

Oct. 22, 1935.

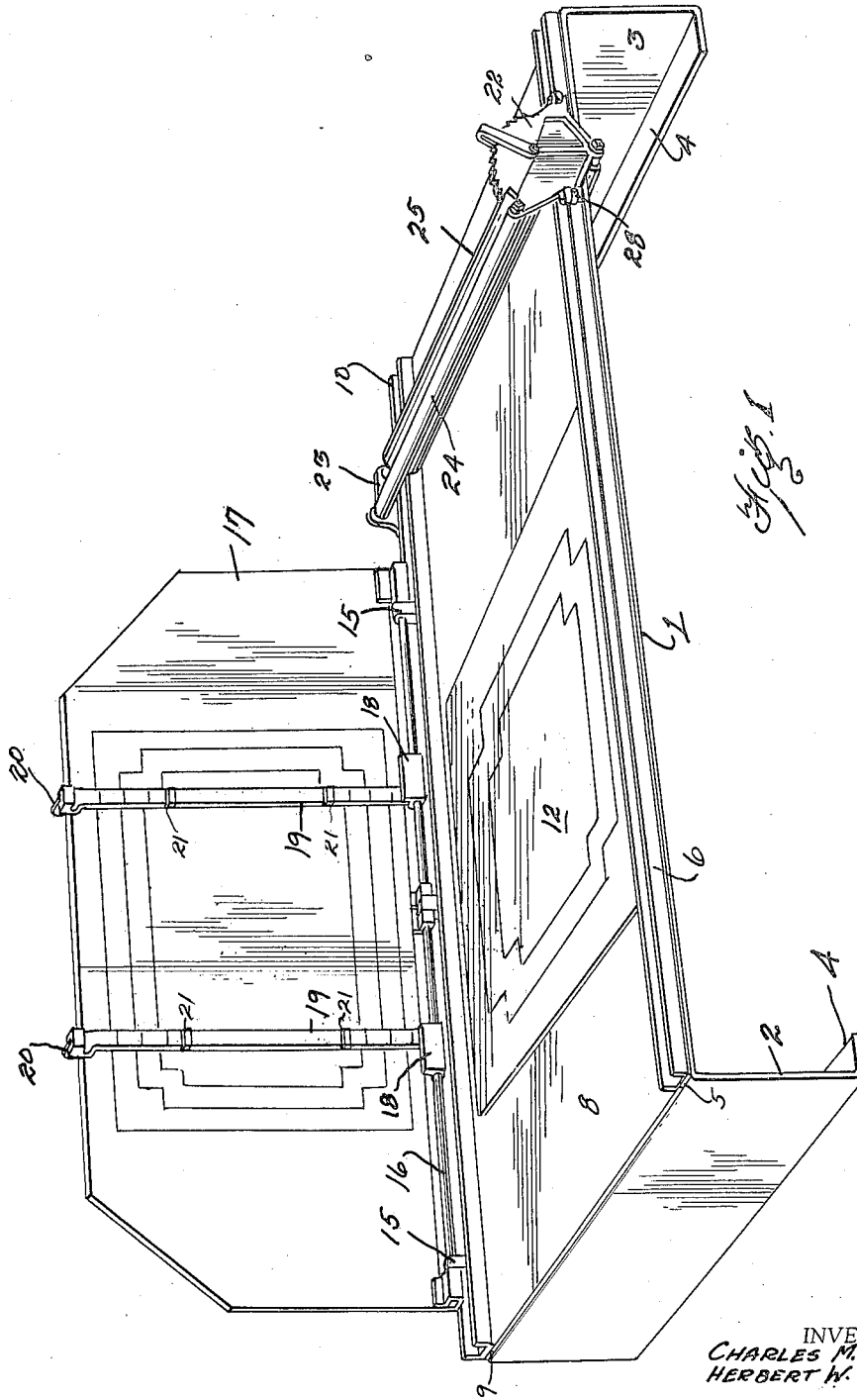
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2,018,072

PRINTING MACHINE

Filed Dec. 3, 1931

5 Sheets-Sheet 1



*Fig. 1*

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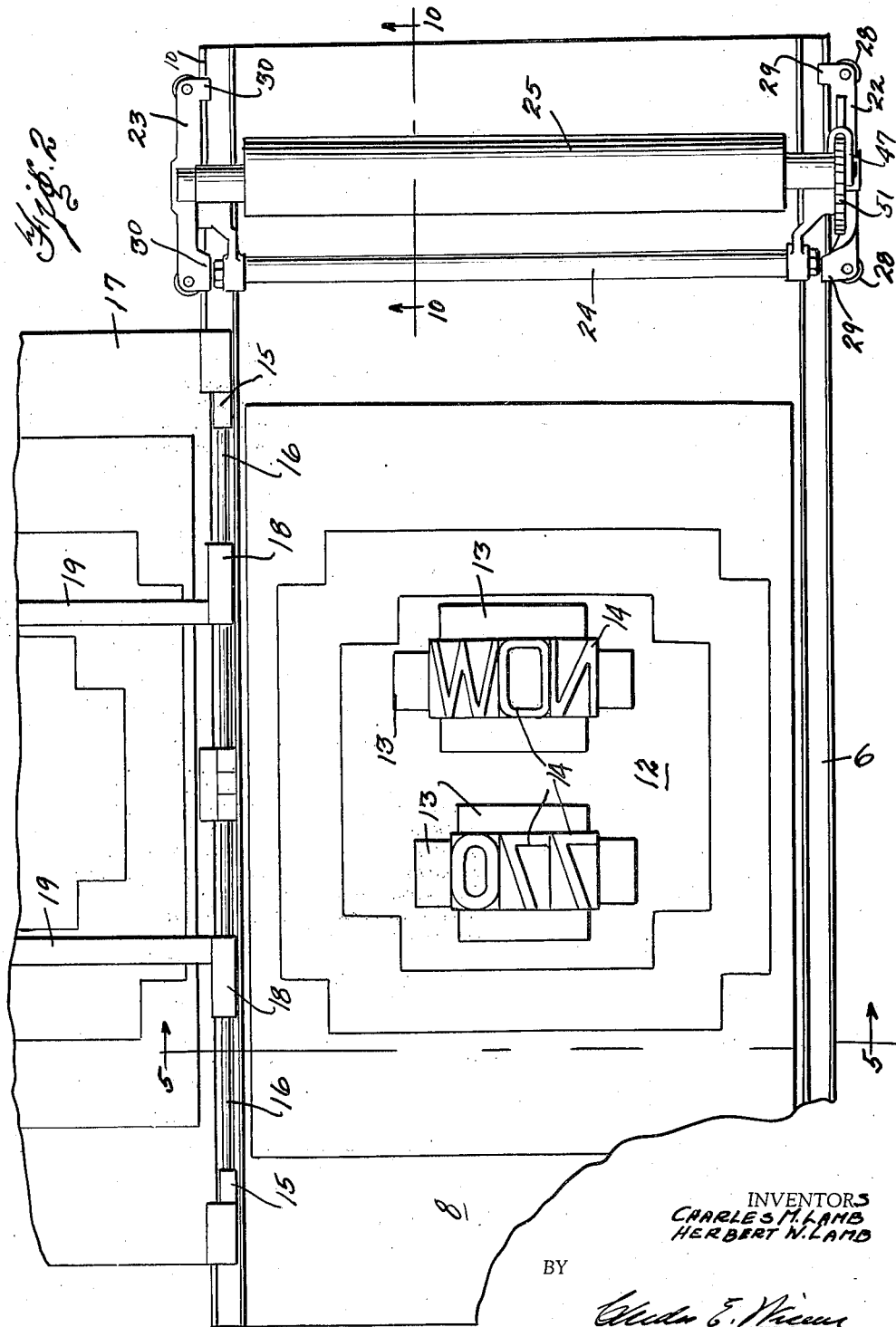
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PRINTING MACHINE

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5 Sheets-Sheet 2



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PRINTING MACHINE

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5 Sheets-Sheet 3

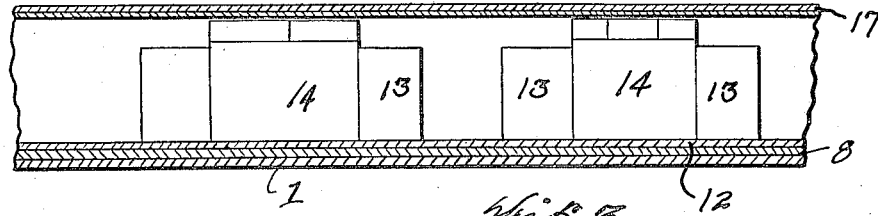


Fig. 3

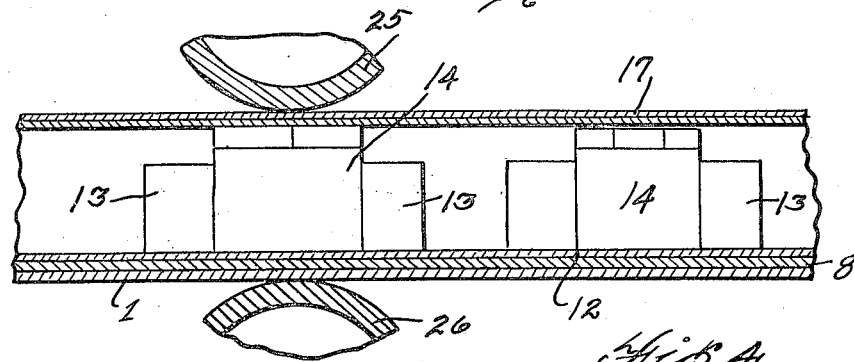


Fig. 4

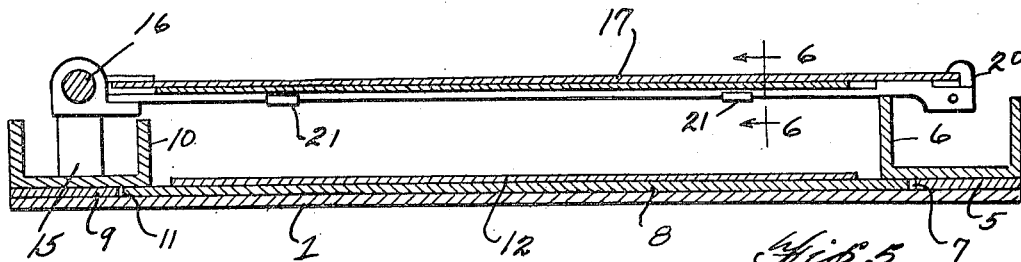


Fig. 5

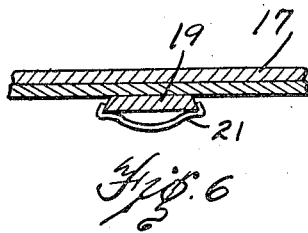


Fig. 6

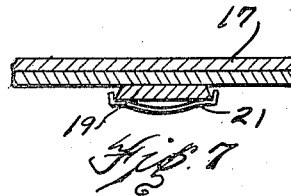


Fig. 7

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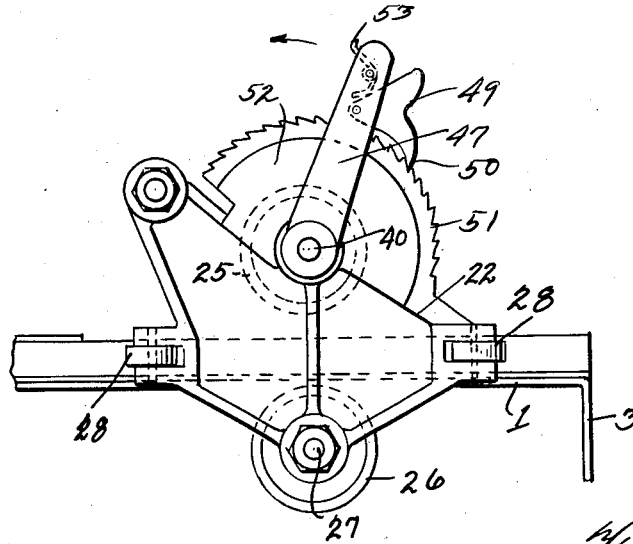
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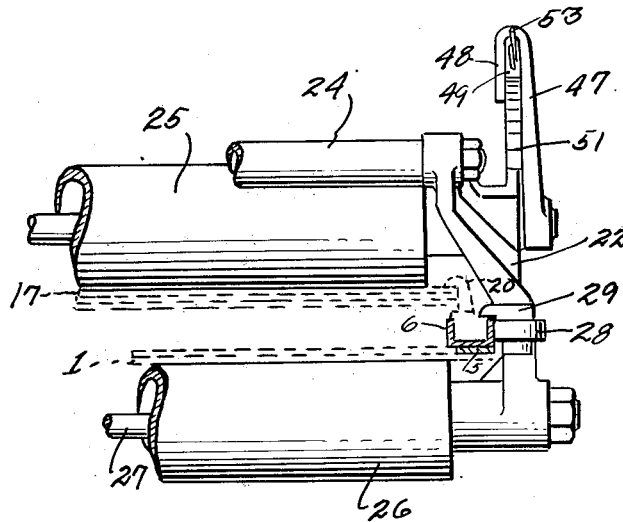
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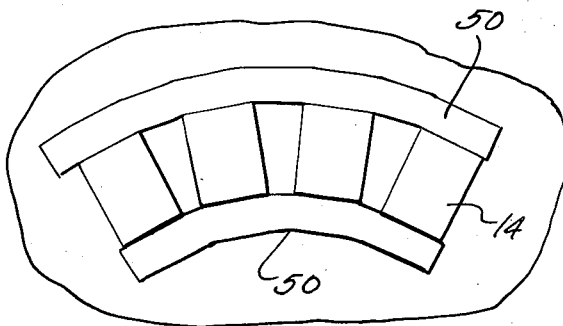
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*Fig. 8*



*Fig. 9*



*Fig. 14*

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PRINTING MACHINE

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5 Sheets-Sheet 5

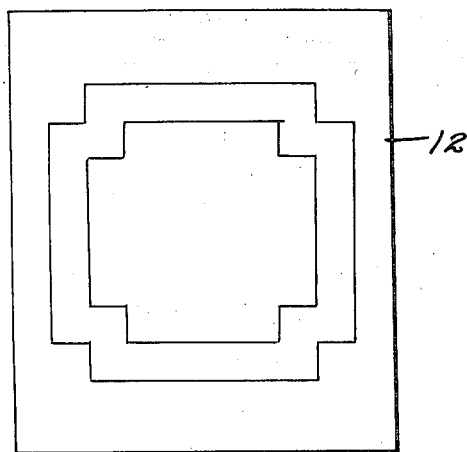
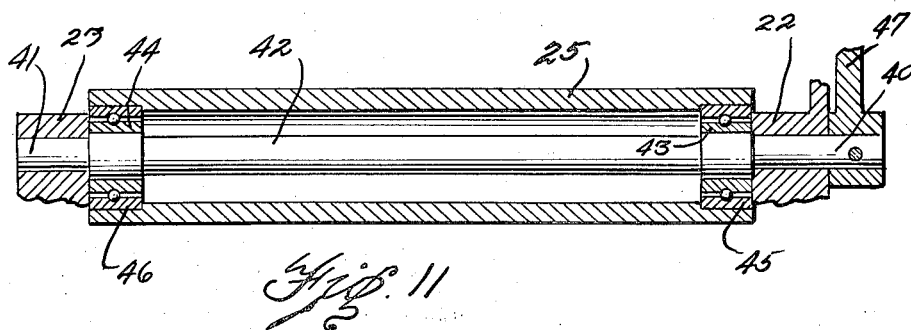
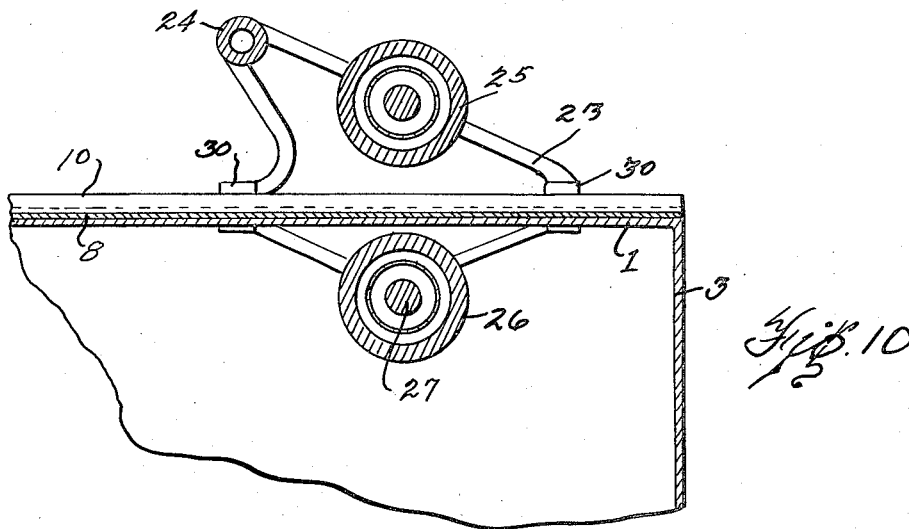


Fig. 12

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# UNITED STATES PATENT OFFICE

2,018,072

## PRINTING MACHINE

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Application December 3, 1931, Serial No. 578,748

6 Claims. (Cl. 101—269)

This invention relates to printing machines, and an object of the invention is in the provision of a device of this character which is primarily adapted for the printing of display cards of various kinds which is relatively cheap to manufacture and assemble and which will permit display cards of various types to be printed by those unfamiliar with the printing art, for instance by the usual clerk in stores of retail merchants in which continual change of display cards is required at a minimum cost for the same.

Another object of the invention is in the provision of a printing machine which is relatively light in weight permitting the same to be portable and which is provided with an impression member operable by hand to cause the impression to be made on the card by means of a roller adjustable in relation to the card to vary the pressure thereon or to accommodate various thicknesses of cards or paper to be printed.

Another object of the invention is in the provision of a printing machine in which a pair of rollers are secured in a mounting as an assembled unit and spaced an adjustable distance apart, the upper roller riding over the card or a cover member therefor and the lower roller running beneath the bed on which the type are positioned so that the impression card and type are subject to a line pressure sufficiently great to produce the desired printing impression whereby any flexing of the bed or supporting elements for the type is prevented at the line of application of pressure the arrangement being such as to cause the card to be printed progressively from one end of the type to the other.

Another object of the invention is in the provision of a machine of this character having a type bed and means for setting the type in a predetermined position and in which the bed bears a series of diagrams or lines indicative of the various sizes of cards to be used within the capacity of the machine to print thereby providing a guide to enable the operator to set the type in the machine in any desired position relative to the various sizes of cards or sheets to be printed thereby predetermining the position of the printed matter thereon.

A further object of the invention is in the provision of a printing machine provided with a hinged cover member provided with a holder for securing the card or sheet thereto, the holder being marked in a manner similar to the markings on the bed plate so that in placing a card in the holder a guide is provided enabling the operator to position the card in the desired printing relationship while out of contact with the type face.

A further object of the invention resides in the provision of a card holder that is of such a character as to flex or yield as the printing rolls are moved across or over the card permitting the

same to come to impression contact with the type faces.

A still further object of the invention is in the provision of a flexible cover member overlying the card during the making of the impression the same being provided with detachable holder elements connected during the taking of the impression and removable after the impression has been made thereby automatically removing the card but maintaining the same in its relative registration with the type so that after the impression has been made the card may be examined without disturbing the relative relationship of the card in its holder to the type faces thereby permitting the cover to be returned to place and a second or a number of subsequent impressions made.

A further object of the invention is to provide a flexible sheet metal bed provided with non-flexible side rails providing guides or runners for supporting the printing rollers during the impression operation.

A further object of the invention is in the provision of a machine of this character in which the type are supported in place on the bed without the necessity of locking the same in a form. It has heretofore been the practice to set the type in a suitable form and lock the same in position on the bed of the machine.

By our improved method a sheet of suitable material is coated on its upper and lower face with a composition such as beeswax thereby providing a surface semi-adhesive in character on which the operator may place the type in any desired relation and by placing a single type with a little pressure on the prepared sheet of material the same adheres sufficiently thereto to permit the inking of the type with an inking roller without displacing the same thereon and likewise the under surface of the prepared sheet will be caused to adhere to the bed plate or backing plate thereon of the machine thereby preventing displacement of the sheet relative to the machine.

Another object of the invention resides in the provision of a waxed sheet on which the type may be secured by a slight pressure, the same being prevented from accidental turning over or displacement during the inking or printing operation by a plurality of metal blocks or bars which are pressed onto the waxed sheet in juxtaposition to the edges of the type.

These objects and the several novel features of the invention are hereinafter more fully described and claimed and the preferred form of construction by which these objects are attained is shown in the accompanying drawings in which—

Fig. 1 is a perspective view of the improved printing machine with the card holder and cover in their raised position.

5  
10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60

5  
10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60

Fig. 2 is a plan view of the bed showing the type in place thereon.

Fig. 3 is a detail longitudinal sectional view showing a card in position above the type faces.

Fig. 4 is a similar view showing the impression taking operation.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2 showing the cover closed.

Fig. 6 is a detailed sectional view taken on line 6—6 of Fig. 5 showing the guide clips and arm for supporting the sheet to be printed.

Fig. 7 is a similar view showing the manner of moving the clip.

Fig. 8 is an enlarged end view of the roller mounting.

Fig. 9 is a front view thereof.

Fig. 10 is a detailed sectional view through the impression rollers taken on line 10—10 of Fig. 2.

Fig. 11 is a longitudinal sectional view through the adjustable roller.

Fig. 12 is a detailed elevation of the waxed sheet.

Fig. 13 is an enlarged sectional view through the wax sheet used for holding the type in place.

Fig. 14 is a plan view of a modified form of supporting block.

Referring to the drawings the bed plate 1 is formed of flexible sheet metal and is provided with the spaced downturned ends 2 and 3 each provided with a return bent portion 4 forming a support for the machine. A flat strip of metal 5 is secured to the upper face of the bed plate 1 and positioned adjacent the front edge thereof. A channel shaped member 6 is secured to the strip 5 and is of non-flexible construction and by referring to Fig. 5 it will be seen that the strip 5 is of less width than the base of the channel 6 to provide a recess 7 in which one edge of the backing plate 8 fits. It will be understood that the backing plate 8 is composed of some slightly compressible material such as cardboard or heavy paper or the like. The metal strip 9 is secured to the upper face of the bed plate 1 adjacent the rear edge thereof and a non-flexible channel shaped member 10 is secured thereto and forms a recess 11 in which the rear edge of the backing plate 8 is inserted. A sheet of material 12 is coated on its upper and lower face with a waxy composition on which the type may be set. The coating for the sheet may be composed of ingredients in the following approximate proportions viz: one pound beeswax, one-half pound rosin and one-half pound glycerin, or one pound beeswax to one pound commercial belt dressing both of which have been found adaptable for the purpose or other ingredients may be found equally desirable.

The sheet to which the waxy composition is applied is preferably made of paper of fibrous material and the upper face thereof is preferably marked with a diagram such as illustrated in Fig. 1 to assist the operator in positioning the type on the waxed sheet and it will be also understood that the waxy material is preferably made of some transparent or semi-transparent material to permit the diagram to be seen therethrough. A plurality of metal blocks or bars 13 of varying lengths are provided for use in maintaining the type in place during the inking or printing operation. These metal blocks are considerably heavier than the type which are ordinarily of wood and it will be seen that by pressing the metal blocks in place on the wax sheet 12 and against the sides of the type 14 after the same have been placed in position on the waxed sheet that the type cannot easily be upset during any of the operations in operating the machine. It has been found in actual

operation that when the waxed sheet 12 was secured to the bed of the machine along two edges thereof that the sheet tended to buckle due to the fact that the printing ink would cause the printed sheet to pull the type as the sheet was being moved out of contact therewith.

By using a sheet waxed on both sides it will be seen that this difficulty is overcome as the adhesion between the bottom of the type and the waxed sheet and between the opposite face of the waxed sheet and the bed plate is greater than that between the printed sheet or card and the type face. The side rails 10 have secured thereto a plurality of blocks 15 forming bearings for the rod 16 on which the cover member 17 is pivotally mounted. If desired the cover 17 may be provided with a diagram similar to that used on the waxed sheet 12. The rod 16 has the blocks 18 slidably mounted thereon and the guide bars 19 are each attached to one of the sliding blocks 18. It will thus be seen that the bars 19 are adjustable longitudinally of the machine to hold cards of varying lengths against the under face of the flexible cover 17. The guide bars at their free ends are each provided with a latch member 20 preferably spring actuated to engage over the free edge of the cover 17 when the parts are in the position as shown in Fig. 5. The arms 19, as shown in Fig. 5, when unattached to the cover by the spring dog 20 normally rest on the upper edge of the channel 6 and provide means for supporting a card over the face of the type that are positioned on the bed plate. The bars 19 are preferably formed of spring steel and normally are slightly bowed and when placed over the bed the upper surface is slightly above the type faces. The cover 17 is likewise transversely bowed and thus the card to be printed is secured between the covers and bars by pressure when the clips 20 are engaged over the edge of the cover, as shown in Fig. 5.

When the type 16 have been placed in position on the waxed sheet 12 the bars 19 are released from the cover and laid over the bed at opposite ends of the set type and out of position to contact the same and when in such position will provide supports for the card or sheet to be printed. When the card has been correctly positioned above the type faces the cover 17 is brought down thereagainst and engaged by the latches 20. Each bar 19 is preferably provided with two spring metal clips 21 and, as shown in Fig. 7, by pressing on the clip toward the bar they may be snapped in place thereon and due to the bars having beveled edges the ends of these clips engage thereover and by pressing on the clip to slightly release the same, are slidable longitudinally of the bar. Thus, in placing the bars in position to support a card for printing, the clips may be positioned in relationship to the guide diagram so that the edge of the sheet to be printed may be properly positioned relative to the type face. It will be noted from Fig. 5 that when the cover is brought down on the card to be printed that the under face thereof will still be slightly spaced from the printing face of the type. It will be noted from Figs. 1 and 2 that the bed plate is longer than the cover member 17 and in the space between the right hand end of the cover member and the end of the bed plate 1 the printing or impression roller is positioned.

The impression unit comprises the end castings 22 and 23 between which extends the rod 24 providing a hand-hold for the operator to draw

the unit across the cover when the latter is in the position as shown in Fig. 3. A roller 25 is likewise positioned between the castings 22 and 23 and is preferably formed of metal and a lower roller 26, also preferably formed of metal, is likewise positioned between the castings. The lower roller 26 is mounted upon the shaft 27 the same being carried in suitable bearings provided in the castings 22 and 23. Each end casting carries a pair of horizontally disposed rollers 28 rotatable about a vertical axis the periphery of the rollers engaging the outer face of the respective side rails 6 and 10 to prevent transverse movement of the impression unit while still permitting the same to be easily drawn across the cover member. The end casting 22 is provided with the inwardly extending lugs 29 engaging over the top edge of the side rail 6 while the casting 23 is provided with similar lugs 30 engaging over the top edge of the side rails 10. The upper roller 25 is of less length than the lower roller 26 in the construction shown and the lower roller is designed to ride in contact with the bottom surface of the sheet metal bed plate 1 while the upper roller is designed to ride over the surface of the cover 17 to make an impression on the sheet or card to be printed. The lower roller therefore supports the bed plate along the line of pressure of the upper roller on the type or cover. By this arrangement therefore it is possible to avoid the use of the heavy bed plate structure usually required in ordinary printing presses.

It will be noted that the type impression is made by a line contact of the roller 25 progressing across the respective surface of the type in fixed relation with the supporting roller 26 and the parts are therefore not permitted to relatively flex in making the impression of the type on the card or sheet. When out of printing engagement or contact the impression unit will be supported by the lugs 29 and 30 engaging over the respective side rails 6 and 10. A satisfactory impression is thus insured before the card is removed from its fixed position on the holder.

It is also a feature of this invention to provide a means for adjusting the distance between the rollers. The purpose of this adjustment is to increase the pressure, if desired, or to vary the distance between the rollers required by reason of the difference in thickness of the cards to be printed. This adjustment is of value in that if the card discloses an imperfect impression on being raised to a position for observation the rollers may be adjusted to a little less distance apart to increase the pressure for successive printing movements of the impression rollers and thus any imperfections in the type impression may be eliminated. This means of adjustment is shown more clearly in Figs. 8, 9, 10 and 11.

In Fig. 8 it will be noted that the longitudinal axis of the roller 25 is eccentric to the supported end 40 of its shaft 42 and in the longitudinal section of the rollers shown in Fig. 11 it will be noted that the end portions 40 and 41 of the shaft 42 which are supported in bearings in the respective castings 22 and 23 are eccentric to the portion 42 of the shaft extending therebetween and that the shaft adjacent the inner faces of the end castings 22 and 23 respectively has attached thereto the inner ball races 43 and 44. The cylindrical outer face of the respective ball races 43 and 44 therefore is eccentric to the axis of the respective end portions 40 and 41 of the shaft 42. The outer ball races 45 and 46 for the respective inner races are each secured in one end of the

roller 25. As will be more particularly noted from Figs. 8 and 9, a lever 47 is attached to the end 40 of the shaft 42 and has the return bent end 48 spaced therefrom to receive a spring restrained pawl 49 therebetween. This pawl, as will be more clearly seen in Fig. 8, has a tooth or pointed end 50 to engage the ratchet teeth 51 of the arcuate member 52. By moving the arm 47 in the direction of the arrow shown in Fig. 8 the distance between the rollers 25 and 26 is decreased but any pressure tending to spread the rollers, as for instance through movement of the compression unit across the bed plate in making the type impression, is prevented due to engagement of the pawl in the teeth 51 of the ratchet 52.

To increase the distance apart between the rollers it is necessary for the operator to release the pawl in order to turn the arm in the reverse direction to that shown by the arrow in Fig. 8. A spring 53 tends to maintain the pawl in engagement with the ratchet teeth. It will be noted that since the end portions 40 and 41 are mounted eccentrically to the portions of the shaft carrying the inner ball races that the roller 25 will be adjusted to an equal degree at both ends. Although this is the preferred form of construction by which we seek to vary the pressure exerted on the type face nevertheless various forms of adjustable mountings may be used without departing from the spirit and scope of the appended claims. The roller 26 in the construction is non-adjustable it merely being rotatable on bearings similar to that provided for the roller 25 the axis of rotation of which is the axis of the shaft 27.

The operation of the device is as follows: The type or printing plates are placed in the desired position on the waxed sheet 12 which has previously been placed in the desired position on the backing 8. The metal blocks 13 are then placed down on the upper face of the waxed sheets 12 in close contact with the sides of the type 14. The diagram enables the operator to position the type as may be desired as the diagram provides a guide to indicate the position the type impression will occupy on a card.

The card holders 19 are preferably marked to correspond to the diagram on the waxed sheet so that the position of the edge of the card toward either side rail of the bed may be placed in registration with the marks on the card holder which are above but in vertical alignment with the corresponding marks on the waxed sheet. The card is next locked in place by the cover which is turned down over the card and holders 19 and with which the holders are detachably connected by means of the latch elements 20 whereupon the card is securely held in its predetermined relative position and yet may be turned as indicated in Fig. 1 out of the printing position without loss of registration. The type faces are then inked in any desired manner and the cover member and card holders then turned downwardly thereover, as indicated in Fig. 3, and the impression unit is drawn across the bed plate one or more times, as shown in Fig. 4, and then returned to inoperative position at the end of the bed plate and in the position shown in Fig. 2. The cover may then be raised for observation of the impression on the card and if imperfect the card may then be returned to its position above the type faces for successive operation of the impression unit and under increased pressure if desired.

It will be noted that when the impression roller is moved across the type faces to make an impression on a card that the type will be caused



to firmly adhere to the waxed sheet 12 and likewise that the lower face of the waxed sheet will be caused to tightly adhere to the backing 8 or in the event that the backing 8 is dispensed with, the waxed sheet will be firmly held to the base 1 of the machine. It will be understood that the waxed sheet is of such a composition as to permit the type 14 or the metal bars 13 to be removed therefrom by hand without having any appreciable amount of wax to adhere thereto.

Referring to Fig. 14, the type 14 are set in the form of an arc or in some form other than in a straight line and, in this case, the supporting blocks 50 are made of some pliable material which will permit the blocks to be easily bent in any desired shape and may be made of lead or the like so that the supporting blocks may be bent to contact the edges of the type while still being of sufficient weight to prevent easy tipping of the type.

From the foregoing description it becomes evident that we have provided a portable printing machine of relatively light weight, which is so designed as to permit the type to be quickly and easily set in position and is of such a character as to permit anyone, even those unfamiliar with the printing art, to print display cards at a relatively low cost.

Having thus fully described our invention, its utility and mode of operation, what we claim and desired to secure by Letters Patent of the United States is—

1. In a printing machine, a bed plate on which type are to be positioned for a printing operation, a flexible cover member including means for holding a sheet to be printed and adapted to position the said sheet in printing relationship with the type, a guide diagram on the sheet supporting side of the cover and relative to which the sheet may be positioned, a type holding device consisting of a sheet of fibrous material detachably supported on the bed plate, a diagram on the said type-holding sheet corresponding to the diagram on the cover, the type holding sheet being positionable with the diagram thereon in alignment with the cover diagram, a wax-like semi-adhesive coating for the type holding sheet through which the diagram is visible, an impression roller for traversing the cover member, said coating being of a character to support the type from displacement in the printing operating operation or removal of the printed sheet therefrom.

2. In a printing machine having a bed plate, a roller impression member for traversing the same to perform a printing operation, a type holding device comprising a type backing of sheet form, means for removably securing the same to the bed plate, a type holding device comprising a sheet of suitable material, the opposite flat faces of which have a semi-adhesive coating adapted by the placing of type thereon under pressure by hand to cause the same to adhere thereto, an additional retaining means for the type comprising pliable metal bars having a base for engaging the adhesive material and a side face to engage the type providing a means for preventing upsetting of the type in the printing operation by the roller impression member, said bars being sufficiently pliable to enable the same to be shaped by hand to correspond to the outline of the set printing elements.

3. In a printing machine, the combination, with a bed plate and means for supporting a sheet in imprintable as well as observable relation thereto, of means positioned on the upper surface of said bed plate for guiding the positioning thereon of individual type blocks and for adhesively opposing their displacement, pressure roller means for bringing the supported sheet into imprinting contact with the printing surfaces of the type blocks, and means positionable upon the prepared surfacing of the bed plate and about the sides of the type block assembly thereon whereby the individual type blocks are supported against rocking displacement as the pressure roller means is moved lengthwise of the bed plate and of its supported type block assembly.

4. In a printing machine, including a frame and a pressure roller mechanism operable lengthwise thereof, a bed plate for the support of selectively located type block elements, and means for holding the type block elements against unintended displacement in either a horizontal or a vertical direction due to the movement of the pressure roller or due to the subsequent lifting of the imprinted sheet, comprising an adhesive lamination applied to the upper surface of the bed plate and adapted to suctioningly oppose the movement of the type block elements whose under faces rest thereupon.

5. In a printing machine, in combination with a bed plate for the support of type units and with traveling roller means for effecting the imprinting of sheets by the application of the printing surfaces of the type units thereagainst, a removable backing sheet for the top surface of said bed plate, means for detachably holding an assembled group of type units in their selected locations on said bed plate despite the tendency to displacement involved in the travel of the roller lengthwise of the bed plate, comprising a fibrous sheet provided with an adhesive coating on both surfaces, one of the latter being adapted to anchoringly engage the top surface of the backing sheet which is supported by the bed plate, while the other surface when engaged by the under surfaces of the arranged type blocks serves to hold them against displacement either lengthwise of the sheet and bed plate or in a direction perpendicular to the plane of the latter.

6. In a printing machine, in combination with a bed plate and a sheet-holding cover member hinged to one edge thereof, an impression roller adapted to traverse the cover member when the latter is in lowered position means for aiding in the locating and temporarily securing of type units in desired position upon said bed plate, comprising a sheet of material positionable upon said bed plate, the surfaces of said sheet being adhesively coated for suitably securing its location on the bed plate and for adhesive action upon the bottom surfaces of type units when pressed into selected positions thereon respectively, whereby, cooperatively with the presence of the lowered cover member adjacent the printing surfaces of the type units, their displacement during the printing operation due to the traveling movement of the impression roller thereover in a direction parallel to the plane thereof is prevented.

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