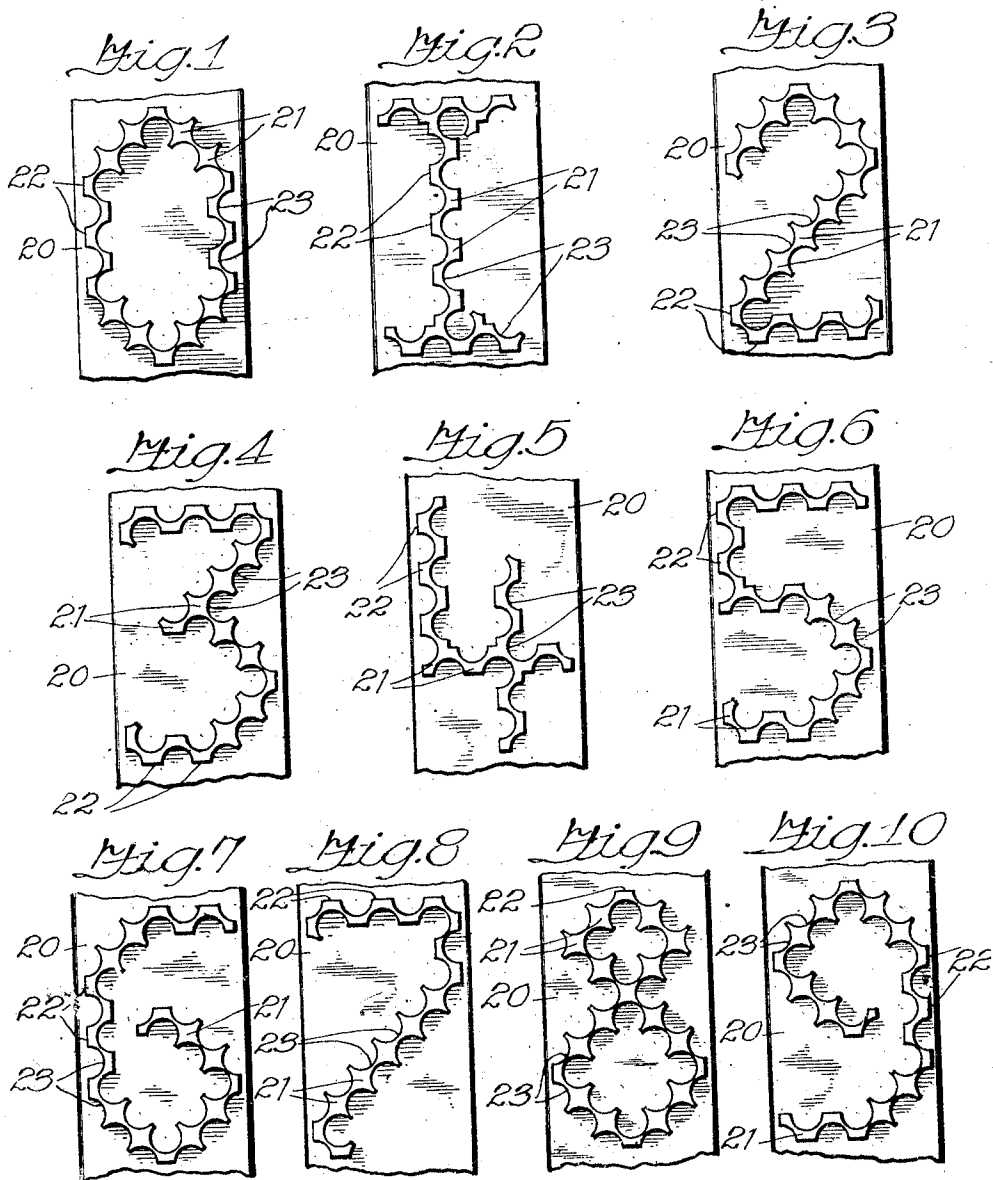


D. F. FESLER AND H. R. HEDMAN.
 PRINTING APPARATUS.
 APPLICATION FILED AUG. 21, 1919.

Patented Apr. 27, 1920.
 4 SHEETS—SHEET 1.

1,338,645.

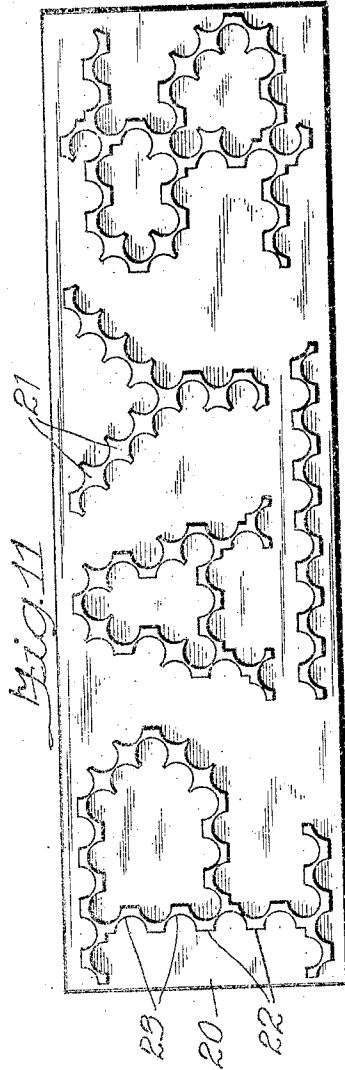
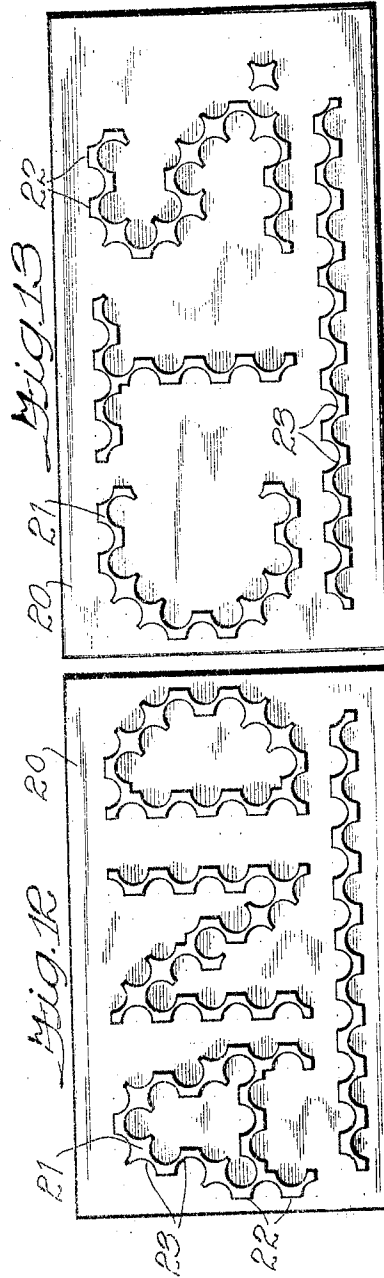


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4 SHEETS—SHEET 2.



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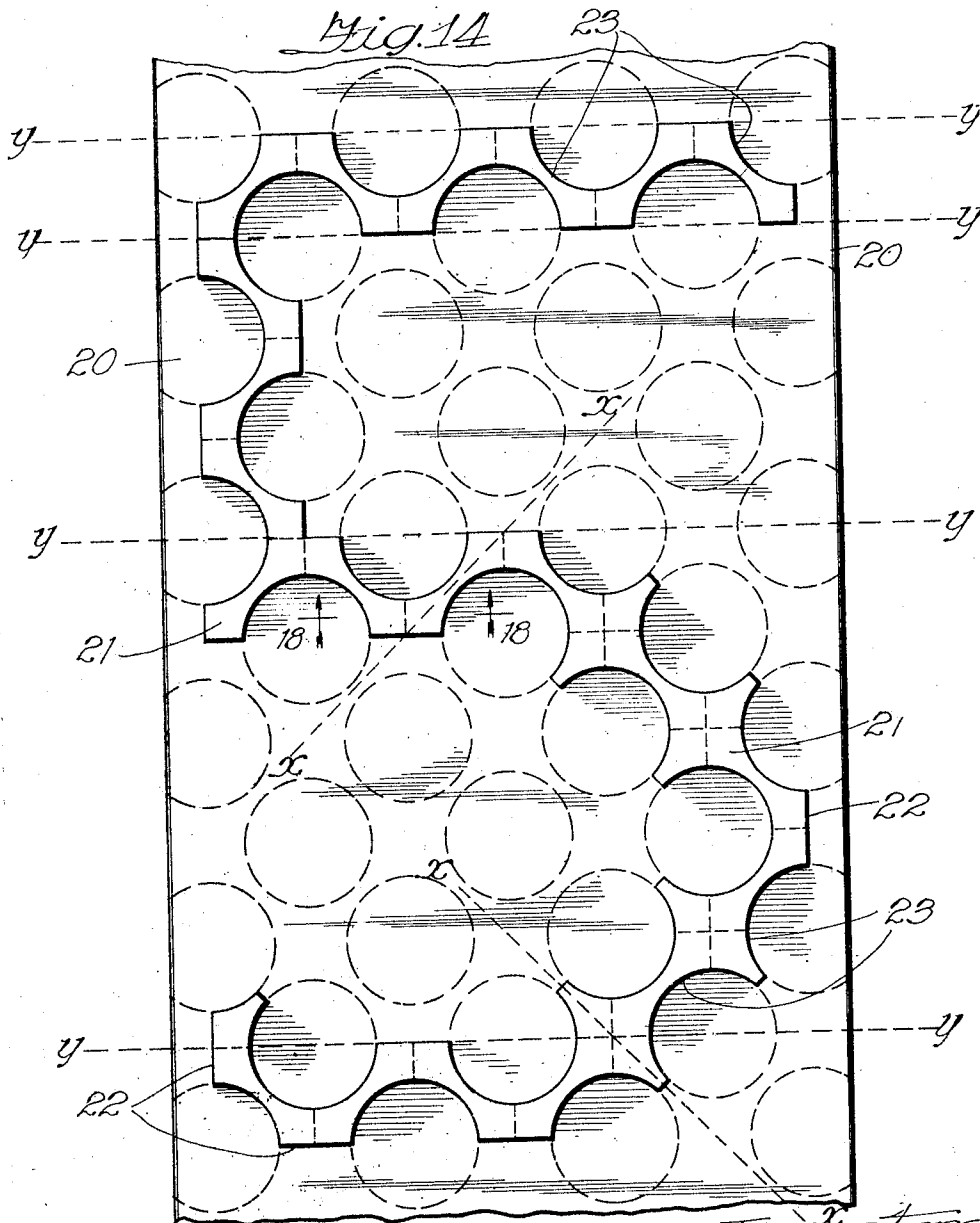
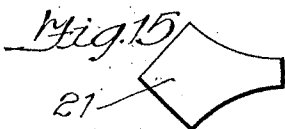
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4 SHEETS—SHEET 3.

1,338,645.



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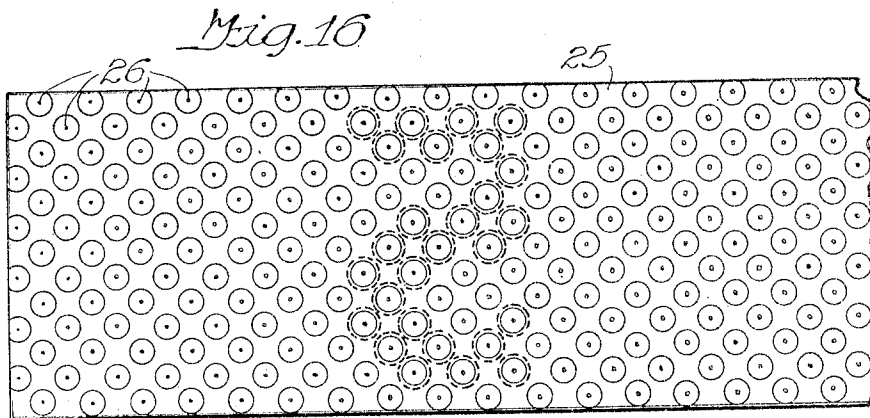
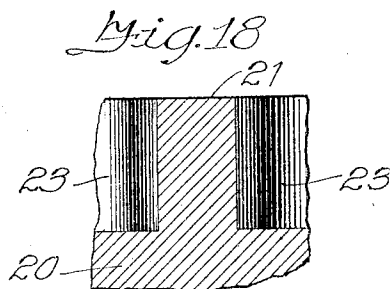
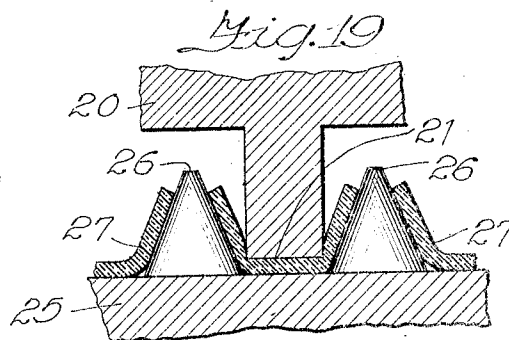
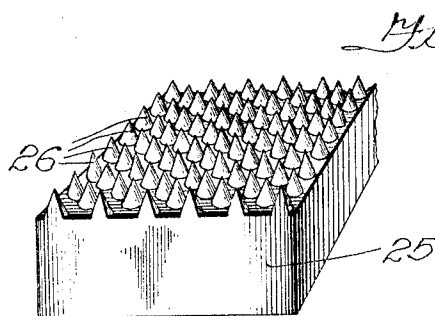
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Patented Apr. 27, 1920.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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PRINTING APPARATUS.

1,338,645.

Specification of Letters Patent.

Patented Apr. 27, 1920.

Application filed August 21, 1919. Serial No. 318,901.

To all whom it may concern:

Be it known that we, DOUGLAS F. FESLER and HERBERT R. HEDMAN, both citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Printing Apparatus, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to improvements in printing apparatus, and more specifically is concerned with the provision of improved type and coöperating platen adapted for use in check protectors, numbering machines and the like, which are designed to make non-eradicable impressions upon checks and other paper instruments.

Our invention contemplates the provision of type and platen capable of making impressions of letters, figures and other characters, which are of better appearance than the impressions made by the various forms of type and platen heretofore provided for use in check protectors and other similar printing devices.

Our invention furthermore contemplates the provision of type and coöperating platen, which when properly operated, are capable of making neat and non-eradicable impressions of any desired character, without materially weakening the paper at the point where the printing is effected.

A further object of our invention is to provide type and a platen that coöperate with each other to perform their intended functions, without incurring very much wear. The type and platens heretofore used in check protectors have ordinarily been provided with cutting surfaces which contacted with each other and caused the rapid wearing away of both type and platen.

The type and platen, by virtue of which we attain the hereinbefore mentioned objects, and more particularly characterized as follows:

(1) The type which are carried by suitable type supporters, preferably by being cast integral therewith, are provided with printing faces which are perfectly flat and smooth, being entirely free from depressions, ridges or grooves of any kind whatsoever.

(2) The platen is provided with a large

number of substantially conical indenting points, which when the type are moved against the platen, in the printing operation, do not at any time engage the printing face of the type, but to the contrary, merely puncture or indent the paper to the sides of and immediately adjacent the printing faces of the type.

(3) The arcuate of each of the several conical indenting points is less than the perpendicular distance from the type face to the type support, so that the indenting points not only do not engage the type at any time, but furthermore, do not even engage the type support. Thus the platen is practically indestructible, since the indenting points are subject to practically no wear.

(4) The sides of each of the type are at all points perpendicular to the flat, smooth printing face of the type, so that the printing in every instance stands out clearly and distinctly on the paper.

(5) The several type are formed in accordance with a definite geometrical plan, so that when the type supports are properly adjusted, and type and platen brought into printing relation, the type, with their flat printing faces and sides perpendicular to the printing faces, pass down between the indenting points without contacting with the latter. The portions of the platen which lie opposite the printing faces of the type, during the printing operation, are also substantially flat, so that the paper, during the printing operation, is compressed between flat, smooth type faces and correspondingly flat portions of the platen.

(6) Each side of each type consists of a plurality of straight and arcuate surfaces, all at right angles to the printing face. The curved or arcuate surfaces of the type sides lie partially around, but out of contact, with the indenting points of the platen, during the printing operation, so that when an impression is effected upon a check, the indentations bounding the figure or letter as printed appear to be within the printed area, since in printing under pressure a portion of the ink pressed out from under the smooth printing face finds its way into some or all of the minute holes or indentations formed by the indenting points of the platen.

(7) The several minute holes or indenta-

tions formed in the paper by the indenting points are entirely disconnected and sufficiently spaced from each other to prevent the paper from being substantially weakened, due to the presence of such indentations. In other words, each indentation is bounded by undisrupted paper, so that there is no tendency at all for the paper upon which the printing has been effected to become separated from the body of the check.

The type and platen herein shown and described, although not necessarily so limited in their use, are particularly adaptable to the check protector shown and described in Patent No. 1,197,279, granted to Douglas F. Fesler on September 5th, 1916.

In the accompanying drawings illustrating our invention,

Figures 1 to 10 are plan views of the faces of numeral type illustrating the preferred formation of digits 0 to 9.

Fig. 11 illustrates the "Pay \$" characters as they appear on the printing type bar or movable logotype of the Fesler machine previously mentioned.

Figs. 12 and 13 illustrate the type characters "And" and "Cts.", as they appear on the stationary type bars or logotypes of the Fesler machine.

Fig. 14 is a clear, enlarged view of the digit 5 as it is preferably formed in accordance with our invention, the dotted lines serving to make clear the geometrical plan to be followed in constructing the type characters.

Fig. 15 illustrates a certain geometrical figure which is employed in constructing the type of our invention, in accordance with the plan to be hereinafter fully described.

Fig. 16 is an enlarged fragmentary plan view illustrating the platen and its indenting points.

Fig. 17 is a fragmentary view illustrating the platen in perspective.

Fig. 18 is a fragmentary cross sectional view taken on the line 18-18 of Fig. 14, and

Fig. 19 is a fragmentary sectional view illustrating the relation between the raised type characters and the platen, during the printing operation.

Since the type and platen as actually used are quite small, a drawing illustrating the same in actual size would be difficult to explain and understand. Therefore, we have deemed it advisable to illustrate the same in this case on a scale much greater than actual size. In Figs. 1 to 13, the type, and in Figs. 16 and 17, the platen, have been shown substantially ten times actual size, whereas in Figs. 14, 15, 18 and 19, the scale employed is substantially forty times actual size.

Check protectors of the class shown and described in the Fesler patent mentioned

comprise a stationary base and a pivoted casing arranged to be struck downwardly toward the base when the printing is to be effected. The casing carries a plurality of pivotally mounted and variably adjustable printing sectors, one assigned to each order of dollars and cents. To the right of the printing sector of lowest order, and permanently disposed at the printing line is a stationary type bar, or logotype, which usually bears the type letters, "Cts." Interposed between the two printing sectors of lowest order, and the sector of next highest order, is a second stationary type bar, likewise permanently at the printing line, which usually bears type capable of printing the characters, "And", while to the left of the printing sector of highest order is a so-called limiting type bar, or movable logotype, capable of printing the characters, "Pay \$", which is always at the printing line, but arranged automatically to take its position immediately adjacent the highest order printing sector used in any printing operation. In the Fesler patent, the stationary type bars, or logotypes, are illustrated at 32 and 33, whereas the limiting type bar, or movable logotype, is illustrated at 35.

Since all of these parts of the mechanism associated therewith are shown and fully described in the patent aforesaid, it will be unnecessary for us to burden this description with the details of the machine with which we prefer to employ the type and platen of our invention. It will suffice to say that in applying our present invention to a machine similar to that of the Fesler patent, the periphery of the several type sectors 16 to 22 will be provided with raised numeral type similar to those shown in Figs. 1 to 10. The stationary logotypes 32 and 33 will be provided with type characters of the kind shown relatively in Figs. 13 and 12, and the limiting type bar 35 will be provided with type characters of the kind shown in Fig. 11, and the platen herein shown and described will be substituted for the platen of said patent.

In applying type characters to a printing sector, the type support, with the type characters standing out from the surface thereof, are ordinarily formed on the periphery of the printing sector by a die casting operation. The stationary and movable logotypes, or at least the portions thereof constituting the type support and the type, are also conveniently formed by a die casting process. With this explanation, it will be necessary to merely illustrate the type supports and the type carried thereby, which of course are conveniently formed integral with the type support.

Referring first to Figs. 1 to 10, at 20 in each figure we have illustrated the type support, which is carried by, or constitutes part

of the periphery of a printing sector. Formed integral with each type support is a plurality of type characters which are provided with flat, smooth printing faces 21, and in this respect are similar to ordinary printers' type, and are distinguished from the type usually employed in check protecting apparatus, since the latter, in all commercial machines with which we are familiar, have been provided with printing faces that are scored with alternate ridges and grooves, or provided with indenting points or the like. Thus the flat, smooth printing faces of the type of our invention enable us to secure the advantage of the good and distinct printing afforded by type faces that are flat and smooth, similar to the type employed in ordinary printing. We secure a non-eradicable impression without mutilating the printing faces of our type with ridges and grooves, or anything of that nature.

The sides of each of the type comprise a plurality of surfaces 22 and 23, all of which are substantially perpendicular to the printing face 21. The surfaces 22 are straight plane surfaces, while the surfaces 23 are arcuate or curved surfaces adapted, when printing is effected, to lie partially around, but not to engage the conical indenting points carried by the platen presently to be described. Since in printing, the arcuate lateral surfaces 23 of the type are designed to lie partially around the indenting points, it is necessary that the type characters be laid out in accordance with a certain definite geometrical plan, in order that when any type has been brought to the printing line and forced downwardly against the platen, the indenting points of the latter will surely not strike any part of the flat, smooth printing face of the type.

The plan which is followed in laying out the several type is schematically illustrated in Fig. 14. In Fig. 15 we have illustrated a five-sided geometrical figure which may be regarded as a plan view of the face of a printing character or projection rising from the surface of a type support. This printing character or projection may be regarded as being provided with a perfectly smooth printing face, three straight plane lateral surfaces and two arcuate lateral surfaces, all of which are perpendicular to the printing face. Each of the type of our invention, although formed in one piece, is theoretically, and in fact nothing more or less than a plurality of printing projections of this kind disposed side by side in accordance with a definite plan. We have selected the digit 5, as shown in Fig. 14, to illustrate the plan, we have followed in laying out the several type. The dotted lines across the printing face of the type indicate the boundaries of the several projections of which the type is formed, as well as the relative disposition of said projections. Each of the several projections of which the type is made up is disposed with at least one (but usually with two or more) of its plane lateral surfaces immediately adjacent corresponding straight lateral surfaces of contiguous projections of identically the same size and shape, so that the printing face, which is the result of the ensemble, is perfectly smooth and continuous, although of varying width.

Attention is directed to the fact that each of the small geometrical figures of which the type face as a whole is made up is in every case so disposed that a line X—X bisecting the angle between its two longest straight sides, and consequently bisecting its smaller straight side, is disposed exactly an angle of forty five degrees to the lines Y—Y, passing through the centers of the several circles indicated by dotted lines, the circumferences of which circles coincide with the arcuate sides of the several geometrical figures which make up the printing face of the type. This arrangement is highly important because, as will later be more fully pointed out, the conical indenting points of the platen similarly to the circles of Fig. 14, are disposed in staggered rows. When the type and platen are brought into printing relation, the centers of the bases of the conical indenting points occupy positions corresponding to the centers of the several dotted circles. The bases of the conical indenting points are of less diameter than the circles between which the type faces are laid out, so that when the type and platen are in printing relation, the indenting points not only fail to engage the printing faces of the type, but in fact do not even engage the sides of the type.

It is of course possible to construct a raised type figure or character consisting of a multiplicity of pins or projections of the shape shown in Fig. 15, the said pins or projections being secured and arranged on a type support, in accordance with the plan just explained. However, as a practical matter, after the form of the desired figure or letter has been laid out in accordance with the plan just described, it is more feasible to cast the type and type support all in one piece. Functionally, type constructed by the two methods are exactly the same thing.

All of the numeral type illustrated in Figs. 1 to 10, as well as the letters and symbols of Figs. 11, 12 and 13, are constructed in accordance with the same plan and have all of the characteristics which have been ascribed to the particular type just described.

In Figs. 16 and 17 the platen illustrated is designed to cooperate with the type illustrated in the preceding figures. The platen is in the form of a bar 25 on the upper sur-

face of which is formed a plurality of conical indenting points 26, arranged in staggered rows, transversely and longitudinally of the bar as shown. This platen, when used with the type of our present invention, in connection with a machine of the Fesler type, is substituted for the platen designated as 24 in the Fesler patent. The platen may be formed by any accepted process. In Fig. 16 the dotted circles around the bases of the conical indenting points correspond to the dotted circles shown in Fig. 1, and thus represent the relative positions of the indenting points and the type, when the type have been moved into engagement with the platen. Of course for the sake of clearness the platen has been shown on a greatly enlarged scale. When the platen is actually used, the indenting points are very small. The platen of a commercial machine embodying our invention, the dimension of which platen is $1'' \times 3\frac{3}{16}''$, is provided with nine hundred and ninety indenting points.

In Fig. 18 we have illustrated a fragmentary section of one of the type and its support, this view being taken through the type and type support on the line 18—18 of Fig. 14. Any other sections taken through the body of the type will be substantially the same except that the width of the flat printing surface of course varies at different points. This view clearly illustrates the fact that the printing face 21 of the type is perfectly smooth and flat, as well as the fact that the lateral surfaces of the type are at right angles to the smooth flat printing face.

In Fig. 19 we have illustrated how the platen and type cooperate to make an indentable impression upon a check 27. When the type are moved down toward the platen, the check in proper position, the check is pressed tightly between the smooth and flat printing face 21 of the type and the platen, which is also substantially flat between the bases of the indenting points. Since the paper is pressed between the smooth printing face 21 and a correspondingly flat portion of the platen, the impression is very clearly and distinctly printed upon the check. At the same time, the indenting points 26 serve to produce minute indentations or apertures in the paper at the very margins of the printing effected by the printing face 21. The printing faces of the type are of course inked prior to the printing operation, as for instance, by the inking pad designated as 50 in the Fesler patent previously mentioned, we find that when the printing operation is effected, a portion of the ink forced out from under the printing face 21 finds its way into the indentations or apertures formed by the indenting points 26, and thus renders it absolutely impossible to separate the printing. The apertures formed in the paper by the indenting

points are very small and are disconnected, so that this method of making an indentable impression upon a check does not to any material degree weaken the check at the points where the printing is effected.

As is clearly illustrated in Fig. 19, the indenting points may be slightly blunt. Moreover, the altitude of each of the conical indenting points is less than the perpendicular distance from the printing face of the type to the type support, or at any rate, not greater than this distance, which insures that the indenting points shall never strike the type support. Since neither do they engage the type, as has been previously explained, it will be seen that they are subject to practically no mechanical wear.

Of course, it is essential that the type of our invention shall be in proper position over the platen before being moved down between the indenting points. This requirement is admirably met by the machine of the Fesler patent previously referred to, in which some of the type are carried on stationary type bars whose positions with respect to the printing line are permanently fixed, while the other type are carried by printing sectors or the movable type bar, the positions of which at the time of printing are accurately determined by the method of their mounting and by the provision of special stop and detent mechanism, all of which are clearly shown and described in the said Fesler patent.

Having thus described our invention, what we claim is:—

1. Printing apparatus of the class described comprising a platen provided with a plurality of indenting points, a type support carrying a raised type character having a flat smooth printing face, said type character conformed to pass down between the indenting points of the platen, without the printing face engaging the indenting points when type and platen are moved into engagement one with the other.

2. Printing apparatus of the class described comprising a platen having indenting points arranged thereon in parallel rows, a type support carrying a raised type character having a flat smooth printing face, said type character conformed to pass down between the indenting points of the platen without the printing face contacting with the indenting points, when type and platen are moved into engagement one with the other.

3. Printing apparatus of the class described comprising a platen having substantially conical indenting points arranged thereon in parallel rows, a type support carrying a raised type character having a flat smooth printing face, said type character conformed to pass down between the indenting points of the platen without the

printing face contacting with the indenting points, when type and platen are moved into engagement one with the other.

4. Printing apparatus of the class described comprising a platen provided with a plurality of indenting points, a type support carrying a raised type character having a flat smooth printing face, said type character conformed to pass down between the indenting points of the platen, without the printing face engaging the indenting points when type and platen are moved into engagement one with the other, the height of said indenting points being not greater than the perpendicular distance from the printing face to the type support.

5. Printing apparatus of the class described comprising a platen provided with a plurality of indenting points, a type support carrying a raised type character having a flat smooth printing face, said type character conformed to pass down between the indenting points of the platen, without the printing face engaging the indenting points when type and platen are moved into engagement one with the other, the height of said indenting points being less than the perpendicular distance from the printing face to the type support.

6. Printing apparatus comprising a platen, a type support, a raised type character carried by said support and having a flat smooth printing face, indenting points carried by the platen which do not engage the printing face when type and platen are moved into engagement one with the other, said indenting points arranged to lie immediately adjacent to the lateral surfaces of the type character and to puncture the paper being printed at the margins of the impression made thereon by said flat smooth printing face.

7. Printing apparatus comprising a platen, a type support, a raised type character carried by said support and having a smooth inked printing face, indenting points carried by the platen which do not engage the printing face when type and platen are moved into engagement one with the other, said indenting points arranged to lie immediately adjacent to the lateral surfaces of the type character and adapted to punch a plurality of minute disconnected apertures in the paper being printed at the very margins of the impression made thereon by said flat smooth type face.

8. Printing apparatus of the class described comprising a platen having a plurality of indenting points formed thereon in parallel rows together with a type support, a raised type character having a flat smooth printing face carried by said type support, said type character arranged to pass down between said indenting points without engaging the latter when the type

and platen are moved into engagement one with the other.

9. Printing apparatus comprising a type support having a raised type carried thereon, said type provided with a flat smooth inked printing surface adapted, when moved against the platen, to make an impression on a paper placed between the type and platen, together with indenting points carried by said platen arranged to punch a multiplicity of minute holes in the paper at and only at the very margins of the impression made thereon by the printing face of said type.

10. Printing apparatus comprising a platen, a type character having a smooth flat printing face adapted to cooperate with said platen to make an impression on a paper instrument together with means carried by the platen adapted to punch a multiplicity of minute holes in the paper at and only at the very margins of the impression made thereon by said printing face.

11. Printing apparatus of the class described comprising a platen having a plurality of indenting points formed thereon in parallel rows, the indenting points of adjacent rows being disposed in staggered relation, together with a type support, a raised type character carried by said type support, said type character conformed to pass down between said indenting points without engaging the latter when type and platen are moved into engagement one with the other.

12. Printing apparatus comprising a platen, a plurality of rows of conical indenting points carried by said platen together with a type support, a raised type character carried by the type support, said type character having a smooth flat printing face and lateral arcuate surfaces struck on centers corresponding to the centers of said conical indenting points.

13. Printing apparatus comprising a platen, plurality of rows of indenting points carried by said platen, together with a type support, a raised type character carried by the type support, said type character having a flat smooth printing face and sides consisting of a plurality of plane and arcuate surfaces, the latter being struck on centers corresponding to the location of the indenting points.

14. Printing apparatus of the class described comprising a platen provided with a plurality of indenting points arranged thereon in rows, a type character having a smooth flat printing face adapted to pass down between the indenting points without having the indenting points engage the printing face of the type, the sides of the type comprising arcuate surfaces arranged to embrace the indenting points nearest the printing face when type and platen are moved into engagement one with the other.

15. Printing apparatus of the class described comprising a platen, a type character having a flat smooth printing face, adapted when pressed thereagainst to make
5 a solid inked impression upon a check or other paper resting on said platen together with indenting points carried by the platen operating concurrently with the making of the impression to punch a plurality of
10 minute holes in the paper at, and only at, the very margins of the inked impression made by the flat printing face of said type, whereby a portion of the ink forced out
15 into said apertures to prevent obliteration of the printing.

16. Printing apparatus of the class de-

scribed comprising a type support, a raised type character thereon having a smooth flat printing face, a platen provided with
20 a flat surface which lies opposite the smooth printing face of the type when type and platen are brought into engagement one with the other and indenting points rising
25 from the platen at the margins of said printing face, none of said indenting points contacting with the printing face.

In witness whereof, we hereunto subscribe our names this 19th day of August, 1919.

DOUGLAS F. FESLER.
HERBERT R. HEDMAN.

Witnesses:

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ELIZABETH PERKINS.