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S. S. HADDAD.

TYPES FOR TYPE WRITERS OR PRINTING PRESSES.

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(No Model.)

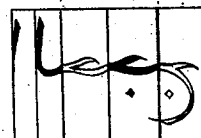
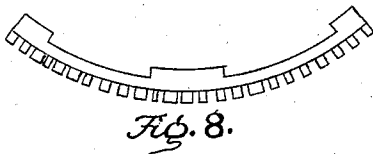
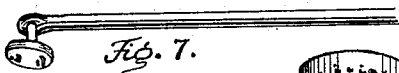
Fig. 1.
ا ب ت ث ج ح خ ذ ز س ش ص ض
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ب ت ث ج ح خ
2^a 3^a 4^a 5^a 6^a 7^a
س ش ص ض
12^a 13^a 14^a 15^a

ط ظ ع غ ف ق ك ل م ن ه و لا ر
16 17 18 19 20 21 22 23 24 25 26 27 28 29

ع غ ف ق ك ل م ن ه
18^a 19^a 20^a 21^a 22^a 23^a 24^a 25^a 26^a
ي
29

Fig. 2.
ا ب ج د
30 31 32 33
Fig. 3.
اميركا
c-
امبركا
d-
الحجج
b-
الحجج
34 35 36
34^a 35^a



WITNESSES:

J. C. Burch.
J. H. Homan

عجل
g Fig. 9.

عجل
f

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TYPES FOR TYPE-WRITERS OR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 637,109, dated November 14, 1899.

Original application filed August 12, 1899, Serial No. 727,059. Divided and this application filed October 13, 1899, Serial No. 733,492. (No model.)

To all whom it may concern:

Be it known that I, SELIM S. HADDAD, artist, a citizen of the Ottoman Empire, residing at Cairo, Egypt, have invented certain new and useful Improvements in Types for Type-Writers or Printing-Presses, of which the following is a specification.

My invention relates to improvements in printing-types used in type-writers and in printing-presses, &c., in the languages which use the Arabic characters or alphabet.

The improvements herein are directed especially to the "face" of the types, whether used in the art of printing or in the analogous art of type-writing.

The Arabic alphabet now in common use in the Arabic, Turkish, and Persian languages consists of about six hundred and thirty-eight characters. Owing to this great number of characters in the present alphabet it is practically an impossibility to construct a type-writing machine to write these languages, and the type-setter in presswork is greatly handicapped in having to select his type from a case in which each "font" consists of six hundred and thirty-eight type.

It is my object to reduce the number of these letters or characters, primarily that the alphabet of these languages may be adapted to a type-writing machine and to facilitate presswork.

Referring to the accompanying drawings, I have shown in Figure 1 the complete alphabet of the letters used in the Arabic, Turkish, and Persian languages, each constructed of a form or shape adapted for carrying out my invention. In Fig. 2 I have shown at *a* a specimen word as such word is printed or written with my new letters and showing the manner of connecting the letters of the word. At *b* I have shown the same word and the same letters, illustrating the manner now in vogue of connecting the letters of such word. In Fig. 3 I have shown at *c* another specimen word as such word is written or printed with my new letters and showing the manner of connecting the letters of the word. At *d* I have shown the same word and the same letters, illustrating the manner now in vogue of connecting the letters of such word. In Fig. 4 I have shown in face view the type assembled

for printing the specimen word shown at *a*, Fig. 2, the faces of such type being constructed of my new letters. In Fig. 5 I have shown in face view the type assembled for printing the same word as shown at *b*, Fig. 2, the faces of such type being constructed of the letters now in use. In Fig. 6 I have shown my new letters or type upon a type-wheel for type-writers. In Fig. 7 I have shown my new letters or type upon a type-bar for type-writers. In Fig. 8 I have shown my new letters or type upon a type-plate or segment for type-writers. In Fig. 9 at *f* is another word printed or written of my new letters. At *g* is shown the same word in the old style.

It will be understood that in the Arabic, Turkish, and Persian languages and all languages which use the Arabic alphabet as used to-day each letter has four different forms or shapes for the four different positions in a word. Three of these forms or shapes are used in the three different positions when connected in a word—that is, at the beginning of the word, at the middle of the word, and at the end of the word. When used disconnectedly or isolated, each and every letter would have still another shape—a fourth form, whether it occur in the beginning, middle, or end of the word. Several exceptions may be noted in this general plan in the letters—alef, (1 and 31, Fig. 1,) dal, (8, Fig. 1,) thal, (9, Fig. 1,) ra, (10, Fig. 1,) zein, (11, Fig. 1,) wao, (27, Fig. 1,) and lam-alef, (28, Fig. 1.) In these letters the forms used in the beginning and isolated positions are of the same shape, and those in the middle or end positions are of the same shape. These letters never join or connect with the succeeding letter on the left, it being the custom to write or print these letters disconnectedly when they occur at the beginning of a word or preceded by such letters, and when they occur in the middle or end of the word they are connected to the preceding letter only.

In the following description I shall refer to the letter according to its position in use—*i. e.*, as "beginning," as "middle," as "end," or as "isolated."

I employ the term "left side" herein to designate that side of the letter or type which would make the left side of the impression or

print and the term "right side" to designate that side of the letter or type which would make the right side of the impression or print.

It will be understood that it is at present the custom in writing and printing the letters of the Arabic alphabet in the Arabic, Turkish, and Persian languages to try to cramp all the letters of a word in the least lateral space, and in doing so the vertical space of the page is sacrificed or disregarded by connecting the letters of a word on an incline from right to left, as is illustrated by the examples of the specimen words at *b*, Fig. 2, and at *d*, Fig. 3, and in Fig. 5.

Referring to Fig. 2, I have shown at *a* the word consisting of the letters alef, (1, Fig. 1,) lam, (23, Fig. 1,) ha, (6, Fig. 1,) geem, (5, Fig. 1,) and geem (5^a, Fig. 1) as such word is written and printed with my new letters or type. This is an Arabic word to designate the certificate of the government that the property therein mentioned has been transferred. The words deed, assignment, or certificate of title of the English language are its equivalent. At *b*, Fig. 2, I have shown the same word as it is written or printed with the letters now in use.

Referring to Fig. 3, I have shown at *c* the word consisting of the letters alef, (1, Fig. 1,) meem, (24, Fig. 1,) yai, (29, Fig. 1,) ra, (10, Fig. 1,) kaf, (22, Fig. 1,) and alef (1, Fig. 1) as such word is written and printed with my new letters or type. This is an Arabic word meaning "America." At *d*, Fig. 3, I have shown the same word as it is written and printed with the letters now in use.

Referring to Fig. 4, I have shown the type for printing the word shown at *a*, Fig. 2, and in Fig. 5 I have shown the type for printing the word shown at *b*, Fig. 2.

Referring to Fig. 9, I have shown at *f* the word consisting of the letters ain, (18, Fig. 1,) geem, (5, Fig. 1,) and lam (23^a, Fig. 1) as such word is written and printed with my new letters or type. This is an Arabic word meaning "calf." At *g*, Fig. 9, I have shown the same word as it is written and printed with the letters now in use.

By comparison of the middle letter geem at *g*, Fig. 9, with the same letter used in the middle of the word at *b*, Fig. 2, it will be seen that this letter at *f*, Fig. 9, has at its lower side or bottom an extension toward the right, which is its connection-bar to the preceding letter; but at *b*, Fig. 2, no such extension or connection-bar is seen. In this word the letter has an extension toward the right from its upper or top side. Both of these letters are connected to the succeeding letter by a connection-bar which is integral with the succeeding letter. This custom of connecting and cramping the letters of a word in the least lateral space leads the type-setter or writer of the Arabic, Turkish, and Persian languages to employ so many different and distinct forms of the same letter for the same position in a word. This is but an illustration of a fact

that may be said to be true of every letter in the present Arabic alphabet. Thus it often happens that one form or shape of a letter will not connect with the preceding letter and the writer or type-setter is compelled to select another form of the letter he wants to use, which by its peculiar shape is adapted for connection with the peculiar shape of the preceding letter. In the evolution of the Arabic, Turkish, and Persian languages and in the evolution of the Arabic alphabet, which is used in these several languages, many forms or shapes of the same letter have accumulated until at the present writing the alphabet consists of about six hundred and thirty-eight differently-shaped letters in common use.

In the art of printing or writing the Arabic, Turkish, or Persian languages the letters of a word are by rule connected, and such letters comprise a body portion proper and a connection-bar.

It is well understood that every middle and end letter of the Arabic alphabet has always been made (either printed or written) with a short line or bar projecting to the right of and added to the body portion integrally for the purpose of connecting the letter to the preceding letter on the right. Such a connection-bar has not been used in the beginning letters for the reason that it was not needed, there being no preceding letter. It will be seen that in the construction of my new letters I do not use such a connection bar or line on the right of my letters; but, on the contrary, I construct my beginning and middle letters with an extension or line of connection solely on their left side, for a purpose hereinafter explained.

As a result of constructing all in line 1 my new letters without a connection-bar solely on their right sides and constructing the middle and beginning letters with a connection-bar on their left I have derived advantages of great importance. It allows me to use one and the same shape of the letter for both beginning and middle positions and one and the same shape for both the end and isolated positions for the reason that no connection-bar is needed on the right of the middle and end letters, as such connection-bar when needed to connect the middle and end letter will be found on the left side of the preceding letter.

My letters alef, dal, thal, ra, zein, thah, zah, waoo, lam-alef, alef-madda, and tzein have but one construction for all the positions, beginning, middle, end, and isolated.

As is well known, the Arabic alphabet consists of only twenty-nine letters, and as used in the Turkish and Persian languages consists of only thirty-two letters; but, as has been stated, different forms of each letter are employed for use in the different positions the letter occupies with relation to the word and also a separate form for the isolated position; also, as stated, many different shapes of the different forms of the different letters

have swelled the number of characters or type employed to the enormous number of six hundred and thirty-eight. The disadvantage of this is well illustrated in an attempt to
 5 build a type-writing machine which would write the Arabic, Turkish, or Persian languages. Such a type-writer would have the six hundred and thirty-eight type; or, at least, one hundred and fourteen for Arabic and
 10 one hundred and twenty-four for Turkish and Persian if only one form of every letter in every position was used, and the operator of the machine would have to operate almost as many keys. In my new alphabet I have
 15 reduced the number of characters of the alphabet to fifty-eight. To state it more forcibly, by way of illustration, I have invented a new construction of each of the letters of the Arabic alphabet for the Arabic, Turkish,
 20 and Persian languages in which a font of type containing only letters would consist of but fifty-eight type, as shown in Fig. 1.

One thing which must be borne in mind is that I am compelled to make the letters of my
 25 alphabet of such shape that each may be readily distinguished by the people who now use the present very complicated alphabet without any necessity of study on their part to learn my new letters. It will also be understood that in order to apply my alphabet to
 30 the known type-writing machines it is necessary that the letters should have some regularity as to width. It is not possible to modify the Arabic alphabet so that all the letters
 35 will be of the same width; but in my alphabet I have so constructed the letters that some of the letters will be about twice the width of the others, or, in other words, will occupy two
 40 units of the lateral space. The other letters will occupy but one unit of the lateral space.

In the well-known type-writing machines the carriage or paper-holder travels in a straight line across the point where the type make the impressions on the paper, and hence
 45 when a line of such impressions is made such line will be straight or horizontal, and so in printing with the Arabic alphabet on such a machine the letters must be joined on the horizontal line which the movement of the
 50 carriage describes. Such a thing could not be done with the present Arabic alphabet for the reason, as stated above, that the letters of the present alphabet are not of a shape that will permit them to be written connect-
 55 edly on a horizontal line and at the same time preserve the popular shapes of the characters, and hence there are no type-writing machines to write the Arabic alphabet.

In lieu of a better machine my new type
 60 are applied to any of the well-known type-writing machines, whether it be of the bar or lever description or of the wheel or segment or plate description. I am aware that in such machines the successive movements
 65 of the carriage or paper-holder to present new surfaces for the successive impressions

or spacings traverse from right to left but one unit of the lateral space, and hence I will so modify the machines for writing my new letters that the sequence of the presen-
 70 tation of the new surfaces will be from left to right, and the "spacing" mechanism will for certain of the letters herein specified present a new surface equal to exactly two units of the lateral space and for other of the let-
 75 ters present new surfaces equal to exactly one unit of the lateral space. The new surfaces so presented for the end and isolated letters need not be exactly of the width of a unit or its multiple, as such letters never con-
 80 nect on their left, and if such letter is more than one or two units in width the excess width will but take up part of the succeeding space.

The exceptional letters dal, thal, ra, zein, 85 wao, lam-alef, and tzein, as stated above, never join on the left whether they occur in the beginning, middle, end, or isolated positions, and will always take up part of the succeeding space.

The letters dal, thal, and lam-alef being 90 less than two units will be given two spaces on the machine, so that if they occur in the middle of the word they will not join the succeeding letter.

In making the type for presswork or for any other purpose than for a type-writer I will not so importantly regard the proportional width of the type, as such feature is not essential in the art of printing. In printing my type will
 100 conform as near as may be to the popular widths of the different characters.

The gist of my invention in printing-types is the new construction of the face or letters of such type, whereby I secure for all the letters a common alinement when assembled in a word or line and whereby I am enabled to use one type for the beginning and middle positions and one type for the end and isolated positions. Generally speaking, the novelty
 110 of such construction lies in omitting the ordinary connection-bar on the right side, and so shaping such letters on their right that the point where they connect with a preceding letter occurs directly on the body portion of the face of the type in a common horizontal line and in adding to the left sides of each beginning and middle letter an extension or projection which terminates in the same line with the connection-point on their right sides.
 120

It will be understood that in writing the Arabic, Turkish, and Persian languages the letters are constructed by movements of the pen from right to left and that a word is constructed of successive letters from right to
 125 left; also, that in composition the line is read from right to left. So must the same characteristics be observed in printing or type-writing.

In order to adapt the present Arabic alpha- 130 bet to the type-writer, I have devised a plan or system by which all the letters bear a cer-

tain uniform relation to a horizontal line, either ruled or imaginary, which I may call the "base-line."

That the letters of a word may be connected each to the other horizontally and each bear one fixed relation to the base-line I have so formed or shaped my new letters that their points of connection to a preceding or succeeding letter shall always occur at points bearing a uniform relation to the base-line. To do this, I comprehend an imaginary line running parallel to and a little distance preferably just above the base-line, as shown by the dotted line *xx* in Fig. 1.

In forming my letters their points of connection with preceding or succeeding letters will always be at the points where their right or left side lines cross the imaginary dotted line *xx*, as shown in Fig. 1, &c.

Generally speaking, the body portion of my letter is of substantially the same form or shape as one of the forms or shapes now in general use; but it will be understood that I have made in each of my letters an essential difference between it and any shape or form of the same letter as at present shaped or formed. This difference arises from the fact that I have so modified or changed the letters that their points of connection with a preceding or succeeding letter of a word shall always be at a uniform distance above the base-line and that all middle and beginning letters which by custom connect with a succeeding letter in a word have a projection or extension from their left side to form a connection-bar, and the connection-bar or extension heretofore formed on the right side of middle and end letters I now dispense with, as shown in Fig. 1.

My new alphabet, as seen in Fig. 1, is composed of the letters alef, (1,) bai, (2,) tai, (3,) thai, (4,) geem, (5,) ha, (6,) kha, (7,) dal, (8,) thal, (9,) ra, (10,) zein, (11,) seen, (12,) sheen, (13,) saad, (14,) thaad, (15,) thah, (16,) zah, (17,) ain, (18,) gain, (19,) fai, (20,) haf, (21,) kaf, (22,) lam, (23,) meem, (24,) noon, (25,) hai, (26,) waoo, (27,) lam-alef, (28,) yai, (29,) and in these shapes are used in the beginning and middle of the word only, with the exception of the letters alef, (1,) dal, (8,) thal, (9,) ra, (10,) zein, (11,) thah, (16,) zah, (17,) waoo, (27,) and lam-alef, (28,) which last letters have the same shape whether used at the beginning of the word, in the middle of the word, at the end of the word, or when written isolated.

When my letters are used at the end of the word or isolated, they have, with the exceptions noted, a second and distinct shape, as seen in Fig. 1, as bai, (2^a,) tai, (3^a,) thai, (4^a,) geem, (5^a,) ha, (6^a,) kha, (7^a,) seen, (12^a,) sheen, (13^a,) saad, (14^a,) thaad, (15^a,) ain, (18^a,) gain, (19^a,) fai, (20^a,) haf, (21^a,) kaf, (22^a,) lam, (23^a,) meem, (24^a,) noon, (25^a,) hai, (26^a,) yai, (29^a,) pai, (34^a,) and jeem, (35^a.)

The omission of the ordinary connection-bar on the right of middle and end letters and the addition of a connection-bar to the left

only of beginning and middle letters which by custom connect on their left are changes made by me in all such letters.

I will now describe the particular change or modification I have made of each type-face, having reference to Fig. 1 of the drawings, in which I have shown my letters of the complete Arabic alphabet as used in the Arabic, Turkish, and Persian languages.

The letter alef (1, Fig. 1) is substantially the same shape as at present used, except that my letter always terminates below at the line of connection *xx*, Fig. 1. In a type-writer this letter occupies one unit of space. I use this same shape as the beginning, middle, end, or isolated form of the letter.

The letter bai (2, Fig. 1) is substantially the same shape as one of the shapes used at present and only differs from it in the increased length or projection of the bottom curve to the left to form a connection-bar, so that between the right and left point of connection the letter is one unit wide. I use this same shape as beginning or middle letter.

The letter bai (2^a, Fig. 1) I use as the end and isolated form, and it is substantially the same shape as one of the present end forms, except that in my letter I dispense with the short curve at the right end of the present form, which was used as a connection-bar. This shape of the letter is about two units in width.

The letter tai (3, Fig. 1) is a modified form of one of the present shapes and only differs from it in the increased length of the bottom curve toward the left to form a connection-bar and the omission of the connection-bar on the right. I use this form as a beginning and middle letter. This shape is one unit in width.

The end and isolated tai (3^a, Fig. 1) is a modification of the present end tai and differs from it in that I do not commence at the right with a short curve, but commence the long curve at a point just above the base-line and dispense with the short curve altogether. This shape is about two units in width.

The letter thai (4, Fig. 1) is substantially the same in shape as at present used modified in the same particulars as are mentioned above with respect to the letter bai (2, Fig. 1.) This letter is one unit in width and is used as a beginning and middle letter.

The letter thal (4^a, Fig. 1) is substantially the same in shape as that at present used, modified, however, in the same particulars as are mentioned with respect to the end or isolated letter bai, (2^a, Fig. 1.) This shape of the letter is about two units in width and is used as an end and isolated letter.

My letter geem (5, Fig. 1) is substantially like one of the present shapes of this letter, except that I project the lower line a little to the left to form a connection-bar and dispense with the connection-bar on the right and make the right and left ends of my let-

ter conform to the connection-line. This letter is two units in width and is used as a beginning and middle letter.

My letter geem (5^a, Fig. 1) is substantially like one of the present shapes, but is slightly modified by omitting the connection-bar on the right, so that its point of connection on the right is at the connection-line. This letter is about two units in width and is used as an end and isolated letter.

My letter ha (6, Fig. 1) is substantially like one of the present shapes, modified, however, in the particulars mentioned with respect to my letter geem, (5, Fig. 1.) This letter is two units in width and is used as a beginning and middle letter.

My letter ha (6^a, Fig. 1) is substantially like one of the present shapes, modified, however, in the same particulars mentioned with respect to my letter geem, (5^a, Fig. 1.) This shape is about two units in width and is used as an end or isolated letter.

My letter kha (7, Fig. 1) is substantially like the present shape, slightly modified, however, in the particulars mentioned above with respect to my letter geem, (5, Fig. 1.) This letter is two units in width and is used as a beginning and middle letter.

My letter kha (7^a, Fig. 1) is substantially like one of the present shapes, modified, however, in the same particulars as are mentioned above with respect to my letter geem, (6^a, Fig. 1.) This shape is about two units in width and is used as an end and an isolated letter.

The letters dal, (8, Fig. 1,) thal, (9, Fig. 1,) ra, (10, Fig. 1,) and zein (11, Fig. 1) are of substantially the same in form as one of those letters in present use, except that I slightly modify them by omitting the connection-bar on their right sides and have their connection-points on their right cross the imaginary dotted connection-line $x\ x$. These letters never connect with a succeeding letter, but only with a preceding letter on the right. I use the same shape of these letters in all four positions, and each letter is about one unit in width.

The letters seen (12, Fig. 1) and sheen (13, Fig. 1) I use as beginning and middle letters, and they are of substantially the same form as the present beginning forms, except that the left line is extended to form a connection-bar and made to terminate as shown on the dotted connection-line. These letters are each two units in width.

The end and isolated forms of my letters seen (12^a, Fig. 1) and sheen (13^a, Fig. 1) are of substantially the same form as one of the present forms, except that the point of commencement of my letters is at the dotted imaginary line, and as I use them as end forms the extension or connection bar on the right is omitted, in order that they may be joined on the right to the connection-bar of a preceding letter.

My letter saad (14, Fig. 1) is substantially

the same shape as one of the shapes now in use, except that the short curve at the left is extended a little to the left and terminates at the line of connection to form a connection-bar, and the extension or connection bar on the right is omitted. This shape is two units in width and is used as a beginning and middle letter.

The end or isolated form of saad (14^a, Fig. 1) is also substantially the same shape as one of the shapes used at present. The extension or connection bar, however, is omitted or cut from the right side. This shape is a little more than two units wide; but as it is only used at the end of a word or isolated the excess of the two units will be taken from the space intervening between the next succeeding letter or word.

My letter thaad (15, Fig. 1) I use as a beginning and middle form, and it is substantially the same shape as one of the shapes used at present, modified, however, in the same particulars as are mentioned above with respect to my letter saad, (14, Fig. 1,) and is of the same width.

The end and isolated form of my letter thaad (15^a, Fig. 1) I have also modified in the same particulars as mentioned above with respect to my end or isolated letter saad, (14^a, Fig. 1.) Otherwise it is of the same shape as one of the shapes now in use.

My letters thah (16, Fig. 1) and zah (17, Fig. 1) are modifications of one of the shapes of these letters now in use, the difference being in the increased length of the bottom curve to the left to form a connection-bar and the omission of the connection-bar on the right. Both these letters are two units wide, and the same shape is used in all the four positions.

My letters ain (18, Fig. 1) and gain (19, Fig. 1) are modifications of one of the beginning shapes of these letters now in use, the difference being in extending the bottom line of my letters toward the left to form a connection-bar. Each of these letters is two units in width, and I use this shape of the letters for beginning and middle forms.

My letters ain (18^a, Fig. 1) and gain (19, Fig. 1) for the end and isolated forms are modifications of the isolated shapes of these letters now in use, the only difference being that the point of connection on the right is always on the dotted line. I use this shape for end and isolated positions, and the letters are about two units wide each.

My letters fai (20, Fig. 1) and haf (21, Fig. 1) are modifications of one of the present forms of such letters, the difference being in the increased length of the bottom line toward the left to form a connection-bar and the omission of the connection-bar on the right. The letters are one unit in width and are used as beginning and middle forms.

My letters fai (20^a, Fig. 1) and haf (21^a, Fig. 1) for the end and isolated forms are modifications of one of the present shapes of these letters, the difference being that the connec-

tion-bar on the right is omitted and the point of connection on the right is always on the dotted line. These letters are about two units in width.

- 5 My letter kaf, (22, Fig. 1,) used as a beginning or middle form, is a modification of one of the present shapes of this letter now in use, the difference being in the extension of the bottom line to the left to form the connection-
10 bar and the omission of the connection-bar on the right side. This letter is one unit in width.

- My letter kaf, (22^a, Fig. 1,) used as the end and isolated form, is a modification of one of the shapes of this letter now in use, the differences being in the omission of the connection-bar on the right. The point of connection on the right is always on the connection-line x , and the letter is about two units wide.

- 20 My letter lam (28, Fig. 1) is used as a beginning or middle form and is substantially like one of the present shapes, except that the short bottom line is extended to the left and to the connection-line to form a connection-
25 bar and the connection-bar on the right is omitted. The letter is one unit wide.

- My letter lam (23^a, Fig. 1) is used both as an end and isolated letter and is substantially like one of the present shapes of the letter,
30 except that the connection-bar is omitted from the right side and the point of connection on the right is always on the connection-line x . This letter is about two units wide.

- My letter meem (24, Fig. 1) is used as a beginning or a middle letter and is substantially like one of the present shapes of this letter, except that I extend the bottom curve a little to the left to form a connection-bar and the connection-bar on the right is omitted. This
40 letter is one unit wide.

- My letter meem (24^a, Fig. 1) is used as an end or isolated letter and is substantially like one of the present shapes of this letter, but the connection-bar on the right is omitted.
45 This letter is about one unit wide.

- My letter noon (25, Fig. 1) is substantially like one of the present shapes of this letter, modified, however, in the same particulars as are mentioned above with respect to my letter bai, (2, Fig. 1.) This letter is one unit in width and is used both as a beginning and middle letter.

- My letter noon (25^a, Fig. 1) I use as an end or isolated letter and is substantially like one of the present shapes of this letter, except that the connection-bar on the right is omitted. In width it occupies about two units.

- My letter hai (26, Fig. 1) is used both as a beginning and middle letter and is substantially the same shape as one of the present shapes, except that the bottom curve is extended to the left to form a connection-bar on the left and the connection-bar on the right is omitted. The letter is two units wide.

- 65 My letter hai (26^a, Fig. 1) is used both as an end and isolated letter and is a modification of one of the present shapes of this letter,

the difference being in making the side line of the letter cross and project a little at the top. The curve of the loop is a little abrupt at the point at the right side where it crosses the connection-line, and this point is the connection-point for the preceding letter. This shape of the letter is about one unit in width.

My letter wao (27, Fig. 1) is used in all four positions and is substantially like one shape of this letter at present used, except that the connection-bar on the right is omitted and its connection-point is at the point where the downward curve crosses the connection-line. This letter never joins at the left. The letter is about one unit wide and is always written disconnected on the left.

My letter lam-alef (28, Fig. 1) is used in all four positions and is substantially the same shape as one of the present shapes of this letter, except that I dispense with the short connection bar or line at the right, and the downstroke line is straight until it reaches the connection-line, at which point it is joined to a preceding letter. This letter never joins with a succeeding letter on the left and is about two units in width.

My letter yai (29, Fig. 1) is used both as a beginning and middle letter and is substantially like one of the present shapes of this letter, modified, however, in the same particulars as are mentioned above with respect to my letter bai, (2, Fig. 1.) This letter is one unit in width.

My letter yai (29^a, Fig. 1) is used both as end and isolated form and is substantially the same shape as one of the present shapes of this letter, except that it is written higher up, so that the connection-point on the right is at the point where the under curve begins. This letter is about two units in width.

My letter tai (30, Fig. 1) is a third shape of the letter tai (3, Fig. 1) and is used in certain special instances, and this shape is a modification of that at present used in such cases, the difference being in making the side lines of the letter cross and project a little at the top. The curve of the loop is a little abrupt at a point at the right side where it meets the line of connection, and this point is the connection-point for the preceding letter. This shape is about one unit in width.

My letter madda (31, Fig. 1) is in reality composed of the letter alef, (1, Fig. 1,) used as a vowel, and another alef called "madda," which is also so used with alef in the letter lam-alef, (28, Fig. 1.) It is substantially the same in shape as at present used, modified, however, in the same particulars as are mentioned above with respect to my letter alef, (1, Fig. 1.) It is one unit wide.

Hamza (32, Fig. 1) is a vowel used isolated to give a special sound and is never connected with any letter. It is about one unit wide and is substantially of the same shape as the present isolated. Hamza (33, Fig. 1) is the same vowel when used in the beginning and

middle of the word, in which case it is written over the shape of an undotted yai, (29, Fig. 1.) It is substantially like in shape as one of the present shapes of this vowel, modified, however, in the particulars mentioned as to my letter yai, (29, Fig. 1,) and is one unit in width.

Pai, (34, Fig. 1,) geem, (35, Fig. 1,) and tzein (36, Fig. 1) are substantially like one of the shapes of the present letters pai, geem, tzein, and are modified in the same particulars as are mentioned above with respect to my letters bai, (2, Fig. 1,) geem, (5, Fig. 1,) and zein, (11, Fig. 1,) respectively. They are respectively one, two, and about one unit wide. These letters are used more especially in the Turkish and Persian languages to convey certain sounds.

Among the many advantages derived from the use of my new letters I may mention a great economy in number of type, and hence a great economy of time in setting type. There is not such a wide difference in the width and thickness of my type as there is in the type used at present, and hence the wear on my type is uniform; but in the present type the very thin type wear quicker and get so low as not to print. A great economy of time in correcting the many errors which occur by reason of the use of the enormous number of forms or shapes of the same letter.

My letters are much easier to learn because of the comparatively small number of characters.

By the present alphabet the successive letters of a word are often connected in an oblique direction above or below the writing-line, and hence much space is often wasted between the lines; but my letters are constructed so that all connect on a horizontal line and all bear a certain fixed relation to a base or writing line, and hence I do not waste much space between lines.

Ordinarily three lines can be written with my letters in the same vertical space as two lines are now written or printed by the letters now in use.

The great number of differently-shaped letters now made and sold in each font of type necessitates the employment of nearly as many different matrices; but in making my new letters the number of matrices is even more greatly reduced in proportion than is the number of differently-shaped letters. Many of the letters will be seen to have a common design in their body portion and are distinguished one from the other by the number and position of the dots. Hence the matrices will be made for the greater design and the separate type made therefrom by cutting away the unnecessary dots. Only about thirty-one matrices would be necessary for a font of my new type.

I do not make claim herein to the new system of Arabic notation herein disclosed, as such matter forms the subject of an applica-

tion filed by me August 12, 1899, Serial No. 727,059, of which the subject-matter herein claimed is a division.

I employ the term "Arabic alphabet" in the claims to designate the characters or letters which are used in the languages of the countries which have adopted the Arabic alphabet, the most important of which for the purposes of this invention being Egypt, Algeria, Tunis, Turkey, and Persia.

I claim—

1. Types of the middle and end characters of the Arabic alphabet for use in the Arabic, Turkish and Persian languages, the ordinary connection-bar on the right of which is omitted.

2. Types of the characters of the Arabic alphabet for use in the Arabic, Turkish and Persian languages, the ordinary connection-bar on the right of the middle and end letters of which is omitted, the beginning and middle letters which by custom connect on the left, having a connection-bar solely on their left, said types having the parts of their faces which join other types fashioned or constructed so as to join in a single horizontal line.

3. Types for the beginning letters of the Arabic alphabet which by custom connect, having a connection-bar solely on the left.

4. Types of the characters of the Arabic alphabet for type-writers and other purposes, the letters, bai, tai, thai, fai, haf, kaf, lam, meem, noon, yai, hamza, and pai for use in the beginning and middle positions, being constructed exactly one unit in width, and the letters geem, ha, kha, seen, sheen, saad, thaad, thah, zah, ain, gain, hai, jeem, for use in the beginning and middle positions, being constructed exactly two units in width.

5. Types for the middle letters of the Arabic alphabet the ordinary connection-bar on the right of which is omitted.

6. Types for the middle letters of the Arabic alphabet having a connection-bar solely on the left.

7. Types for the middle letters of the Arabic alphabet the ordinary connection-bar on the right of which is omitted in combination with a type having a connection-bar solely on the left.

8. Types for the beginning letters of the Arabic alphabet which by custom connect on the left, having a connection-bar solely on the left, in combination with a type for the middle-letter the ordinary connection-bar on the right of which is omitted.

9. Types for the beginning and middle letters of the Arabic alphabet which by custom connect on the left, having a connection-bar solely on their left sides terminating in a connection-point and a connection-point located upon the body of the letter at their right sides, the connection-point on the left and the connection-point on the right being located on the same horizontal line.

10. Types for the end letters of the Arabic alphabet the ordinary connection-bar on the right of which is omitted.

11. Types for the end letters of the Arabic alphabet having a connection-point upon the right directly on the body of the letter a uniform distance from a base-line, for the purpose stated.

12. Types for the letters alef, dal, thal, ra, zein, thah, zah, waoo, lam-alef, alef-madda, and tzein of the Arabic alphabet the ordinary connection-bar on the right of which is omitted, whereby said types may be used in all the four positions.

13. Types for the letters alef, dal, thal, ra, zein, thah, zah, waoo, lam-alef, alef, madda and tzein of the Arabic alphabet having a connection-point located directly upon the right of the body of the face a uniform distance from a base-line.

14. Types for the end letters of the Arabic alphabet the ordinary connection-bar on the

right of which is omitted, in combination with types of beginning and middle letters which by custom connect having a connection-bar on their left.

15. An Arabic type which by custom is connected on an adjoining type, of a shape which adapts it to be used either in the beginning or middle of a word.

16. An Arabic type which by custom is connected to an adjoining type, of a shape which adapts it to be used as an end or an isolated letter of a word.

17. Types of the letters of the Arabic alphabet which by custom connect on the left, having a connection-bar solely on the left.

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

SELIM S. HADDAD.

Witnesses:

A. ROLAND JOHNSON,
GUY H. JOHNSON.