed plate with substantial pressure.

As shown in Fig. 5, the carriage **260C** is extended back behind the rails **273** and **274** where a pair of guide rollers as **268**, Fig. 3, are journaled in spaced relation at the top plate **265** to travel at the rear of the track. To further guide carriage **260C** in its travel, a pair of vertically spaced guide rollers **269** and **270** are journeled on a vertical shaft **271** that extends between the plates **265** and **266**, as shown in Fig. 4, so as to travel at the front of the track, and this arrangement of guide rollers together with the pressure rollers **261** and **262** serve to mount the carriage **260C** for its reciprocable movements.

In connection with the description above regarding the manner in which the feed plate **191** is driven at the bottom of the magazine M, it will be recalled that attention was directed to a crank arm **240** journably mounted on the vertical drive shaft **239**. This arm constitutes a drive for the roller structure **260**, and as can be seen in the drawings, the arm **240A** is connected to the carriage **260C** by means of a link **241**, one end of which is journaled to the shaft **271** which journably supports the guide rollers **269** and **270** and the other end of which is connected to the arm **240A** by a pin **242**.

The carriage **260C** is normally at rest in the normal position shown in Fig. 5 wherein the rollers **261** and **262** are removed to the right of the roller station, and this condition will prevail as a plate is ejected at the unloader position to drop into the roller station and be interrupted in its travel by the gate **290** which is closed at this time. The same condition will prevail until the carriage **80** is effective in its travel along the track **60** to trip the clutch actuating lever **205**, and as the clutch **200** engages under this condition, the roller structure **260** is driven from right to left as viewed in Fig. 5 and then back. Thus, as the connecting rod **230** is driven to the right during initial clutch engagement as viewed in Fig. 5, arm **240** is turned clockwise about the shaft **239** through the action of the driving pin **237**. The carriage **260** is forced to travel to the left on its track and this brings the pressure roller **262** to bear on the embossures on the face of the embossed plate located at the roller station **260S**. In this connection, it will be realized that the roller **261** travels along the forward face of the anvil **275** and thus serves to back up the pressure roller **262** in its evening out action. A complete roller operation is characteristized by travel of the roller **262** in one direction across the face of the embossed plate end then back, return movement of the carriage **260C** occurring simultaneously with reciprocable movement of the connecting rod **230** to the left as viewed in Fig. 5. In the event that an embossed plate at the roller station **260S** should bet out of line or otherwise cause a jamming condition whereby the carriage **260C** cannot move, the driving pin **237** which is carried on the arm **236** rides out of the slot **240S** to permit the connecting rod **230** to complete its normal movement.

*The plate packer mechanism*

After the roller structure **260** is effective at the rolling station to even out the embossures on the face of a printing plate, such plate in position on the gate **290** can be looked upon as being in a finished condition suitable for effecting reproductions in the usual manner, and therefore it only remains to deliver this finished plate to a collecting station which, in the present instance, is represented by a horizontally disposed collecting tray T, Fig. 1. This delivery operation is instituted by the opening of the gate **290** to permit the embossed printing plate located at the roller station to drop by gravity on to the top **355T** of a packer **355**, Fig. 3, and subsequently the packer **355** is

actuated in a particular manner from the vertical drive shaft 239 to permit the plate to drop further into the tray T at the rear thereof. With the embossed plate thus located in the collecting tray, the packer is then operated in a manner such as to pack this plate into a stack of plates P, Fig. 1.

The gate 290 is pivotally mounted on a bracket arm 296 which extends to the right of the casing 45 as viewed in Fig. 1, and under and in accordance with the present invention means are afforded to open this gate immediately as the roller carriage 260C completes a plate rolling movement.

The gate 290 may be looked upon as representing a trap door at the bottom of the roller station 260S, being one which normally interrupts the downward travel of an embossed plate entering the rolling station from the upper chute 50. Directly beneath the gate 290 is another or lower vertically disposed chute 310 which is aligned with the guide channels 283C at the roller station, so that when the gate 290 is opened the plate at the roller station will drop into and down through the chute 310. This chute 310 includes a back guide as 312 extending up from the table 34 and a forward guide 311 supported by spaced apart mounting plates as 315, Fig. 1. Under normal conditions, the packer 355 is located immediately beneath the lower opening of the chute 310 to arrest an embossed plate passing down through this chute.

As viewed in Fig. 8, opening movement of the gate 290 occurs in a counterclockwise direction about the pivot pin 297, and in view of this the gate 290 is formed with a forwardly sloping or canted edge 290E so that the gate 290 in its opening movement will open all at once, so to speak, relative to the bottom edge of the embossed printing plate resting thereon. Secured to the underside of the gate closely adjacent to the pivot pin 297 is a fixed ear or lug 306 which has a beveled rear edge 306B. Associated with the beveled lug 306 is a dog 305 that is pivotally mounted on a pin 304 attached to the roller carriage 260 just opposite the lug 306. This dog 305 has a one way action such that it is free to turn on the pin 304 in a counterclockwise direction only as is seen in Fig. 8. The relationship between the lug 306 and the one way dog 305 is such that on the movement of the carriage 260C to the left the dog simply engages and rides past the lug 306, pivoting counter-clockwise, as indicated by dotted lines in Fig. 8. However, upon return movement to the right of carriage 260, the complementary beveled edges 305S and 306S engage, and since the dog 305 has a one way action only, this engagement is unyielding. Consequently, continued movement of the carriage 260C causes the dog 305 to effectively bear against the lug 306 and the gate 290 is forced in an opening direction about the pin 297. The canted edge 290E of the gate accounts for the embossed plate at the roller station dropping evenly down through the chute 310 on to the top 355T of the plate packer where it is arrested.

It will be seen, therefore, that when the carriage 260C once again comes to rest at the completion of a roller operation, gate 290 is open and there is no printing plate in the roller station 260S. Of course, the gate 290 does not open in any event until the clutch 200 engages to drive the carriage 260C in the first place, and it follows that the gate 290 is open during the time that any particular plate is being embossed. This, however, is immaterial inasmuch as the next plate to be located at the roller station will normally be the one that is presently being embossed. In order that this next embossed plate may be properly located at the roller station, it is necessary that the gate 290 be operated in a closing or clockwise direction, as viewed in Fig. 8, so that it will be disposed once more in a trapping relation beneath the guide channels 283C at the roller station. This closing movement of the gate 290 is directed by the carriage 80 as it moves to the right along the track 60 after the completion of an embossing operation. Thus, the embossed plate located in the carriage 80 at this time, and being carried toward unloading position, represents what will be the next embossed plate to be located at the roller station.

To close the gate 290, a lug 75, Fig. 3, is carried at the bottom of the carriage 80. The gate 290 includes a vertical extension 295, Fig. 1, which extends upwardly in front of the track 60, and a triangular projection 295E is formed at the top thereof. The left hand side 294 of the triangular portion 295E of the open gate projects into the path of the lug 75 advancing to the right on the track 60, and accordingly this lug will ride along the edge 294 on the gate and turn the latter clockwise, as viewed in Fig. 8, to close off the bottom of the plate rolling station 260S. It will be appreciated that when the gate 290 is fully closed, the lug 75 is free to pass the triangular portion 295E of the gate in either direction.

From the foregoing, it will be recognized that many of the actions and operations afforded by the plate treating and conditioning unit FR, Fig. 1, of the present invention are controlled in accordance with the movement of the carriage 80 along the track 60. When the carriage 80 is located at embossing position to present a printing plate to the embossing head 32, the various operating combinations in the unit FR are disposed in normal or at rest position, and under such conditions an unembossed plate is located on the forward section of the feed plate 191 in loading position at the front of the magazine M, the last embossed plate, if any, has been cleared from the roller station and rests on the top of the packer 355, and the roller structure 260 assumes the position shown in Fig. 1 wherein the roller 262 is located in removed relation with respect to the roller station 260S. After the completion of the embossing operation, the carriage 80 is advanced to the right along the track 60 to loading position where the embossed plate carried thereby is ejected by pulling on the trigger 162, the gate 290 being closed before the carriage comes to rest. The embossed plate thus ejected drops on to the closed gate 290 at the roller station, and the plate holding jaws 130 and 131 are then tilted from unloading position up to loading position to locate a new plate in the carriage 80. The carriage 80 is then moved along the track 60 to the left toward the embossing head 32, and the lever 205 is tripped during this movement of the carriage 80 to cause the clutch 200 to engage. Instantly, and simultaneously in the same cycle of operation of the drive shaft 239, the feed plate 191 moves back and then forward to feed a new plate from the magazine M to loading position, the roller carriage 260C carries the pressure roller 262 in one direction and then back across the face of the embossed plate located on gate 290 at the roller station, and immediately as the roller 262 moves into its normal position at the completion of the cycle of operation the gate 290 opens and the finished printing plate drops down through chute 310 to the packer 355. Thus, it will be seen that in one cycle of operation a new or unembossed printing plate is advanced from the bottom of the magazine M to loading position, and the printing plate that was last embossed in the machine 30 is rolled out and ejected from the roller station 260S. However, the finished plate thus ejected from the roller station and passing to the plate packer in a particular cycle of operation is not stacked and arranged in the tray T until the next cycle of operation, as will now be described.

The packer mechanism which includes the packer 355 and which is effective to stack finished plates as P in the tray T is best shown in Figs. 2, 3 and 12. The packer 355 is in the form of a U-shaped block which is formed at the forward end of a one-piece packer plate 350. This packer plate 350 is adapted to slide back and forth along the top of the table 34, Figs. 2 and 12, and is guided in this movement by a pair of oppositely disposed guide plates 348 and 349 which are suitably secured to the table 34 and appropriately recessed along

their inner edges to permit the packer plate 350 to be located in a guided relation therebetween.

The packer mechanism is driven from the vertical drive shaft 239 that drives most of the mechanism in the unit FR, and for this purpose an arm 340 is attached to the bottom of the drive shaft 239. The arm 340 is relatively long, as shown in Fig. 2, and carries a downwardly projecting drive pin 341 for driving the packer.

The packer structure also includes an upstanding ear 350E, Fig. 3, which is formed out of material of the packer plate 350, and this ear is provided with an opening which serves as a mounting for a rod 345 that extends through another suitable opening in the packer block 355, as shown in Figs. 3 and 12. The end of the rod 345 away from the packer block 355 has secured thereto a lug 346 aligned generally with the drive pin 341 carried by the arm 340. Another lug 347 is fastened on the rod 345 immediately in front of the ear 350E, and the lug 347 serves to tension a spring 345S mounted on the rod 345 to be normally tensioned against the back of the packer block 355.

The packer plate and block are normally under the tension of a pair of springs as 353 which tend to draw this assembly to a rearwardmost position, as viewed in the drawings, the springs as 353 being connected between one set of pins as 352 on the table 34 and another set of pins as 353P on the top of the packer plate 350 as best shown in Fig. 12. However, the position of the arm 340 is adjusted so that the pin 341 carried thereby bears against the lug 346 at the end of the rod 345 to normally hold the packer block 355 in position beneath the chute 310, as shown in Fig. 3. Thus, the spring 345S is stronger than the springs 353, and the latter are therefore placed under tension. It will be seen then that the arm 340 and the pin 341 normally resist the return action of the springs 353.

When the clutch 200 engages to rock the main drive shaft 239 clockwise as viewed in Fig. 12, the arm 340 and the pin 341 are driven in a removed relation with respect to the packer plate 350 and the block 355, and consequently the springs 353 are effective to pull the packer mechanism to the rear from beneath the embossed plate P–1 located in the chute 310. As the packer mechanism is fully withdrawn relative to this finished printing plate, the latter is delivered to the tray T in the form of the rearward-most plate. Now, when the connecting rod 230 is effective to rock the drive shaft 239 counterclockwise, as viewed in Fig. 2, the arm 340 is then carried in a forward direction and pin 341 forces the packer in a forward direction against the action of the springs as 353 to stack the plate as P–1 in a manner now to be described.

It remains to point out first, however, that during normal operation of the packer mechanism, the plate 350, block 355, spring 345S, and the lugs 346, 350E, and 347 move together as one body. In other words, while the rod 345 is mounted independently on the packer mechanism, the spring 345S is effective to transmit to the block 355 the drive imparted to rod 345 by the arm 340.

As best shown in Figs. 1, 6 and 12, a pair of feed dogs 330 and 335 are located at the back of the tray T on pivot pins 331 and 332 to assist the packer 355 in arranging the embossed printing plates in a compact stack in the tray T. The relationship is such that when the packer 355 is moved to the rear from beneath the printing plate as P–1 resting on the top thereof, the plate drops into the tray T in spaced relation to the rearward-most printing plate previously stacked therein and just back of the dogs 330 and 335, as viewed in Fig. 12. The feed dogs 330 and 335 are each provided with corresponding feed pawls 336 and 337. The feed pawls of the dogs 330 and 335 extend through respective slots in the mounting plates as 315. Fig. 1, and are held in this position by a spring 316S attached at either end to a pin on the respective dogs 330 and 335. Accordingly, when an embossed printing plate drops into the tray and just back of the feed dogs during removal to the rear of the packer block 355, the marginal portions at the opposite ends of the printing plate engage the feed pawls 336 and 337, and the packer 355 is then behind this embossed printing plate in the tray. When the packer block 355 is driven in a forward direction by the arm 340, the printing plate is forced toward the stack of plates in the tray T, and the dogs 330 and 335 pivot outwardly on the pivot pins 331 and 332 against the action of the spring 316S to permit the embossed plate to enter the stack.

The forward motion of the packer block 355 under the action of the arm 340 is just sufficient to feed the printing plate past the feed pawls 336 and 337, and when this occurs, the pawls snap back in place to properly position the next plate to be fed by the packer to the stack of plates P in the storage tray T. A follower F in the tray is effective to resist somewhat the action of the packer so that the plates P are arranged in a compact stack, as best indicated in Fig. 1, and it will be observed in Fig. 12, that the embossed faces of the stacked printing plates P face the rear of the tray T. This is the relationship that prevails at the storage station occupied by the packer mechanism when the clutch 200 disengages at the end of a cycle of operation, and it will be appreciated that in this particular cycle, a printing plate as P–1 that was located on the top 355T of the packer block 355 was first permitted to drop into the tray T as the result of the removal of the packer block and was then pushed forward past the dogs 330 and 335 into the stack of plates P at storage. Concomitantly with the occurrence of the packer pushing an embossed plate to storage and coming to rest beneath the chute 310, the gate 290 opens and the next plate to be stacked in the tray T drops on to the top 355T of the packer block. This latter plate, however, will not be stacked at storage until the next cycle of operation.

From the foregoing it will be seen that the present invention is adapted to process thin deformable plates from an initial or blank stage through a supplying operation, an embossing operation, a finishing operation, and finally a stacking operation without individual handling. Certain of these operations and others are controlled by a common drive means so that a regular and efficient sequence of events is established, occurring cyclically as a plate to be embossed is carried from the supply station to the embossing position or station. And while the present invention has been described from the standpoint of a particular embossing machine, it will be recognized that this is for purposes of disclosure, other embossing machines as well being capable of use.

I claim:

1. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, a feed means at the bottom of the magazine operative to advance such unembossed plates individually to loading position whereat the plates can be loaded on to a movable carriage to be carried to an embossing position, a passageway adjacent the magazine into which an embossed plate may be ejected for movement through the passageway, a station at the other end of the passageway including normally closed discharge means to stop said plate in the passageway, pressure-applying means for working on the face of such an embossed plate to even out the embossures thereon, means responsive to operation of the pressure-applying means to open said discharge means, and means disposed in the path of the movable carriage responsive to movement of the carriage for instituting operation of the pressure-applying means.

2. In a cyclically operable device of the kind described, a magazine for holding a supply of printing plates to be embossed, feed means at the bottom of the

magazine operative to advance such unembossed plates individually to loading position whereat the plates can be loaded on to a movable carriage to be carried to an embossing position, a passageway adjacent the magazine and having an opening into which an embossed plate in the carriage may be ejected for movement through the passageway, a station at the other end of the passageway including pressure-applying means for working on a face of such an embossed plate in the passageway to even out the embossures thereon, and cyclically operable drive means common to the feed means and the pressure-applying means whereby the feed plate and pressure-applying means are simultaneously operative in the same cycle of operation of the device.

3. In a cyclically operable device of the kind described, a magazine for holding a supply of printing plates to be embossed, a feed means at the bottom of the magazine operative to advance such unembossed plates individually to a loading position whereat the plates can be loaded on to a movable carriage to be carried to an embossing position, a passageway having an opening at the front of which such a carriage may subsequently be located to discharge an embossed plate into the passageway, a station at the other end of the passageway including pressure-applying means for working on a face of such an embossed plate to even out the embossures thereon, a cyclically operable drive means common to the feed means and the pressure-applying means whereby the feed means and pressure-applying means are operative together in the same cycle of operation of the device, said drive means including a normally disengaged one revolution clutch, and means adapted to be controlled by the movement of said carriage to permit the clutch to engage.

4. In a device of the kind described for handling and treating deformable plates which are to be provided with embossed characters, a reciprocable feed means for individually feeding said deformable plates from a supply station to a plate loading position whereat said deformable plates may be individually located on a travelling carriage which is adapted to carry the plates to an embossing position, a vertical chute closely adjacent said plate loading position into which embossed plates may be discharged from the carriage at the completion of an embossing operation to drop by gravity down the chute, a normally closed discharge means at the bottom of the chute for stopping such an embossed plate at the bottom of the chute with a face in position to be worked upon, a reciprocable carriage adjacent the bottom of the chute including roller structure for rolling with pressure across a face of said plate at the gate to even out the embossures formed on the plate, and means controlled by said reciprocable carriage to open said discharge means after the rolling operation to permit the embossed plate having evened-out embossures to be discharged to storage.

5. In a device of the kind described for handling and treating deformable plates which are to be provided with embossed characters, a reciprocable feed means for individually feeding said deformable plates from a supply station to a plate loading position where said deformable plates may each be individually located on a travelling carriage which is adapted to carry the plates to an embossing position, a vertical chute closely adjacent said plate loading position into which embossed plates may be discharged from the carriage at the completion of an embossing operation to drop by gravity down the chute, a normally closed gate at the bottom of the chute for locating such an embossed plate at the bottom of the chute with a face thereof in position to be worked upon, a reciprocable carriage adjacent said gate and including roller structure for rolling with pressure across a face of said plate thus located by the gate to even out the embossures formed thereon, means controlled by said reciprocable carriage to open said gate at the completion of a rolling operation to permit the embossed plate having evened-out embossures to be discharged to storage, and a cyclically operable drive means common to the feed plate and the reciprocable carriage whereby the feed plate and reciprocable carriage are operative in the same cycle of operation.



6. In a device of the kind described for handling and treating deformable plates which are to be provided with embossed characters, a reciprocable feed means for individually feeding said deformable plates from a supply station to a plate loading position where said deformable plates may be individually located on a travelling carriage which is adapted to carry the plates to an embossing position, a vertical chute closely adjacent said plate loading position into which embossed plates may be discharged from the carriage at the completion of an embossing operation to drop by gravity down the chute, a normally closed gate at the bottom of the chute for locating the plate in the chute with a face thereof in position to be worked upon, a reciprocable carriage at the bottom of the chute including roller structure for rolling with pressure across a face of said plate thus located by the gate to even out the embossures formed thereon, means controlled by said reciprocable carriage to open said gate at the completion of a rolling operation to permit the embossed plate having evened-out embossures to be discharged to storage, and a cyclically operable drive means common to the feed plate and the reciprocable carriage whereby the feed plate and reciprocable carriage are operative in the same cycle of operation, said cyclically operable drive means including a normally disengaged clutch, and means controlled by the movement of said movable carriage to permit the clutch to engage.

7. In a device of the kind described for handling printing plates or like articles which are to be and which have been embossed to provide raised characters on the face of each plate, a supply magazine for holding a stack of said plates, feed means at the bottom of the magazine for feeding said plates one by one out of the magazine and in to position to be carried to an embossing station, a carriage for so transporting the plates to the embossing station, a chute into which each embossed plate may be deposited from the carriage to drop by gravity down the chute with the said embossed face thereof disposed in a vertical plane, a discharge means to interrupt the downward travel of each such embossed plate in said chute and to locate the plate at a roller station, roller structure adapted to apply rolling pressure to a face of each embossed plate that is thus located at the roller station to thereby even out the embossures in a common plane, a storage station beneath said discharge means, means to open and means to close said discharge means after each rolling operation to permit the embossed plate located at the rolling station to be discharged to storage, said means to open the discharge means being operable as an incident to completion of the plate rolling operation and said means to close the discharge means being operable as an incident to movement of said carriage relative to said chute, and means under control of the movement of said carriage away from said chute to institute actuation of said roller structure.

8. In a device of the kind described for handling printing plates or like articles which are to be embossed to provide raised characters on the face of each such plate, a carriage, a pair of jaws for holding such articles individually and being mounted on said carriage, said jaws being normally held closed, a rock shaft mounted on said carriage and having a cam portion for forcing open said jaws, an ear fixed to the rock shaft, a barrel connected to and extending outwardly of said carriage, an elongated link connected at one end to the ear on said rock shaft whereby the rock shaft may be rocked in a jaw opening direction by actuation of said link in a corresponding

direction to cause said cam portion to force open the jaws, a trigger pivotally connected to the barrel and to which the other end of said link is connected, spring means serving to bias the trigger, the link and the ear to normal positions whereat the jaws are closed, and a handle so spaced from the trigger that the trigger can be conveniently manually actuated against the action of the spring means to open the jaws.

9. In a device of the kind described for handling printing plates or like articles, a carriage, a pair of jaws mounted on the carriage and aadpted to be opened and closed for holding and releasing such articles individually, a rock shaft mounted on the carriage and having cam means for controlling follower means on one of the jaws for opening and closing said jaws, a barrel connected to said carriage in normal relation to the jaws, a link mounted in the barrel and connected at one end to said rock shaft for operating the latter, a trigger pivotally attached to said barrel and to which the other end of said link is connected to open said jaws when the trigger is actuated, a spring in the barrel for holding the trigger and the link in normal position whereat the jaws are closed, and a handle grip on the barrel adjacent the trigger enabling the trigger to be conveniently actuated manually.

10. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, means to advance such unembossed plates individually to a loading position whereat the plates can be loaded on to a movable carriage for transportation to an embossing position, a passageway adjacent the magazine having an opening at one end into which an embossed plate may be ejected for movement through the passageway, a station at the other end of the passageway including means for applying pressure to the face of an embossed plate in the passageway to even out the embossures thereon, a normally closed discharge means in the passageway to interrupt movement of an embossed plate through the passageway to enable the plate to be operated on by the pressure-applying means, means responsive to operation of the pressure-applying means for opening the discharge means to discharge the plate from said passageway, and means responsive to movement of the carriage for instituting operation of the pressure-applying means.

11. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, means to advance such unembossed plates individually to a loading position whereat the plates can be loaded on to a movable carriage for transportation to an embossing position, a passageway adjacent the magazine having an opening at one end into which an embossed plate may be ejected for movement through the passageway, a station at the other end of the passageway including means to stop such an embossed plate in its movement through the passageway and at least one roller to thereafter move with sufficient pressure across the face of such an embossed plate to even out the embossures thereon, means responsive to the movement of said roller to open the stop means to discharge the embossed plate from the passageway after the embossures thereon have been evened out, and means responsive to the movement of said carriage to initiate operation of said roller.

12. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, a carrier for advancing such unembossed plates individually to a loading position, a movable carriage positionable at the loading position for transporting said plates to an embossing position, a passageway having an opening at one end into which an embossed plate may be ejected from said carriage for movement through the passageway, a station at the other end of the passageway including a normally closed discharge means to stop such an unembossed plate in its movement through the passageway, means to thereafter move with sufficient pressure across the face of such an embossed plate to even out the embossures thereon, means carried by the pressure-applying means effective to open said discharge means to permit an embossed plate subjected to the action of said pressure applying means to leave said station, and means responsive to the movement of said carriage to institute operation of the pressure-applying means.

13. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, means to advance such unembossed plates individually to a loading position whereat the plates can be loaded on to a movable carriage for transportation to an embossing position, a passageway adjacent the magazine having an opening at one end into which an embossed plate may be ejected for movement through the passageway, and a station at the other end of the passageway including a normally closed gate to stop such an unembossed plate in its movement through the passageway, means to thereafter move with sufficient pressure across the face of such an embossed plate to even out the embossures thereon, and means on the pressure applying means for opening the gate after the pressure applying means are operative for the purpose mentioned.

14. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, feed means to advance such unembossed plates individually from the magazine to a loading position whereat the plates can be loaded on to a movable carriage for transportation to an embossing position, a passageway adjacent the magazine having an opening at one end into which an embossed plate may be ejected from the carriage for movement through the passageway, a station at the other end of the passageway including a normally closed gate for stopping such embossed plate in its movement through the passageway, means operative adjacent said gate to apply pressure to the face of the embossed plate stopped thereby, a packer mechanism located opposite said gate for receiving embossed plates in a finished condition that have been operated on by said pressure applying means and for arranging such finished plates in a compact stack, means for opening and closing said gate being at least partly under control of said pressure applying means, and means under control of the movement of said carriage to drive the pressure-applying means and the packed in the same cycle of operation.

15. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, feed means to advance such unembossed plates individually from the magazine to a loading position whereat the plates can be loaded on to a movable carriage for transportation to an embossing position, a passageway adjacent the magazine having an opening at one end into which an embossed plate may be ejected from the carriage for movement through the passageway, a station at the other end of the passageway including a normally closed gate for stopping such embossed plate in its movement through the passageway, means operative adjacent said gate to apply pressure to the face of the embossed plate stopped thereby, a packer mechanism located opposite said gate for receiving embossed plates in a finished condition that have been operated on by said pressure applying means and for arranging such finished plates in a compact horizontal stack, means for opening said gate after the pressure applying means is operative on an embossed plate at said station to permit the embossed plate to pass on to said packer mechanism, and drive means for operating the pressure applying means and the packer mechanism simultaneously in the same cycle of operation.

16. In a device of the kind described, a magazine for holding a supply of printing plates to be embossed, feed means to advance such unembossed plates individually from the magazine to a loading position whereat the plates can be loaded on to a movable carriage for trans-

portation to an embossing position, a passageway adjacent the magazine having a opening at one end into which an embossed plate may be ejected from the carriage for movement through the passageway, a station at the other end of the pasageway including a normally closed gate for stopping such embossed plate in its movement through the passageway, means operative adjacent said gate to apply pressure to the face of the embossed plate stopped thereby, a packer mechanism located opposite said gate for receiving embossed plates in a finished condition that have been operated on by said pressure applying means and for arranging such finished plates in a compact horizontal stack, means for opening said gate after the pressure applying means are operative on an embossed plate at said station to permit the embossed plate to pass on to said packer mechanism, and drive means for operating the pressure applying means and the packer mechanism simultaneously in the same cycle of operation, said drive means including a drive shaft common to operation of the pressure applying means and the packer mechanism and a one-revolution clutch adapted to be controlled by the movement of said carriage.

17. In a device of the kind described for handling and treating printing plates that have been embossed, a chute into which such an embossed plate may be passed, a roller station at the end of said chute including a normally closed gate for obstructing the chute to stop said plate in its passage through the chute, roller structure adjacent said gate adapted to move from a normal at-rest position with pressure across the face of such an embossed plate located at the gate and then back to said normal position to even out the embossures on said plate, and means under the control of said roller structure as the latter moves back to its normal position to open the gate to permit the embossed plate at the gate to pass from said station.

18. In a device of the kind described for handling and treating printing plates that are to be loaded on to a movable carriage for transportation in one direction to an embossing head whereat the plates are to be embossed one by one, and then back, means for guiding the carriage between such an embossing head and the magazine, a chute at a point along said guide means whereat the carriage may be located to unload an embossed plate into the chute, a roller station at the end of said chute including a normally closed gate for obstructing the chute to stop said plate in its passage through the chute, roller structure adjacent said gate adapted to move from a normal at-rest position with pressure across the face of such an embossed plate located at the gate and then back to said normal position to even out the embossures on said plate, and means under the control of said roller structure as the latter moves back to its normal position to open the gate to permit the embossed plate at the gate to pass from said station.

19. In a device of the kind described for handling and treating printing plates that are to be loaded on to a movable carriage for transportation in one direction to an embossing head whereat the plates are to be embossed one by one, and then back, means for guiding the carriage between such an embossing head and the magazine, a chute at a point along said guide means whereat the carriage may be located to unload an embossed plate into the chute, a roller station at the end of said chute including a normally closed gate for obstructing the chute to stop said plate in its passage through the chute, roller structure adjacent said gate adapted to move from a normal at-rest position with pressure across the face of such an embossed plate located at the gate and then back of said normal position to even out the embossures on said plate, drive means for thus driving the roller structure, a normally disengaged clutch for transmitting a drive to said drive means, means adapted to be tripped by the carriage to its movement in one direction to cause the clutch to engage, and means under the control of said roller structure as the latter moves back to its normal position to open the gate to permit the embossed plate at the gate to pass from said station.

20. In a device of the kind described for handling and preparing individual embossed printing plates, and having a track along which a carriage for holding said plate may be moved, a chute located along said track into which such an embossed printing plate may be passed, a station at the end of the chute including a normally closed gate for interrupting the passage of the embossed plate through the chute, roller structure adjacent said gate adapted to advance with pressure across the face of an embossed plate thus located by the gate to even out the embossures thereon, means under control of said roller structure to open the gate, and means under control of said carriage to close the gate.

21. In a device of the kind described for handling and preparing individual embossed printing plates, and having a track and a carriage on the track for holding said plates may be moved, a chute located along said track into which such an embossed printing plate may be passed, a station at the end of the chute including a normally closed gate for interrupting the passage of the embossed plate through the chute, mechanism mounted adjacent said gate for a pressure-applying operation on the embossed plate thus located by the gate to even out the embossures on such printing plate, means carried by said mechanism for opening said gate at the completion of said pressure-applying operation, means on the carriage for closing said gate, and means disposed in the path of the carriage to institute operation of said mechanism.

22. In a device of the kind described for handling and preparing individual embossed printing plates, and having a track along which a carriage for holding said plates may be moved, a chute located along said track into which such an embossed printing plate may be passed, a station at the end of the chute including a normally closed gate for interrupting the passage of the embossed plate through the chute, mechanism mounted adjacent said gate for a pressure-applying operation on the embossed plate thus located by the gate to even out the embossures on such printing plate, and means controlled by the movement of said pressure-applying mechanism and means controlled by movement of said carriage for respectively opening and closing said gate at the completion of said pressure-applying operation.

23. In a device of the kind described having a carriage for moving plates to be embossed to an embossing station for the plates, a passageway opposite which the carriage may be located and into which embossed plates in the carirage may be deposited for movement through the passageway, a normally closed discharge means in the passageway adapted to interrupt the movement of an embossed plate deposited therein from said carriage and to locate the plate in position to have the embossed characters thereon rolled to an even plane, at least one roller arranged along said passageway to roll across the face of an embossed plate located as aforesaid by the discharge means, means disposed along the path of the carriage responsive to movement of the carriage for initiating operation of said roller after a plate has been deposited in the passageway from said carriage, and means responsive to movement of the roller across the face of an embossed plate located as aforesaid to open the discharge means to permit the embossed plate having evened embossures to pass from said passageway.

24. In a device of the kind described having a carriage for moving plates to be embossed to an embossing station for the plates, a passageway opposite which the carriage may be located and into which embossed plates in the carriage may be deposited for movement through the passageway, a normally closed discharge means in the passageway adapted to interrupt the movement of an em-

bossed plate deposited therein from said carriage and to locate the plate in position to have the embossed characters thereon rolled to an even plane, at least one roller arranged along said passageway to roll across the face of an embossed plate located as aforesaid by the discharge means, means disposed along the path of the carriage responsive to movement of the carriage in a direction away from the passageway for initiating operation of said roller after a plate has been deposited in the passageway from said carriage, and means responsive to movement of the roller across the face of an embossed plate located as aforesaid to open the discharge means to permit the embossed plate having evened embossures to pass from said passageway.

25. In a device of the kind described having a carriage for moving plates to be embossed to an embossing station for the plates, a passageway opposite which the carriage may be located and into which embossed plates in the carriage may be deposited for movement through the passageway, a normally closed discharge means in the passageway adapted to interrupt the movement of an embossed plate deposited therein from said carriage and to locate the plate in position to have the embossed characters thereon rolled to an even plane, at least one roller arranged along said passageway to roll across the face of an embossed plate located as aforesaid by the discharge means, means disposed along the path of the carriage responsive to movement of the carriage in a direction away from the passageway for initiating operation of said roller after a plate has been deposited in the passageway from said carriage, means responsive to movement of the roller across the face of an embossed plate located as aforesaid to open the discharge means to permit the embossed plate having evened embossures to pass from said passageway, and means responsive to movement of the carriage toward the passageway to close said discharge means after a plate has been discharged thereby.

26. In a device of the kind described having a carriage for moving plates to be embossed to an embossing station for the plates, a passageway opposite which the carriage may be located and into which embossed plates in the carriage may be deposited for movement therethrough, a normally closed discharge means in the passageway adapted to interrupt the movement of an embossed plate deposited therein from said carriage and to locate the plate in position to have the embossed characters thereon rolled to an even plane, at least one roller arranged along said passageway to roll across the face of an embossed plate located as aforesaid by the discharge means, a shiftable packer adjacent said passageway to which embossed plates in said passageway are to be discharged by the discharge means so that the packer may arrange and hold the embossed plates in a compact stack, means for operating the roller and the packer cyclically together, means disposed along the path of the carriage responsive to movement of the carriage for initiating operation of the roller and the packer after a plate has been deposited in the passageway from said carriage, and means responsive to movement of the roller across the face of an embossed plate located as aforesaid to open the discharge means to permit the embossed plate having evened embossures to pass from said passageway to the packer.

27. In a device of the kind described having a carriage for moving plates to be embossed between a supply magazine and an embossing station for the plates, a passageway opposite which the carriage may be located and into which embossed plates in the carriage may be deposited for movement through the passageway, a normally closed discharge means in the passageway adapted to interrupt the movement of an embossed plate deposited therein from said carriage and to locate the plate in position to have the embossed characters thereon rolled to an even plane, at least one roller arranged along said passageway to roll across the face of an embossed plate located as aforesaid by the discharge means, means disposed along the path of the carriage responsive to movement of the carriage for initiating operation of said roller after a plate has been deposited in the passageway from said carriage, means responsive to movement of the roller across the face of an embossed plate located as aforesaid to open the discharge means to permit the embossed plate having evened embossiveness to pass from said passageway, and means responsive to movement of the carriage to close said discharge means after a plate has been discharged thereby.

28. In an embossing machine having an embossing head and a forwardly tilted vertically disposed magazine for holding a supply of plates to be embossed as printing plates at said embossing head, a track extended between the magazine and embossing head of the machine, a plate carriage arranged to travel along said track in opposite directions to carry such plates from the magazine to said embossing head, a set of releasable clamping jaws on the carriage adapted to be disposed in a horizontal plane whereby the plate to be embossed is presented in a horizontal plane at the embossing head, a guideway above the track adapted to guide plates from the magazine to a plate loading position at the end of said guideway along said track, a vertical chute along the track into which embossed printing plates carried by the clamping jaws are to be discharged upon ejection from said clamping jaws, plate ejector means carried by said jaws, the opening for said chute being located above said track and below said loading position so that an embossed plate disposed in said horizontal plane in the plate clamping jaws may be discharged directly from the plate clamping jaws by said ejector means into the discharge chute, said clamping jaws being arranged on the carriage for pivotal movement in unison upward from said discharge chute opening to said loading position, said jaws being normally held closed, a rock shaft mounted on the carriage and having cam means for controlling follower means on one of said jaws for opening said jaws, a barrel connected to the carriage, a link in the barrel and connected at one end to said rock shaft for operating the rock shaft, a spring-biased trigger pivotally attached to said barrel and to which the other end of said link is connected, a handle grip on the barrel adjacent said trigger enabling said trigger to be conveniently actuated manually, and said guideway being inclined at an angle corresponding to the angle of the upwardly tilted clamping jaws to facilitate removal of a plate in the guideway by the clamping jaws.

29. In an embossing machine having an embossing head and a forwardly tilted vertically disposed magazine for holding a supply of plates to be embossed as printing plates at said embossing head, a track extended between the magazine and embossing head of the machine, a plate carriage arranged to travel along said track in opposite directions to carry such plates from the magazine to said embossing head, a set of releasable clamping jaws on the carriage adapted to be disposed in a horizontal plane whereby the plate to be embossed is presented in a corersponding horizontal plane at the embossing head, a guideway above the track adapted to guide plates from the magazine to a plate loading position at the end of said guideway along said track, said clamping jaws being arranged on the carriage for pivotal movement in unison from said horizontal plane through a relatively small central angle in an upward tilting direction toward said plate loading position, said jaws being normally held closed, a rock shaft mounted on the carriage and having cam means for controlling follower means on one of said jaws for opening said jaws, a barrel connected to the carriage, a link in the barrel and connected at one end to said rock shaft for operating the rock shaft, a spring-biased trigger pivotally attached to said barrel and to which the other end of said link is connected, a handle

grip on the barrel adjacent said trigger enabling said trigger to be conveniently actuated manually, and said guideway being inclined downwardly from said magazine toward said track an amount corresponding to said central angle whereby the plate at loading position is disposed in the same plane as the upwardly tilted clamping jaws to facilitate removal of such a plate from said guideway by the clamping jaws.



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