

May 30, 1944.

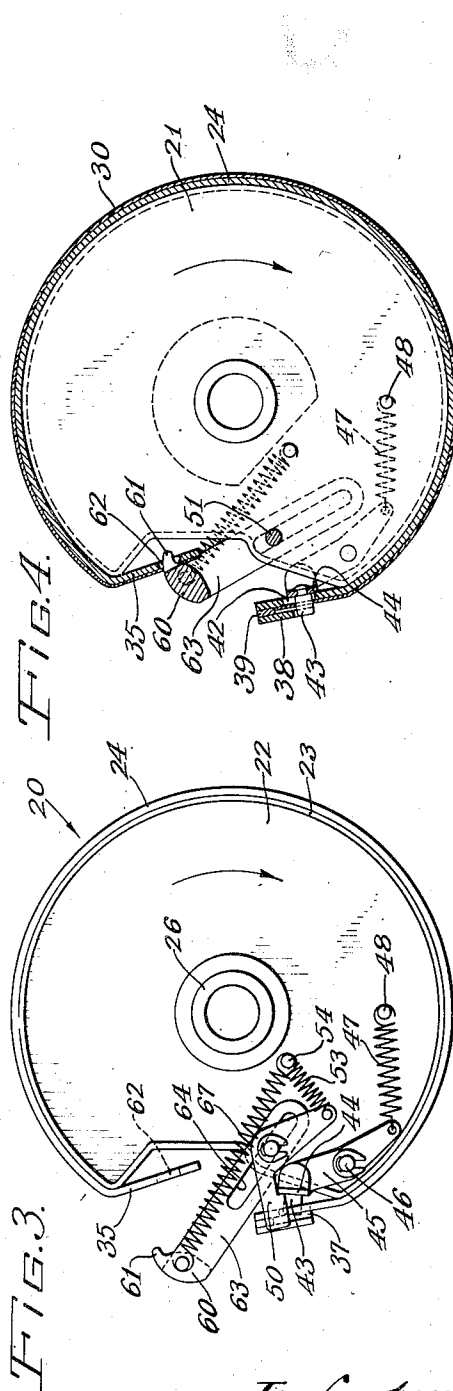
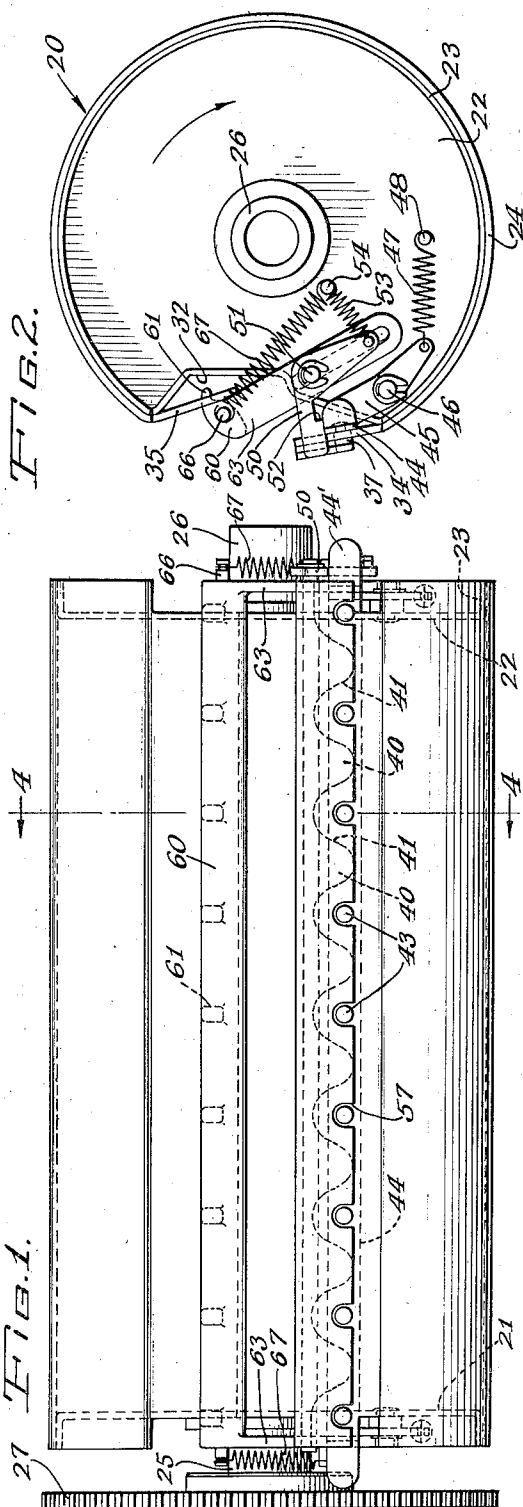
F. E. CURTIS

2,350,016

PRINTING MACHINE

Filed Aug. 15, 1942

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

FIG. 5.

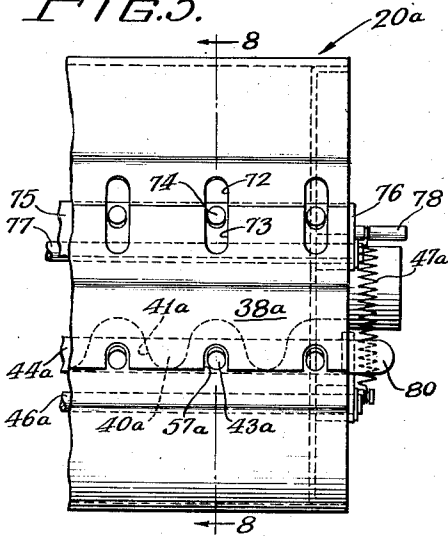


FIG. 6.

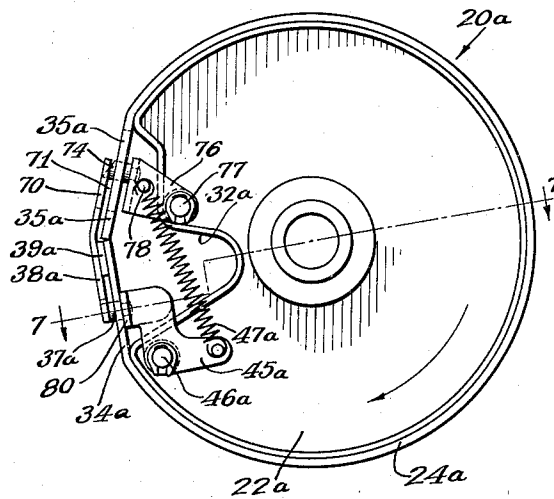


FIG. 7.

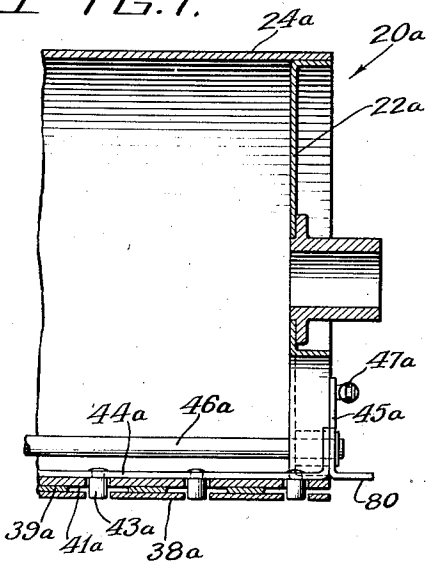


FIG. 8.

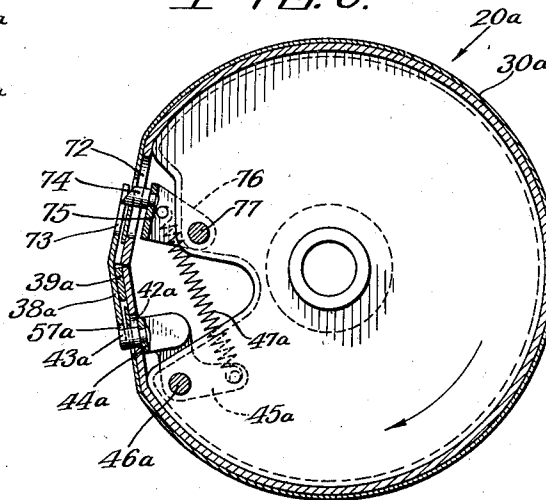


FIG. 9.

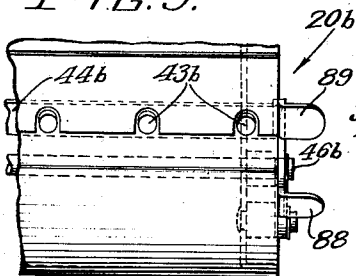
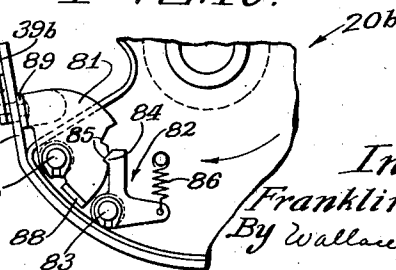


FIG. 10.



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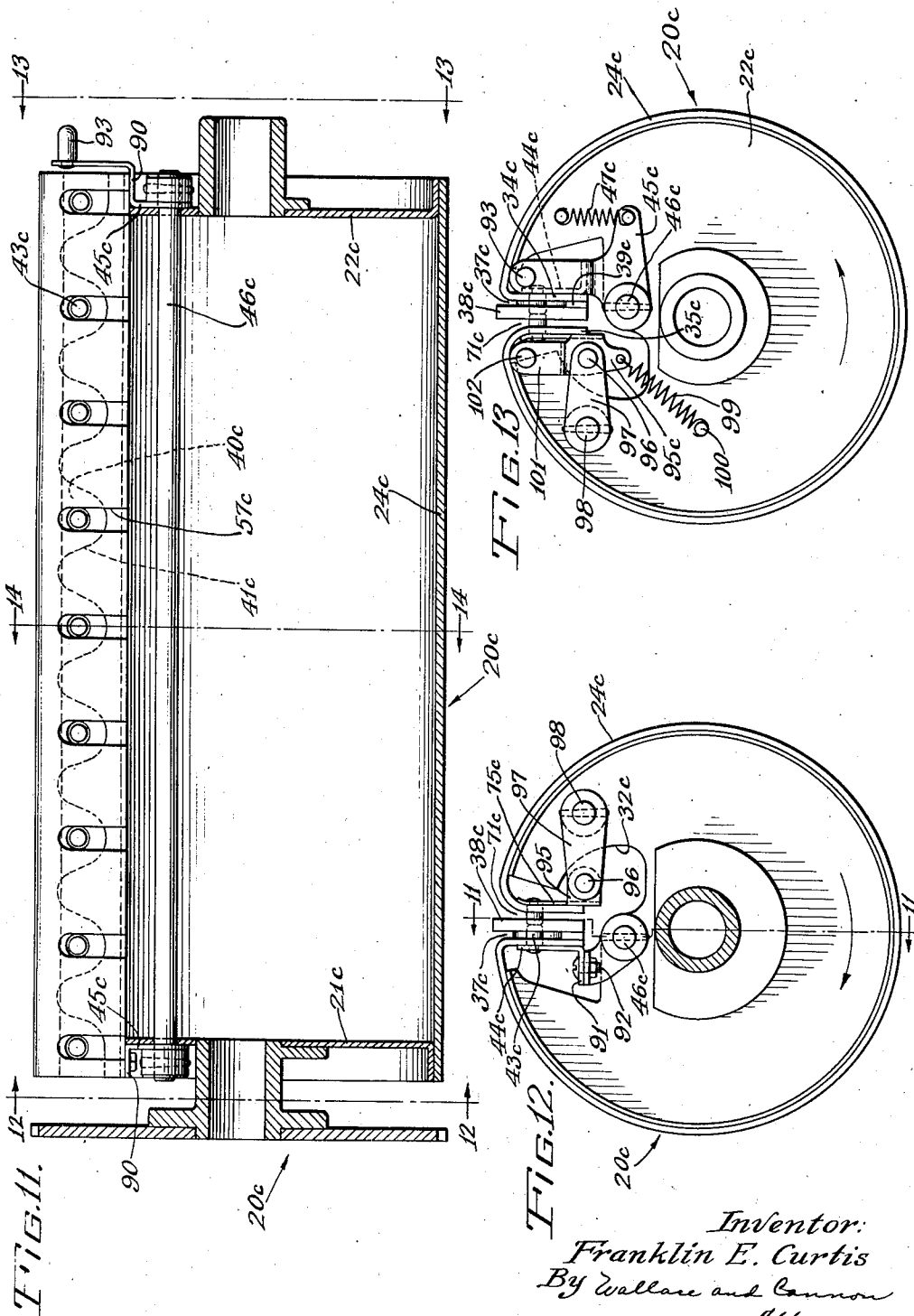
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4 Sheets-Sheet 3



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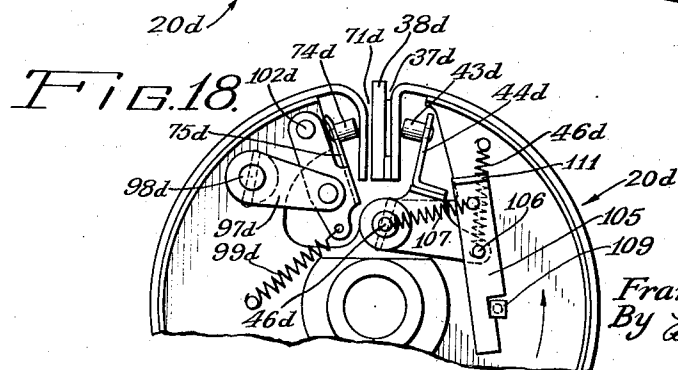
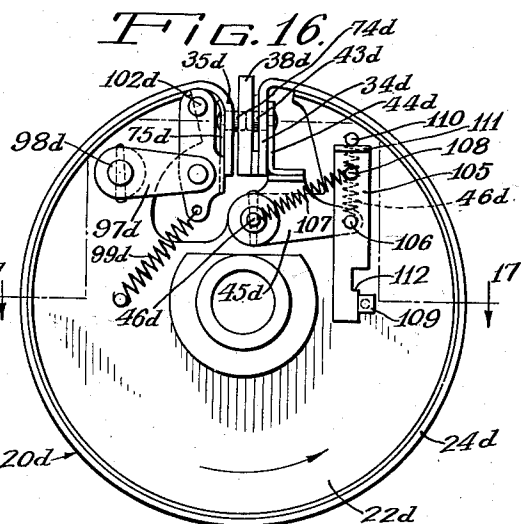
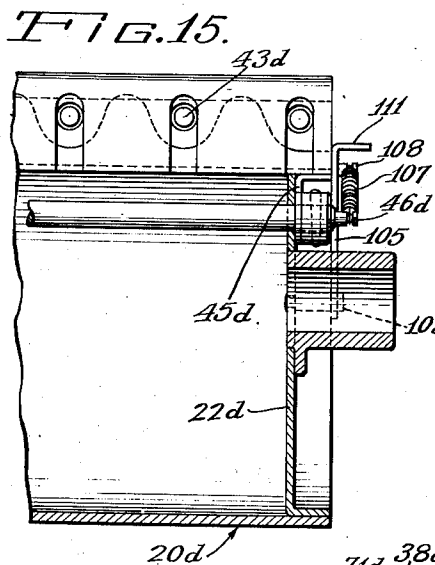
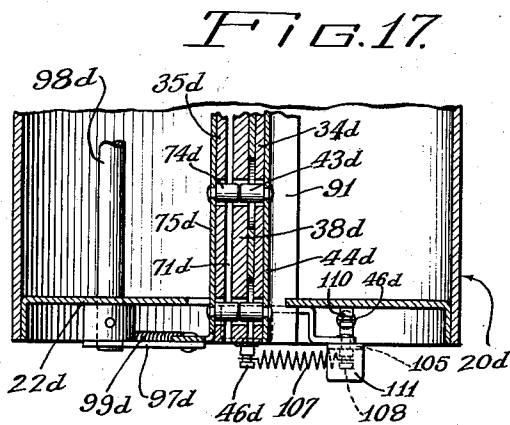
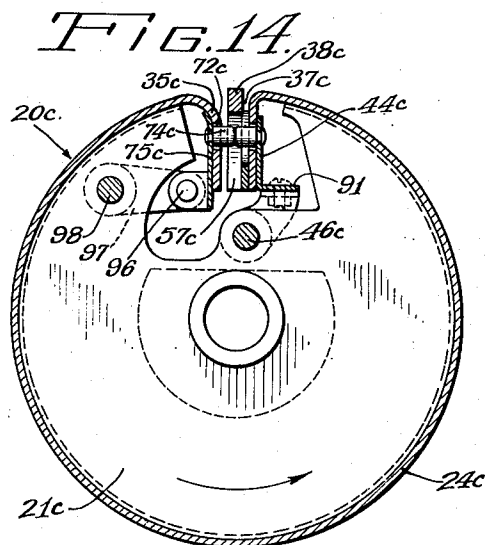
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2,350,016

PRINTING MACHINE

Filed Aug. 15, 1942

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,350,016

PRINTING MACHINE

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Addressograph-Multigraph Corporation, Wil-
mington, Del., a corporation of Delaware

Application August 15, 1942, Serial No. 454,925

20 Claims. (Cl. 101—415.1)

This invention relates to printing machines and particularly to rotary printing machines wherein a master sheet bearing the image which is to be reproduced is mounted on the periphery of a drum.

Printing machines of the kind to which this invention relates may be of many different types, for such rotary printing machines employ the direct image lithographic process, the offset lithographic process, or the spirit duplicator process. However, in these various types of rotary duplicating machines the master sheet which carries the image which is to be reproduced is mounted upon the periphery of a drum which is driven in timed relation to the other rotary members of the printing machine, and satisfactory operation of machines of this general character is dependent in large measure upon the proper mounting of the master upon the supporting drum. In the past it has been relatively difficult to attain such proper mounting without the loss of considerable time in the performance of the mounting operation, and accordingly it is an important object of this invention to simplify the mounting of such a master sheet upon the drum of a printing machine. An object related to the foregoing is to incorporate the mounting or securing means as permanent parts of the drum, and to so form and relate the securing means to the drum as to enable the operator of such a machine to utilize both hands in the initial positioning of the master with relation to the drum, thereby to insure that the master will be secured in the proper relation on the drum. A further object is to enable the securing means for the leading edge of a master to be latched in a released or inactive position so that when the operator has properly located the master with respect to the drum, and to so arrange the latch that it may be released so that the securing means will move immediately to its operative position. A further and related object of this invention is to simplify the movements which must be performed by the operator in the course of a mounting operation, and to so correlate these required movements that proper positioning of the master on the mounting drum is facilitated.

In clamping devices which have heretofore been used in rotary printing machines of the character to which this invention pertains the devices for securing the master upon the drum have occupied a considerable portion of the periphery of the drum and a further object of

this invention is to reduce the space which is required for such securing means so that a larger proportion of the periphery of the drum may be utilized as an impression surface of the drum.

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

In the drawings:

20 Fig. 1 is an elevational view of a mounting drum adapted for use in a rotary printing machine and embodying one form of the invention;

Fig. 2 is an end elevational view showing the right hand end of the mounting drum illustrated in Fig. 1;

25 Fig. 3 is an elevational view similar to Fig. 2 showing the securing elements in their released positions;

30 Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 1 and illustrating the securing devices in their operative relation to a master extended about the periphery of the drum;

35 Fig. 5 is a fragmental elevational view of a mounting drum adapted for use in rotary printing machines and embodying an alternative form of the invention;

Fig. 6 is an elevational view showing the right hand end of the drum illustrated in Fig. 5;

40 Fig. 7 is a fragmental sectional view taken substantially along the line 7—7 of Fig. 6;

Fig. 8 is a transverse sectional view taken substantially along the line 8—8 of Fig. 5;

45 Fig. 9 is a fragmental view similar to Fig. 5 and illustrating an alternative embodiment of the invention;

Fig. 10 is a fragmental elevational view illustrating the right hand end of the mounting drum shown in Fig. 9;

50 Fig. 11 is a longitudinal sectional view of a mounting drum embodying another alternative form of the invention, the view being taken substantially along the line 11—11 of Fig. 12;

Fig. 12 is a sectional view taken substantially along the line 12—12 of Fig. 11;

Fig. 13 is an end elevational view taken from the position indicated by the line 13—13 in Fig. 11;

Fig. 14 is a cross sectional view taken substantially along the line 14—14 in Fig. 11;

Fig. 15 is a fragmental sectional view similar to Fig. 11 and illustrating a further embodiment of this invention;

Fig. 16 is an elevational view showing the right hand end of the mounting drum illustrated in Fig. 15;

Fig. 17 is a fragmental sectional view taken substantially along the line 17—17 in Fig. 16; and

Fig. 18 is a fragmental view similar to Fig. 16 and illustrating the securing devices in their released positions.

In Figs. 1 to 4 of the drawings the invention is illustrated as embodied in a cylindrical mounting drum 20 which may form part of a rotary printing machine of any of the various types such as direct lithographic printing machines, offset lithographic printing machines or the spirit duplicator machines. The mounting drum 20 has disk-like end walls 21 and 22 which are outwardly flanged as at 23 for the mounting of a generally cylindrical outer supporting wall 24 thereon, the supporting wall 24 being relatively rigid and being secured at opposite edges to the flanges 23 of the end walls 21 and 22. The end walls 21 and 22 have axial stub shafts 25 and 26 projecting outwardly therefrom so that the drum may be rotatably supported in suitable bearings in a printing machine, and the shaft 25 has a driving gear 27 thereon whereby the mounting drum 20 may be driven in timed relation to the other parts of the printing machine.

In the use of a mounting drum 20 in a rotary printing machine of any of the aforesaid types, a master sheet 30 bearing the image to be reproduced is secured in a position about the peripheral mounting or impression surface afforded by the generally cylindrical wall 24, and one or both of the opposite end edges of the master 30 are secured in position on the drum so that the intermediate portions of the master are accurately located upon the impression surface of the generally cylindrical wall member 24. The master 30 may be made from different materials such as paper or various kinds of metal, and in accordance with the present invention means are provided on the drum 20 whereby the mounting of the master 30 on the drum 20 may be accomplished in a simple and expeditious manner. In order that this result may be accomplished the end walls 21 and 22 are recessed inwardly as at 32 so that one end of the generally cylindrical wall 24 may be bent inwardly to afford a flange 34, while the other end of the wall 24 may be bent inwardly to afford a flange 35. This arrangement positions the flanges 34 and 35 of the wall 24 radially inwardly of the drum 20, thereby to interrupt the cylindrical impression surface of the drum longitudinally thereof, and securing means for fastening the master 30 in position on the drum are disposed on the drum so as to operatively engage the master 30 in the clearance space which is thus afforded.

The drum 20 as herein shown is adapted when in use to be rotated in the direction indicated by the arrows in Figs. 2 to 4 so that the end edge of the master 30 which is located adjacent to the flange 34 constitutes the leading edge of the master 30, and the portion of the master which is disposed adjacent to the flange 35 constitutes the trailing edge of the master 30. The securing

means as herein shown are particularly adapted for use with a master 30 having a scalloped leading edge formed which provides a series of projecting ears thereon as disclosed in the Allen and Hartley Patent No. 1,967,221, patented July 24, 1934, and the end of the flange 34 is therefore formed to provide a slot 37 to receive the leading edge of a master 30 of this character. Thus an outer plate 38 and a spacer plate 39 are secured against the outer face of the portion 34, and the spacer plate 39 has the edge thereof which lies within the slot 37 formed with a plurality of rounded ears 40 so arranged that intermediate the ears 40 a series of spaced recesses 41 are afforded. The recesses 41 are arranged to receive the ears which are formed on the leading edge of the master 30 and, as disclosed in the aforesaid Allen et al. patent, these ears each have an opening therein which may be engaged to secure the leading edge of the master in place. The flange 34 has openings 42 therein so disposed as to be substantially aligned with the openings in the ears of a master when the master is in place with the ears thereof in the slot 37, and after the leading edge of the master 30 has been inserted into the slot 37 so that the ears on the master 30 are located in the recesses 41, a plurality of securing members or pins 43 are projected through the openings 42 into the recesses 41 of the slot 37 and through the openings formed in the ears of the master 30. In the present instance pins 43 are mounted at appropriate intervals along a mounting or carrier bar 44, and at its opposite ends the mounting bar 44 is supported on the corresponding ends of levers 45. The levers 45 are pivoted at 46 on the end walls 21 and 22, the pivots 46 being disposed intermediate the ends of the mounting levers 45. The other ends of the two levers 45 have springs 47 connected thereto and these springs are anchored on pins 48 so as to urge the levers and the bar 44 toward the position shown in Figs. 2 and 4, the pins 43 in this position being located so as to extend through the recesses 41 of the slot 37.

When a master 30 is to be mounted in position on the drum 20 the mounting bar 44 is shifted inwardly of the drum 20 from the position shown in Fig. 2 to the position shown in Fig. 3 thus withdrawing the pins 43 from the recesses 41, and in accordance with the present invention means are provided for latching the carrier bar 44 in the inactive position of Fig. 3 so that the operator may readily utilize both hands in attaining the desired positioning of the master 30 with relation to the drum 20. In the present instance the releasing movement of the carrier bar 44 is attained by manual engagement of a projecting finger piece 44', such a finger piece being provided in the present instance on both ends of the bar 44. When the carrier bar 44 has been moved to its released or inactive position, the right hand one of the finger pieces 44' is engaged by latch means. In the present instance this latch means is in the form of a bell crank 50 mounted on a pivot pin 51 on the end wall 22 of the drum, the bell crank 50 having one arm 52 arranged to ride upon an edge of the finger piece 44' as shown in Fig. 2 of the drawings. A spring 53 acting between an anchoring pin 54 and the other arm of the bell crank 50 serves to hold the first mentioned arm 52 of the bell crank against the finger piece 44', and when the carrier bar 44 is pushed inwardly as aforesaid, the spring 53 pivots the latch 50 so that a latching shoulder 55 on the arm 52 thereof engages the

outer face of the carrier bar 44 to latch the same in its inactive position of Fig. 3.

After the carrier bar 44 has thus been latched in its inactive position, the operator may insert the ears on the forward or leading edge of the master 30 into the recesses 41, and after the master has been accurately located in position by engagement of the complemental positioning surfaces afforded by the ears on the master and by the recesses 41, the operator may hold the master with the left hand and may actuate the arm 52 of the latch member 50 in an upward direction as viewed in Fig. 2, thereby to unlatch the carrier bar 44 so that its operating spring 47 may actuate the carrier bar 44 and project the pins 43 thereof into the slot 37 and through the openings in the leading edge of the master 30. In such movement the pins 43 move into clearance openings or notches 57 which are provided in the plate 38.

After the leading edge of the master 30 has thus been secured in position the drum 20 is rotated to substantially a complete revolution so as to extend the master about the drum 20 with the trailing edge thereof adjacent to the portion 35 of the outer wall 24. In many rotary printing machines such as those operating on the lithographic principle, it is desirable to secure the trailing edge of the master in position so as to tension the master about the impression surface of the drum, and is herein shown, the drum embodies means for so securing the trailing edge of the master 30 in position on the drum 20. As illustrated in Figs. 1 to 4, these means comprise a bar 60 having projecting teeth 61 formed thereon at spaced points for projection through complemental openings formed in the trailing edge of the master 30, and when the bar 60 is in the operative position shown in Fig. 4, the teeth 61 extend through clearance openings 62 formed in the flange 35 of the wall of the drum. The bar 60 has arms 63 at its opposite ends which extend in parallel relation to each other along the opposite end walls 21 and 22, and the arms 63 have slots 64 formed longitudinally thereof and embracing the projecting ends of the pin or rod 51. Anchoring pins 66 extend from the mounting bar 60 at its opposite ends and have springs 67 connected thereto, and the other ends of the spring 67 are connected to the anchoring pins 54 so that the springs 67 tend to rock the arms 63 and the bar 60 to the position shown in Figs. 2 and 4. It will be observed that the springs 67 also tend to shift the arms 63 longitudinally from the position shown in Figs. 3 to the position shown in Fig. 4. Thus when the trailing end edge of a master 30 has been located as aforesaid in a position adjacent to the flange 35, the bar 60 is withdrawn to the position of Fig. 3 so that the trailing end of the master 30 lies between the bar 60 and the flange 35. The bar 60 is then released so that the teeth 61 thereof may engage the outer face of the master 30 and as the springs 67 draw the clamp bar toward the position of Fig. 4, the teeth 61 enter the openings in the trailing edge of the master 30 and draw the master in a counterclockwise direction as viewed in Fig. 4 so that the master 30 is tensioned and is thereby firmly engaged with the impression surface of the drum.

In the form of the invention illustrated in Figs. 5 to 8 of the drawings the invention is embodied in a printing machine drum 20a having a generally cylindrical outer wall 24a mounted on end walls such as the end wall 22a. The end walls

such as the end wall 22a are recessed as at 32a and the ends or adjacent edges of the outer wall 24a are bent inwardly to form flanges 34a and 35a. It will be observed that the two flanges 34a and 35a are arranged so that their adjacent edges are in substantial abutment, and means for securing the opposite ends of a master 30a in position about the interrupted impression surface of the drum 20a are associated with the flanges 34a and 35a. To this end an outer plate 38a and a spacer plate 39a are mounted on the flange 34a to form a slot 37a into which the leading edge of a master 30a may be inserted by endwise movement of the master. The spacer plate 38a is formed with spaced ears 40a between which rounded recesses 41a are afforded to receive the complemental ears formed on the leading edge of the master 30a as disclosed in the aforesaid Allen et al. patent. The flange 34a has spaced openings 42a therein while the outer plate 38a has openings 57a in the form of notches which are substantially aligned with the openings 42a, and thus a plurality of anchoring pins 43a carried at appropriate points on a carrier bar 44a may be moved through the aligned openings and into and out of the recesses 41a of the slot 37a. To provide for such movement of the anchoring pins 43a the carrier bar 44a is mounted on corresponding arms of a pair of bell crank levers 45a, the bell crank levers being so disposed on the carrier bar 44a that the bell crank levers may be pivotally supported adjacent to the outer face of the end walls of the drum by the projecting ends of a pivot shaft 46a. A spring 47a acts on the other arm of the bell cranks 45a so as to urge the carrier bar to its active position wherein the pins 43a thereof extend through at recesses 41a of the slot 37a.

In this form of the invention the outer plate 38a is extended as at 70 so as to lie in spaced relation to the flange 35a, thereby to provide a slot 71 into which the trailing edge of the master 30a may be inserted. The flange 35a has a plurality of slots 72 formed therein and corresponding openings in the form of notches 73 are formed in the portion 70 of the plate 38a in alignment with the slots 72. A plurality of tensioning pins 74 are mounted at spaced points along a carrier bar 75 so that by movement of the carrier bar 75 the pins 74 may be moved into the slots 72 and 73 so as to extend across the slot 71, and the arrangement is such that in the movement of the carrier bar 75 the pins 74 will first engage the openings in the trailing edge of the master 30a and will then move in a direction which is generally circumferential with respect to the drum and thereby to apply tension to the intermediate portions of the master 30a. Such a mounting for the carrier bar 75 is afforded by arms 76 formed on opposite ends of the carrier bar 75 so as to extend into engagement with the outer faces of the end walls of the drum, at which points the arms 76 are pivoted on the projecting ends of a mounting shaft 77. In order to apply the desired tension to the master 30a the arms 76 are urged yieldingly in a counterclockwise direction as viewed in Figs. 6 and 8, and the desired blasing action is attained in this instance by securing the other end of the spring 47a to an anchoring pin 78 which projects from the arm 76.

When the tensioning pins 74 are to be withdrawn from the slot 71, the operator may manually engage the anchoring pin 78 which is extended as viewed in Fig. 5 to afford a handle.

The operator rocks the carrier bar 75 in a clockwise direction, Fig. 6, about the supporting pivot shaft 77 to thereby withdraw the pins 74 to their inactive positions, and when this has been done the trailing edge of a master 30a may be inserted in or removed from the slot 71. Similarly, the carrier bar 44a may be shifted in its inactive position through manual engagement and actuation of a finger piece 80 which, as herein shown, is formed so as to project laterally from that arm of the bell crank 45a upon which the carrier bar 44a is mounted. Thus when the pins 43a have been withdrawn by actuation of the finger piece 80, the leading edge of a master 30a may be inserted in or withdrawn from the slot 37a.

In Figs. 9 and 10 of the drawings an alternative actuating arrangement is illustrated for the pins 43b which serve to secure the leading edge of the master in position on the drum 20b. The drum 20b is constructed with the flange 34b thereof formed in the same manner as in the embodiment of the invention illustrated in Figs. 5 to 8, and a plate 38b and a spacer plate 39b are arranged on the flange 34b to afford a slot 37b which is substantially similar to the slot 37a shown in Figs. 5 to 8. The anchoring pins 43b are mounted on a carrier bar 44b which is pivotally mounted on a shaft 46b in substantially the same manner as the carrier bar 44a. In this embodiment of the invention, however, this supporting action is attained by means including a segmental plate 81 which is pivotally mounted on the shaft 46b and has the carrier bar 44b secured thereto at a point spaced from the pivotal axis. The mounting plate 81 has a detent 82 associated therewith, the detent 82 being in the form of a bell crank which is pivoted on a shaft 83 adjacent to one edge of the segmental plate 81. One arm of the detent 82 has a tooth 84 thereon which is adapted to be selectively engaged with spaced notches 85 formed in the peripheral edge of the segmental plate 81, and a spring 86 acts upon the other arm of the detent 82 to urge the tooth into such engagement. The notches 85 are so disposed that when the carrier bar 44b is in its active position of Fig. 10, the tooth 84 is engaged with one of the notches 85, thereby to retain the carrier bar in its active position. The other of the notches 85 is so disposed that when the carrier bar 44b has been shifted in a clockwise direction as viewed in Fig. 10 to its inactive position wherein the pins 43b are withdrawn from the slot 37b, the tooth 84 will be engaged with the other one of the notches 85. The detent 82 thus acts to retain the carrier bar in its inactive position while the operator inserts the leading edge of the master into the slot 37b. The operator may then engage a projecting finger piece 88 formed on the segmental plate 81 and by pressing the finger piece 88 in an inward direction, that is, toward the axis of the drum, the operator may shift the carrier bar 44b to its active position, in which position carrier bar will be retained as aforesaid by the detent 82. When the carrier bar 44b is to be shifted to its inactive position, the operator may engage a similar finger piece 89 formed on the segmental plate 88 on the opposite side of the pivotal axis 46b, and by an inward movement imparted to the finger piece 89 the operator may overcome the action of the detent 82 so as to shift the carrier bar 44b to its inactive position, and when the carrier bar has thus been shifted, the detent then serves to maintain the carrier bar in the desired posi-

tion. It will be understood that with the structure disclosed in Figs. 9 and 10 the trailing edge of the master may be clamped by any desired means such as the means illustrated in the other embodiments of the invention, or in certain instances, as for example, in spirit duplicator machines, the trailing edge need not be clamped.

In the form of the invention illustrated in Figs. 11 to 14 of the drawings the printing machine drum of the present invention is constructed and arranged so that an unusually large proportion of the periphery of the drum may be utilized as an impression surface. Thus the drum 20c has end walls 21c and 22c about which a generally cylindrical outer wall 24c is secured. The end walls 21c and 22c are cut away as at 32c and the adjacent edges of the wall 24c are bent inwardly to afford flanges 34c and 35c. It will be observed that flanges 34c and 35c are substantially parallel to each other and extend inwardly toward the axis of the drum 20c in a substantially radial direction. Hence the outer wall 24c is cylindrical in form through substantially its entire periphery and this entire cylindrical portion may be utilized as an impression surface. With this arrangement the interruption in the peripheral or cylindrical surface of the impression surface is relatively narrow, and means is provided in the clearance space which is afforded between the two flanges 34c and 35c to provide individual spaces into which the opposite ends of a master may be individually inserted. Thus a spacer plate 39c is secured to the surface of the flange 34c which is adjacent to flange 35c, and a division wall or division plate 38c is secured to the spacer plate 39c to thereby form an outwardly facing slot 37c between the flange 34c and the plate 38c. The spacer plate 39c has ears 40c and intermediate recesses 41c thereon to conform with the complemental form of the leading edge of a master, and a plurality of pins 43c are mounted on a carrier bar 44c so that they may be moved through aligned openings in the flange 34c and into aligned slots 57c formed in the plate 38c. To support the carrier bar 44c a rock shaft 46c is extended through the end walls 21c and 22c of the drum and arms 45c are pinned to the rock shaft 46c. In the present instance the arms 46c are bent laterally at their outer ends to afford securing arms 90 and the carrier bar 44c is in the form of an angle, one flange 91 of which is rested upon the securing arms 90 and is fixed thereto by means such as bolts 92. One of the mounting arms 45c has a spring 47c acting thereon to urge the carrier bar 44c to its active position of Figs. 12 and 13, and since the arms 45c are pinned to the shaft 46c the single spring 47c accomplishes this function. To facilitate the withdrawal of the pins 43c to their inactive positions, one of the mounting arms 90 is extended in a radial direction as shown in Figs. 11 and 13 and has an operating handle 93 mounted thereon. This operating handle 93 is located in a conveniently accessible position at one end of the drum so that the desired operating movements may be readily and easily imparted to the carrier bar 44c.

It will be observed that the division plate 38c is also spaced from the flange 35c, thereby to afford an inwardly extending slot 71c into which the trailing edge of a master may be inserted. The flange 35c has openings 72c formed therein through which tensioning pins 74c may be projected, and the arrangement as herein shown is such that the pins 74c will extend across the slot

71c and into the slots 57c. The arrangement in this embodiment of the invention is such that pins 74c may be moved into the opening 72c and may then be shifted laterally, generally toward the axis of the drum, thereby to apply tension to the master which is engaged by the pins. In accomplishing this result the pins 74c are mounted on a carrier bar 75c which has ears 95 projecting from its opposite ends. The ears 95 are pivoted at 96 on the ends of supporting arms 97 which are pinned to opposite ends of a rock shaft 98, the rock shaft 98 being extended through and supported by the end walls 21c and 22c of the drum. The location of the rock shaft 98 is such that in a rocking movement of the shaft 98, the ends of the arms 97 are shifted substantially parallel to the plane of the slot 71c, and hence when the pins 74c are located in the openings 92c, the arms 97 may be actuated to shift the pins 74c laterally of the openings 72c and toward the axis of the drum 20c. In the present instance one of the ears 95 has an extension 95c which extends generally toward the axis of the drum, and a spring 99 acting between this arm 95c and anchoring pin 100 serves to impart such tensioning movement to the pins 74c. The spring 99 acts at such an angle upon the arm 95c that it also serves to urge the carrier bar 75c toward its active position of Fig. 14, thereby to maintain the pins 74c fully projected into the slot 71c. When the pins 74c are to be withdrawn, an actuating arm 101 which is formed as an extension of one of the ears 95 is engaged and actuated by the operator, and to facilitate such engagement a projecting finger piece or handle 102 similar to the finger piece 93 is provided on the arm 101.

In Figs. 15 to 18 of the drawings there is illustrated a still further embodiment of the invention, and in this form the drum 20d has the flanges 34d and 35d formed in the same manner as in the embodiment of the invention illustrated in Figs. 11 to 14, and the securing mechanism which is associated with flange 35d is of the same form and construction as that shown in Figs. 11 to 14. The securing mechanism associated with the flange 34d is, however, somewhat modified in that a different actuating means is provided. In this form of the invention the carrier bar 44d is formed and mounted in the same manner as the carrier bar 44c, but the handle 93 has been eliminated in this form of the invention, and means has been associated with the right hand one of the arms 45d whereby the carrier bar 44d may not only be actuated to its inactive position but may also be releasably latched in its inactive position. These means as herein shown comprise a bar 105 pivoted intermediate its ends on a pivot pin 106 mounted on the extended end of the right hand arm 45d. A spring 107 acts between a spring anchor 108 on the upper end of the bar 105 and the mounting rod 46d so as to tend to rotate the bar 105 about its axis 106 in a counterclockwise direction. Such rotation is, however, limited by a stationary block 109 mounted on the end wall 22d of the roll of the drum so that the bar 105 normally assumes the position shown in Fig. 16. It will be recalled that the carrier bar 44d is biased to its active position by a spring 46d which acts between the pin 106 and a spring anchor 110, and when the bar 105 is located in its normal position, the movement thereof by the spring 46d is limited by engagement of the carrier bar 44d with the flange 34d. The upper end of the bar 105 has an outwardly

bent finger piece or handle 111 formed at its upper end, as viewed in Figs. 15 and 16, and when an operator desires to shift the carrier bar 44d to its inactive position, the handle 111 is engaged and the bar 105 is shifted downwardly as viewed in Figs. 16 and 18. When the carrier bar 44d has reached its inactive position a notch 112 in the lower portion of the bar 105 is moved to a point opposite the block 109, and the spring 107 acts at this time to shift the bar 105 in a counterclockwise direction, thus to engage the notch 112 with the block 109. Hence the bar 105 is held against return movement and acts as a latch to retain the carrier bar 44d in its inactive position. When the operator wishes to return the carrier bar 44d to its active position, the finger piece 111 is engaged and shifted to the right as viewed in Figs. 18 or in a clockwise direction. The notch 112 is thereby disengaged from the block 109 and the spring 46d then acts to return the carrier bar 44d to its active position.

From the foregoing description it will be apparent that the present invention enables a master to be secured to the drum of a printing machine in a convenient manner whereby the securing operations may be quickly performed and the master may be accurately located upon the drum in every instance. It will be observed that in accordance with the present invention the securing means are permanently mounted on the drum and the desired securing and releasing operations are performed merely by shifting these permanently mounted securing elements. Moreover the present invention so arranges the securing means on the drum that the operator may utilize both hands in initially positioning the master with relation to the drum, after which the master may be held in place by one hand of the operator while the other hand is utilized in a relatively simple releasing movement which causes the securing means to assume its active relation. The present invention attains the desired securing action in such a manner that a relatively large proportion of the periphery of the drum may be utilized as an impression surface.

Hence, while I have illustrated and described preferred embodiments of my invention, it is to be understood that these are capable of variation and modification and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a printing machine drum, a wall providing a generally cylindrical impression surface over which a master may be extended which is interrupted longitudinally thereof to afford a clearance space, means including spaced walls affording a slot into which the leading edge of a master may be extended, means in said slot providing positioning surfaces some of which face generally outwardly of said slot and some of which face generally in opposite directions endwise of the slot, and into abutment with which positioning surfaces complementary positioning surfaces on the leading edge of a master may be moved by endwise shifting movement of the master with relation to the drum to thereby dispose the border portion of the leading edge of the master in an accurately predetermined endwise and lateral relation to said drum, and securing means mounted on the drum for shifting movement into and out of said slot and generally normal to the face of said border portion of the leading edge of

the master to operatively engage such border portion and hold said positioning surfaces of the leading edge of the master in engagement with said positioning surfaces of said drum to thereby retain the border portion of the master in said accurately predetermined relation to said drum.

2. In a printing machine drum, a wall providing a generally cylindrical impression surface over which a master may be extended and which is interrupted longitudinally thereof to afford a clearance space into which the leading end edge of such a master may be extended, means including spaced walls in said clearance space providing a narrow slot having positioning surfaces therein into abutment with which positioning surfaces on the leading edge of a master may be moved by endwise shifting movement of the master with relation to the drum and into said slot to thereby dispose the border portion of the leading edge of the master in an accurately predetermined relation to said drum, at least one of said spaced walls having a plurality of openings therein, securing means mounted on the drum for shifting movement through said openings generally normal to the face of said border portion of the leading edge of the master to operatively engage such border portion and hold said positioning surfaces of the leading edge of the master in engagement with said positioning surfaces of said drum to thereby retain the border portion of the master in said accurately predetermined relation to said drum, means yieldingly urging said securing means to its operative relation, and latch means for releasably holding said securing means in an inactive out of the way position while the leading edge of a master is being placed in said accurately predetermined relation to the drum.

3. In a printing machine drum having a wall defining an interrupted cylindrical impression surface including an area into which the leading and trailing end edges of a master may be extended as such a master is placed in position to extend peripherally over the impression surface of the drum, means including spaced walls having substantially aligned openings therein and mounted on said drum in said area to define a slot into which the leading edge of a master may be inserted to dispose such leading edge between the aligned openings in the spaced walls of the slot, a carrier bar having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, means supporting said carrier bar for shifting movement from an active position wherein said anchoring pins project through said openings and across said slot so as to engage openings in the leading edge of such a master, and said carrier being shiftable to an inactive loading position wherein said anchoring pins are substantially withdrawn from said slot.

4. In a printing machine drum having a wall defining an interrupted cylindrical impression surface including an area into which the leading and trailing end edges of a master may be extended as such a master is placed in position to extend peripherally over the impression surface of the drum, means including spaced walls having substantially aligned openings therein and mounted on said drum in said area to define a slot into which the leading edge of a master may be inserted to dispose such leading edge between the aligned openings in the spaced walls of the slot, a carrier bar having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, means supporting said carrier bar

for shifting movement from an active position wherein said anchoring pins project through said openings and across said slot so as to engage openings in the leading edge of such a master, and said carrier being shiftable to an inactive loading position wherein said anchoring pins are substantially withdrawn from said slot, and latch means for releasably retaining said carrier bar in said inactive position while the leading edge of a master is inserted into said slot.

5. In a printing machine drum having a wall defining an interrupted cylindrical impression surface including an area into which the leading and trailing end edges of a master may be extended as such a master is placed in position to extend peripherally over the impression surface of the drum, means including spaced walls having substantially aligned openings therein and mounted on said drum in said area to define a slot into which the leading edge of a master may be inserted to dispose such leading edge between the aligned openings in the spaced walls of the slot, a carrier bar having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, means supporting said carrier bar for shifting movement from an active position wherein said anchoring pins project through said openings and across said slot so as to engage openings in the leading edge of such a master, and said carrier being shiftable to an inactive loading position wherein said anchoring pins are substantially withdrawn from said slot, spring means urging said carrier to its active position, latch means for releasably retaining said carrier bar in said inactive position while the leading edge of a master is inserted into said slot, and means for releasing said latch disposed at one end of said drum.

6. In a printing machine drum having an interrupted cylindrical impression surface including an area into which the leading and trailing end edges of a master may be extended as such a master is placed in position to extend peripherally about the impression surface of the drum, means including spaced walls mounted on said drum in said area and defining a slot into which the leading edge of a master may be inserted to dispose such leading edge between the spaced walls of the slot, said spaced walls having substantially aligned openings therein, a carrier bar having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, means supporting said carrier bar for shifting movement from an active position wherein said anchoring pins project through said edge of such a master, and said carrier being shiftable to an inactive loading position wherein said anchoring pins are substantially withdrawn from said slot, and means mounted in said area for engaging the trailing edge of such a master to apply tension thereto peripherally about said impression surface.

7. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls and defining an interrupted cylindrical impression surface about which a master may be extended, said interrupted cylindrical impression surface being formed to terminate at its opposite peripheral ends in a clearance space, said clearance space being defined at least in part by a pair of mounting walls spaced inwardly from said impression surface toward the axis of the drum, means in-

cluding a plate mounted in fixed relation to one of said mounting walls and cooperating therewith to define a slot into which the leading edge of a master may be inserted, said plate and said one mounting wall having substantially aligned openings therein, anchoring pins adapted to be inserted through said openings to project across said slot and through mounting openings in the leading edge of a master to secure such leading edge of the master to the drum, and means mounted on said drum and cooperating with the other of said mounting walls to engage the trailing edge of such a master and apply tension to the master in a peripheral direction about the drum.

8. In a printing machine drum, a wall providing a generally cylindrical impression surface about which a master may be extended and said wall being interrupted longitudinally thereof to form a clearance space into which the leading end edge of such a master may be extended, means in said clearance space including a pair of spaced plates extending substantially normal to said impression surface and defining an outwardly opening slot into which the border portion of the leading edge of a master may be inserted, means in said slot providing positioning surfaces into abutment with which positioning surfaces on the leading edge of a master may be moved by endwise shifting movement of the master into said slot to thereby dispose the border portion of the leading edge of the master in an accurately predetermined relation to said drum, said plates having substantially aligned openings therein between which said border portion of a master is located when it is thus inserted into said slot, and securing means mounted on the drum for shifting movement generally normal to said plates to operatively engage such border portion and hold said positioning surfaces of the leading edge of the master in engagement with said positioning surfaces within said slot to thereby retain the border portion of the master in said accurately predetermined relation to said drum.

9. In a printing machine drum, a wall providing a generally cylindrical impression surface about which a master may be extended and said wall being interrupted longitudinally thereof to form a clearance space into which the leading end edge of such a master may be extended, means in said clearance space including a pair of spaced plates extending substantially normal to said impression surface and defining an outwardly opening slot into which the border portion of the leading edge of a master may be inserted, means in said slot providing positioning surfaces into abutment with which positioning surfaces on the leading edge of a master may be moved by endwise shifting movement of the master into said slot to thereby dispose the border portion of the leading edge of the master in an accurately predetermined relation to said drum, said plates having substantially aligned openings therein between which said border portion of a master is located when it is thus inserted into said slot, securing means mounted on the drum for shifting movement generally normal to said plates to operatively engage such border portion and hold said positioning surfaces of the leading edge of the master in engagement with said positioning surfaces within said slot to thereby retain the border portion of the master in said accurately predetermined relation to said drum, and means operable with

a yielding force to maintain said securing means in its operative securing position.

10. In a printing machine drum, a wall providing a generally cylindrical impression surface about which a master may be extended and said wall being interrupted longitudinally thereof to form a clearance space into which the leading end edge of such a master may be extended, means in said clearance space including a pair of spaced plates extending substantially normal to said impression surface and defining an outwardly opening slot into which the border portion of the leading edge of a master may be inserted, means in said slot providing positioning surfaces into abutment with which positioning surfaces on the leading edge of a master may be moved by endwise shifting movement of the master into said slot to thereby dispose the border portion of the leading edge of the master in an accurately predetermined relation to said drum, said plates having substantially aligned openings therein between which said border portion of a master is located when it is thus inserted into said slot, securing means mounted on the drum for shifting movement generally normal to said plates to operatively engage such border portion and hold said positioning surfaces of the leading edge of the master in engagement with said positioning surfaces within said slot to thereby retain the border portion of the master in said accurately predetermined relation to said drum, means urging said securing means yieldingly into said operative securing position, and a manually engageable element projecting beyond one end of said drum for releasing said securing means.

11. In a printing machine drum having an interrupted cylindrical impression surface between opposite ends of which a longitudinally extending clearance space is defined into which the end edges of a master may be extended as such a master is placed in position to extend peripherally about the impression surface of the drum, means including spaced walls mounted on said drum in said clearance space and defining a pair of slots into which the opposite end edges of a master may be respectively inserted to dispose such edges between the spaced walls of the respective slot, said spaced walls of said slots having substantially aligned openings therein, a pair of carrier bars each having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, said carrier bars being allocated one to each of said slots, means supporting said carrier bars for shifting movement from active positions wherein said anchoring pins thereof project through certain of said openings and across respective slots to which the carrier bars are allocated so as to engage openings in the opposite end edges of the master, and said carriers being shiftable to inactive loading positions wherein said anchoring pins are substantially withdrawn from said slots to enable the end edges of a master to be inserted into said slots.

12. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls so that the other surface of said side wall defines an interrupted cylindrical impression surface about which a master may be extended, said interrupted cylindrical impression surface being formed to terminate at one of its peripheral ends in an inwardly bent securing flange spaced inwardly from said impression surface toward the axis of the drum, means includ-

ing a plate mounted in fixed relation to and on the outer surface of said securing flange and cooperating therewith to define a slot into which an end edge of a master may be inserted, said plate and said flange having substantially aligned openings therein, anchoring pins adapted to be inserted through said openings to project across said slot and through mounting openings in the end edge of a master to secure such edge of the master to the drum, a carrier bar upon which said pins are mounted, mounting arms extending from opposite ends of said carrier bar and pivoted respectively on said end walls of said drum to support said carrier bar for movement toward and away from the inner surface of said flange, means resiliently urging said carrier bar toward said inner surface to project said pins into said slot, and a finger piece connected to said carrier bar and projecting from one end of said drum for actuating said bar to move said pins out of said slot.

13. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls so that the outer surface of said side wall defines an interrupted cylindrical impression surface about which a master may be extended, said interrupted cylindrical impression surface being formed to terminate at one of its peripheral ends in an inwardly bent securing flange spaced inwardly from said impression surface toward the axis of the drum, means including a plate mounted in fixed relation to and on the outer surface of said securing flange and cooperating therewith to define a slot into which an end edge of a master may be inserted, said plate and said flange having substantially aligned openings therein, anchoring pins adapted to be inserted through said openings to project across said slot and through mounting openings in the end edge of a master to secure such edge of the master to the drum, a carrier bar upon which said pins are mounted, mounting arms extending from opposite ends of said carrier bar and pivoted respectively on said end walls to support said carrier bar for movement toward and away from the inner surface of said flange, means resiliently urging said carrier bar toward said inner surface to project said pins into said slot, a finger piece connected to said carrier bar and projecting from one end of said drum for actuating said bar to an inactive position to move said pins out of said slot, and a latch adapted to releasably secure said carrier bar in said inactive position.

14. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls so that the outer surface of said side wall defines an interrupted cylindrical impression surface about which a master may be extended, said interrupted cylindrical impression surface being formed to terminate at one of its peripheral ends in an inwardly bent securing flange spaced inwardly from said impression surface toward the axis of the drum, means including a plate mounted in fixed relation to and on the outer surface of said securing flange and cooperating therewith to define a slot into which an end edge of a master may be inserted, said plate and said flange having substantially aligned openings therein, anchoring pins adapted to be inserted through said openings to project across said slot and through mounting openings in the end edge of a master to secure such edge of the master to the drum, a carrier bar upon which said pins are mounted, mounting arms extending from opposite ends of said carrier bar and pivoted

respectively on said end walls to support said carrier bar for movement toward and away from the inner surface of said flange to thereby move said pins into and out of said slot, means for holding said carrier bar in an active position wherein said pins are extended into said slot, and means for holding said carrier bar in an inactive position wherein said pins are substantially withdrawn from said slot.

15. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls and affording an interrupted cylindrical impression surface about which a master may be extended, said side wall being terminated at said interrupted portion in a pair of inwardly turned generally parallel flanges disposed in spaced relation to each other, a division wall mounted between and in spaced relation to both of said flanges to define a pair of slots into which opposite ends of a master may be inserted, said plate and said flanges having substantially aligned openings therein, a first carrier bar having anchoring pins thereon adapted to be inserted through said openings in one flange so as to project across said slot and into the aligned openings in said plate, a second carrier bar having anchoring pins thereon adapted for movement through the openings in the other flange and into the aligned openings in said plate, means mounting said first carrier bar for movement of its pins into substantially predetermined positions in the related slot, and means supporting said second carrier bar for movement of its pins into the other of said slots and for movement substantially radially in said slot, and resilient means urging said second bar in an inward and substantially radial direction.

16. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls and affording an interrupted cylindrical impression surface about which a master may be extended, said side wall being terminated at said interrupted portion in a pair of inwardly turned generally parallel flanges disposed in spaced relation to each other, a division wall mounted between and in spaced relation to both of said flanges to define a pair of slots into which opposite ends of a master may be inserted, said plate and said flanges having substantially aligned openings therein, a first carrier bar having anchoring pins thereon adapted to be inserted through said openings in one flange so as to project across said slot and into the aligned openings in said plate, a second carrier bar having anchoring pins thereon adapted for movement through the openings in the other flange and into the aligned openings in said plate, means mounting said first carrier bar for movement to an active position wherein its pins are located in substantially predetermined positions in the related slot, means urging said first mounting bar yieldingly to said active position, and means supporting said second carrier bar for movement to an active position wherein its pins are located in the other of said slots and for inward tensioning movement substantially radially in said slot, and a common resilient means for moving said second bar to said active position and for imparting such tensioning movement thereto.

17. In a printing machine drum, disk-like end walls having a generally cylindrical side wall secured to said end walls and affording an interrupted cylindrical impression surface about which a master may be extended, said side wall

being terminated at said interrupted portion in a pair of inwardly turned generally parallel flanges disposed in spaced relation to each other, a division plate mounted between and in spaced relation to both of said flanges to define a pair of slots into which opposite ends of a master may be inserted, said plate and said flanges having substantially aligned openings therein, a first carrier bar having anchoring pins thereon adapted to be inserted through said openings in one flange so as to project across said slot and into the aligned openings in said plate, a second carrier bar having anchoring pins thereon adapted for movement through the openings in the other flange and into the aligned openings in said plate, means mounting said first carrier bar for movement to an active position wherein its pins are located in substantially predetermined positions in the related slot, means urging said first mounting bar yieldingly to said active position, and individual operating handles for said carrier bars extending beyond the ends of said slots for manual actuation of said carrier bars to withdraw the anchoring pins thereof from respective slots.

18. In a printing machine drum having an interrupted cylindrical impression surface between peripherally opposite ends of which a longitudinally extending clearance space is defined into which the end edges of a master may be extended as such a master is placed in position to extend peripherally about the impression surface of the drum, means including spaced walls mounted on said drum in said clearance space and defining a pair of slots into which the opposite end edges of a master may be respectively inserted to dispose such edges between the spaced walls of the respective slots, said spaced walls of said slots having substantially aligned openings therein, a pair of carrier bars each having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, said carrier bars being allocated one to each of said slots, said carrier bars each having a mounting arm projecting from each end thereof, means pivoting the extending ends of the arms of one of said carrier bars in such a relation that said one carrier bar is supported for shifting movement into and out of an active position wherein said anchoring pins thereof project through certain of said openings and across the related slot so as to engage openings in an end edge of the master inserted in said related slot, a rock shaft mounted on said drum and having supporting arms fixed thereto for movement of the ends of said supporting arms generally parallel to the other of said slots, means pivotally connecting the ends of the arms of the other of said carrier bars upon the respective supporting arms whereby the pins of said other carrier bar may be projected into other of said openings and into the other slot and by rocking movement of said supporting arms may be shifted laterally of said other openings to apply tension to a master engaged thereby, and said carriers being shiftable to inactive loading positions wherein said anchoring pins are substantially withdrawn from said slots to enable the end edges of a master to be inserted into said slots.

19. In a printing machine drum having an interrupted cylindrical impression surface between opposite ends of which a longitudinally extending

clearance space is defined into which the end edges of a master may be extended as such a master is placed in position to extend peripherally about the impression surface of the drum, means including spaced walls mounted on said drum in said clearance space and defining a pair of slots into which the opposite end edges of a master may be respectively inserted to dispose such edges between the spaced walls of the respective slot, said spaced walls of said slots having substantially aligned openings therein, a pair of carrier bars each having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings, said carrier bars being allocated one to each of said slots, said carrier bars each having a mounting arm projecting from each end thereof, means pivoting the extending ends of the arms of one of said carrier bars in such a relation that said one carrier bar is supported for shifting movement into and out of an active position wherein said anchoring pins thereof project through certain of said openings and across the related slot so as to engage openings in an end edge of the master inserted in said related slot, means supporting the ends of the arms of the other of said carrier bars for movement of said other carrier bar into and out of an active position whereby the pins of said other carrier bar may be projected into other of said openings and into the other slot and may be shifted laterally of said other openings to apply tension to a master engaged thereby, said carriers being shiftable to inactive loading positions wherein said anchoring pins are substantially withdrawn from said slots to enable the end edges of a master to be inserted into said slots, and spring means urging said carrier bars to said active positions and acting to apply tensioning force to said other carrier bar.

20. In a printing machine drum having an interrupted cylindrical impression surface between opposite ends of which a longitudinally extending clearance space is defined into which the end edges of a master may be extended as such a master is placed in position to extend peripherally about the impression surface of the drum, means including spaced walls mounted on said drum in said clearance space and defining a slot into which an end edge of a master may be inserted to dispose such edge between the spaced walls of the slot, said spaced walls of said slot having substantially aligned openings therein, carrier bars having a plurality of anchoring pins projecting therefrom at points so spaced that said pins are adapted to project through said openings and into said slot, said carrier bar having mounting arms projecting from opposite ends thereof, means supporting the extending ends of the arms of said carrier bar in such a relation that said carrier bar is shiftable from an active position wherein said anchoring pins thereof project through certain of said openings and across said slot so as to engage openings in an end edge of the master inserted in said slot, said supporting means being constructed and arranged for shifting movement of said carrier bar through a tensioning stroke in which said pins move laterally, and spring means for imparting such tensioning movement to said carrier bar.

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