

H. C. GAMMETER.
 DUPLICATING MACHINE.
 APPLICATION FILED DEC. 12, 1904.

1,052,910.

Patented Feb. 11, 1913.

4 SHEETS—SHEET 1.

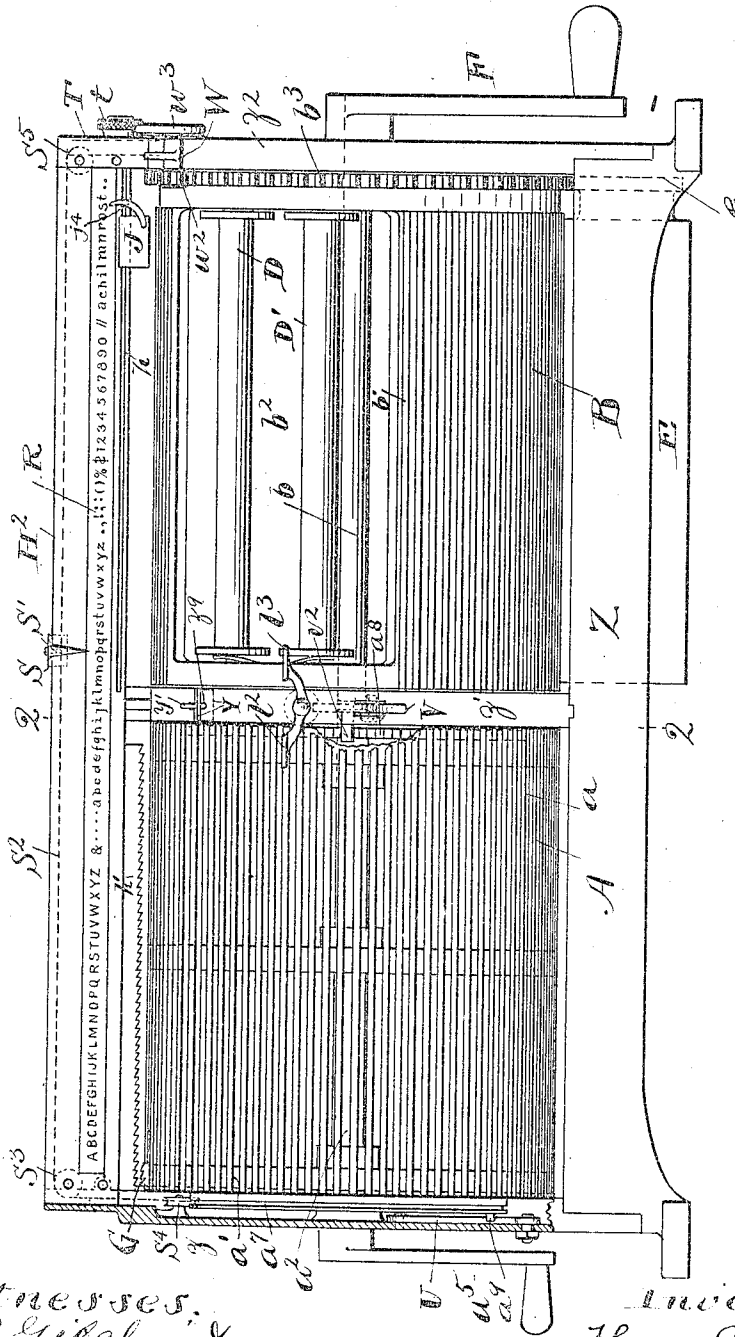


Fig. 1.

Witnesses:
 E. B. Gilchrist.
 N. L. Brennan.

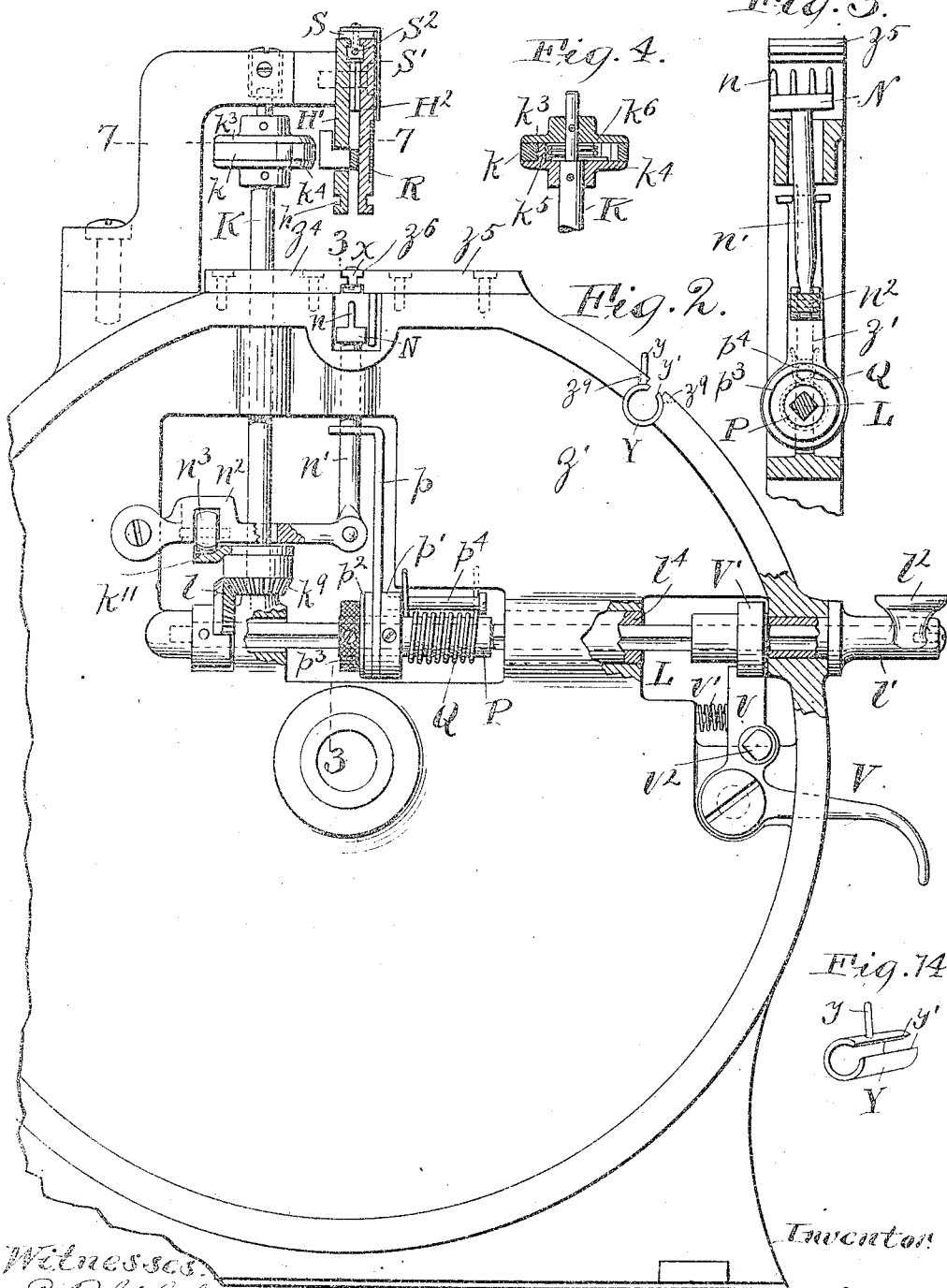
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 By his Attorneys,
 Thurston & Bates.

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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

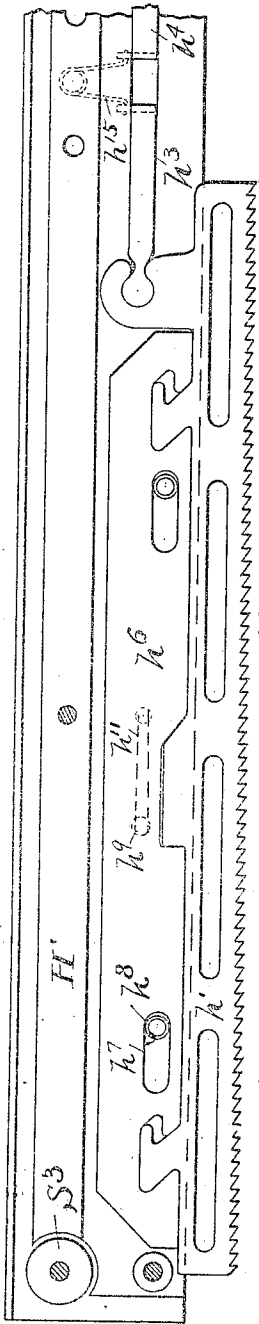


Fig. 5.

Fig. 6.

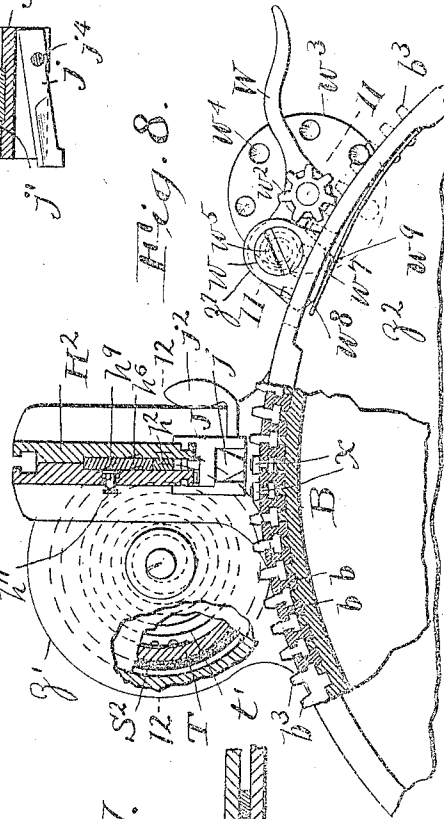
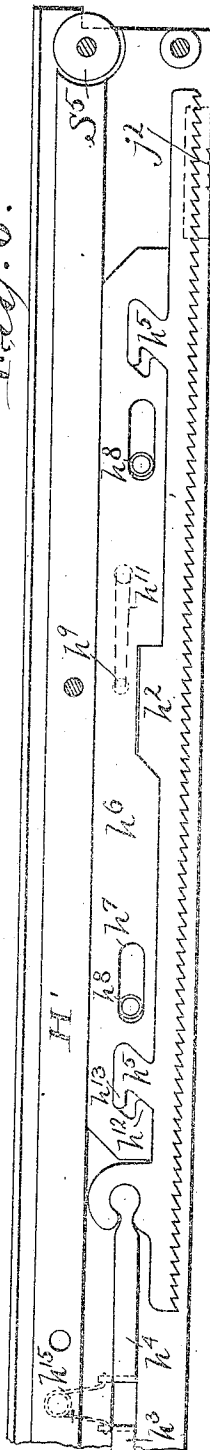


Fig. 8.

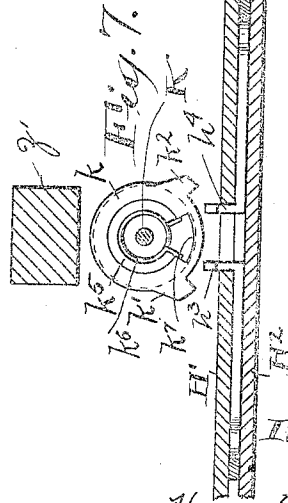


Fig. 7.

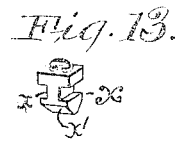
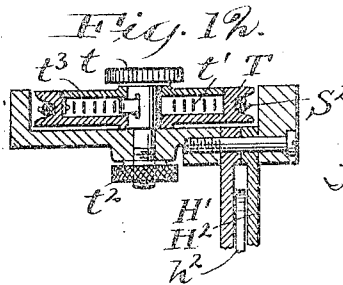
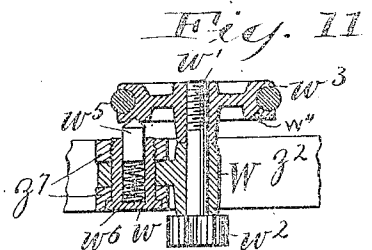
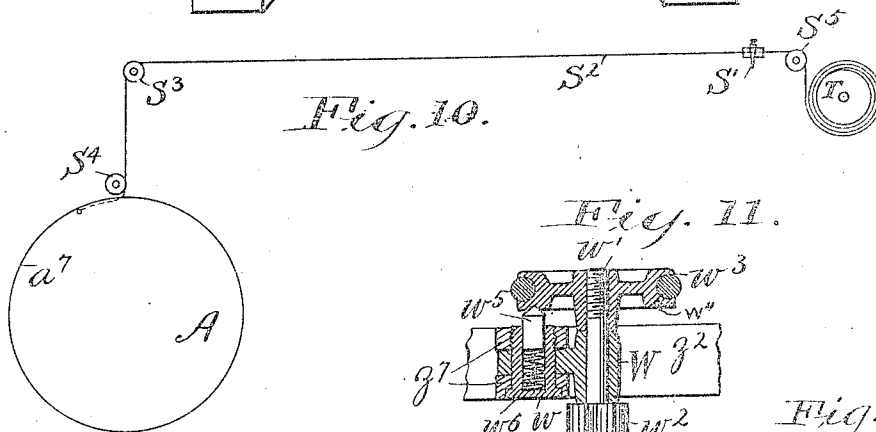
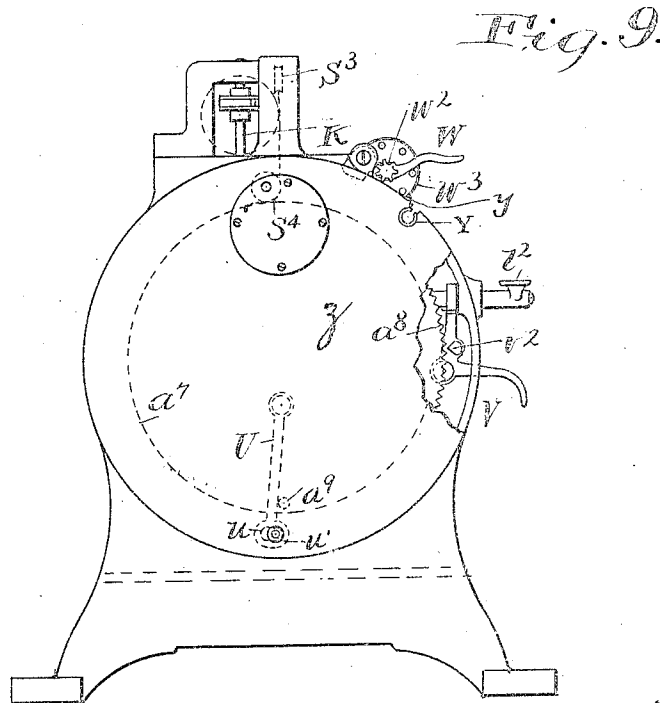
Witnesses.
 E. B. Lilchrist
 N. L. P. ...

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 DUPLICATING MACHINE.
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Patented Feb. 11, 1913.
 4 SHEETS—SHEET 4.



Witnesses.
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 N. L. Renshaw

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UNITED STATES PATENT OFFICE.

HARRY C. GAMMETER, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN MULTI-GRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

DUPLICATING-MACHINE.

1,052,910.

Specification of Letters Patent.

Patented Feb. 11, 1913.

Application filed December 12, 1904. Serial No. 236,463.

To all whom it may concern:

Be it known that I, HARRY C. GAMMETER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Duplicating-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide an efficient machine for producing circular letters or similar matter in large quantities, particularly in making many copies of letters which shall have all the appearance of having been individually written upon the typewriter. Such a machine may comprise a supply drum for carrying type, arranged in lines of the same letter, a printing drum, feeding mechanism for conveying the type individually from the supply drum to the printing drum to make words and spaces and for distributing it from the printing drum to the supply drum, and a pair of finger keys for operating the feeding mechanism accordingly. After the type have been assembled on the printing drum, an inked ribbon is placed around it and the drum is continuously rotated, the paper to be printed being fed between it and an impression platen.

The present invention, which is an improvement on the structures shown in my prior Patent No. 722,404 and my application No. 196,840, (renewed as No. 297,447) is concerned with the type setting and distributing features of the machine, comprising the supply drum, the printing drum, the type feeding mechanism, the means for positioning the drums, and the means for indicating the position of the supply drum.

In the drawings, Figure 1 is a front elevation of the complete machine; Fig. 2 is a cross section along the left side of the central standard looking toward the same, as indicated by the line 2—2 of Fig. 1; Fig. 3 is a detail in vertical section on the line 3—3 of Fig. 1, looking toward the right; Fig. 4 is a vertical section of the comb-operating mechanism being in a plane parallel to Fig. 2; Figs. 5 and 6 are front elevations of the comb-mechanism which operates to feed the type toward the transfer channel; Fig. 7 is a horizontal section on

the line 7—7 of Fig. 2, showing a portion of the feeding mechanism; Fig. 8 is a vertical section through a portion of the printing drum and broken away to show the spring barrel of the indicating mechanism; Fig. 9 is a left hand elevation of the machine, partly broken away; Fig. 10 is a diagram illustrating the course of the cable which operates the indicator; Fig. 11 is a cross section of the mechanism for positioning the printing drum, on the line 11—11 of Fig. 8; Fig. 12 is a cross section through the spring barrel, being on the line 12—12 of Fig. 8; and Fig. 13 is a perspective view of the type employed; Fig. 14 is a perspective view of a gate between the drums.

The supply drum as a whole is designated A, and the printing drum B. These are arranged so that the type ordinarily stored on the supply drum may be transferred as desired to the printing drum,—a preferable arrangement being that shown in the drawings, wherein the drums are of the same periphery and are placed with their axes in alinement. The supply drum consists of a series of bars or rails a having enlarged outer edges and mounted longitudinally around spiders a' secured to a shaft a^2 which is journaled in the end member z and intermediate member z' of the general frame Z .

The printing drum B is mounted on a shaft b journaled in the intermediate frame member z' and end member z^2 . Into radial grooves in the periphery of this drum are set rails b' having enlarged outer edges, similar to the rails a . The type X are in the form shown in Fig. 13 having grooves x on opposite sides, wherefore they are adapted to be slipped endwise into the channels between consecutive rails and retained thereon while the drums rotate. The rails b' do not occupy the entire periphery of the drum B, an opening b^2 being made in a portion of the drum. In this opening are set a pair of spools D and D'. After the type has been assembled on the printing drum, as hereinafter explained, a ribbon from one of these spools is passed around the type and secured to the other spool. Thereafter the printing may be accomplished by rotating the drum B and drawing between it and an impression platen E the paper to be printed. The drum is rotated by a crank F on the shaft b . The

printing drum and impression platen are geared together by gears b^3 and e thereon respectively.

When the machine is idle, the type are carried on the rails of the supply drum, all of the type on one rail being of the same character. Between the two drums and adjacent to the uppermost portion thereof is a transfer channel, and below this is a movable head N against which the type are adapted to be fed from either drum, and which forms a limiting stop allowing but one type at a time to be transferred to the other drum. To bring that channel of the supply drum, which carries the desired character, in line with the transfer channel, I secure to the shaft a^2 of the supply drum a crank a^6 , by which the drum may be turned, as desired.

I now come to the setting and distributing mechanism proper. This comprises a feeding mechanism to shove a line of type in the channel in either drum toward the other drum, and the limiting mechanism between the drums operating to prevent the entrance of more than one type at a time into the transfer channel. In each of the channels of the supply drum behind the type are followers G which have teeth on their upper edges. Mounted between a pair of bars H^1 H^2 extending lengthwise of the machine above the drums is a comb h^1 adapted to be drawn downward and forward and then to pass upward and backward in a four-way motion. This movement serves to shove forward the followers G and hence the line of type in front of it, to bring the foremost character in the line to the limiting mechanism between the drums, herein-
after explained.

Sliding in grooves h on opposite sides of the bars H^1 and H^2 is a follower J . This follower has a pawl j (Fig. 6) pivoted on a handle j^4 (by which it may be turned up out of the way) and adapted to engage behind the type in the uppermost groove in the printing drum. It has a spring j^1 , tending to prevent its accidental displacement, and upwardly extending teeth j^2 . With these teeth there is adapted to engage a comb h^2 , which is given a four-way motion downward and forward and then upward and backward.

To cause the desired four-way motion to the feeding combs h^1 and h^2 the following mechanism is provided: Pivoted to the inner ends of these combs are links h^3 and h^4 which have rearwardly extending lugs adapted to be engaged by lugs k^1 and k^2 , on a ring k mounted on and adapted to be oscillated by a shaft K (Figs. 2 and 7). Thus either comb may be drawn toward the center by the engagement of one or the other lug k^1 or k^2 with the rearward lugs on the links h^3 or h^4 . This operation of the comb

gives it immediately a downward movement by reason of each comb having backwardly inclined lugs h^5 seating within correspondingly inclined recesses in bars h^6 . Each of these bars h^6 is slotted at h^7 and is guided thereby on rollers h^8 . A pin h^9 pressed against the bar by a suitable spring h^{10} provides some friction to the movement of the bar h^6 . By reason of the frictional retardation of the bar h^6 , a pull on either link, h^3 or h^4 , causes the corresponding comb to move downward its full limit before the bar h^6 moves. Its downward movement is limited by lugs h^{12} (Fig. 6) projecting beneath overhanging ends h^{13} on the lugs h^5 . When, however, the overhanging lug h^{13} engages with the lug h^{12} no further movement of the comb independent of the bar h^6 is possible, and any further pull on the link h^3 or h^4 draws the corresponding bar h^6 forward, feeding toward the center of the machine the engaged follower G or J as the case may be, and thus shoving forward the type from either drum toward the other. When the pull on the link h^3 or h^4 is released a spring h^{15} , acting on these links and tending to separate them, forces upward the comb until it can go no farther upward, and then backward both the comb and bar h^6 . It will thus be seen that each comb has a four-way motion—downward into engagement with the follower, then forward with the follower, then upward to clear the follower, then backward above the follower.

To stop the advancing action of the comb when the forward type in the line has been stopped, the ring k , carrying the lugs k^1 and k^2 , is elastically mounted on the shaft K . This is accomplished by mounting this ring between collars k^3 and k^4 pinned to the shaft,—the collar k^4 having a horse shoe shaped boss k^5 within which is mounted a coiled spring k^6 (Figs. 4 and 7). This spring has its ends extending across the ends of the boss k^5 and onto shoulders provided by a recess k^7 in the ring k . When the shaft K is turned the ring turns with it, driving either comb, as explained. When, however, the comb is stopped, the ring is held against further movement by the lug which was driving the comb, and any further movement of the shaft K simply serves to wind tighter the spring k^6 ,—the ends of the spring being thus forced toward each other by the end of the boss k^5 moving forward one end of the spring, and the shoulder on the ring retaining the other end of the spring. To give the oscillation to the shaft K , there is provided on its lower end a bevel gear k^9 meshing with a gear l on the rock shaft L journaled in the frame standard s^1 and having on its forward end the operating lever l^1 having two finger keys l^2 and l^3 . By this means, when the finger key l^2 is depressed, the shaft is rocked

in the direction to bring the lug k' into engagement with the link h^3 , drawing downward and forward the comb h' and thus feeding the type in the supply drum toward the printing drum. When the finger key l^3 is pressed downward the lever L is rocked in the opposite direction and this brings the lug k^2 into engagement with the link h^4 and draws downward and forward the comb h^2 , feeding the type in the printing drum toward the supply drum. Thus the type in either drum is fed toward the other by depression of either finger key l^2 or l^3 .

To limit the advancement of the line to one type at a time, the following mechanism is provided: On the upper edge of the frame member z' are a pair of plates z^4 and z^5 (Fig. 2) on the opposed edges of which are ribs whereby there is left between them a slot or channel corresponding in shape to the channels of either drum, the ribs providing a track-way which supports and guides the type X in passing from one drum to the other. Within a recess in the frame member z' beneath this track way is a limiting head N having upwardly projecting teeth n . This head is given, as hereinafter explained, a four way motion upward, crosswise, downward and backward, and in this movement its prongs take between the type in the transfer slot z^6 . The movement of the head N along the transfer channel is limited to a distance equal to just the width of a type, and as the head advances with the type, in one direction or the other, it limits such advancement to just one type. The feet of the type are beveled, as at x' (Fig. 13), to allow the prongs n to enter between them. As shown in Fig. 8, this beveled edge of the foot is out of contact with the drum surface, so that the printing pressure is taken by the shoulders of the type on the outer surface of the rails. This insures accuracy and prevents wear of the beveled foot.

It is to be understood that preceding the operation of the feeding mechanism, the particular row of type under consideration in either drum has its forward type at the end of the drum against the frame member z' . When either comb is operated the whole line is shoved forward the thickness of one type so that this forward type passes into the slot z^6 and rests therein. Before the succeeding type is fed into this slot the limiting mechanism operates to cause the head N to enter behind the preceding type. This is accomplished as follows, reference being had to Figs. 2 and 3. The head N has a shank n' pivoted to a link n^2 which carries a roller n^3 normally resting in a depression in a disk k'' rigid on the shaft K . In the first portion of the depression of either finger key l^2 or l^3 , therefore, the rocking of the shaft L operates, through the

shaft K and the disk k'' , to raise the head N so that its end prong takes behind the type last inserted in the slot z^6 . The shaft L is squared, and mounted on it is a sleeve P . Journalled on this sleeve is an arm p , which at its upper end forks around the shank n' and at its lower end is frictionally held between a collar p' on the sleeve and a spring washer p^2 adjusted by a nut p^3 screwing into the end of the sleeve. When either finger key is depressed the arm p rocks with the shaft as far as the limited movement of the head N allows. This insures the head being in one or the other extreme position when elevated by the disk k'' . Thereafter the head is moved along the channel with the advancing type. When the head is lowered by the return of the shaft, L , it remains in this extreme position by friction. This return movement of the shaft L is caused by a spring Q which is shown as surrounding the sleeve P and having its ends resting on opposite sides of the pin p^4 carried by the collar p' and also on opposite sides of the frame member z' . The purpose of mounting these various parts on the sleeve P is so that they may be conveniently removed as a whole from the machine and adjusted outside. The impingement of either end of the gear I against the corresponding side of the frame plate z' limits the movement of the shaft L . This shaft, for convenience of construction, is made square or other angular shape, whereby the various parts carried by it are securely held against angular displacement. Its rear end may be turned for a bearing and intermediately it may have a bushing l^4 as a bearing. At its outer end the shaft takes into the tubular shank of the key lever V which has its bearings in the frame member z^2 .

In the embodiment shown in the drawings, when the machine is in the operation of setting or distributing type, there will always be four type within the slot z^6 , and each time a new type is inserted into the end of the slot it forces along the head N and the other four type, transferring the foremost one into the opposite drum. After the matter has been fed from either drum, the type remaining in the channel may be transferred by hand by a suitable implement.

It is to be noticed particularly that the present invention provides a continuous channel between the drums along which the type are fed without being turned, so that the characters on the type may face the same way in the supply drum and the printing drum. This is of importance as it allows the type to be so placed on the supply drum that the characters may be conveniently read. At the same time, by reason of the head N and its operation, it is impossible for a too energetic movement of

the transfer mechanism to overset the type, transferring more than one at a time. This controlled feed along a continuous channel is a distinguishing characteristic over my prior application No. 196,840 referred to, wherein the type are transferred from one drum to the other by means of a rotatable head which turns the type half way around.

In some classes of work whole lines of words are repeated with different matter set up, and, in such cases, it is convenient to keep these whole lines on temporary holders in addition to the supply drum, the type being shoved by hand onto the supply drum and thence onto the printing drum. To enable this to be accomplished, I form aligned openings in the end standard z and the intermediate standard z' of the frame and I leave an empty channel on the supply drum. If this channel is brought between these openings, the outside line may be shoved first onto the supply drum and then onto the printing drum. The contour of the channel is preserved at these openings by the edges y' of a split tube Y set into the opening. A handle y by occupying one or the other of a pair of notches z'' in the standard holds the tube against displacement, but enables it to be turned to form a gate closing the opening and preventing accidental displacement of the type.

The additional transfer channel between the drums enables extra type of the most commonly used letters to be stored in normally unused channels of the supply drum and be shifted on to an empty channel in the printing drum and thence back to an exhausted channel in the supply drum. This retransfer may be accomplished without disturbing the line being set on the printing drum and frequently without moving the printing drum, for there is usually an empty channel in the printing drum opposite this transfer opening.

As heretofore stated the supply drum is turned to bring the channel containing the desired character into line with the transfer slot z'' by means of a crank a' . In order to indicate to the operator which channel is in line with this transfer slot the following indicating mechanism is provided: Along the front side of the bar H^2 which extends along above the drums is a strip R, on which are printed letters or characters corresponding to the type within the various channels on the supply drum. Sliding within grooves in the inner sides of the bars H^1 and H^2 near their upper edges is a block S from which a pointer S' extends down on the forward side of the machine, into proximity to the scale R. A cable S^2 extends through the block S and is suitably clamped therein. This cable passes at one end over a suitable guide pulley S^3 and under another guide pulley S^4 onto a sheave

a' carried on the end of the supply drum. The cable leads from the other side of the block S over a guide pulley S^5 onto a spring barrel T. This spring barrel is mounted in a recess in the frame member z^2 . It is shown most clearly in Fig. 12, and consists of a sheave mounted on a pin t and having around the pin and within the sheave a spring t' , one end of the spring being secured to the sheave and the other end to the pin. The tension of the spring is adjusted by turning the pin and then clamping it by the nut t^2 . A plate t^3 may close the outer face of the spring barrel. The spring barrel keeps the cable S always taut, and as the supply drum is rotated in one direction or the other the pointer travels over corresponding indications on the scale.

To allow the supply drum to turn nearly or entirely into the same position from either direction, and at the same time provide an effective stop for preventing its turning beyond that position, the following mechanism has been devised: Mounted on the frame member z is a depending pivoted bar U, which has at its lower end a yoke u , taking around a pin u' adjustably connected to the frame member (Figs. 1 and 9). On the end of the supply drum is a pin a'' which is adapted to impinge against the side of the bar U. Now when the drum is turned in one direction this pin hits the forward side of the bar and swings the lever backward until the forward end of the slot engages the pin u' . This stops the rotation of the drum. When the drum is turned in the opposite direction the pin hits the backside of the bar and swings the lever until the rear end of the slot engages the pin u' and this stops the pin a'' in a position which may be the same as before. In order to insure the accurate position of the supply drum before the type is transferred to or from it, there is provided an interlocking device which is adapted to accurately position the supply drum, and until the drum is positioned to hold the finger keys against operation. This interlocking device consists of a finger latch V (Figs. 2 and 9), below the shaft L, pivoted to the frame member z' and having an upwardly extending arm v which normally occupies a radial slot in a collar V' on the shaft L, the lever V being held in this position by the spring v' . The engagement of the arm v in the slot of the collar prevents the operation of the finger keys. On the side of the arm v is a beveled pin v^2 and in the rear of this pin v^2 is a notched ring a^8 carried by the supply drum,—each notch corresponding to one of the channels in the drum. Now, when the crank a^5 has positioned the supply drum under the guidance of the pointer and scale indicator, the finger latch is drawn upward just preceding the de-

pression of one of the finger keys by the thumb. This movement of the latch brings the beveled pin v^2 into the corresponding notch in the ring a^3 accurately positioning the supply drum and at the same time releasing the collar V' so that the finger keys may be depressed.

To properly position the printing drum during transference of the type and provide for rotating the drum a channel at a time, the following construction has been devised. (shown best in Figs. 8 and 11). Screwed into a pair of ears z^7 rising from the frame member z^2 is a stud w . Pivoted on this stud is a lever W , and journaled in the lever is a shaft w' having on one end a pinion w^2 , adapted to mesh with the gear b^3 on the printing drum, and on the other end a hand wheel w^3 . On the inner face of this hand wheel are formed depressions w^4 , one for each tooth of the pinion w^2 . Cooperating with these depressions is a plunger w^5 carried within the tubular stud w and pressed toward the hand wheel by a spring w^6 . This plunger forms a spring detent which enables the pinion w^2 to be turned a tooth at a time by means of the hand wheel which advances the drum. The pinion w^2 is maintained in engagement with the gear by means of a spring w^7 which acts on the flattened face w^8 of the lever W beneath its pivot. After the type has been assembled on the printing drum the lever W is turned upward withdrawing the pinion w^2 from engagement with the gear b^3 and allowing the free rotation of the printing drum for printing. The lever W and the parts it carries are held in this position against accidental displacement by reason of the spring w^7 bearing on another flattened face w^8 of the lever W .

It is to be understood that the type are normally stored in the channels of the supply drum, each channel carrying type of a certain character. In assembling, the supply drum is turned by its handle to bring the character desired into alinement with the transfer channel. As it comes into such alinement, the pointer so indicates on the scale. Then the finger latch is raised, locking the supply drum accurately in position and releasing the finger keys. The finger key b^3 is then depressed, which operates to move downward and forward the comb h' advancing the type, and at the same time to give the head N a movement upward and crosswise with the type. This operation is repeated for each new letter. When one entire line on the printing drum has been filled, the drum is advanced by the hand wheel w^3 to bring a new channel into alinement. At the completion of the setting, the ribbon is passed around the drum. Thereafter, the rotation of the drum drawing the paper between it and the impression platen

causes the printing. The operation of distributing type is similar to that of setting except that the finger key l^2 is used, which moves downward and forward the comb h^2 and operates the head in a reversed direction.

As has been stated, the present invention is an improvement on the structures shown in my prior Patent No. 722,402, and my application No. 297,447. In that patent the type stands in the supply drum facing in the same direction they are to occupy in the printing drum, and are transferred through an open channel, but no finger keys are provided for effecting the transfer, and no limit stop to engage the type being transferred. Moreover the indication of the supply drum's position is carried by that drum. The application referred to improves these features by providing finger keys to effect the transfer, providing means to engage the type being transferred, limiting such transfer to one type at a time. It also provides a stationary indicating chart and a pointer, provides an interlock between the operating keys and the supply drum, provides a mechanism for temporarily holding the supply drum in desired position, and other features of improvement. In that application, however, the desirable feature of engaging the type during the transfer is had at the expense of the desirable feature in the patent of having the type stand facing in the same direction in both the supply drum and the printing drum, the transfer mechanism in that application operating to engage the type and turn it half way around when it is taken from one drum and presented to the other.

The present application is designed to contain the advantages of both the prior patent and prior application referred to and additional advantages. It has the type standing facing the same way in both drums, the transfer is through a continuous open channel, and there is also provided a limit stop arranged to so engage the type during the transfer that only one type at a time may be transferred. The present application has a stationary indicator and movable pointer, an interlocking device for the finger keys and supply drum, and means for positioning and holding the printing drum, but all these features are improvements over those shown in the application referred to. The present invention also has what may be called an emergency channel between the supply drum and the printing drum in addition to the regular transfer channel, and has a gate for closing this, thereby enabling whole lines to be transferred whenever desired from one drum to the other. Lines may also be fed from outside of the machine directly to the supply drum or through the supply drum to the

printing drum. Other features of improvement are also included in the present application. It may be further stated that any claims which might be made alternatively in either this application or my prior application No. 297,447, referred to, are made in that application or its divisions. Such claims dominate the embodiment herein shown on the following broad features, namely: the transfer mechanism (as to its locative character, its finger key operation, its four-motion combs, its type follower, and its individual control of the type); the interlock between the finger keys and supply drum; the indicator; the line-by-line positioner for the printing drum; the ribbon printing with type-holding drum and rotary platen.

I claim:

1. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from either mechanism to the other and present it with its character standing in the same direction, and a depressible key accessible for finger contact for operating said feeding mechanism.
2. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from one mechanism to the other with its character standing in the same direction, and a pair of finger keys for operating said feeding mechanism in one direction or the other.
3. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism also adapted to carry type, feeding mechanism, a limiting device, and means for giving it an orbital movement to engage type and moving with it a distance equal to the thickness of one type in its transfer from one mechanism to the other.
4. In a duplicating machine, the combination of a type supply mechanism, printing mechanism, feeding mechanism, a limiting device, and means for giving it a four-way motion allowing it to travel with the type the thickness of one type.
5. In a duplicating machine, the combination of mechanism for carrying a supply of type, a rotary printing drum, a continuous stationary channel for the type leading from the supply to said drum, feeding mechanism acting to advance the type along said channel to or from the printing drum while it is stationary, and a finger key for operating said feeding mechanism.
6. In a duplicating machine, the combination of a supply drum, a printing drum, a channel between the same, feeding mechanism adapted to shove type along said channel, a limiting mechanism operating to engage a type in said channel and limit its movement, preventing oversetting.
7. In a duplicating machine, in combination, a supply for the type, printing mechanism, a channel leading from one to the other, a head, a finger key and mechanism operated thereby to cause the head to engage the type in said channel and move with it a distance equal to the thickness of a type.
8. In a duplicating machine, in combination, a supply drum and a printing drum placed end to end, a channel intermediate of said drums, and mechanism for advancing the type from either drum through the channel, and mechanism for engaging the type in the channel and thereby limiting each advancement to a distance equal to the thickness of a single type.
9. In a duplicating machine, in combination, a supply member and a printing member each having means for carrying rows of type, mechanism for advancing a row of type in either member toward the other, and mechanism acting between the members for engaging the end type in the row and preventing oversetting while allowing subsequent row-advancements to carry the type to the other member without turning the type, whereby the type may face the same way in both members.
10. In a duplicating machine, in combination, a supply member and a printing member each having means for carrying rows of type, mechanism for advancing a row of type in either member toward the other, a stationary type support between the members, and mechanism for engaging the type on said support and preventing oversetting thereof.
11. In a duplicating machine, the combination of a supply mechanism and printing mechanism placed end to end, a channel member between the same, a head having a four-way motion adapted to engage individual type in said channel, and mechanism for imparting such motion to said head.
12. In a duplicating machine, in combination, type supply mechanism, printing mechanism, a rock shaft, means operated thereby to convey type between such mechanisms without turning the type, and finger keys for rocking said shaft in one direction or the other.
13. In a duplicating machine, in combination, supply mechanism and printing mechanism placed end to end, a type support between the same, a rock shaft, finger keys for operating said rock shaft in either direction, a head adapted to be operated by said rock shaft lengthwise of the type support, and mechanism for moving said head toward the type support.
14. In a duplicating machine, the com-

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5 combination, of supply mechanism and printing mechanism placed end to end, a type channel between them, means for feeding the type into said channel and tending to overfeed it, and a limiting means preventing over-feeding and then withdrawing from the path of the type, whereby the type is fed a type at a time from one mechanism to the other without being turned.

10 15. In a duplicating machine, the combination of type supply mechanism, printing mechanism, a type support between the same, a head having projecting teeth, and mechanism for giving said head an orbital motion to cause it to approach the type, advance with the same, and to return to normal position.

16. The combination of a type channel, a head adapted to engage type therein and move with it along the channel, mechanism for moving said head toward the channel, mechanism for moving said head along the channel, and a finger key for operating both of said mechanisms.

25 17. The combination of a type channel, a head adapted to engage type therein and advance with it along the same, a cam adapted to move said head toward the channel, an arm adapted to move said head along the channel, a rock shaft for operating said arm and said cam, and a finger key for rocking said rock shaft.

30 18. The combination of a type support, mechanism for separating type on the same, consisting of a head having teeth, and means for giving said head an orbital movement toward the type channel along the type channel and back to normal position.

35 19. The combination of a type support, a head adapted to engage type carried thereby, mechanism adapted to move said head toward the support, an arm adapted to move said head along the support, a rock shaft with which said arm has a frictional engagement, and a connection between said rock shaft and said mechanism.

40 20. The combination with a type channel, a head having teeth below the same, a cam adapted to elevate said head, an arm adapted to swing said head lengthwise of the channel, a rock shaft, finger keys on said rock shaft adapted to rock the same in either direction, and a spring tending to center said rock shaft, said arm having a frictional engagement with said rock shaft, and said cam being operatively connected with said rock shaft.

45 21. In a duplicating machine, in combination, a supply drum and a printing drum placed end to end, a vertical frame member between said drums, a type channel across said frame member between the drums, a rock shaft mounted in said frame member below said channel, means on the forward end of said rock shaft to rock it in either di-

rection, a spring tending to center said rock shaft, an arm frictionally carried by the rock shaft, a device having teeth adapted to engage type in said channel, a cam operated by said rock shaft and serving to raise said device, said arm engaging said device to move with the same along the channel.

22. The combination of a type support, a device for engaging type carried thereby, mechanism for moving said device toward the type, a rock shaft for operating said mechanism, a sleeve mounted on said rock shaft to rotate therewith, said sleeve carrying a pair of collars, one of which is adjustable, and an arm frictionally clamped between said collars and engaging said device.

23. The combination of a type support, a device for engaging type carried thereby, a rock shaft, a pair of collars carried thereby, one of which is adjustable, an arm frictionally clamped between said collars and engaging said device, a spring serving to center said rock shaft, and finger keys for rocking the shaft in one direction or the other.

24. The combination, with a type drum adapted to carry longitudinal rows of type, of a channeled member extending along said drum and having its channel face the same, a flat comb occupying such channel and guided thereby, a bar within the channel above the comb, said bar having its lower edge connected to the upper edge of the comb by an inclined lug on one of said edges occupying an inclined slot in the other, means for guiding said bar parallel with said type drum, and means for operating said comb and through it said bar.

25. The combination with a member adapted to carry type, of a channeled member parallel with the surface of such type-carrying member, a comb occupying said channel and having on its upper edge a pair of inclined lugs, a bar occupying the channel above said comb and having in its under edge inclined recesses which said lugs occupy, means for retarding said bar, and means for moving said comb and moving the bar by means of it.

26. The combination with a member adapted to carry type, of a channeled member parallel with the surface of such type-carrying member, a comb occupying said channel and having on its upper edge an inclined lug, a bar occupying the channel above said comb and having in its under edge an inclined recess which said lug occupies, means for retarding said bar, means for moving said comb and moving the bar by means of it, said lug carrying a projection and said bar having a projection beneath said lug whereby the engagement of said projections limits the downward movement of said comb, said bar having a loose

play connection with said channeled member in a direction parallel with said comb.

27. In a duplicating machine, the combination of a pair of drums placed end to end, a pair of combs supported above said drums, followers adapted to be engaged by said combs and thereby move the type in said drums, bars for operating said combs, a spring tending to separate said bars, a rocking member adapted to engage either bar and move it toward the other, a rock shaft for operating said rocking member, and a spring connection between the rock shaft and rocking member tending to center the rocking member but allowing independent movement of the shaft.

28. In a duplicating machine, the combination of a supply drum and a printing drum, each adapted to carry type, a rock shaft, a member mounted thereon having a pair of projecting lugs, a spring allowing independent movement between the rock shaft and said lugs and tending to return said lugs to neutral position, followers for the type, and mechanism adapted to be engaged by said lugs to advance the followers.

29. In a duplicating machine, the combination of a pair of drums, mechanism for shoving type from either drum to the other, and means for operating said mechanism comprising a rock shaft, heads rigid thereon, a ring between said heads having lugs adapted to engage said mechanism, and a spring between the heads tending to center said ring.

30. In a duplicating machine, the combination with printing mechanism and supply mechanism, means for transferring type from one mechanism to the other, and means for alternately locking said supply mechanism and such transfer means, and a latch for controlling such interlocking.

31. The combination of a supply member, mechanism adapted to feed the type therefrom, means for locking said supply member accurately in position, means for locking said feed mechanism, a finger key for operating said feed mechanism, and a finger latch for controlling the locking mechanism.

32. The combination of a supply drum, type-feeding mechanism therefor, a rock shaft for controlling the same, mechanism preventing rotation of said rock shaft, means for moving said mechanism to a position to release the rock shaft, a member having a series of recesses carried by said drum, and a beveled projection carried by the locking member and adapted to enter one of said recesses when the locking member is moved to idle position.

33. In a duplicating machine, the combination of a pair of drums, a rock shaft, mechanism operated thereby for causing the transfer of type from one drum to the

other, finger keys for rocking said shaft in one direction or the other, a latch lever pivoted below said finger keys, and an interlocking device operated by said latch lever to alternately lock one of the drums in position or the rock shaft against movement.

34. In combination of a drum adapted to carry a supply of type, a pivoted stop-bar, means for limiting the movement of said bar, and a stop carried by said drum and adapted to engage either side of said bar whereby the movement of the drum is stopped.

35. In a duplicating machine, in combination, a printing drum, a gear on said drum, a pinion adapted to engage said gear, means for rotating said pinion, a lever carrying said pinion, and a spring adapted to hold said lever in either of two positions, one with the pinion in engagement with the gear and the other with it out of engagement.

36. In a duplicating machine, in combination, a printing drum, means for rotating the same, a gear on said drum, a pinion adapted to engage said gear, a hand wheel for rotating said pinion, said hand wheel having a series of shoulders corresponding to the teeth of the pinion, and a spring detent adapted to engage said shoulders.

37. In a duplicating machine, in combination, a printing drum, means for rotating the same, a gear on said drum, a pinion adapted to engage said gear, a hand wheel for rotating said pinion, a lever on which said pinion and hand wheel are mounted, said hand wheel having a series of depressions, the pivot of said lever being tubular, a plunger mounted in the bore thereof, and a spring pressing said plunger against the hand wheel whereby it may enter said depressions.

38. The combination of a supply drum adapted to carry type and adapted to be turned to bring characters into active position, an indicator marked to correspond to the characters in the supply drum, a pointer adapted to travel along the indicator, and a cable connected with the pointer and with a sheave on the supply drum.

39. The combination of a supply drum adapted to carry type and adapted to be turned to bring characters into active position, an indicator marked to correspond to the characters in the supply drum, a pointer adapted to travel along the indicator, a cable connected with the pointer and drawn by the supply drum, and a spring operating to keep said cable taut.

40. The combination of a supply drum adapted to carry type and adapted to be turned to bring characters into active position, an indicator marked to correspond to the characters in the supply drum, a pointer adapted to travel along the indicator, a sheave on

the supply drum, a cable connecting the sheave and pointer, a spring barrel to which the other end of said cable is secured and which tends to wind in the cable.

5 41. The combination of a supply drum adapted to carry rows of type, an indicator marked to correspond to said rows and extending lengthwise of the drum, a pointer adapted to travel along said indicator, a
10 sheave on one end of the drum, a spring barrel, a cable secured to the pointer and to said sheave, and a cable extending from said pointer in the opposite direction and passing around the spring barrel, the tension of said spring serving to keep the cables
15 taut in whichever direction said supply drum is turned.

42. In a duplicating machine, the combination of a supply drum and a printing
20 drum placed end to end and adapted to carry rows of type, an indicator marked to correspond with the rows on the supply drum and extending lengthwise of the machine above the supply drum and printing
25 drum, a sheave on the outer end of the supply drum, a spring barrel located adjacent to the outer end of the printing drum, a track way parallel with the indicator, a pointer traveling along said track way, a
30 cable extending in opposite directions from said pointer, one member of said cable passing around said sheave, the other around said spring barrel.

43. In a combined setting and distributing and printing machine, the combination
35 of a font of type of individual characters which form a permanent part of the machine and are grooved on their sides, of supply mechanism and printing mechanism, each having undercut channels which such
40 grooved type occupy, the type being transferable between said mechanisms, and mechanism adapted to be inserted between successive type to control the transfer.

44. In a combined setting and distributing and printing machine, a font of type
45 which form a permanent part of the machine and are beveled on their feet, and feeding mechanism therefor and a stop adapted to engage between such beveled
50 feet, combined with a rotary printing drum having means for holding such type during rotation of the drum.

45. In a combined setting and distributing and printing machine, the combination
55 of a font of type which form a permanent part of the machine and are grooved on their sides, of a supply mechanism and a printing mechanism, each having rails with overhanging edges providing channels
60 which such grooved type occupy, the type above the grooves extending over the rails and bearing thereon, and means adapted to convey type from one drum to the other,
65 and movable mechanism adapted to engage

the type from underneath them during such conveyance.

46. In a duplicating machine, in combination, mechanism for carrying a supply of
70 type, printing mechanism adapted also to carry type, a passage-way therebetween, and a gate independent of the supply mechanism adapted to close the passageway.

47. In a duplicating machine, in combination, a pair of alined drums, a passage-way
75 between them, an alined passage-way at the end of one of the drums, and gates for closing said passage-ways.

48. In a duplicating machine, the combination of mechanism for carrying a supply
80 of type, printing mechanism adapted also to carry type, a continuous open type channel between said mechanisms, mechanism for feeding type through said channel from either of the mechanisms mentioned to the
85 other, and finger keys for operating such mechanism.

49. In a duplicating machine, in combination, movable mechanism for carrying a
90 supply of type, movable printing mechanism adapted also to carry type, a continuous stationary channel between said mechanisms, means for feeding type from the supply mechanism through said channel to the printing mechanism and vice versa, and
95 finger keys for operating said feeding mechanism in one direction or the other.

50. In a duplicating machine, the combination of a pair of rotatable drums each
100 adapted to carry type on its surface, a frame in which said drums are mounted, said frame having rigid end members at the ends of the drums and a rigid partition between the drums, said partition carrying a stationary type channel between the drums,
105 and means for feeding the type from either drum to the other through said channel.

51. The combination of a movable type supply member, a movable printing member,
110 a continuous channel between said members, means for feeding the type from one member to the other along said channel, and means for controlling the feed to prevent transferring more than one type at a time.

52. In a duplicating machine, the combination of a drum having on its surface a
115 series of longitudinal rails with overhanging edges combined with type grooved on its sides to receive said edges, said type occupying the channels between the rails and extending above their grooves on to the
120 outer surface of the rails and bearing on said rails, said type having transversely tapered feet, and mechanism to engage such taper.

53. The combination of a type drum having set into its surface parallel longitudinal
125 rails whose sides are grooved, whereby undercut channels are presented, and type occupying said channels and having their
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sides grooved, the grooves of the type occupying the edges of the rails and the grooves of the rails receiving the feet of the type, said rails having a cross section like the letter I the outer surface of the base of said rails being substantially flush with the surface of the drum between the rails.

54. In a duplicating machine, the combination of a type carrying member having parallel grooves on its surface, and a series of rails set in said grooves, and having a cross section like the letter I, the outer surface of the base of such rails being substantially flush with the surface of the member between the rails.

55. The combination in a duplicating machine, of mechanism for carrying a supply of type, printing mechanism adapted also to carry type, two type channels between said mechanisms, means for feeding type through one of the channels, and means for closing the other channel.

56. In a duplicating machine, the combination of a supply mechanism, and a printing mechanism, each adapted to carry lines of type, a type channel between said mechanisms, and an additional type channel leading from outside the machine to the supply mechanism.

57. In a duplicating machine, the combination of a type supply mechanism and a printing mechanism, each having channels for carrying rows of type, a type channel, between adjacent ends of said mechanisms, a second type channel positioned to communicate with the other end of the same channel in the supply mechanism which is communicating with the type channel referred to, whereby type may be passed from outside the machine on to the supply mechanism and thence uninterruptedly to the printing mechanism.

58. In a duplicating machine, the combination of mechanisms for carrying a supply of type, printing mechanism adapted also to carry type, a passage way therebetween, and a gate adapted in one position to close the passage way and in another position to form a guide for the type.

59. In a duplicating machine, in combination, a type supply mechanism, a printing mechanism, each having on its surface longitudinal rails with overhanging edges, type having grooves on their sides which said edges occupy, a passage way between said mechanisms, and means for closing such passage way, said means, when open, being adapted to engage in the grooves of the type and guide them from one of said mechanisms to the other.

60. In a duplicating machine, the combination of a supply mechanism, and a printing mechanism, each adapted to carry longitudinal lines of type, a type channel between

said mechanisms, type adapted to be confined by either mechanism and transferred from either to the other through such channel without release from the machine, and a type channel leading from outside the machine to the supply mechanism, whereby type may be shoved from outside the machine onto the supply mechanism to and thence the printing mechanism.

61. The combination of printing mechanism, storage mechanism, mechanism for transferring type from one of said mechanisms to the other, and mechanism adapted to engage the foremost type in the line and move with it a distance corresponding to the thickness of the type and then release it for preventing an over-transfer by momentum of the type itself.

62. The combination of mechanism for advancing a line of type and mechanism for engaging the under side of the type and move with the advancing type to limit the advancement to one type at a time.

63. The combination of mechanism for advancing a line of type and a limiting finger adapted to be moved into the path of the type to engage the type and to move with it a distance limited to the thickness of the type to prevent oversetting by momentum of the type itself.

64. The combination of mechanism for advancing a line of type and mechanism adapted to engage the foremost type in the line and move with it a distance corresponding to the thickness of the type and then release it for preventing over-advancement by momentum of the type itself.

65. The combination of a supply member, and a printing member, a type channel leading from one to the other, mechanism for advancing a line of type in either of said members so that the forward end of the line may pass into and along said channel, and withdrawable means engaging individual type near the forward end of the line on the forward side of the engaged type for limiting the advancement of one type at a time.

66. The combination of mechanism for advancing a line of type and mechanism adapted to engage the foremost type in the line and move with it a distance corresponding to the thickness of the type and then release it for preventing over-advancement by momentum, and a finger key for operating the advancing mechanism.

67. The combination of mechanism for advancing a line of type and a withdrawable limiting finger adapted to engage the type in its advance side and prevent oversetting by momentum, and a finger key for operating both the advancing mechanism and the limiting finger.

68. The combination of a movable type supply member, a movable printing member,

a continuous channel between said members, means for feeding the type from one member to the other along said channel, and means for controlling the feed to prevent transferring more than one type at a time, and finger mechanism for conjointly operating both the feeding and controlling means.

69. The combination of a movable type supply member, a movable printing member, a continuous channel between said members, means for feeding the type from one member to the other along said channel, and means adapted to engage type in the channel to prevent transferring more than one type at a time.

70. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from one mechanism to the other and present it with its character standing in the same direction, and means adapted to engage each individual type being transferred and prevent its being overset by its own momentum.

71. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from one mechanism to the other with its character standing in the same direction, and means to engage each individual type being transferred and advance with it a limited distance and thereby prevent over feed by momentum of the type itself.

72. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from one mechanism to the other with its character standing in the same direction, means to prevent over feed by momentum, and a pair of finger keys for operating said feeding mechanism and the preventing means in either direction.

73. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism also adapted to carry type, a type channel, a limiting device, and means for giving it movement to engage type in the channel and move with it a distance equal to the thickness of one type.

74. In a duplicating machine, the combination of a type supply mechanism, printing mechanism, a type guide between them, a limiting device, and finger operated means for giving it a motion allowing it to travel with the type along the guide the thickness of one type.

75. In a duplicating machine, the combination of mechanism for carrying a supply of type, a printing drum, a support for the

type leading from the supply to the drum, feeding mechanism acting to advance the type along said support without turning the type, means for limiting the advancement to a single type at a time, and a finger key for operating both the feeding mechanism and the limiting means.

76. In a duplicating machine, the combination of a supply drum, a printing drum, a stationary channel between the same, and a limiting mechanism operating to engage a type in said channel and limit its movement.

77. In a duplicating machine, the combination with type having beveled feet, of a supply for the type, printing mechanism, a channel leading from one to the other, and mechanism adapted to enter between the feet of the type to prevent oversetting.

78. In a duplicating machine, the combination with a font of type, the individuals of which are of the same thickness and have beveled feet, of a supply mechanism, and a printing mechanism, a channel intermediate of said mechanisms, means for advancing the type from either mechanism through the channel, and mechanism adapted to enter between the feet of the type for limiting each advancement to a distance equal to the thickness of a single type.

79. In a duplicating machine, the combination with type having beveled feet, of a supply member and a printing member each having means for carrying rows of such type, mechanism for advancing a row of type in either member toward the other, and mechanism entering between the feet of the type for separating the end type in the row while allowing subsequent row-advancements to carry the type to the other member without turning the type, whereby the type may face the same way in both members.

80. The combination of a printing member, a type guide leading thereto and along which type may be fed in a continuous course, and means engaging each type successively for limiting the feed to one type at a time.

81. The combination of a channeled printing member, a stationary type channel adapted to communicate therewith, and means engaging each type in the channel successively and moving with it a distance equal to the thickness of a type.

82. The combination with type having grooved edges and beveled feet, of a channeled printing member having longitudinal undercut channels which said type may occupy, a guide along which the type may be fed to the printing member, and mechanism engaging between the feet of consecutive type.

83. The combination of supply mechanism, printing mechanism, feeding mechanism, and a limiting device adapted to en-

gage each type successively and move with the type a distance equal to the thickness of a type and then withdraw out of the path of the type.

- 5 84. The combination of supply mechanism, printing mechanism, feeding mechanism, and a limiting device adapted to move with the type a distance equal to the thickness of a type and then withdraw out of the
10 path of the type.

85. In a duplicating machine, the combination of a supply drum, a printing drum, a channel between the same, and a limiting mechanism operating to engage a type in
15 said channel and limit its movement, and finger keys for operating the limiting mechanism.

86. The combination of supply mechanism, printing mechanism, a continuous type
20 channel between them, feeding means adapted to advance the type along said channel from one of said mechanisms to the other, and a depressible key accessible for finger contact for operating said feeding
25 means.

87. The combination of supply mechanism, printing mechanism, a continuous type channel between them, feeding means adapted to advance the type along said channel from either of said mechanisms to the
30 other, and a pair of finger keys for operating said feeding means in opposite directions.

88. The combination of a supply mechanism, a rotatable printing mechanism, a continuous channel between them, means for feeding type along said channel from either
35 mechanism to the other, and finger keys for controlling said means.

89. The combination of a movable supply mechanism, a movable printing mechanism, a continuous open stationary channel between them, means for feeding type along
40 said channel, and a plurality of finger keys for controlling said means.

90. The combination of a rotatable supply mechanism, a rotatable printing mechanism, a continuous open stationary channel between them, means for feeding type along
50 said channel in either direction, and finger keys for controlling said means.

91. The combination of a pair of type-holding drums placed end to end with a type guide intermediate thereof, finger keys,
55 and mechanism operated thereby for feeding type from either of said drums to the other along said guide.

92. The combination of a pair of movable channeled drums placed end to end with a
60 stationary type channel intermediate thereof, finger keys, and mechanism operated thereby for feeding type from either of said drums to the other through said channel.

93. The combination of a pair of rotatable

channeled drums placed end to end, a continuous stationary open type channel between them, means for feeding type from either drum to the other, through said channel and a pair of finger keys for operating
65 said means in opposite directions.

94. The combination of a channeled supply mechanism, a channeled printing mechanism, a continuous type channel between them having one end in constant unvarying proximity to the end of said supply mechanism, each mechanism being adapted to be
70 moved independently across the end of said type channel, and means movable independently of the supply mechanism for feeding type in such mechanism into said channel.

95. The combination of a supply member, a printing member, a type guide between them having its ends in constant unvarying proximity to the ends of said members, and means for feeding type from either member
85 to said guide without varying the position of that member.

96. The combination of a movable supply member, a movable printing member, a type guide between them having its ends in constant unvarying proximity to the ends of
90 said members, finger key, and means operated thereby for feeding type from either member to said guide without varying the position of that member.

97. The combination of a pair of rotatable channeled drums placed end to end, a continuous stationary open type channel between them, means for feeding type from either drum to the other, through said channel,
100 means engaging the type in the channel for limiting the feed to one type at a time, and a pair of finger keys for operating both of said means in opposite directions.

98. The combination of a supply mechanism, a printing mechanism, a type guide between the same, means for shoving type from either mechanism along such guide to the other mechanism, said means operating
105 on the distant end of a line of type, and limiting mechanism operating to engage the type individually during such shoving.

99. The combination of a supply mechanism, printing mechanism, type transferable between said mechanisms with their characters facing constantly in the same direction,
115 means for shoving a line of type as a whole in either mechanism toward the other, and means for engaging type individually to control the transfer.

100. In a duplicating machine, in combination, a supply member and a printing member each having means for carrying longitudinal rows of type, mechanism for advancing a row of type *en masse* in either
120 member toward the other, a type support between the members, and mechanism for engaging the type individually on the advance-

ing side of the type on said support and having a limited movement with the type for a distance equal to the thickness thereof and then a withdrawal from the path of the
5 type.

101. In a duplicating machine, the combination of a supply mechanism and printing mechanism placed end to end, a channel between the same, a member having a four-
10 way motion adapted to engage individual type in said channel, and a finger key and mechanism controlled thereby for imparting such motion to said member.

102. In a duplicating machine, the combination, of a type holding member, a type channel communicating therewith, means for feeding the type from said member into and along said channel and tending to over-
15 feed it, and a limiting mechanism adapted to successively engage each type being fed and move with it in the direction of feed, while remaining on the advance side of it, whereby the type may be fed a type at a
20 time to or from said member without being overfed or turned in transit.

103. The combination, with a movable member having a plurality of longitudinal type-holders, of a type guide adapted to register therewith, means for advancing type
30 along said guide, and means for engaging individual type on the guide and moving with the advancing type to control the feed.

104. The combination, with type having beveled feet, of a movable member having a
35 plurality of longitudinal type-holders, a type guide adapted to register therewith, means for advancing type along said guide, and means entering between the feet of the type and moving with the advancing type
40 to control the feed.

105. The combination of a movable member having a plurality of type holders, a type guide along which type may be shoved and which is adapted to register with differ-
45 ent ones of said holders, means adapted to engage the rear end of a line of type in said member and move such line toward said guide to shove the forward type thereonto, and means engaging such forward type and
50 adapted to move with it along the guide.

106. The combination of a channeled type-holding member, a type channel adapted to register therewith, advancing means adapted to engage the rear end of a line of
55 type, and limiting means adapted to engage the forward type of said line and move with it a definite distance along said type channel while on the forward side of the type and then withdraw.

107. The combination, with type having beveled feet, of a channeled type-holding member, a type channel adapted to commu-
60 nicate therewith, mechanism for advancing type *en masse*, and mechanism adapted to

enter between the feet of the type in the 65 channel to prevent oversetting.

108. The combination of a supply mechanism, a printing mechanism, a continuous type-guide between them, advancing means adapted to engage the rear end of a line of
70 type in one of said mechanisms, and limiting means adapted to successively engage each type in the line to the extent to which the line is advanced.

109. The combination of a supply mechanism, a printing mechanism, a continuous type-guide between them, advancing means adapted to engage the rear end of a line of
75 type in either of said mechanisms and move it toward the guide, and limiting means adapted to engage individual type of said line, and a pair of finger keys for operating the advancing means in opposite directions.

110. The combination of a supply mechanism, a printing mechanism, a continuous
85 stationary type-guide between them, advancing means adapted to engage the rear end of a line of type in either of said mechanisms and move it toward the guide, and a pair of finger keys for operating the advancing
90 means in opposite directions.

111. The combination of a pair of rotatable channeled drums placed end to end, a continuous stationary open type channel between them, means for engaging the rear
95 end of a line of type in either drum and shoving such line toward the open channel to cause the forward type to pass thereinto, whereby subsequent advancements may feed such forward type to the other drum with-
100 out turning it, and a pair of finger keys for operating said means for the two drums respectively.

112. The combination of a type support, means for advancing type along the same,
105 a limiting member adapted to move with the advancing type, and means for projecting it across the type.

113. The combination of a type support, means for advancing type along the same,
110 a member adapted to move toward and from the support and movable lengthwise thereof, means for limiting such lengthwise movement, and means for projecting said member across the type.

114. The combination with type having beveled feet, of a type support, means for advancing type along the same, a member adapted to move toward and from the support and movable lengthwise thereof, means
120 for limiting such lengthwise movement, and means for projecting said member across the type between the bevels of the feet of adjacent type.

115. In a duplicating machine, the combination of type supply mechanism, print-
125 ing mechanism, a type support between the same, a member having a projecting tooth,

and mechanism for giving said member a movement to cause it to approach the type, allow it to advance with the same, and to return to normal position.

116. The combination with type, of a type channel, a member adapted to engage the type therein and move with it along the channel, mechanism for moving said member toward the channel, a finger key for operating said mechanism, and means for limiting the movement of said member.

117. The combination with type having beveled feet, of a type channel, a member adapted to engage between the feet of type therein and advance with the type along the same, and means for moving said member toward the channel.

118. The combination with type having beveled feet, of a type channel, a member having a tooth, and means for giving said member an orbital movement toward the type channel along the type channel and back to normal position.

119. In a duplicating machine, in combination, type supply mechanism, printing mechanism, a type guide between them, a rock shaft, means operated thereby to feed type from either mechanisms toward the other along said guide, and finger mechanism on the forward end of the shaft for moving it in either direction.

120. In a duplicating machine, in combination, supply mechanism and printing mechanism, a type support between the same, a rock shaft, means for operating said rock shaft in either direction, a member adapted to engage type on the support, and means adapted to be operated by said rock shaft for moving said member toward and along the type support.

121. In a duplicating machine, the combination of a horizontal supply drum and a horizontal printing drum placed end to end, a vertical frame member extending crosswise between said drums, a rock shaft journaled on said frame member, a finger lever on the forward end of said rock shaft, and means operated by the rock-shaft for feeding type from either drum to the other.

122. The combination of a type support, a member adapted to engage type carried thereby and movable therewith, mechanism adapted to move said member toward the support, a rock shaft, and a connection between said rock shaft and said mechanism.

123. The combination with a type channel, a member having a tooth normally below the same, means adapted to elevate said member and allow it to swing lengthwise of the channel, a rock shaft, finger keys on said rock shaft adapted to rock the same in either direction, and a spring tending to center said rock shaft, said means being operatively connected with said rock shaft.

124. In a duplicating machine, in combination, a supply drum and a printing drum placed end to end, a frame member between said drums, a type channel across said frame member between the drums, a rock shaft mounted in said frame member below said channel, means on the forward end of said rock shaft to rock it in either direction, a spring tending to center said rock shaft, means for advancing a row of type, a device adapted to engage type in said channel, and operative connections between said rock shaft and such advancing means and between said rock shaft and said device.

125. The combination of a type support, a device for engaging type carried thereby, mechanism for moving said device toward the type, a rock shaft for operating said mechanism, a sleeve mounted on said rock shaft to rotate therewith, and an arm carried by said sleeve and engaging said device.

126. The combination of a type support, a device for engaging type carried thereby, a rock shaft, an operative connection between said rock shaft and said device, a spring serving to center said rock shaft, and finger keys for rocking the shaft in one direction or the other.

127. The combination, with a suitable type-channel, of a font of type each having a groove on its edge, the sides of the type being parallel from the upper end of the body well toward the bottom, whereby the types may firmly abut each other, said type having the lower portion of its body tapered toward an edge at the bottom, a limiting finger, and means for projecting it between the tapered feet of adjacent type.

128. The combination, with a suitable type-channel, of a font of type each having grooves on its opposite edges, the sides of the type being parallel from substantially the top to points adjacent to the grooves, said sides being tapered inwardly below the grooves, whereby consecutive types may firmly abut each other while allowing mechanism to engage between them below, a limiting finger, and means for projecting it between the tapered feet of adjacent type.

129. The combination, with a suitable type-channel, of a font of type each having grooves on its opposite edges, the sides of the type being parallel from substantially the lower face of the grooves upward and being tapered inwardly beneath the grooves, a limiting finger, and means for projecting it between the tapered feet of adjacent type.

130. The combination, with a suitable type-channel, of a font of type each having an overhanging head, a shank produced by grooves in the opposite edges of the type, and a base portion below the grooves shorter than the head, the sides of the head and shank being parallel, and the base portion

having its sides tapered to a central bottom edge, a limiting finger, and means for projecting it between the tapered feet of adjacent type.

5 131. The combination, with a suitable type-channel, of a font of type each having grooves in their opposite edges and having the lower portion of their sides tapered inwardly, combined with a holder having an undercut channel to receive such type, the
10 base of the channel being out of contact with the bottom of the type and the type bearing at their heads on such holder, a limiting member, and means for moving it
15 between the tapered feet of adjacent type in the type channel.

132. A font of type each having grooves on its edges and having the lower portions of its sides tapered toward the bottom of the type, combined with rails which said
20 grooves occupy and which are adapted to hold them with their sides abutting above the tapered portion, a limiting member, and means for moving it between the tapered
25 feet of adjacent type.

133. A font of type each having grooves in their opposite edges and having the lower portion of their sides tapered inwardly, combined with a holder having an undercut
30 channel to receive such type, the base of the channel being out of contact with the bottom of the type and the type bearing at their heads on such holder, a type-trackway communicating with said channel and being
35 open on its underside, a limiting finger, and means for projecting the same upward between adjacent type on said trackway.

134. A font of type each having grooves on its edges and the lower portion of its
40 sides tapered toward the foot of the type, combined with a drum equipped with rails which said grooves occupy and which are adapted to hold them with their sides abutting above the tapered portion, the heads of
45 the type extending across the rails farther than the base of the type whereby the heads may stand over the webs of the rails, a type holding channel adapted to communicate with the spaces between the rails of said
50 drum, a member capable of a limited movement with type in such channel, and means for inserting such member between the tapered feet of adjacent type in the channel.

135. The combination, of a pair of type
55 drums adapted to carry longitudinal rows of type, a continuous type channel between the drums, a pair of combs adjacent to the respective drums and adapted to feed a row of such type into the channel, means operating
60 in the channel and movable along it with the type advanced by a comb for limiting the advancement to a single type at a time.

136. In a duplicating machine, the combination of a supply drum and a printing

drum, each adapted to carry type, a rock
shaft, a member mounted thereon having a
pair of projecting lugs, followers for the
type, and mechanism adapted to be engaged
by said lugs to advance the followers.

137. In a duplicating machine, the combination with printing mechanism and supply
70 mechanism, means for transferring type from one mechanism to the other, and means for locking the transfer mechanism, and means for releasing such locking and thereby
75 locking the supply mechanism.

138. In a duplicating machine, the combination with printing mechanism and supply
mechanism, means for transferring type from one mechanism to the other, means for
80 normally locking the means mentioned, and means for releasing such lock and thereby locking one of said mechanisms.

139. In a duplicating machine, the combination of a pair of drums placed end to end,
85 a type channel between said drums, means for feeding type from either drum into said channel, means for normally locking the feeding means, means for releasing such lock and thereby locking one of the drums.

140. The combination of a supply member, mechanism adapted to feed the type therefrom, means for alternatively locking
90 said supply member and said feed mechanism, a finger key for operating said feed
95 mechanism, and an adjacent finger latch for controlling the locking mechanism.

141. The combination of a supply drum, type-feeding mechanism therefor, a rock
shaft for controlling the same, mechanism
100 preventing rotation of said rock shaft, means for moving said mechanism to a position to release the rock shaft, and means whereby such movement locks the supply
105 drum.

142. In a duplicating machine, the combination of a pair of drums placed end to end, a rock shaft between the drums, mechanism operated thereby for causing the
110 transfer of type from one drum to the other, a finger lever on the forward end of said rock shaft for rocking said shaft in one direction or the other, a latch lever pivoted below said finger lever and adjacent to it, an interlocking device normally locking the
115 rock shaft but movable by said latch lever to release the rock shaft and concurrently lock one of the drums in position.

143. In a combined setting and distributing and printing machine, the combination
120 of a font of type of individual characters which form a permanent part of the machine and are grooved on their sides and tapered transversely at their lower ends, of supply mechanism and printing mechanism,
125 each having undercut channels which such grooved type occupy, and means for engaging the beveled foot portion of such type to

regulate its passage between said mechanisms.

144. In a combined setting and distributing and printing machine, the combination of supply mechanism, printing mechanism, a font of type which form a permanent part of the machine and are beveled on their feet, feeding mechanism therefor adapted to advance a line of such type, and controlling mechanism adapted to engage between such beveled feet.

145. In a combined setting and distributing and printing machine, the combination of a font of type which form a permanent part of the machine and are grooved on their sides, of a supply drum and a printing drum placed end to end each having rails with overhanging edges providing channels which such grooved type occupy, any channel of one drum being adapted to aline with any channel of the other, and mechanism operating independently of each drum and adapted to convey type from one drum to the other without turning it.

146. In a duplicating machine, the combination of a pair of channeled drums placed end to end, a channel between them adapted to register with each drum, whereby type may be transferred from one drum to the other through such channel, and an additional channel at the opposite end of one of the drums adapted to register with a channel in the drum.

147. In a duplicating machine, the combination of mechanism for carrying a supply of type, printing mechanism adapted also to carry type, a continuous open type channel between said mechanisms, and means independent of the supply mechanism and the printing mechanism for feeding type through said channel from either of the mechanisms mentioned to the other.

148. In a duplicating machine, in combination, movable mechanism for carrying a supply of type, movable printing mechanism adapted also to carry type, a continuous stationary channel between said mechanisms, and means independent of the supply mechanism and the printing mechanism for feeding type from the supply mechanism through said channel to the printing mechanism and vice versa.

149. In a duplicating machine, the combination of a pair of rotatable channeled drums each adapted to carry type on its surface, a frame in which said drums are mounted, said frame having rigid end members at the ends of the drums and a rigid partition between the drums whereby both drums are held against longitudinal movement, and a stationary type channel between the drums.

150. In a duplicating machine, the combination of a pair of aimed, rotatable drums

of the same diameter mounted between rigid end frame members and on opposite sides of a rigid intermediate frame member, each of said drums having longitudinal type channels, a stationary type channel carried on the edge of the intermediate frame member and adapted to aline with any channel in either drum according to the positions of such drums, mechanism for feeding type from either drum into and along said channel, mechanism for engaging the type in the channel to control its advancement, and common operating means for both of said mechanisms, which means are mounted on said intermediate frame member.

151. In a duplicating machine, the combination of a pair of aimed horizontal rotatable drums of the same diameter mounted between rigid vertical end frame members and on opposite sides of a rigid vertical intermediate frame member, each of said drums having longitudinal type channels, a stationary type channel carried on the edge of the intermediate frame member and adapted to aline with any channel in either drum according to the positions of such drums, mechanism extending longitudinally over the two drums for feeding type from either drum into said channel, mechanism adapted to be projected between the type in the channel to control its advancement, a vertical rock shaft for operating said feeding mechanism, a horizontal rock shaft mounted on said intermediate frame member and extending to the front of the machine, operating connections between the vertical rock shaft and horizontal rock shaft and between the horizontal rock shaft and said mechanism for engaging type in the channel, and a finger lever on the forward end of said horizontal rock shaft for rocking it in either direction.

152. The combination of a pair of drums placed end to end, mechanism for feeding a type line in either drum toward the other, a rock shaft for operating said mechanism in either direction, a second rock shaft geared therewith, and finger mechanism on said second rock shaft for rocking it in either direction.

153. The combination of a pair of drums mounted end to end on opposite sides of an intermediate frame member, mechanism located longitudinally of the drums for feeding type in either drum toward the other, a rock shaft mounted on said intermediate member and having a finger key on its forward end, and an operative connection between said rock shaft and the feeding mechanism.

154. The combination of a pair of drums mounted end to end on opposite sides of an intermediate frame member, a type channel on said frame member, mechanism for feed-

ing type in either drum into said channel, a rock shaft mounted on said intermediate member and having a finger key on its forward end, an operative connection between said rock shaft and the feeding mechanism, and means also connected with said rock shaft for controlling the passage of type through said channel.

155. In a duplicating machine, in combination, printing mechanism, a gear thereon, a pinion adapted to engage said gear, means for rotating said pinion, a lever carrying said pinion, and a spring adapted to hold said pinion in engagement with the gear.

156. In a duplicating machine, in combination, a printing drum, means for rotating the same, a gear on said drum, a pinion adapted to engage said gear, a hand wheel for rotating said pinion, movable means carrying the pinion and hand wheel, said hand wheel having a series of depressions, and a spring-pressed plunger adapted to enter said depressions.

157. The combination of two typeholders, and mechanism for transferring at one operation a line of type from one to the other and for transferring such line by a series of operations, one for each type, said mechanism having means engaging each type successively in such series of operations.

158. The combination of supply mechanism, printing mechanism, a rock-shaft, means operated thereby to feed type from either mechanism toward the other, and finger levers on the forward end of said rock-shaft for rocking it in opposite directions.

159. The combination of a supply member adapted to carry type and adapted to be moved to bring characters into active position, an indicator marked to correspond to the characters in the supply member, a pointer adapted to travel with reference to the indicator, a cable connected with the pointer and the supply member, and means operating to keep said cable taut.

160. In a duplicating machine, in combination, a pair of drums, two passage-ways intermediate thereof, and a passage-way at the end of one of the drums alined with one of said intermediate passageways.

161. In a duplicating machine, in combination, a pair of drums, two passage-ways intermediate thereof, a passage-way at the end of one of the drums alined with one of said intermediate passageways, and a gate for closing one of said intermediate passageways.

162. In a duplicating machine, the combination of a pair of channeled members adapted to have at least one channel of each in alinement, an intermediate channel adapted to also aline, and a channel at the end of one of the members adapted also to aline,

whereby four channels may be brought into alinement.

163. In a duplicating machine, the combination of mechanism for carrying a supply of type, printing mechanism adapted also to carry type, a type channel between said mechanisms, mechanism for feeding type through said channel, and an additional type channel between the supply mechanism and the printing mechanism.

164. The combination of a supply member, a printing member, means for advancing a line of type in either toward the other, and a member entering between the type for separating from the line the type in advance of such member and for limiting the advancement of type behind such member.

165. The combination of a supply member, a printing member, means for engaging the rear end of a line of type carried in either member and shoving such line toward the other member and means for successively engaging and controlling the individual type of such line without turning them as they pass from one member to the other.

166. The combination of a channeled supply member, a channeled printing member, a stationary type channel between them, means for engaging the rear end of a line of type in one of said members and shoving such line toward the other member to cause the forward type to enter said channel, and means for engaging type individually in the channel to control the advancement thereof, whereby successive line advancements may cause a controlled transfer of individual type from one member to the other.

167. The combination of a rotatable channeled supply member, a rotatable channeled printing member, a stationary type channel between them, means for engaging the rear end of a line of type in one of said members and shoving such line toward the other member to cause the forward type to enter said channel, and means movable along the channel for engaging type individually in the channel to control the advancement thereof, whereby successive line advancements may cause a controlled transfer of individual type from any channel of one member to any channel of the other.

168. The combination of a pair of type holding members, means for feeding type from either member to the other and presenting it thereto with its character facing in the same direction, and movable mechanism engaging the individual type during the passage and controlling it.

169. In a duplicating machine, the combination of a supply drum, a printing drum, said drums being mounted end to end on opposite sides of a stationary plate and each being provided with parallel longitudinal

type-channels whose ends are normally closed by proximity to said plate, said drums being independently rotatable but held against longitudinal movement, and an intermediate stationary type channel adapted to aline with channels of both drums.

170. In a duplicating machine, the combination of a supply drum, a printing drum, said drums being mounted end to end on opposite sides of a stationary plate and each being provided with parallel longitudinal type-channels whose ends are normally closed by proximity to said plate, said drums being independently rotatable but held against longitudinal movement, whereby said channels may carry type lines whose forward individuals substantially engage said plate, a stationary type channel between the drums, and means for advancing a line in either drum a distance substantially equal to the thickness of a type to cause the end type opposite the channel to enter the same.

171. In a duplicating machine, the combination with a supply member, a printing member, a continuous open channel between them, and mechanism controlled by finger keys for feeding type from either member into one end of the channel through the channel and out of its other end into the other member.

172. The combination of two type-carrying members each having a plurality of typeholders, means defining a continuous open channel between them, and finger keys for feeding type from either member into the adjacent end of the channel and from the other end of the channel to the other member.

173. The combination of a type guide having a rib adapted to occupy a groove in a type, finger keys for feeding such type along the guide in either direction while the type is confined by said rib, and two type holding members opposite the ends of said guide respectively.

174. The combination of a type guide and finger keys for feeding type on to either end, and from either end thereof in a continuous course.

175. The combination with supply mechanism and printing mechanism, of a type guide between them, finger keys, and means controlled thereby for feeding the type from either of said mechanisms onto one end of said guide and from the other end of said guide to the other mechanism.

176. In a duplicating machine, the combination of a supply drum and printing drum, a continuous type channel between them, and finger keys for feeding type from either drum into one end of the channel and from the other end of the channel to the other drum.

177. The combination of a movable type carrying member, and a stop therefor, adapted to be engaged near the end of the movement of the member, said stop having a limited movement to allow some movement of the type carrying member after it engages the stop.

178. The combination of a rotatable drum adapted to carry type and a stop for the drum adapted to be engaged by it near the end of the drum's rotation, said stop having a limited movement to allow a portion of a rotation after engagement.

179. In a duplicating machine, the combination of mechanism for carrying a supply of type, printing mechanism adapted also to carry type, a passageway therebetween, and a gate adapted to close the same.

180. The combination of two type-carrying mechanisms, a type guide between them, mechanism for advancing a line of type in either type carrying mechanism toward said guide, a limiting finger adapted to engage the type on said guide and move with the type and then withdraw from its path, and a finger key for operating both the advancing mechanism and the limiting finger.

181. The combination of a rotary type-holding supply drum, a rotary printing drum, a continuous channel between said drums, means for feeding the type from one drum to the other along said channel, means for controlling the feed to prevent transferring more than one type at a time, and finger mechanism for conjointly operating both the feeding and controlling means.

182. The combination of a movable type supply member, a movable printing member, a continuous channel between said members, means for feeding the type from one member to the other along said channel, means adapted to engage type in the channel to prevent transferring more than one type at a time, means for inking the type on the printing member, and a rotary under-running impression platen cooperating with said printing member.

183. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from one mechanism to the other with its character standing in the same direction, finger keys for operating the feeding mechanism, and an impression platen cooperating with the printing mechanism.

184. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism adapted also to carry type, feeding mechanism adapted to convey type from one mechanism to the other with its character standing in the same direction, means to prevent over feed

by momentum, finger keys for operating said feeding mechanism and the preventing means in either direction, means for inking the type on the printing mechanism and an impression platen cooperating with the printing mechanism.

185. In a duplicating machine, in combination, mechanism for carrying a supply of type, printing mechanism also adapted to carry type, a type channel, a limiting device, and a pair of finger keys for giving it movement to engage type in the channel and move with it on its advancing side a distance equal to the thickness of one type in either direction.

186. In a duplicating machine, the combination of mechanism for carrying a supply of type, a printing drum, a support for the type leading from the supply to the drum, feeding mechanism acting to advance the type along said support without turning the type, means for limiting the advancement to a single type at a time, a finger key for operating both the feeding mechanism and the limiting means, an inking ribbon carried by the printing drum, and an under-running rotary impression platen.

187. In a duplicating machine, the combination with type having beveled feet, of a supply for the type, printing mechanism, a channel leading from one to the other, mechanism adapted to enter between the feet of the type to prevent oversetting, and means on the printing mechanism to take the pressure off the feet of the type.

188. The combination, with individual type having beveled feet, of a printing mechanism formed with means to engage the type between their faces and feet and carry such type with the printing pressure off the feet, and type-feeding mechanism having a member to engage between the beveled feet.

189. In a duplicating machine, the combination with a font of detached type, the individuals of which are the same thickness and have beveled feet, of means for advancing the type limiting mechanism engaging the beveled feet, a finger key for controlling the advancing and limiting mechanisms, means for printing with such type, and means for keeping the pressure off the feet during printing.

190. The combination of supply mechanism, printing mechanism, a continuous type channel between them, feeding means adapted to advance the type along said channel from one of said mechanisms to the other, a finger key for operating said feeding means, a latch for locking the finger key, and a lock for the supply mechanism engaged by the releasing movement of said latch.

191. The combination of a movable supply mechanism, a movable printing mechanism, a continuous open channel between them,

means for feeding type along said channel, a finger key for controlling said means, and an interlock between such finger key and said mechanism.

192. The combination, with a font of transferable individual type, of typeholding mechanism, type feeding mechanism, a finger key therefor, and an adjacent finger-actuated latch for the key adapted for concurrent manual engagement and operation therewith.

193. The combination of type holding mechanism adapted to hold free type, a finger key, mechanism operated thereby to move the type, and an adjacent finger latch for the finger key, the latch and key being relatively positioned for concurrent actuation by the same hand.

194. The combination of type holding mechanism, a finger key, mechanism controlled thereby for moving the type, a latch for the finger key, and a lock for the type holding mechanism engaged by the movement of the latch to release the key.

195. The combination of supply mechanism, printing mechanism, a rock-shaft, means operated thereby to feed type from either mechanism toward the other, a finger lever for rocking said rock shaft, and a finger latch adapted to alternately release the rock shaft and lock the supply mechanism.

196. The combination of supply mechanism, printing mechanism, a pair of finger keys, means operated thereby to feed type from either mechanism toward the other, respectively, and a single-locking finger latch common to both keys.

197. The combination of a supply member adapted to carry type and adapted to be moved to bring characters into active position, an indicator marked to correspond to the characters in the supply member, a pointer adapted to travel with reference to the indicator, a cable connected with the pointer and the supply member, and a spring barrel to which the other end of said cable is connected.

198. In a duplicating machine, the combination of a supply drum, a printing drum, said drums being mounted end to end, a longitudinal chart extending over the two drums, a cable extending along said chart and connected with a sheave on the far end of the supply drum, and a pointer moved by the cable.

199. In a duplicating machine, the combination of a supply mechanism, and a printing mechanism each adapted to carry longitudinal lines of type, a type channel between said mechanisms, a type channel leading from outside the machine to the supply mechanism, whereby type may be shoved from outside the machine onto the supply mechanism and thence to the printing mechanism.

anism, and means for closing said last mentioned channel.

200. The combination of supply mechanism, printing mechanism, a type guide between them, means for transferring type along said guide, and a second guide for hand transfer between said mechanisms.

201. The combination of supply mechanism, printing mechanism, a type guide between them, means for transferring type along said guide, and a second guide for hand transfer between said mechanisms, and means for normally closing said last mentioned guide.

202. The combination of supply mechanism, printing mechanism, a type guide between them adapted to connect aligned typeholders on the two mechanisms, and a closure for said guide operatable when the typeholders are aligned therewith.

203. The combination of a rotary printing drum carrying a gear, a pinion adapted to engage said gear, a hand wheel for rotating the pinion, means for holding the pinion against free rotation to lock the gear meshing therewith, and means for moving the pinion out of engagement with the gear.

204. The combination of a rotary printing drum carrying a gear, a movable member, a pinion carried thereby and adapted to be held in engagement with said gear or out of engagement therewith, means for rotating the pinion and means for holding the pinion against free rotation to lock the gear meshing therewith.

205. The combination of a type carrying member having parallel spaced line holders and correspondingly spaced teeth, a pinion adapted to engage such teeth and by its rotation feed said member, a hand wheel for rotating the pinion, and a detent engaging the hand wheel to periodically resist its rotation, whereby the type carrying member is locked against accidental displacement.

206. The combination of a type-carrying member, means including a rotatable hand wheel adapted to give the same periodic advancement, means for moving the hand wheel bodily to disengage its connection with the type-carrying member, and a spring detent periodically resisting said hand wheel against rotation.

207. The combination with a type-carrying member, a pivoted arm, means carried by said arm for advancing said member, and a spring detent carried in the pivot of said arm and acting on said means.

208. The combination of a type-carrying member, a pivoted arm, a shaft journaled therein and carrying a pinion and hand wheel, said pinion being adapted to advance said member, and a spring-pressed plunger carried axially of the pivot of said

arm and engaging intermittent shoulders on the hand wheel.

209. The combination of a member carrying a plurality of parallel typeholders and a set of teeth spaced correspondingly, a pinion for engaging such teeth, a bearing for the pinion, and a movable member carrying such bearing and adapted to hold the pinion in active or inactive position.

210. The combination of a type-carrying member, a pinion adapted to engage therewith, whereby the rotation of the pinion may feed such member, a hand wheel for rotating the pinion, a movable member for moving the pinion to active or inactive position, and a detent device for periodically resisting the rotation of the pinion.

211. The combination of a type carrying member, a rotary platen geared thereto, a pinion adapted to gear with the type carrying member, a shaft for the pinion, a movable member in which the shaft is mounted, whereby the pinion may be moved to active or inactive position, and a detent device for periodically resisting the rotation of the pinion.

212. The combination of a type-holding drum having a sheave, an indicator having a movable member, a spring barrel, and a flexible member connected at one end to the spring barrel, at the other to the sheave, and intermediately, to the movable member of the indicator.

213. The combination, with typeholding mechanism, of a finger key, mechanism operated thereby for moving type in the typeholding mechanism, and a movable finger latch for locking the key positioned adjacent thereto and adapted to be operated by one digit of the operator's hand while another digit of the same hand engages the finger key.

214. The combination of typefeeding combs, finger actuated mechanism for operating the same, and a controlling finger latch.

215. The combination of typeholding mechanism, type-feeding mechanism, a rock shaft for operating the latter, finger keys on the rock shaft, and a finger latch for controlling the operation of the finger keys.

216. The combination of a type supply mechanism, a printing mechanism, means for feeding type from one to the other, and a finger-operated latch for controlling the feed.

217. The combination of a type supply mechanism, a printing mechanism, a type channel between them, mechanism for feeding type along said channel in either direction, and a finger latch for controlling the feed.

218. The combination of a movable type-

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holding mechanism, finger operated feeding mechanism, and a latch to alternately lock either of said mechanisms and release the other.

5 219. The combination of a movable typeholder, a movable type feeder, a finger latch for controlling the latter, and an interlock alternately acting between the finger latch and the typeholder and between the finger
10 latch and the type feed.

220. The combination of a typeholder, type feeding mechanism, a rock shaft for operating the same, and an interlocking device adapted to lock alternately the type-
15 holder and the rock shaft.

221. The combination of means for holding a line of type, mechanism for advancing such line as a whole, mechanism for engaging the forward type in the line to separate
20 it in the direction of the advancement, and a rock shaft for controlling such mechanisms.

222. The combination of two type holders, and means for feeding a line of type at
25 a single operation from one holder to the other and for feeding the forward type in such line by itself from one holder to the other and automatically limiting the feed to such single type.

30 223. The combination of mechanism adapted to hold a plurality of lines of type, a type holder, and means for feeding at one operation whole lines from the holder to the mechanism and for engaging the
35 foremost type for feeding at one operation only the foremost type in the holder.

224. The combination of a rock shaft, a pair of finger keys on the end thereof adapted to rock it in one direction or the
40 other, and means for feeding type controlled by such rocking.

225. The combination of a rock shaft, a finger key thereon, and means for feeding type from either of two directions toward
45 an intermediate point, said means being controlled by opposite rockings of said rock shaft.

226. The combination of mechanism adapted to hold a plurality of lines of type,
50 a typeholder, and means for feeding at one operation a line of type between the holder and mechanism and for feeding at one operation only the foremost type in such line and for automatically limiting the feed to
55 such single type.

227. The combination of two mechanisms for holding lines of type, mechanism for advancing the type in either holder toward
60 the other, a rock shaft for controlling such mechanism, and a pair of finger keys or levers on said rock shaft.

228. The combination of a rock shaft, assemblage mechanism actuated by rocking

the shaft in one direction, distributing mechanism actuated by rocking it in the 65 other direction, a spring tending to center said shaft in an intermediate position and a finger key for operating the rock shaft.

229. The combination, with individual type having beveled feet, of means adopted 70 to enter between the bevels of adjacent type in a row, to separate them, and move with them a limited distance in the direction of the length of the row.

230. The combination with type having 75 beveled feet, mechanism for feeding such type, and means adapted to enter between the feet of the type to control the feed.

231. The combination with type having beveled feet, mechanism for advancing a 80 line of such type, and means adapted to enter between the feet of the type to control the feed.

232. The combination with type having beveled feet, means for advancing a line 85 thereof, means to engage such feet and prevent over-advancement, and a rock shaft for controlling both means.

233. The combination with type having beveled feet, means for advancing a line 90 thereof, means to engage such feet and prevent over-advancement, and finger keys for actuating both means.

234. The combination of a storage member, a printing member, mechanism for 95 moving type from either to the other, such type having beveled feet, and mechanism adapted to engage between the feet of the type to control the transfer.

235. In assemblage and distribution mechanism, the combination with a font of type having beveled feet, of storage mechanism therefor, means for feeding the same from the storage mechanism including means which engage the beveled feet and move 105 with the type, and a finger key for controlling such means.

236. The combination of a railed structure having parallel rails with overhanging edges adapted to hold parallel rows of 110 grooved type arranged about an axis, means for turning such structure about such axis, a stationary member opposite the end of the railed structure having a recess, and a movable split tube adapted to seat in such recess and have its portions adjacent to the 115 split a line with the adjacent overhanging edges of adjacent rails and carry a plurality of type adapted to be slid to or from the railed structure.

237. The combination of a structure having parallel rails with overhanging edges providing under cut channels adapted to hold rows of type grooved on their opposite 120 sides and arranged about an axis, means for turning such structure about such axis, 125

means adjacent to one end of the railed structure provided with a recess, and a type-holding device having parallel guiding edges formed to occupy the grooves of type 5 grooved on their opposite sides, said type-holding device being adapted to occupy said recess with its channel in alinement with any channel between the rails, whereby type may be shoved by continuous movement from the holding device to any channel or vice versa.

238. The combination, with a rotatable shaft, mechanism thereon, formed to hold parallel overhanging rails which may be moved by the rotation of the shaft, a type-holding device comprising a split tube formed to hold a plurality of contiguous type, a stationary device for holding said tube in presentation to the railed structure, the adjacent rails and the edges of the split tube being adapted to enter grooves formed in the opposite sides of each type.

239. The combination of a horizontal shaft, a series of parallel rails held equidistantly about the shaft to provide a drum-like typeholder, and an end member having a recess and a split tube for holding a plurality of type in alinement, said tube being adapted to occupy the recess and be held thereby with its channel in alinement with the channel between adjacent rails.

240. The combination, with a rotatable shaft, of a series of rails held about the shaft and parallel with it to provide a drum-like typeholder, an end member on which the shaft is mounted, means on the opposite side of the end member from the drum for turning the drum, a transverse recess formed in the edge of the end member, and a typeholder adapted to seat in such recess and aline with the channel of the drum, whereby type may be brought by a continuous movement from the outside of the machine onto the drum.

241. The combination, with a movable railed structure adapted to hold parallel rows of grooved individual type arranged about an axis, means for turning such structure about such axis, a typeholder in the form of a split tube, and means for holding such typeholder with its channel in alinement with the channel between adjacent rails.

242. The combination, with a multi-channeled typeholder consisting of a plurality of equidistant rails with overhanging edges arranged parallel with each other, the adjacent rails being adapted to confine a row of type grooved on their opposite sides, a tubular typeholder having a slot parallel with its axis, the walls of the typeholder adjacent to the slot being adapted to enter the grooves of the type and the body of the tubular typeholder standing continuously beneath the

feet of the type, and means for positioning such typeholder with reference to the railed member.

243. The combination, with a multi-channeled typeholder consisting of a plurality of equidistant rails with overhanging edges arranged parallel with each other, the adjacent rails being adapted to confine a row of type grooved on their opposite sides, a tubular typeholder having a slot parallel with its axis, the walls of the typeholder adjacent to the slot being adapted to enter the grooves of the type and the body of the tubular typeholder standing continuously beneath the feet of the type, and stationary means adapted to engage the outside of such tube and hold it with the walls adjacent to the slot alining with the adjacent overhanging portions of adjacent rails.

244. The combination, with a multi-channeled typeholder composed of a series of parallel rails with edges overhanging in both directions whereby each rail forms the wall of two adjacent channels, a cooperating typeholder comprising a tube having a slot parallel with its axis, the edges of the tube on opposite sides of the slot being adapted to aline with the adjacent overhanging portions of adjacent rails whereby type may be shoved by continuous movement from said holder into the channel provided by adjacent rails.

245. The combination, with a pair of frame members, of a rotatable horizontal shaft mounted therein, parallel rails held in the form of a drum about said shaft, means for turning the shaft and thereby moving the rails, a notch in the edge of one of the frame members adjacent to the rails, and a typeholder in the form of a split tube adapted to seat in such recess and enable grooved type held by the edges adjacent to the split to be shoved by a continuous movement onto the railed structure.

246. The combination, of a rotary printing drum, rails on the drum adapted to hold between them rows of grooved type, upright frame plates between which the drum is mounted, a recess in the edge of one of the frame plates adjacent to the path of travel of the rails, and a split tube adapted to occupy such recess and having its edges aline with the edges of the typeholding rails on the drum.

247. The combination, with a rotary printing drum, a rotary supply drum, said drums being mounted end to end, means for guiding the type from the supply drum to the printing drum, and means for guiding type from outside of the machine to the supply drum.

248. In a machine of the character described, the combination of a rotatable drum carrying rails on its surface adapted to hold

parallel lines of type, two guiding channels leading to the space between the rails on the drum, means for limiting the feed through one channel to one type at a time, the other channel allowing a continuous feed.

249. The combination of a rotary printing drum carrying on its surface parallel rails, two means for passing type to the drum, one

a type at a time and the other a line at a time.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HARRY C. GAMMETER.

Witnesses:

ALBERT H. BATES,

E. L. THURSTON.