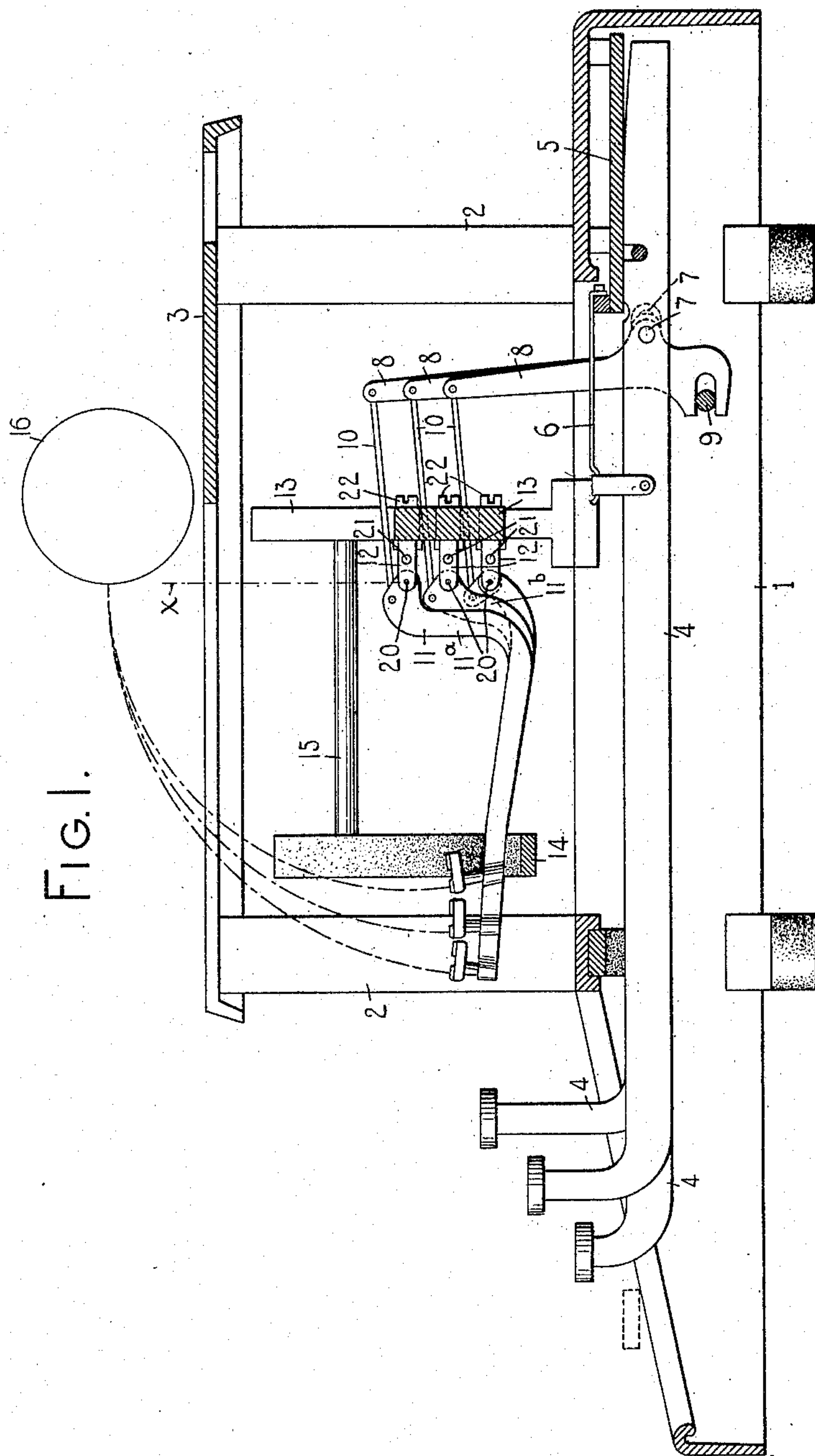


947,253.

S. NIELSEN.  
TYPE WRITING MACHINE.  
APPLICATION FILED JAN. 19, 1906.

Patented Jan. 25, 1910.

3 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR:

Stefanus Nielsen

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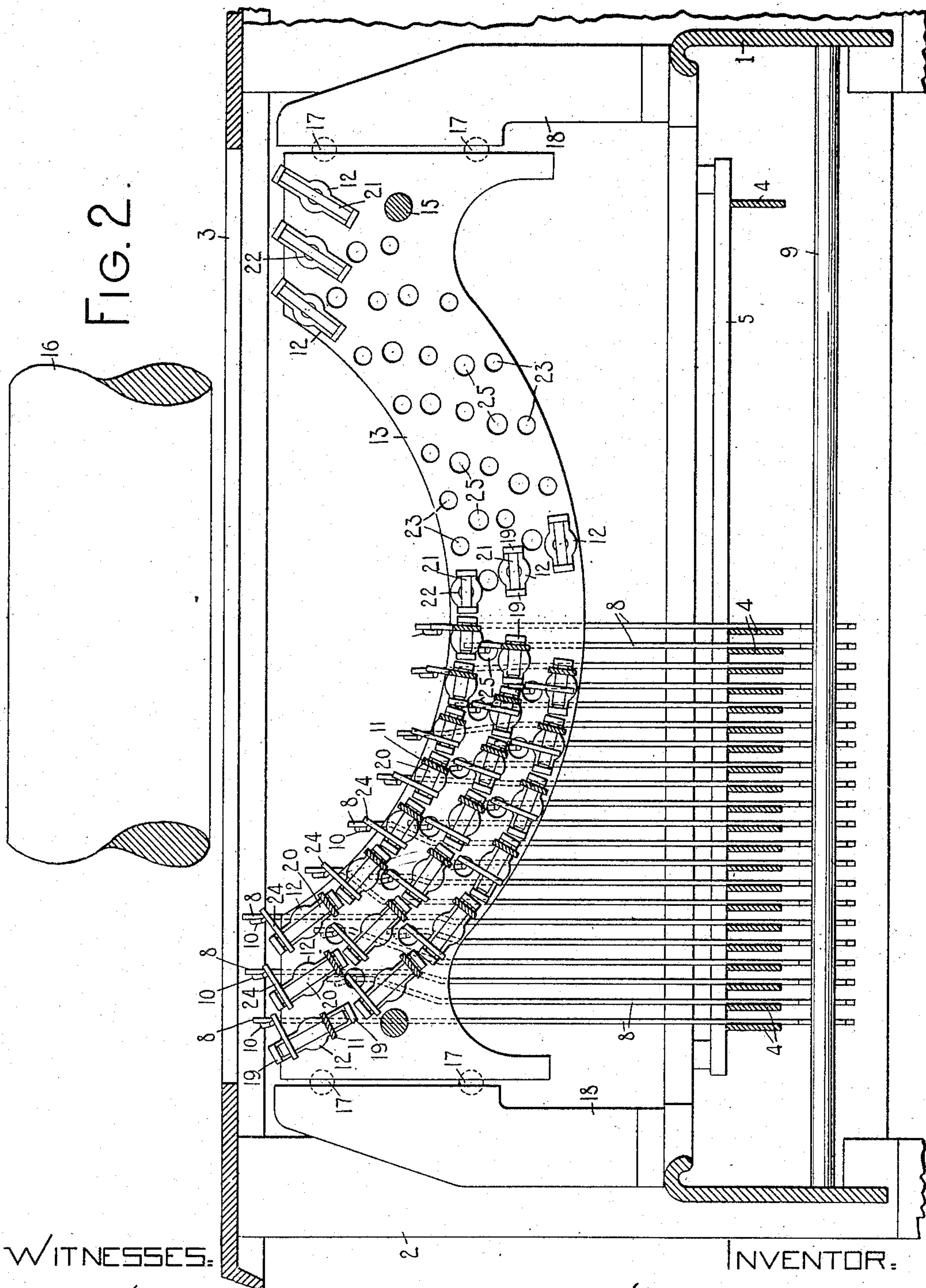
HIS ATTORNEY

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3 SHEETS—SHEET 2.



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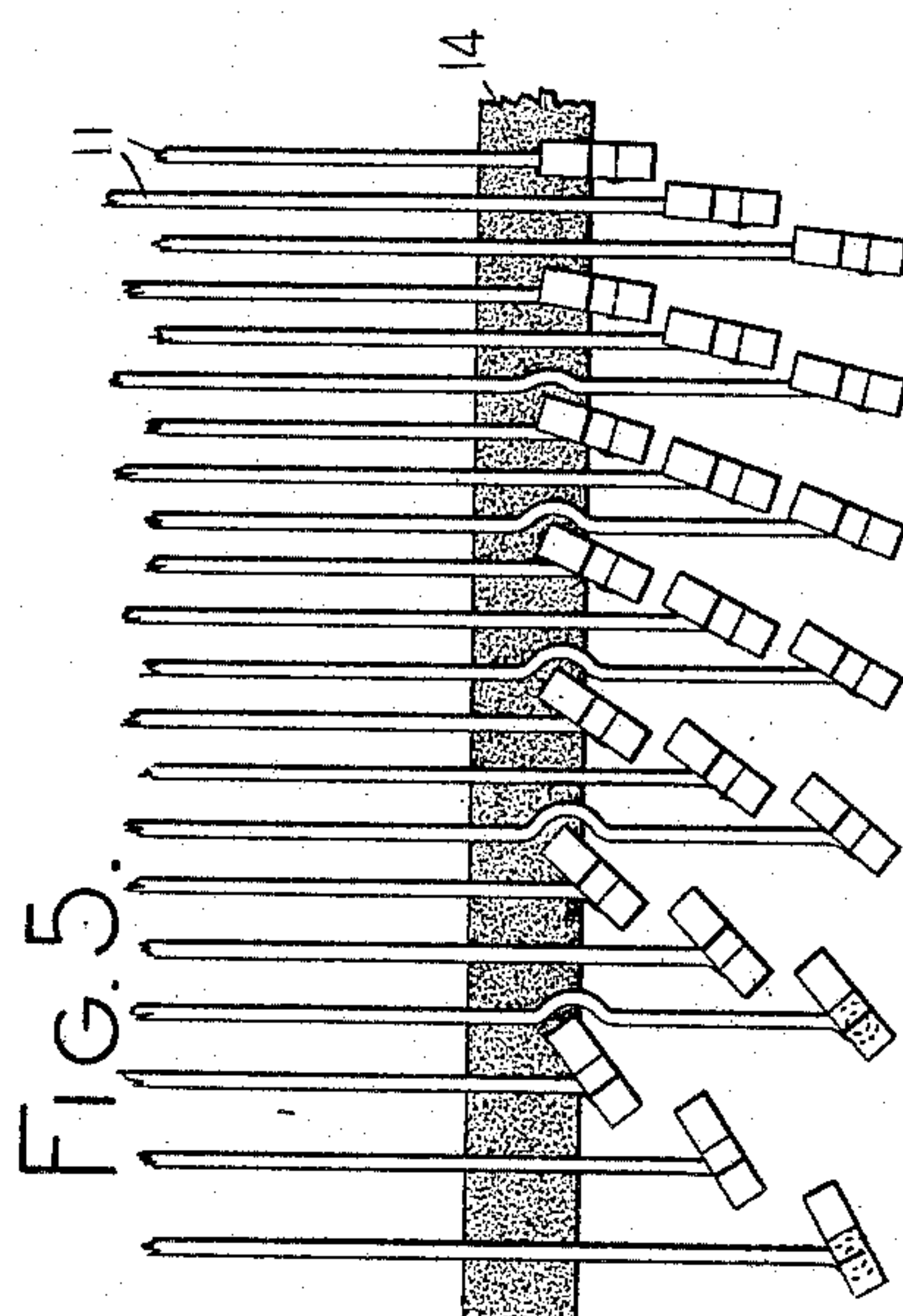
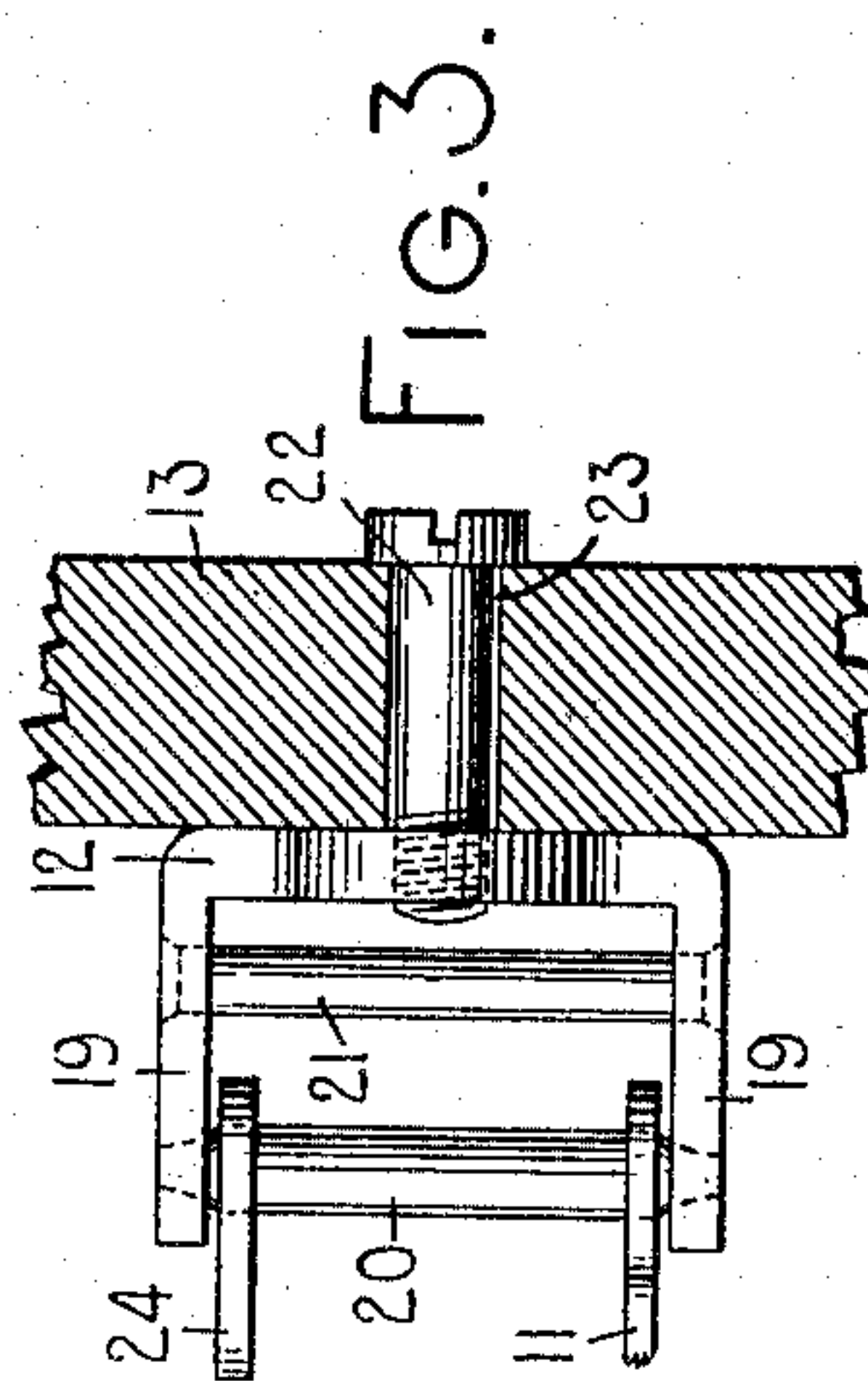
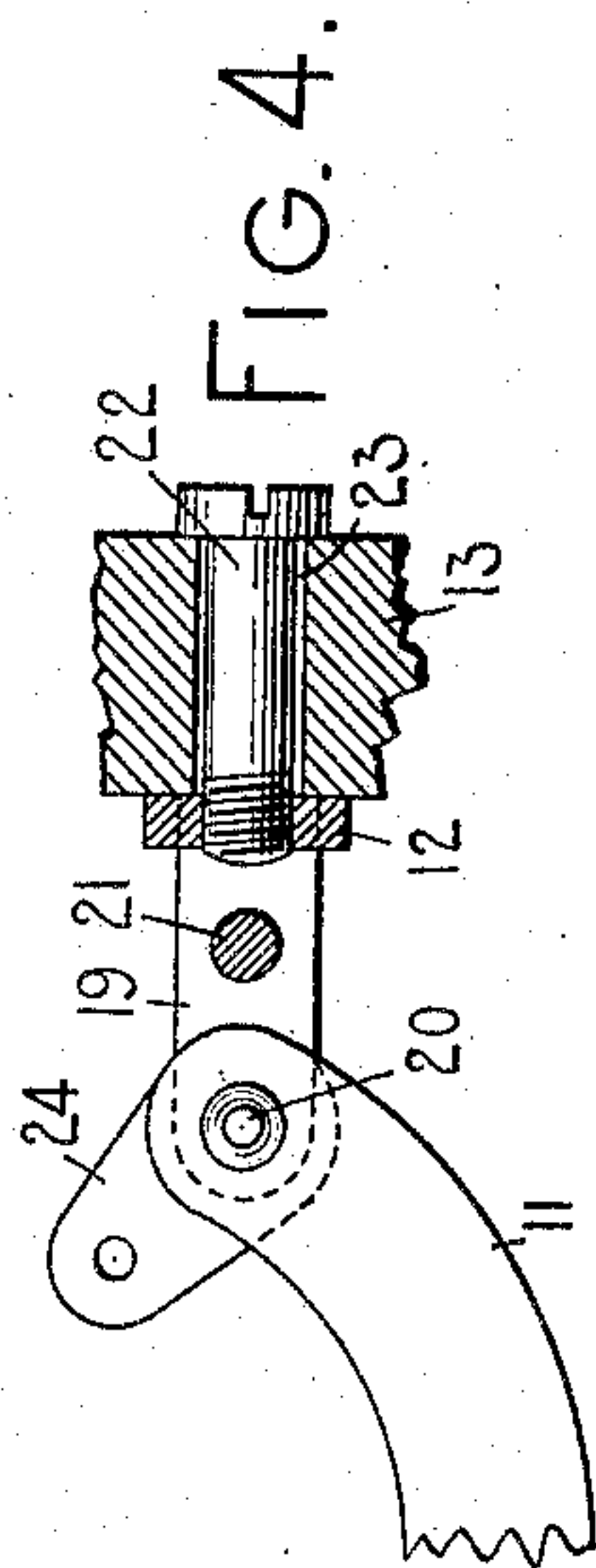
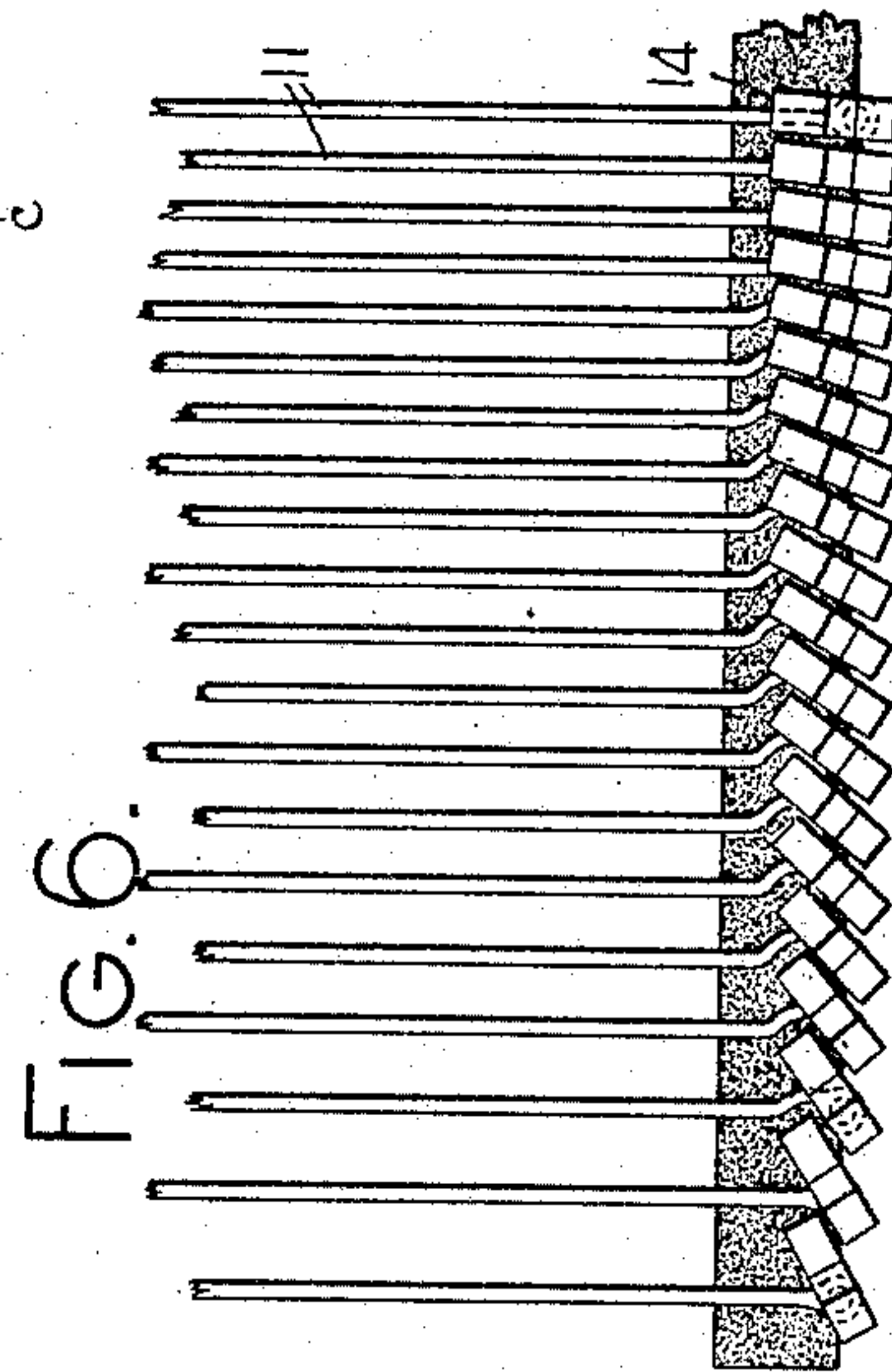
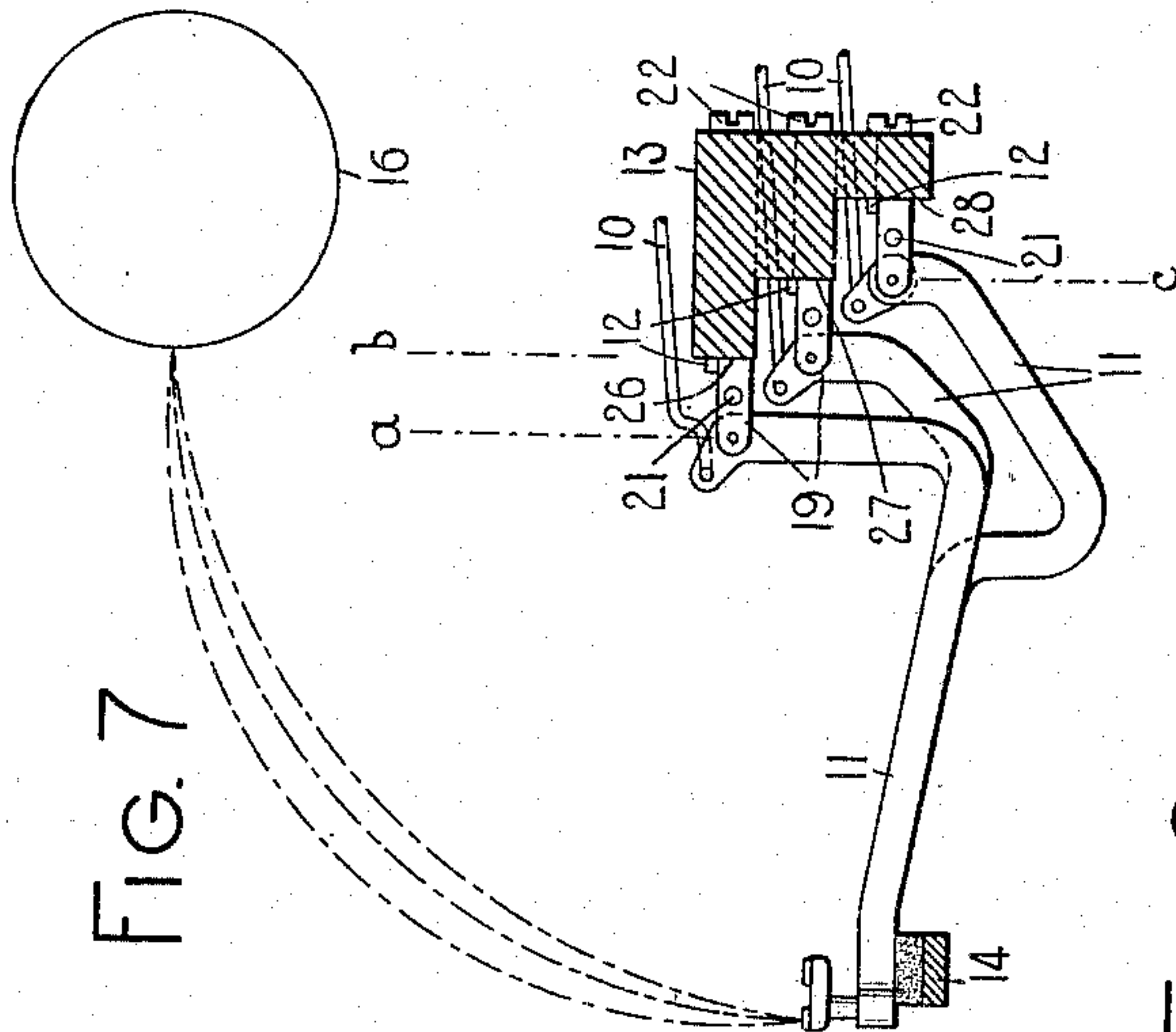
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TYPE WRITING MACHINE.  
APPLICATION FILED JAN. 19, 1906.

Patented Jan. 25, 1910.  
3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

STEFANUS NIELSEN, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## TYPE-WRITING MACHINE.

947,253.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed January 19, 1906. Serial No. 296,815.

*To all whom it may concern:*

Be it known that I, STEFANUS NIELSEN, subject of the King of Norway, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines of the type bar class and more especially to the type bars and hangers and to the type actuating mechanism of such machines.

The main object of the invention is to provide an improved construction and arrangement of type bars and hangers for visible typewriting machines, and wherein the type bars are individually mounted and individually adjustable, and wherein the type bar pivots are comparatively long, those at the sides of the series being longer than those near the middle.

Another object of the invention is to combine such a series of type bars and hangers with a type bar actuating mechanism so that the connecting links for the series of bars are pulled in parallel lines and do not interfere with one another.

Other objects will subsequently appear.

To the above ends the invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter fully described and particularly pointed out in the claims.

I have shown my invention as applied to a front-strike writing machine of the Monarch type, but I do not wish to be understood as limiting the application of said invention to machines of such a type, as most of the features of the invention may be adapted to other types or styles of visible writing machines.

In the accompanying drawings, Figure 1 is a longitudinal vertical sectional view, taken about centrally, of so much of a typewriting machine as is necessary to illustrate my invention. Fig. 2 is a front vertical sectional view of the machine taken a little forward of the platen, the type bars being shown cut off a little forward of their pivots. Fig. 3 is an enlarged fragmentary view of one of the type bars and hangers, as seen from the direction of the printing point, and showing the securing means for said hanger.

Fig. 4 is a sectional view on a plane at right angles to the plane of Fig. 3 of the type bar and hanger shown in Fig. 3. Fig. 5 is a fragmentary developed view of the type ends of the type bars at the left of the series as they lie in the basket. Fig. 6 is a view, corresponding to Fig. 5, of a series of type bars mounted in the modified manner shown in Fig. 7. Fig. 7 is a diagrammatic side elevation of several of the type bars and hangers of the modified construction and arrangement, the type bar support being shown in section.

In the various views parts are omitted and broken away for the sake of clearness.

Referring to Figs. 1 to 5 inclusive of the drawings, 1 represents the base of the machine supporting corner posts 2 which in turn sustain a top plate 3. Key levers 4 are fulcrumed on a fulcrum plate 5 at the rear of the base, each key lever being provided with a restoring spring 6. Pivoted at 7 to each key lever is a sub-lever 8, the lower end of said sub-lever being slotted to cooperate with a fixed abutment 9 and the upper end of said sub-lever being connected by a link 10 with a type bar 11, which is one of a series of type bars each pivotally mounted in a type bar hanger 12 secured against the front face of a vertically disposed segmental type bar support 13. The free ends of the type bars normally rest against a type rest 14 secured to supporting rods 15 which are fixed to and extend forwardly from the type bar segment 13. The type bars are adapted to cooperate with the front face of a platen 16 which is diagrammatically illustrated and is adapted to be moved in printing direction a letter space distance at a time and to be line spaced by suitable mechanisms. As herein illustrated, the type bar segment 13 is of the shifting variety, being adapted to be moved up and down by any suitable construction of shifting mechanism, and cooperating with anti-friction balls which run in fixed guide posts 18. For the purposes of my invention, however, it is immaterial whether the type rest be of the shiftable or non-shiftable variety.

As will be understood from a consideration of Figs. 1 and 2, the series of type bar hangers are arranged in concentric rows, the center of which is at or near the printing point, three of such rows being shown in the drawings. Each hanger 12, as is best



shown in Figs. 3 and 4, is preferably U-shaped and is arranged with its base against the front face of the segmental type bar support 13, which front face is substantially vertical. The bearing arms 19 of each hanger project horizontally toward the front of the machine and are formed with bearing openings which receive the tapering ends of the axle 20 of the associate type bar, the body portion of said type bar being at right angles with the axle 20. Behind the axle the arms 19 of each hanger are preferably connected by a rivet 21 which is adapted to take up wear in the type bar pivots and to prevent spreading of the hanger arms. Each hanger is secured to the segment 13 by a headed securing screw 22, which passes from behind through a perforation 23 in the segment 13 and screws into a threaded opening in the base of its associate type bar hanger 12. The opening 23, as clearly appears in Figs. 3 and 4, is somewhat larger than the diameter of the screw 22, so that the latter may pass freely there-through, the head of said screw cooperating with the rear face of the segment 13. This construction enables each hanger when its securing screw 22 is slightly loose to be given a rotary movement so that the associate type bar may be properly aligned without having its internal structure or its relation with the hanger altered.

As has been stated, the body portion of each type bar is at right angles with its axle, so that each type bar moves in a plane radial of the printing point and the axle of said type bar is perpendicular to said plane. It will be noted that as I arrange them, the hangers, considered in respect of the rows of which they are a part, are progressively disposed from the center to the sides of the segment, when viewed from the front, as in Fig. 2. That is, the first hanger to the left of the center in the second row is nearer to the side of the segment than is the corresponding hanger in the first row, the first row being considered to be that row which is nearest the printing point; and the corresponding hanger in the third row is nearer to the left side of the segment than is the first hanger in the second row. The same progressive arrangement is maintained in respect of the second hangers in the first, second and third rows, and in respect of all the following hangers in each of the several rows. It will further be noted that the arrangement of the hangers is symmetrical on opposite sides of the middle of the segment. The body portion of each type bar is arranged near one end of its axle, this being the right end in the case of the bars to the left of the center of the machine and the left end of the axle in the case of the bars to the right of the center. It will furthermore be noted that the axles of the type bars progressively increase in

length from the center to the sides of the series, those axles near the center being comparatively short and those at the sides being comparatively long, the intermediate axles gradually increasing in length as the sides of the series are approached. Near the center of the machine, the links 10 which connect the type bars with their actuating mechanisms are connected to the type bars close to their body portions, and in the case of several of the bars near the center in the first row I have found it preferable to connect the links 10 with the body portions proper. In the case of the remainder of the type bars, however, I prefer to provide arms or lugs 24 which are perforated to receive the forward ends of the connecting links 10. These arms are fixed to the axles 20 of the type bars and the distance between said arms and the body portions of their associate type bars, measured along the axle, increases progressively from the center to the sides of the series, those arms 24 near the center of the machine being quite close to the body portions of their respective type bars and those arms near the sides of the series being comparatively distant from the body portions of the type bars.

The several connecting links 10 are substantially parallel and extend in substantially direct straight lines from the front to the rear of the machine. The type bars with which said links are associated are arranged in three rows so that in order to bring about substantial parallelism among the series of links it is necessary to provide sub-levers 8 of varying lengths. The series of sub-levers 8 are substantially parallel throughout the greater portions of their lengths, although in the case of some of said sub-levers their upper end portions are slightly bent or offset to properly connect with the connecting links 10. The connecting links of the upper row, it will be observed, extend over the top face of the segment 13. In the case of the two other rows of links, however, it is necessary to provide perforations 25 in the segment through which said links pass and within which they may play without contacting with or being obstructed by the sides of said openings.

In the preferred construction of my novel type bar and hanger system, I arrange the pivotal axes of all of the type bars in the same vertical plane which is indicated in Fig. 1 of the drawings by the dotted line marked *a*, said plane being coincident with the vertical plane which embraces the printing line on the platen. In this construction the type blocks, viewed as they lie in the basket in the normal position, will have a staggered arrangement, as shown in the developed plan view (Fig. 5). The type blocks of the bars pivoted in the first or upper row of hangers lie in one line, those of the second or middle row in another line,



and those of the third or lower row in a third line, which last line is farther from the plane  $\alpha$  of the type bar pivots than either of the other two rows, the second of said rows being farther from said plane than is the first row. The type bars of the lowest row are slightly bent or curved in order to avoid conflict with the type blocks of the innermost row, as is shown in Fig. 5.

To present a comparatively uniform appearance of the type bars as they lie in the basket, the type bars of the first or top row are bent downward from their pivots, having portions 11<sup>a</sup> (Fig. 1) which are substantially vertical normally. The bars of the lowest or third row extend forwardly with only a slight downward curve near their pivots while the bars of the middle row have downwardly extending portions 11<sup>b</sup> (Fig. 1) and are intermediate the shape of the bars of the first and third rows.

In Figs. 6 and 7 I have shown a modified construction and arrangement of type bars and hangers, the segment 13 in this case, instead of having its front face in one vertical plane, is provided with steps 26, 27 and 28 against which the three rows of type bar hangers are arranged so that the top row of bars have their pivots in a vertical plane  $a$  forward of a plane  $b$  which is a vertical plane embracing the printing line. The pivots of the bars of the second row of hangers are embraced in a plane which coincides with the plane  $b$  while a plane  $c$  embracing the pivots of the third row of hangers, is behind the plane  $b$ . With the type bars mounted as last described their type blocks will all lie in a single line in the basket, as indicated in Fig. 6.

Besides the modification just described, various other changes in construction and arrangement may be effected without departing from the spirit and scope of my invention.

It will be observed that I have provided a construction and arrangement of type bars and hangers for a visible writing machine which permits a compact arrangement of the type bars, enabling a large number to be assembled in a comparatively small space; that the bearing of each type bar is comparatively broad, conducing to stability and preservation of alinement; that each type bar and hanger are adjustable independently of their fellows and may be removed from and replaced in the machine without disturbing any of the other type bars and hangers; and that the various parts are simple in design and may be substantially constructed.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of type

bar hangers on the front face of said support, said hangers being arranged in a plurality of rows and the hangers in the different rows being symmetrically and progressively arranged from the middle to the sides of the system; type bars pivoted in said hangers; and means for actuating said type bars.

2. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged in a plurality of rows and the hangers that are one above another in the different rows being symmetrically and progressively arranged from the center to the sides of the system; type bars pivoted in said hangers; and means for actuating said type bars.

3. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged in a plurality of rows; type bars, each comprising a body portion and an axle mounted in said hangers; and means for actuating said type bars, the distances between the body portions of the type bars and their actuating means, measured along the axles, being greater near the sides than they are near the middle of the system.

4. In a typewriting machine, the combination of a platen; a segmental type bar support below the said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged in a plurality of rows; type bars, each comprising a body portion and an axle, mounted in said hangers; and means for actuating said type bars, the body portion of each type bar being arranged at substantially one end of its axle and the actuating means of the various type bars being connected with the axles thereof at distances from the body portions of the bars which increase from the middle to the sides of the system.

5. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged in a plurality of rows and the hangers in the different rows being symmetrically and progressively arranged from the center to the sides of the system; and type bars pivoted in said hangers, said type bars lying in planes radiating from the printing point and the pivotal axes of the type bars being perpendicular to said planes.

6. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged



in a plurality of rows and the hangers in the different rows being symmetrically and progressively arranged from the center to the sides of the system; type bars pivoted in said hangers, the pivots of all the type bars being embraced in the vertical plane passing through the printing line on the platen and the types on the type bars being disposed in staggered arrangement in the basket; and means for actuating said type bars.

7. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged in a plurality of concentric rows and the hangers that are one above another in the different rows being symmetrically and progressively arranged from the center to the sides of the system; type bars pivoted in said hangers, the pivots of all the type bars lying in the vertical plane passing through the printing line on the platen and the types on the type bars being disposed in staggered arrangement in the basket; and means for actuating said type bars.

8. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of individual type bar hangers on the front face of said support, said hangers being arranged in a plurality of concentric rows; type bars pivoted in said hangers, the pivotal axes of the type bars in each row increasing progressively in length from the middle to the sides of the system, the pivots of all the type bars lying in the vertical plane passing through the printing line on the platen and the types on the type bars being disposed in staggered arrangement in the basket; and means for actuating said type bars.

9. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of type bar hangers thereon; type bars, each comprising a body portion and an axle, mounted in said hangers; and means for actuating said type bars, the distance between the body portions of the type bars and the actuating means, measured along the axles, increasing progressively from the center to the sides of the system, and the pivots of all the type bars being substantially in the vertical plane passing through the printing line on the platen and the types on the type bars being disposed in staggered arrangement in the basket; and means for actuating said type bars.

10. In a typewriting machine, the combi-

nation of a platen; a segmental type bar support below said platen; a series of type bar hangers thereon; type bars, each comprising a body portion and an axle mounted in said hangers; and means for actuating said type bars, the body portion of each type bar being arranged at substantially one end of its axle and the actuating means being connected with the axles at distances from the body portions which increase progressively from the middle to the sides of the series and the pivots of all the type bars being substantially in the vertical plane passing through the printing line on the platen and the types on the type bars being disposed in staggered arrangement in the basket; and means for actuating said type bars.

11. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of type bar hangers thereon; type bars each comprising a body portion and an axle mounted in said hangers, the axles each being pivotally supported at their ends; and means for actuating said type bars, the distances measured on the axles between the body portions of the type bars and their actuating means varying in length and the distances between the actuating means and the adjacent end of the axle measured along the axle varying in length.

12. In a typewriting machine, the combination of a platen; a segmental type bar support below said platen; a series of type bar hangers thereon; type bars each comprising a body portion and an axle mounted in said hangers, the axles each being pivotally supported at their ends and each being provided with a crank arm; and means connected with the crank arms for actuating said type bars, the body portion of each type bar being arranged at substantially one end of its axle and the associate crank arm being arranged between the other end of the axle and said body portion, the distances between the crank arms and the body portions varying, measured along the axles, and the distances at the other sides of the crank arms between the crank arms and the ends of the axles also varying.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 18th day of January, A. D. 1906.

STEFANUS NIELSEN.

Witnesses:

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M. F. HANNEVERER.