

A. B. DICK.
PRINTING APPARATUS.
APPLICATION FILED JAN. 4, 1911.

1,057,125.

Patented Mar. 25, 1913.
2 SHEETS—SHEET 1.

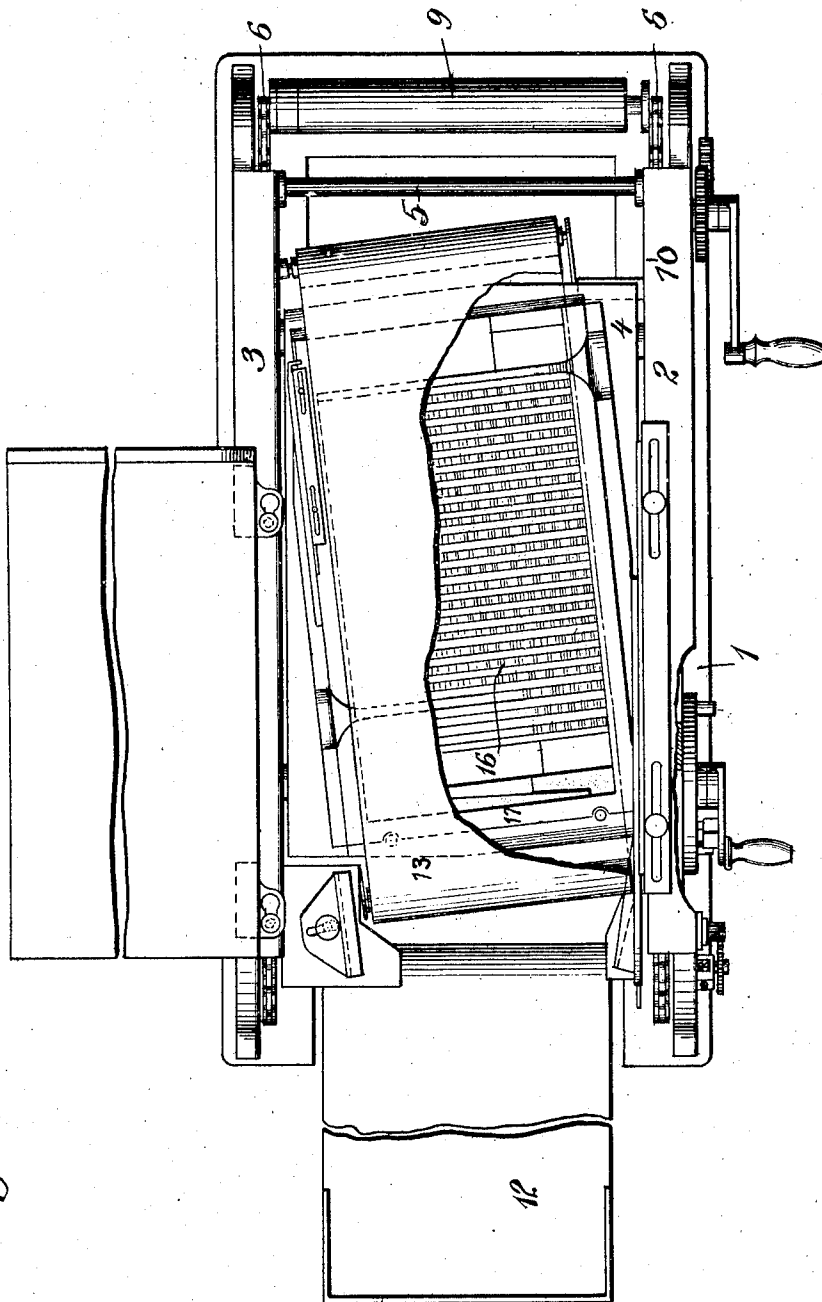


Fig. 1.

WITNESSES:

J. F. Collins
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INVENTOR

Albert B. Dick

BY

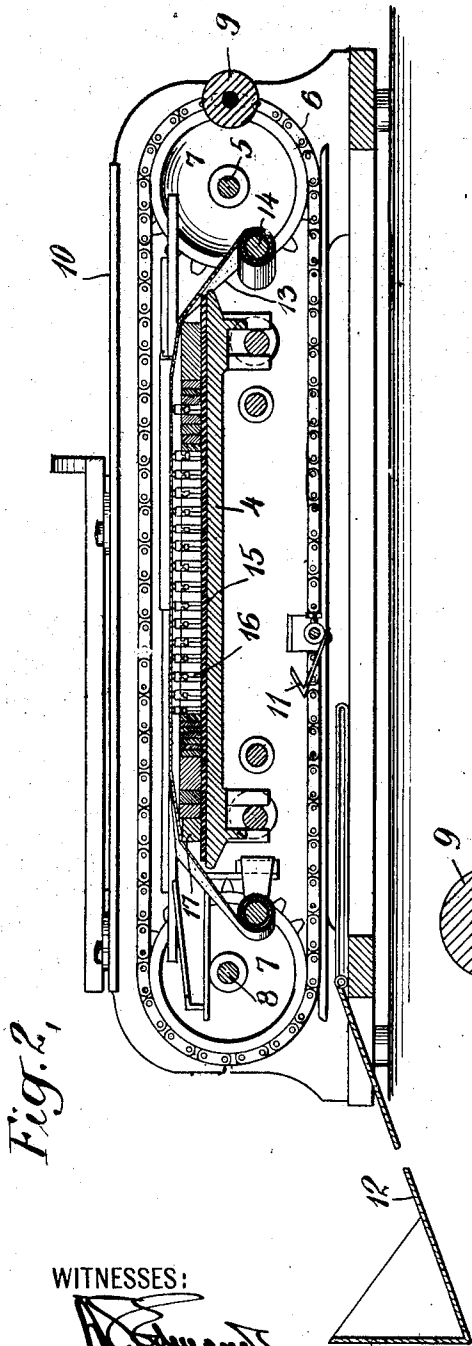
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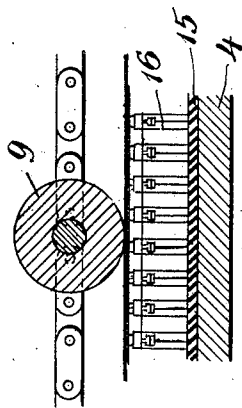
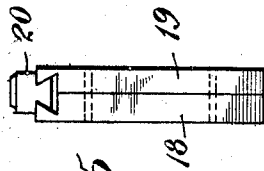
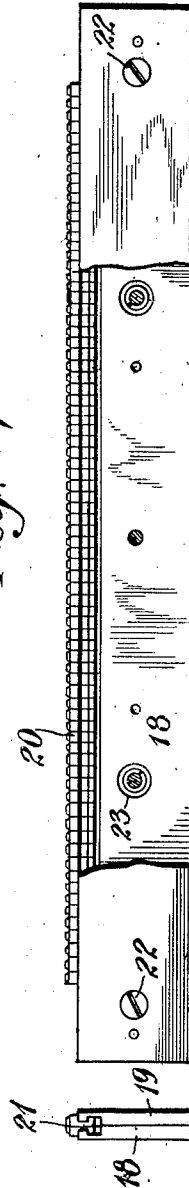


Fig. 4,



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UNITED STATES PATENT OFFICE.

ALBERT B. DICK, OF LAKE FOREST, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRINTING APPARATUS.

1,057,125.

Specification of Letters Patent.

Patented Mar. 25, 1913.

Application filed January 4, 1911. Serial No. 600,687.

To all whom it may concern:

Be it known that I, ALBERT B. DICK, a citizen of the United States, residing at Lake Forest, in the county of Lake, in the State of Illinois, have invented certain new and useful Improvements in Printing Apparatus, of which the following is a specification.

This invention relates to printing apparatus and especially to printing machines for use in offices in printing multiple copies of letters and circulars in imitation of type-written work, for which use the apparatus would generally be operated by an unskilled person.

The object of the invention is to effect certain improvements in the construction of apparatus of this character to the end that superior results may be obtained, the amount of power required in operating the machine reduced and the work of setting up the type and arranging them in the machine for printing facilitated.

The invention involves the use of a type-form and a pressure-roller movable one relatively to the other while in co-action to effect the printing, an ink-ribbon being preferably employed to supply the ink.

In accordance with the invention, type are employed which are movable one line relatively to another in the direction of the height of the type and a pad of rubber or other resilient material is provided in supporting relation to the type so that such relative movement would be made only by the compression and subsequent expansion of the rubber. The pressure-roller provided to co-act with these parts is one having a hard surface; if a roller having a comparatively soft surface be employed, the pressure between the roller and type necessary to secure a sufficiently heavy impression would cause embossing of the sheet, which is very objectionable. With a hard-surface roller, good results and easy running of the machine may be obtained and rapid wear and breakage avoided by the provision for relative lengthwise movement of the type against a resilient backing. The type are set up on type-holders each of which carries one line of type and the several type-holders are movable as individual units one relatively to another in the direction of the height of the type. With such a construction, the machine can be made to run more

easily and hence with less expenditure of power and less jarring of the parts. This is due to the fact that with lines of type movable as units, each movable part is supported upon a large area of the resilient surface so that while practically the maximum movement permitted by the resiliency of the rubber is possible, the movable part will be supported more stiffly and will therefore give the desired impression in response to a lighter pressure thereon. To provide for such movement of the several lines of type each as a unit, type-holders are employed, each holding one line of type and each with its type being type-high, so that they may be used in the same form with electrotypes and the like. Each type-holder has a lengthwise dove-tail groove in the upper edge thereof to receive the type when setting up and hold them during the printing operation. Each holder consists of two similar metallic strips secured together side by side, and preferably this securing means is such that the strips may be so drawn together as to cause them to grip the type of the line and hold them rigidly against movement in a direction transverse to their length.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a printing machine embodying the invention; Fig. 2 is a vertical section of the same; Fig. 3 is a detail view of the pressure roller and type; Fig. 4 is a view of one of the type-holders, with a line of type thereon, broken away in part; and Fig. 5 is a detail view illustrating a modification.

Referring to these drawings, I have illustrated a machine of a well-known type, having a support for a plane type-form and means for moving a pressure roller in one direction on one side of the form of type and in co-action with the printing faces thereof to effect the printing, and in the other direction on the opposite side of the form of type to return the pressure roller to its initial position. The machine consists of a base, 1, upon which are erected standards, 2 and 3. The support for the type, 4, lies between the side-frames 2 and 3, and is adjustable vertically to permit of securing the proper height. Extending between the side-frames, near one end, is a shaft, 5, having sprocket wheels, 7, mounted thereon, each of which

receives a chain, 6, the two chains lying adjacent to the side-frames 2 and 3. At the opposite end of the machine each chain, 6, runs on a sprocket wheel, 7, which is mounted for rotation upon a stub-shaft, 8. The two chains, 6, form the support and moving means for the pressure roller, 9, which extends between the two chains and has its ends received in bearings formed in links of the chains. When the roller 9 is moving horizontally in co-action with the type, members secured to the links of the chains which support the ends of the roller co-act with flanges, 10, formed on the side-frames 2 and 3, and extending inwardly therefrom, these flanges serving to make the pressure roller move in a true horizontal plane. A delivery device is provided, consisting of a hook, 11, carried by a rod extending between the chains, this hook being adapted to engage the rear edge of a sheet immediately after that sheet has been imprinted upon, and to push the sheet ahead of it off of the type form and into a delivery tray, 12. For inking, an ink ribbon is preferably employed, this ribbon, 13, being here shown as having its ends wound upon spools, 14, between which the ribbon extends over the form of type. Preferably the form of type is so disposed upon the support, 4, that the lines of type extend at a slight incline to the axis of the pressure roller, 9, so that when the pressure roller is moving in co-action with the type it bears at any one time upon a few type in each of a few lines, since in this way better results and more easy running are obtained than when the pressure roller moves from one line to another and co-acts with all of the type of a line at once. For further description of these parts of the machine, reference may be had to Patent No. 917,022, heretofore granted to me.

In accordance with the present invention, the pressure roller, 9, is one having a hard surface and the type are resiliently supported so that they are capable of movement in the direction of their length. Overlying the face of the support, 4, is a pad, 15, of resilient material, such as rubber, and the type or the holders for the type are supported directly upon this resilient pad.

In stating that the roller 9 has a hard surface, I do not mean that the surface of this roller is of the hardness of metal. The roller is characterized as having a surface which is hard by comparison with rollers which have been commonly employed heretofore and which have had surfaces so soft that embossing of the sheets would occur.

The invention contemplates the provision of means for locking together all of the type of a line so that each line of type moves as a unit relatively to the other lines as such movement is permitted by the rubber pad 15. With this provision the important ad-

vantage is obtained that equally good impressions may be obtained with less pressure of the roller, 9, upon the type, and, therefore, an economy in the power consumed is effected and there is less jarring of the parts. To accomplish this I provide a type-holder for each line of type, and this holder is preferably so constructed as to facilitate the setting up of the type thereon. Each type-holder consists of two similar strips of metal of uniform cross-section throughout, secured together side by side and having a lengthwise dove-tail groove in the upper edge thereof. The two strips for a type-holder are shown at 18 and 19 in Fig. 4, and the type, 20, are formed so as to slide readily in the dove-tail groove, 21, in the upper edge of the type-holder. The type-holder with the type thereon is type-high, so that lines of type set up upon such type-holders may be used in the same form with electrotypes or types of the ordinary form. The two strips, 18 and 19, for a type-holder may be permanently secured together, as by means of rivets; in that case the groove, 21, would be of such size that the type could be made to slide freely therein, I prefer, however, to employ means for drawing together the two strips, 18 and 19, for a type-holder, so as to cause them to grip the type 20 and hold those type against bodily movement transverse to their length. In Fig. 4, screws, 22, are shown for drawing the two parts, 18 and 19, of the type-holder together. Also, springs, 23, are provided between the plates, 18 and 19, so that if the screws, 22, be loosened slightly, these springs will spread the plates 18 and 19 so that the type can be moved readily in groove 21.

Fig. 5 shows a slight modification of the structure, in which the sides of the lower portions of the type are inclined to coact with similarly inclined surfaces on the type-holder whereby when the two parts of the type-holder are drawn together a cam action will take place, which will result in drawing the type down tightly upon the upper edge of the type-holder. With this construction it will be seen that each line of type may be set up as a unit upon a type-holder, and this type-holder is of such construction that it may be readily used with a suitable type-setting machine by which the type are set up upon the holder. A plurality of lines of type having been set up on the type-holders in the manner indicated in Fig. 4, these holders would be placed in a chase and the form thus assembled would be mounted upon the rubber pad, 15, overlying the support 4. Now, when the pressure roller, 9, is moved into coaction with the type, downward movement of a type or a small number of type with which the roller is in coaction, can be effected only by de-

pressing the whole line of type, or at least one end of that line of type. It is possible for each type to move downwardly practically as far as if the type were individually supported by the resilient pad, but by locking together all of the type of a line, each type in that line is more stiffly supported by reason of the larger area of the rubber pad underlying the support for the whole line of type. As a result of this, less pressure of the roller 9, upon the type is required in order to give the desired impression. The coaction of these parts is shown on an enlarged scale in Fig. 3, where it will be seen that as the pressure roller 9 moves along in coaction with the type, the pressure exerted by it will tend to press downwardly those type with which it is in co-action, but since the type of each line are supported as a unit, such downward movement of the type directly underlying the pressure roller can be made only by depressing that line of type as a unit. Therefore, each type, while capable of being depressed the desired amount, is supported by a relatively large area of the resilient material, and as a result a materially reduced pressure of the roller upon the type will be sufficient to give the desired impressions. It will, therefore, require less power to operate the machine, and the jar incident to the initial engagement of the roller with the type, and the passage of the roller off of the type, will be reduced to a minimum.

35 Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is:

1. The combination of a form of type disposed in a plane and consisting of a plurality of holders each as long as the width

of the form and each having a line of type mounted thereon, each holder and its line of type being capable of movement as a unit in the direction of the length of the type independently of the other holders and their type, a pad of rubber supporting directly the several holders and lines of type and permitting any holder with its line of type to yield as a unit independently of the other lines in the direction of the length of the type, a roller having a hard surface, and means for moving the type-form and roller relatively in coaction to effect the printing, substantially as set forth.

2. The combination of a form of type disposed in a plane and consisting of a plurality of holders each as long as the width of the form and each having a line of type mounted thereon, each holder and its line of type being capable of movement as a unit in the direction of the length of the type independently of the other holders and their type, a pad of rubber supporting directly the several holders and lines of type and permitting any holder with its line of type to yield as a unit independently of the other lines in the direction of the length of the type, a roller having a hard surface, and means for moving the type-form and roller relatively in coaction to effect the printing, the type-form being so arranged that the lines thereof extend at an incline to the axis of the roller, substantially as set forth.

This specification signed and witnessed this 29th day of December, 1910.

ALBERT B. DICK.

Witnesses:

M. H. BURHART,
W. G. ARNOLD.