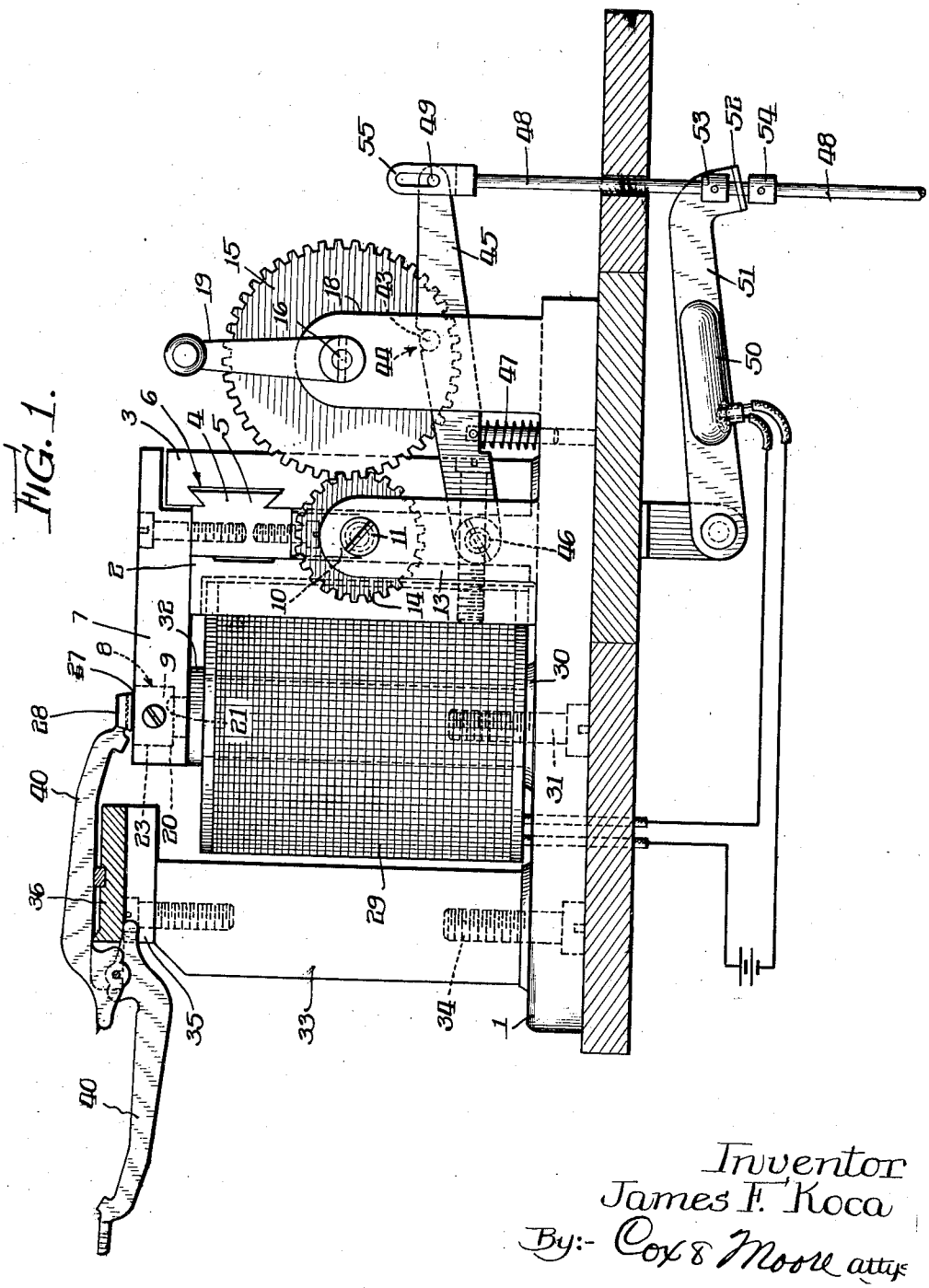
Jan. 5, 1937. J. F. KOCA 2,066,980

TYPESETTING MECHANISM FOR TYPEWRITERS

Filed Nov. 9, 1934 3 Sheets-Sheet 1

FIG. 1.




Inventor
James F. Koca
By:- Cox & Moore attys

Jan. 5, 1937. J. F. KOCA 2,066,980

TYPESETTING MECHANISM FOR TYPEWRITERS

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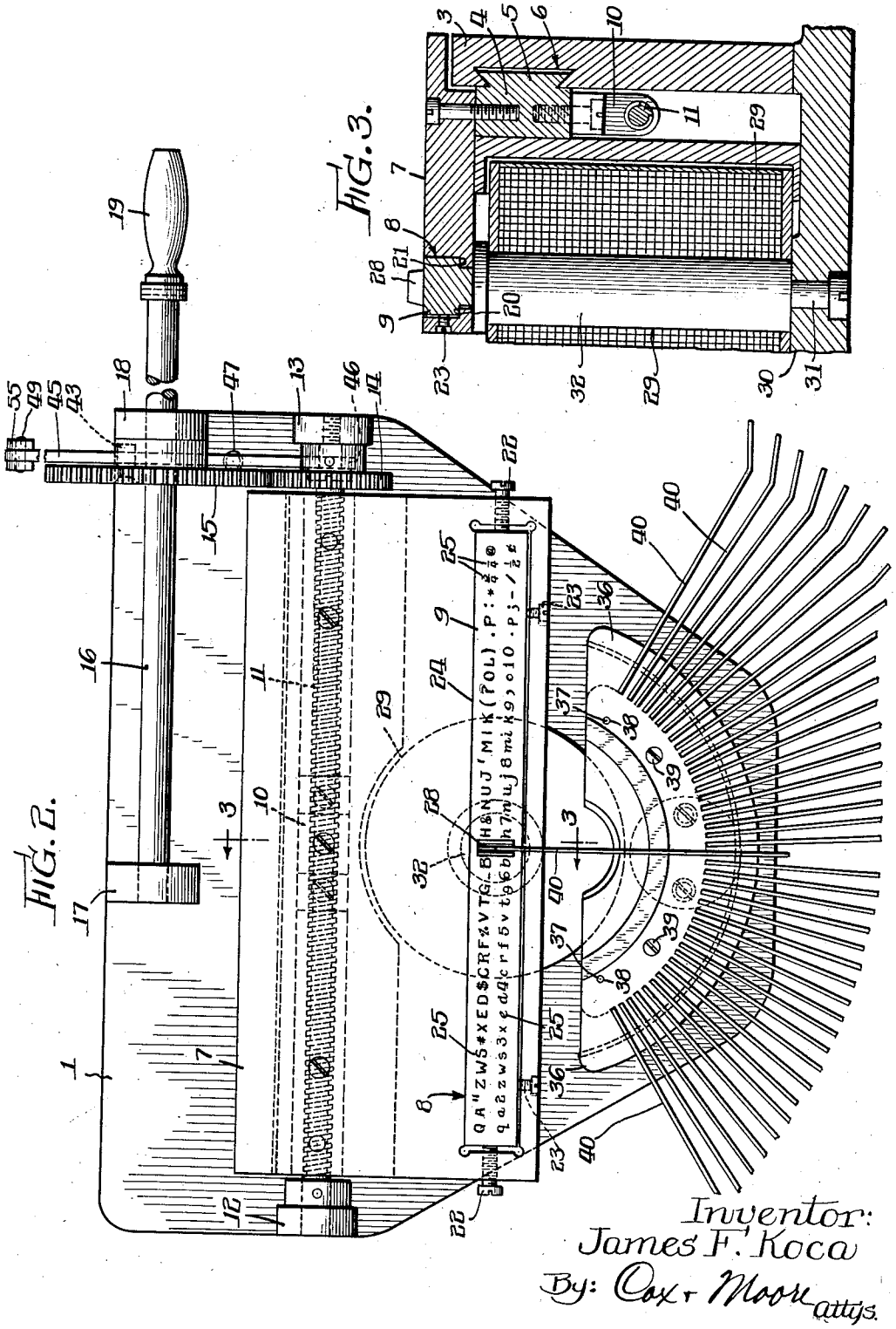


FIG. 2.



FIG. 3.

Inventor:
James F. Koca
By: Cox & Moore attys.

Jan. 5, 1937. J. F. KOCA 2,066,980

TYPESETTING MECHANISM FOR TYPEWRITERS

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FIG. 5.

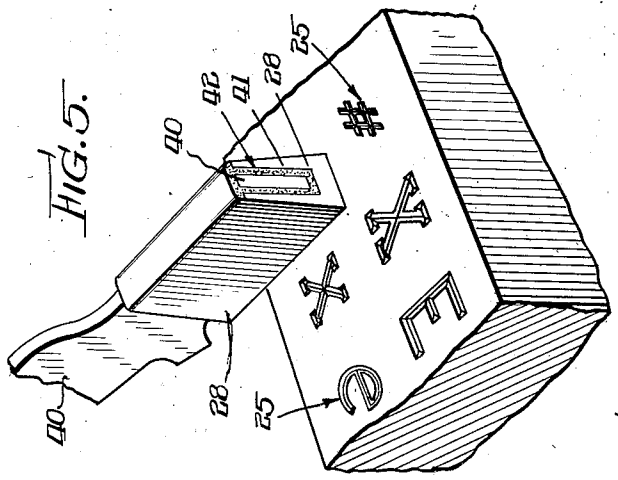



FIG. 6.

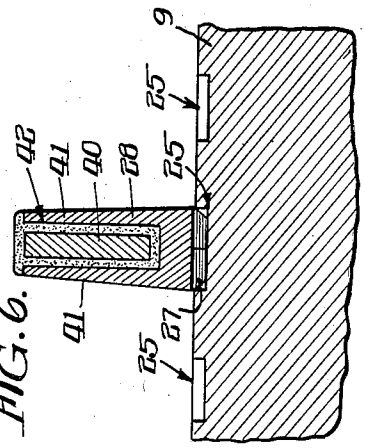



FIG. 4.

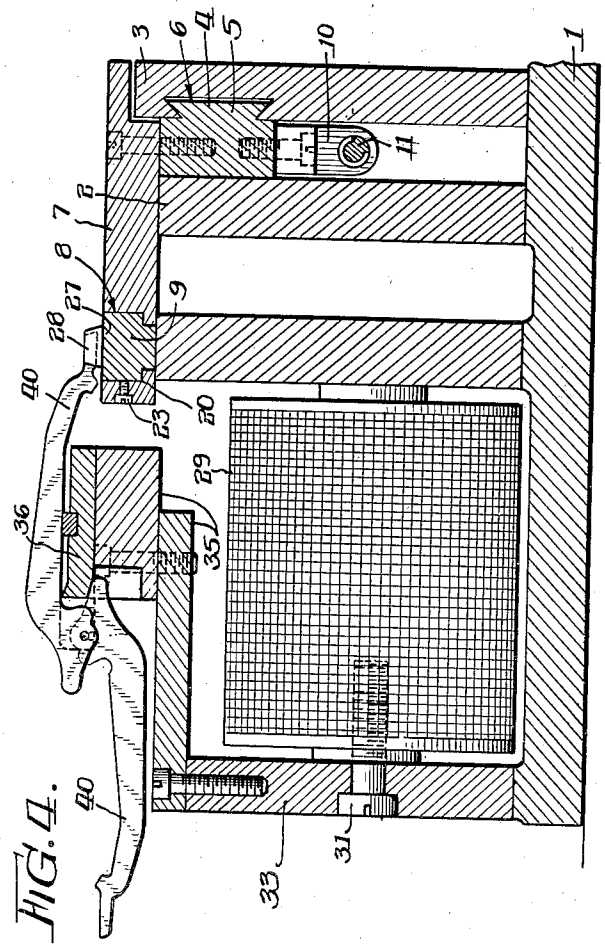



FIG. 7.

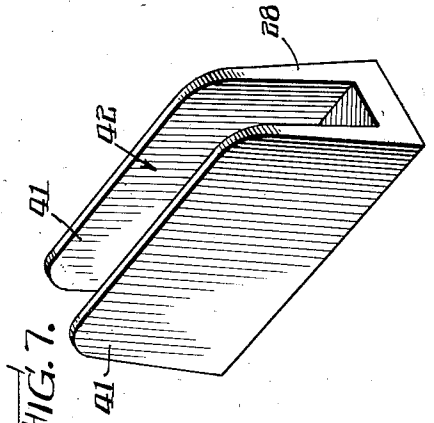
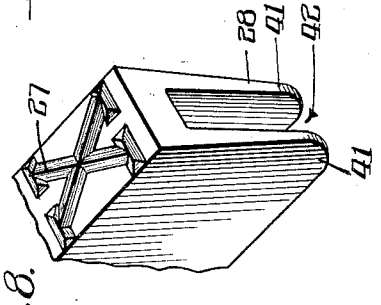



FIG. 8.




Inventor:-
James F. Koca
By Cox & Moore attys

Patented Jan. 5, 1937 2,066,980

# UNITED STATES PATENT OFFICE

2,066,980

## TYPESETTING MECHANISM FOR TYPEWRITERS

James F. Koca, Woodstock, Ill., assignor to Woodstock Typewriter Company, Woodstock, Ill., a corporation of Illinois

Application November 9, 1934, Serial No. 752,199

17 Claims. (Cl. 113—59)

This invention relates to typesetting mechanism for typewriters, and particularly to mechanism or apparatus for holding a type element in proper position in respect to a type bar whereby the type bar may be dropped into the element in substantially proper alined position and then soldered thereto.

An important object of the invention is the provision of a mechanism or apparatus of the type described which has a matrix comprising a single unitary block with all the characters used on a typewriter cut or formed therein so that all the type elements containing all the printing characters may, if desired, be arranged on said matrix, thereby permitting an operator to set the type bars and solder the same to the type elements consecutively.

Another object of the invention is to provide a single matrix having all the type characters of a typewriter cut or formed therein, whereby it is relatively simple and easy to replace or substitute other matrices with great accuracy.

A further object of the invention is to provide an apparatus of the kind described which has a single elongated matrix having all the characters formed therein, there being electro-magnetic means provided to magnetize the entire matrix, thereby permitting the full number of type elements to be arranged in position on the matrix and held magnetically thereto so that a juxtaposed type segment may have its connected type bars moved to position progressively.

A further object of the invention is the provision of an apparatus of the type described wherein there is provided a typewriter segment supported on a suitable base and carrying the type bars of the typewriter, the base being insulated as much as possible from a magnet so as to prevent the segment and the type bars from becoming magnetized. A magnet is arranged underneath a longitudinal matrix which is supported in a slide block. The slide block cooperates with means for shifting the same longitudinally in a straight direction so as to bring any character representation on the matrix in position relative to a type bar whereby the type bar may be soldered to the type element which carries the character.

Numerous other objects and advantages will be apparent through the progress of the following specification.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail end elevation of the device or apparatus and embodying the invention.

Fig. 2 is a detail top plan view.

Fig. 3 is a detail transverse sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a detail transverse sectional view of a modified form of apparatus showing the magnet arranged in a different position.

Fig. 5 is a detail enlarged view of the matrix block and of a type element which has been soldered to the type bar.

Fig. 6 is a detail transverse sectional view through a type bar and the matrix showing the type elements supported by the matrix and soldered to the type bar.

Fig. 7 is a detail perspective view of one of the type elements.

Fig. 8 is a detail perspective view of the type element shown in Fig. 7 and showing the character side thereof.

The apparatus herein shown for the purpose of illustration comprises a base 1 which is made of material, preferably non-magnetic, such as brass or bronze. A pair of vertically extending spaced supports 2 and 3 are rigidly fastened to the base and are also preferably made of non-magnetic material such as brass or bronze. A slide block 4 is arranged between the uprights or supports 2 and 3 and is provided with a projection 5 which is received in a complementary slot 6, Fig. 1, forming a dovetailed slidable connection between the upright 3 and the slide block. The slide block and the uprights are accurately formed and positioned so that the slide block will have longitudinal slidable engagement with the supports, but will be constrained from shifting within the slidable support which comprises the uprights 2 and 3. A supporting plate or table 7, which may be made of a magnetic material, such as iron, is rigidly secured to the slide block 4 and this table is provided with an elongated rectangularly-shaped opening 8 to receive an elongated rectangularly-shaped matrix 9.

The slide block 4 is provided with extensions 10 which are threaded to receive a longitudinal screw 11. The screw 11 is revolubly mounted in end supports 12 and 13. A gear or pinion 14 is fixed to the screw 11 and meshes with a driving gear 15. The driving gear is fixed to a longitudinal shaft 16 which is mounted in bosses or supports 17 and 18 respectively, and this shaft may be rotated in any convenient manner such as by a manually controlled handle crank 19. Rotation of the handle crank 19 rotates the screw 11 through the gears 15 and 14. This rotation of the screw 11 being screw-threaded with fixed members on the slide block, will cause longitudi-

nal movement of the slide block. Therefore, the matrix is brought into proper operable position. The matrix 9 is fitted into the slot or recess 8 of the plate 7, its bottom 20 resting upon the upper surface 21 which defines the bottom of the groove or slot 8. Set screws 22 permit for longitudinal adjustment of the matrix in the slot 8 and lock the matrix in adjusted position in the slot or groove. Other set screws 23 are provided for lateral adjustment. Therefore, only the edge 24 defining the rear side of the slot or groove 8 need be accurately machined as it is against this side or surface that the straight true edge of the matrix bears against and is alined, being impinged thereagainst by the set screws 23. The matrix 9 is provided with character recesses 25 which are adapted to receive characters 27 on a type element 28. All of the character recesses 25 are cut or otherwise formed in the matrix 9 and are properly spaced longitudinally as clearly shown in Fig. 2.

An electro-magnet 29 is supported by the base 1, preferably by resting upon an integral boss 30 and fixed to the base by a screw 31. The electro-magnet 29 has its pole 32 spaced centrally of the matrix 9 as clearly indicated in Fig. 2 so that the magnetic influence or flux will attract the type element 28 when the said element is to be soldered to a type bar. The magnetic influence or flux from the pole piece 32 passes through the tool steel die matrix and attracts and holds the type element securely in position on the matrix with the characters 27 recessed at the respective character recesses 25.

A front support 33, which is preferably made of non-magnetic material such as bronze, is fixed to the bronze base 1 and secured thereto by means of fastening elements such as screws 34. A segment support 35, which is preferably made of non-magnetic material, such as bronze, is carried by the front support 33. This segment support is substantially semi-circular and of a size smaller than a typewriter segment 36. The typewriter segment is of the usual type and may be made of zinc or other material or it may be made of cast iron. Even if made of cast iron, the magnetic influence of the magnet will not magnetize the segment because the segment is insulated from the magnet. The segment support is provided with upstanding points or fingers 37 which engage openings 38 provided in the segment 36 so that the segment will be positively alined and positioned in respect to the matrix. If necessary or desirable, locking screws 39, passing through the segment and threadedly engaging the segment support, may be provided for positively locking the segment to the support and positively preventing movement of the segment in respect to its support. The segment has type bars 40 pivotally connected thereto and the segment is so positioned and centered in respect to the matrix that any type bar, when moved inwardly, will be properly centered, spaced and correlated with respect to a character recess in the matrix. The character recesses in the matrix are so arranged that the first recesses 25 (to the extreme left, Fig. 2) will coincide with the characters on a type element 28 which is to be applied to the first type bar 40 (the type bar to the extreme left, Fig. 2). Likewise the last character recesses 25 (to the extreme right, Fig. 2) will coincide with the characters on the type element to be carried by the last type bar 40 (to the extreme right, Fig. 2). The intermediate recesses 25 in the matrix will correspond progressively with the intermediate type bars. Therefore, in actual practice, the first type bar to the left, Fig. 2, will be brought to position to correspond with a type element set in the first type recess. The second and succeeding type bars may be brought to position successively, thereby positively applying the type elements to the type bars in the regular order and sequence.

The type elements 28 which carry the type characters 27 are provided with upstanding legs 41, there being a space 42 provided therebetween to receive the type bar 40. The type elements may be arranged singly on the matrix or all of the type elements may be arranged on the matrix, if desired. A type bar is then brought downwardly into position to fit in the space 42 between the legs 41, the character recess being so arranged with respect to the type element and the type bars being so arranged and constructed that when a type bar is moved downwardly into the space 42, it will be properly centered. Each type element 28 is held in position by the magnetic flux of the magnet 29 and, therefore, when a type bar 40 is moved to interfitting position relative to its respective type element, the magnetic flux in the type element will tend to draw and attract the type bar into the recess 42 in the type element. Therefore, the electro-magnet magnetizes the matrix which attracts and holds the type element. The type element then being magnetized, will draw and attract the type bar in the recess 42. The type element may then be soldered to the type bar. The soldering is done progressively and is always done immediately above the center of the magnet pole 32 where the magnetic flux is the greatest. The magnetic flux will be distributed throughout the entire length of the magnet, but the greatest flux will be concentrated immediately at the magnet pole where the soldering is done. However, there is sufficient magnetism in the matrix to hold all the type elements thereto, but the greatest attraction is concentrated at the place where the actual soldering is being done. The apparatus or device is so constructed and arranged that the type bar segment will not be magnetized. The reason for not magnetizing the segment is to prevent the type bars from becoming magnetized because if the type bars were magnetized, they would have a tendency to lift the type element from the matrix as it was being lowered to position. Therefore, if the type bar segment were magnetized and the magnetic influence on the type bars were as great or greater than the magnetized type element, the type bar would tend to draw the type element away from the matrix to meet the type bar. By not magnetizing the type bar segment nor the type bars, the result is just the opposite. The magnet will draw the type element to the matrix and then when the type bar is moved down into position with respect to the type element, the type element will attract the type bar. In other words, in the present invention the type bar will be drawn toward the type element instead of the type element being drawn toward the type bar which would be the case if the type bar were magnetized. It is, therefore, one of the important features of the invention that the type bar be not magnetized.

It is desirable that the matrix be moved a distance equal to the distance between the centers of the type recesses. Therefore, means are provided to positively center a type element with respect to a cooperating respective type bar. The matrix is shifted back and forth by the shifting

of the slide block, the shifting of the slide block being accomplished by the rotation of the handle or crank 19. The apparatus has been so constructed and arranged that one complete revolution of the shaft 16 will move the slide block carrying the matrix a distance equal to the space between type recess centers. When a type recess is brought into proper center line position with respect to a type bar, a ratchet or stud 43 will engage a slot or recess 44 provided in a locking arm 45. The locking arm 45 is pivoted to a part of the device as indicated at 46, Fig. 1, and is urged upwardly into contacting engagement with the button or stud by a spring 47. Therefore, when the crank 19 is turned, the ratchet or stud 43 will engage its recess 44 and lock the parts in position which position will be the center line of the character recess coinciding with the center line of the part of the type bar which receives the type element. Therefore, in order to move the matrix, the locking arm must be shifted on its pivot 46 to bring the recess out of engagement with the ratchet or stud 43. The movement of this locking arm 45 may be accomplished by means of a rod 48 operatively connected to the end of the locking arm 45 as indicated at 49. The opposite end of the rod 48 may be connected to a foot pedal so that the arm may be released from the gear or pinion 15 by stepping on a pedal.

It is also preferable that the magnet, which is an electro-magnet, be not energized except during actual use of the device. The energization and de-energization of the electro-magnet may be effected by a mercury switch 50. The mercury switch may be operated by means of an arm 51 fastened thereto and carrying a lug 52 which is received between spaced members 53 and 54 on the rod 48. Due to the slot and pin construction 55, 49, Fig. 1, providing lost motion between the rod 48 and the locking arm 45, the mercury switch will be operated to de-energize the electro-magnet on lowering of the rod 48 prior to the time that the locking arm 45 is lowered to release the stud 43 on gear-wheel 15, and on raising of rod 48 the locking arm 45 will be restored to operative locking position prior to the time that the arm 51 is raised sufficiently to again re-energize the electro-magnet. This insures that the electro-magnet will be de-energized during the shifting of the matrix by the crank mechanism 19. Likewise due to the pin and slot connection it is possible for the operator, by imparting only a limited movement to the reciprocating rod 48, to de-energize the electro-magnet without moving the locking arm 45. This operation may be desirable where it is desired to de-energize the magnet at certain intervals without releasing the locking mechanism such as in cases where single type bars are being operated upon; that is, where it is desired that only one type bar at a time or a series of individual type bars of the same character are to be applied to a given matrix. The collar members 53 and 54 are, however, adjustably secured to the rod 48 so that they may be positioned at any desired point thereon. By this means the mechanism may be so adjusted, if desired, that the arm 51 will not operate to de-energize the electro-magnet prior to the time the locking arm 45 is moved, or adjustment may be made so that the arm 51 is never moved sufficiently to release the electro-magnet during the operative functioning of rod 48 and the locking arm 45.

However, in practice, it has been found preferable to have the matrix not energized except when a type bar is to be soldered to the type element. Therefore, the preferable operation of the device is to have the rod 48 positioned with respect to the arm 51 so that pressure on the foot pedal, to pull the rod 48 downwardly, will cause the mercury to run to the right, Fig. 1, and bare the conductor contacts so that the circuit will be broken and, therefore, the magnet will be de-energized. When the foot pedal is pressed downwardly, the matrix is free to be shifted by operation of the handle or crank 19. When the foot is removed from the foot pedal, the spring 47 urges the arm 45 upwardly and consequently tilts the mercury switch so that the mercury is again in contact with the conductors, thereby energizing the magnet. It has been found that this latter arrangement of operation is preferable as the elements reside in their respective recesses sufficiently for all purposes except during the soldering operation, at which time the magnet is energized. The reason for this latter preferred operation is that when the type bar is soldered, it is desirable to move to the next station as rapidly as possible. Therefore, if the matrix were energized during the movement of the slide block, and the type bar were lifted from position, the solder, which probably would not yet have become set, would tend to loosen. In other words, if an attempt were made to pull the type bar from the type element and the solder were still wet, the movement of the type bar away from the matrix and the pull of the type bar against the matrix would tend to loosen or otherwise spoil the connection between the type bar and the type element.

The invention provides an accurate, efficient, positively operating apparatus or device for arranging a type element with respect to a type bar so that the alinement with the type bar and the type element will be accurate and true. Furthermore, the device permits for easy and quick operation so as to bring a respective type element on the matrix in position with respect to the soldering position. By providing all the character recesses in the matrix in a single block of material as herein shown and described, a plurality of adjustments are eliminated. In other words, as soon as the matrix containing all the character recesses is once in alinement, all the character recesses will be in proper position. Also, only one alinement is necessary. If an individual matrix were required for each character, forty or more matrix adjustments would be required. In practice it has been found that a single matrix containing all of the character representations is as economical to manufacture as a matrix for a single type element. The invention further permits all the elements to be in plain sight of the operator and in easy working position. It has been found that the old style disk type of matrix support is impractical as requiring too much room and requiring too many individual adjustments because the disk required recesses for forty or more individual type matrices.

Changes may be made in the form, construction, and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. In a machine for setting type on typewriter type bars, the combination with a frame, a block slidable in said frame, said block having a recess therein, a matrix adjustably fastened in said re-

cess, and micrometer control means for adjusting said matrix within said recess.

2. In a machine for setting type on typewriter type bars, the combination with a frame, a block slidable in said frame, said block having a recess therein, a matrix adjustably fastened in said recess, micrometer control means for adjusting said matrix within said recess, and means for sliding the block in the frame.

3. In a machine for setting type on typewriter type bars, the combination with a frame, a block slidable in said frame, said block having a recess therein, a matrix adjustably fastened in said recess, a screw threadedly engaging the block, and means including a crank for rotating the screw, rotation of the screw translating the block.

4. In a machine for setting type on typewriter bars, the combination with a support, a slide block carried by said support, crank means operatively connected to the slide block for moving the slide block longitudinally of said support in two directions, a matrix carried by said slide block, said matrix having the same number of character representations as type characters on a typewriter.

5. In a machine for setting type on typewriter bars, the combination with a support, a slide block carried by said support, crank means operatively connected to the slide block for moving the slide block longitudinally of said support in two directions, a matrix having spaced character recesses formed therein adjustably carried by the block, and means for adjusting the matrix relative to the block, operation of the crank means bringing the character recesses successively to soldering position and operation of said adjustment means serving to accurately align a recess at such position.

6. In a machine for setting type on typewriter bars, the combination with a support, a slide block carried by said support, crank means operatively connected to the slide block for moving the slide block longitudinally of said support in two directions, a matrix having spaced character recesses formed therein carried by the block, operation of the crank means bringing the character recesses successively to soldering position, and means fixed to the support for holding a type bar carrying segment juxtaposed in respect to said matrix.

7. In a typesetting machine, the combination with a long narrow matrix slidable in two directions and having a plurality of different letter characters carried in spaced relation thereon, means for moving the matrix in either direction, and means operable in tuned relation to said moving means for selectively energizing the matrix.

8. In a typesetting machine, the combination with a slide block, a matrix having character recesses formed therein carried by the slide block, a vertically disposed electro-magnet arranged beneath the matrix, means for selectively energizing the matrix whereby a type element in a recess will magnetically adhere to the matrix, a segment juxtaposed with respect to the matrix, type bars carried by the segment, and means for shielding the segment to prevent the segment and type bars carried thereby from becoming magnetized.

9. In a typesetting machine, the combination with a slide block, a matrix having character recesses formed therein carried by the slide block, a vertically disposed electro-magnet arranged beneath the matrix, means for selectively energizing the matrix whereby a type element in a recess will magnetically adhere to the matrix, a segment juxtaposed with respect to the matrix, type bars carried by the segment, and means to slide the block to bring a type element in a recess on the matrix to soldering position.

10. In a typesetting machine, the combination with a slide block, a matrix having character recesses formed therein carried by the slide block, a vertically disposed electro-magnet arranged beneath the matrix, means for selectively energizing the matrix whereby a type element in a recess will magnetically adhere to the matrix, a segment juxtaposed with respect to the matrix, type bars carried by the segment, means to slide the block to bring a type element in a recess on the matrix to soldering position, means for locking the slide in said latter position, and means for releasing the locking means.

11. In a machine for setting type on typewriter type bars, the combination with a base, a frame carried by the base, a slide block slidably mounted in said frame, a long narrow matrix recessed in said slide block, said matrix having a spaced series of character representations thereon, a vertically positioned electro-magnet carried by said base, said matrix being above the magnet and movable thereover, means for energizing the magnet, means for sliding the slide block to various operating positions, and means for locking the slide block at any one of said operating positions.

12. In a machine for setting type on typewriter type bars, the combination with a base, a frame carried by the base, a slide block slidably mounted in said frame, a long narrow matrix recessed in said slide block, said matrix having a spaced series of character representations thereon, a vertically positioned electro-magnet carried by said base, said matrix being above the magnet and movable thereover, means for energizing the magnet, means for sliding the slide block to various operating positions, means for locking the slide block at any one of said operating positions, a typewriter type bar carrying segment positioned adjacent the matrix and means for shielding the segment from the magnetic flux of the magnet to prevent the segment and the type bars from being magnetized.

13. In a machine for setting type on typewriter type bars, the combination with a base, a frame carried by the base, a slide block slidably mounted in said frame, a long narrow matrix recessed in said slide block, said matrix having a spaced series of character representations thereon, a vertically positioned electro-magnet carried by said base, said matrix being above the magnet and movable thereover, means for energizing the magnet, a screw revolubly supported in the frame and threadedly engaging the slide, and means for rotating the screw.

14. In a machine for setting type on typewriter type bars, the combination with a base, a frame carried by the base, a slide block slidably mounted in said frame, a long narrow matrix recessed in said slide block, said matrix having a spaced series of character representations thereon, a vertically positioned electro-magnet carried by said base, said matrix being above the magnet and movable thereover, means for energizing the magnet, a screw revolubly supported in the frame and threadedly engaging the slide, a gear on the screw, a second gear meshing with the first gear, a crank for rotating the second gear, stop means adapted for engagement with one of

said gears to prevent rotation of the screw, and means for unlocking the locking means.

15. In a machine for setting type on typewriter type bars, the combination with a frame, of a block slidable in said frame, means for sliding the block in the frame, a matrix adjustably secured to the block, means for adjusting the matrix relative to the block, and means for selectively energizing the matrix with a magnetic flux, said energizing means being operable in timed relation to the operation of said block sliding means.

16. In a machine for setting type on typewriter type bars, the combination with a frame, of a block slidable in said frame, means for sliding the block in the frame, a matrix adjustably secured to the block, micrometer control means for adjusting the matrix relative to the block, and means for energizing the matrix with a magnetic flux.

17. In a type-setting machine, the combination with a long narrow matrix slidable in two directions and having a plurality of different letter characters carried in spaced relation thereon, of means for moving the matrix in either direction, means operable in timed relation to said moving means for selectively energizing the matrix with a magnetic flux, means for holding a type bar segment in operative juxtaposition to the matrix, and means for shielding said type bar segment from energization with said magnetic flux.

JAMES F. KOCA.