

J. H. O'BRIEN.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 9, 1906.

938,690.

Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.

FIG. 1.

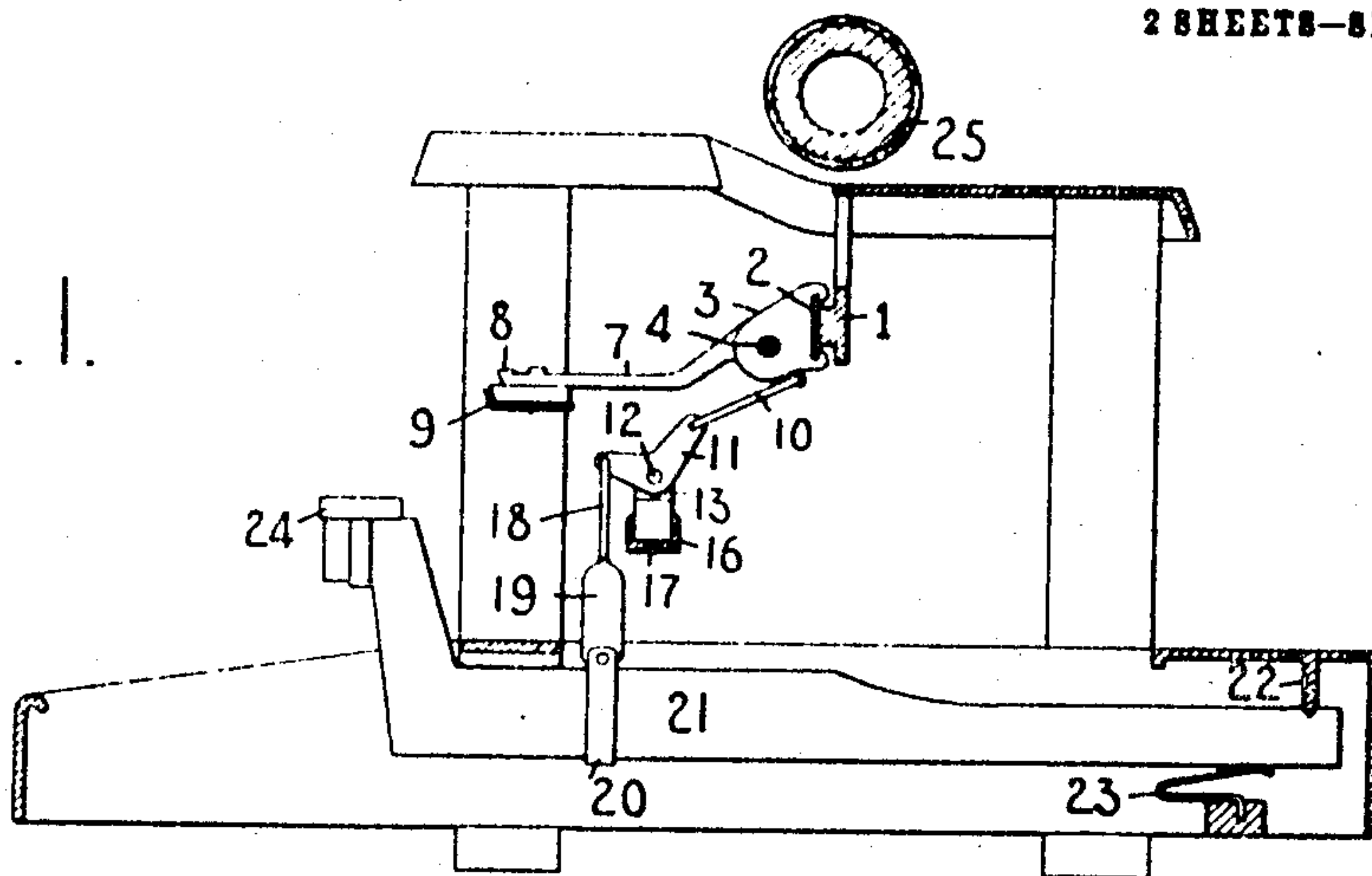


FIG. 2.

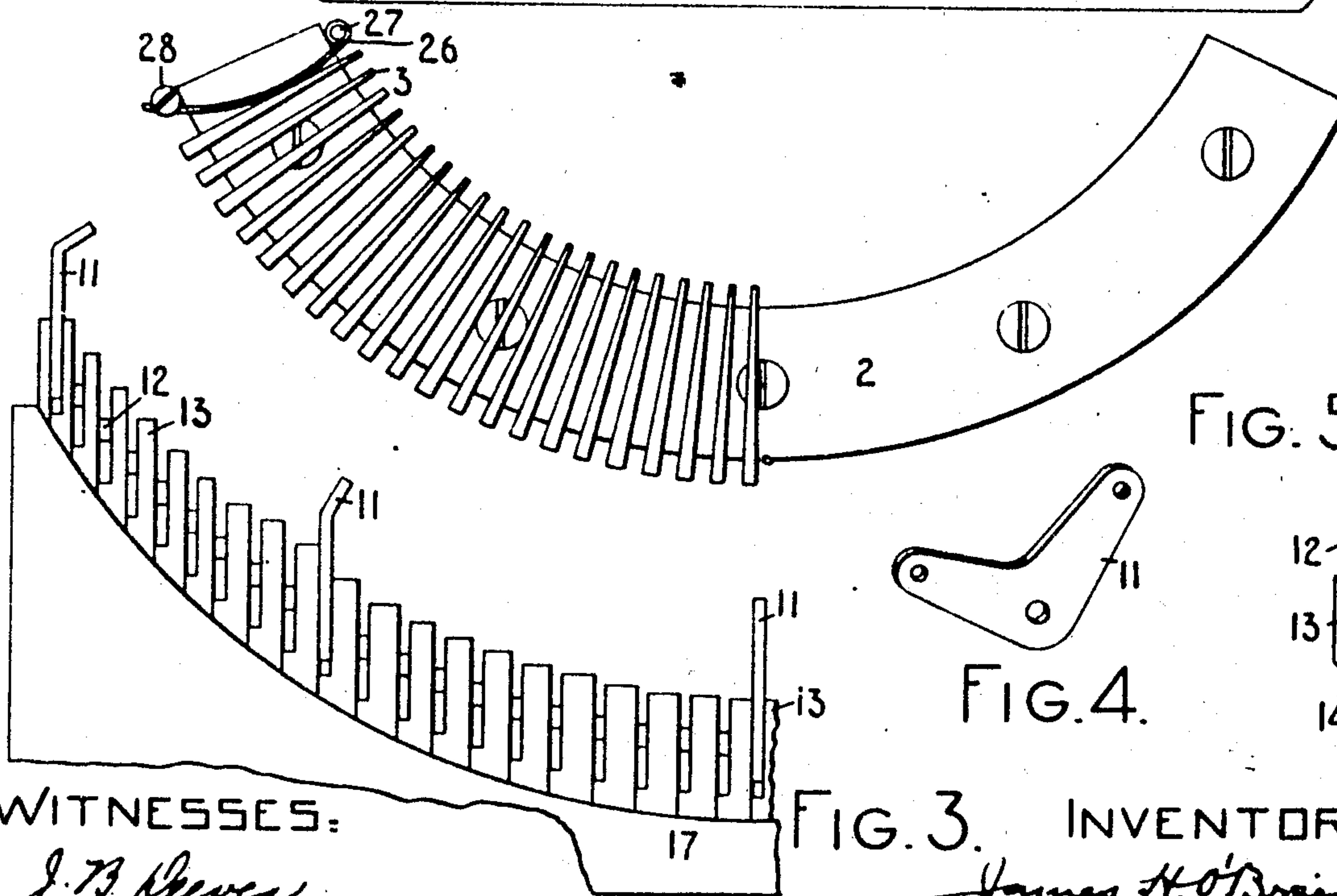
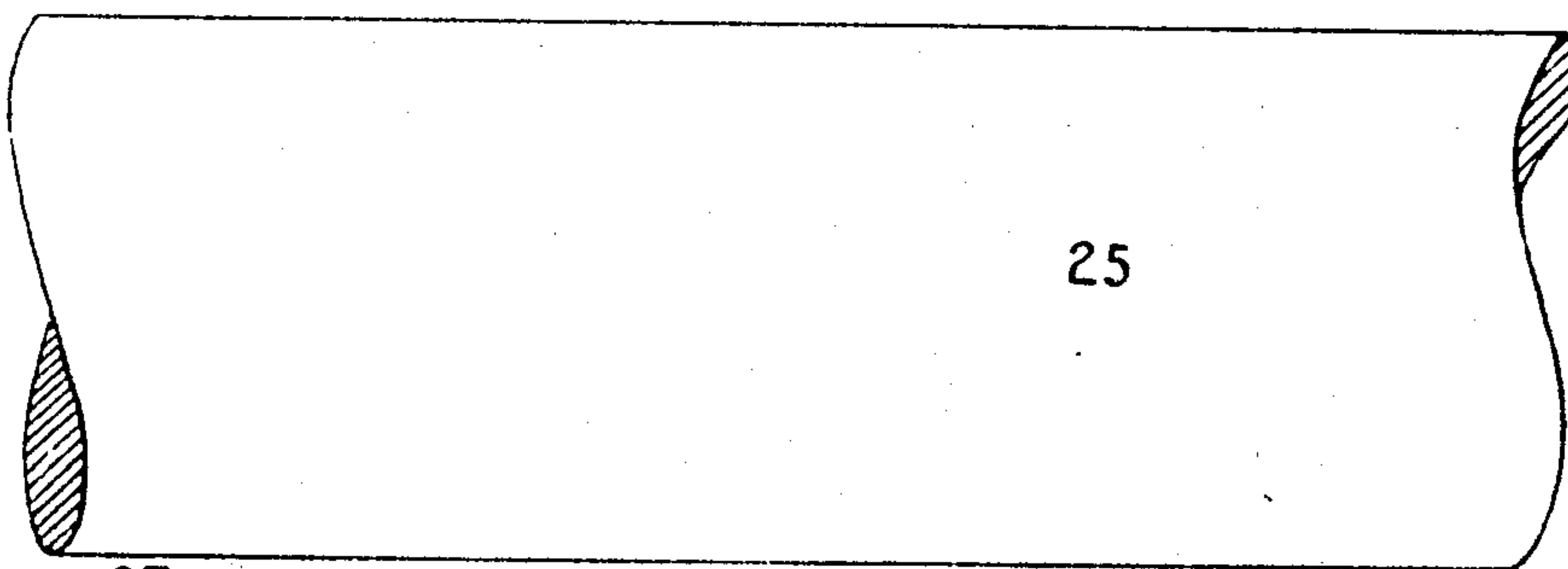


FIG. 5.

FIG. 4.

FIG. 3. INVENTOR.

WITNESSES:

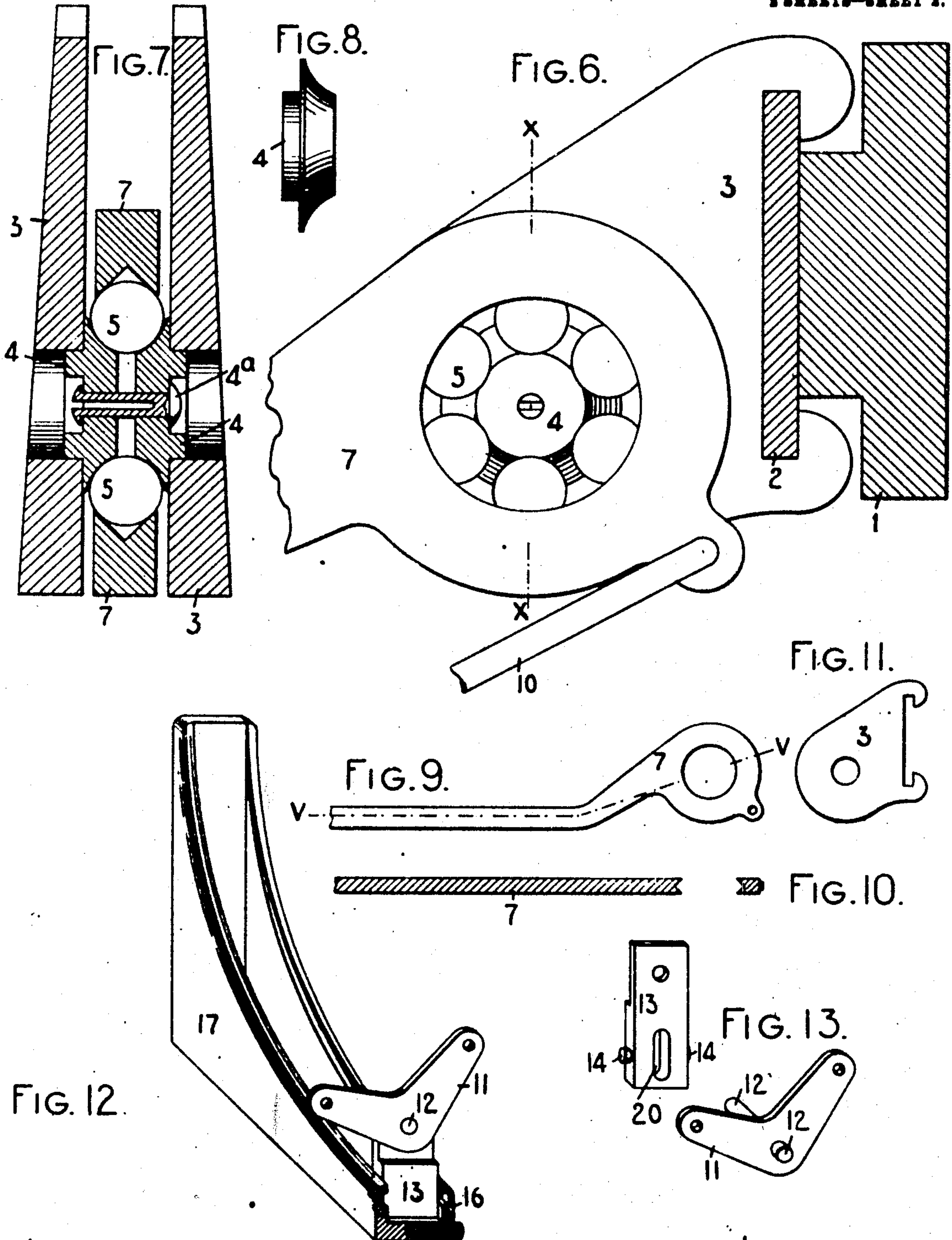
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UNITED STATES PATENT OFFICE.

JAMES H. O'BRIEN, OF ILION, NEW YORK, ASSIGNOR, BY MEANS ASSIGNMENTS, TO
UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION
OF NEW JERSEY.

TYPE-WRITING MACHINE.

938,690.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed June 9, 1908. Serial No. 320,965.

To all whom it may concern:

Be it known that I, JAMES H. O'BRIEN, a citizen of the United States, and a resident of Ilion, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to the type bar actions of typewriting machines and its object is to save space and at the same time have a quick, steady, easy action and durable type bar bearing. In attaining this object, however, I employ certain novel features of construction which are both simple and economical and being very compact my construction is especially useful for the so-called visible typewriting machines where there is but a part of a circle or segment for all the type bar joints.

It is one of the objects also of my invention to provide certain means by which the type bars will be kept tight in the joints and in case of wear, which there must be, all play or side motion will be taken up by springs and screws at the extreme ends of the segment.

It is still another object of my invention to have the bars removable so that when it becomes necessary to change a type-bar for any reason it may be done without much trouble. I have also provided means for retaining the balls in the grooved track in the type bars so that the type bars may be removed with no danger of the balls dropping out of their place, the type-bars, balls, and cone-steps being fastened together by a rivet through holes in the center of the cone-steps.

Another object of my invention is to have a segment that is easily and cheaply assembled and without the use of screws in the type bar hangers which, in prior constructions, often work loose from the jar by the stroke of the type bar, or of the shift of the segment, when that form of shift is used.

Another object is to have a type bar hanger that will not occupy much space, allowing more space for the type bars.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, in which similar characters of

reference indicate corresponding parts in all figures.

Figure 1 is a vertical, longitudinal section of a typewriting machine embodying my improvements. Fig. 2 is a fragmentary front view showing the hanger plate designated as 2 with a section of the type bar hangers in position and about the right distance apart to allow a type bar between each two hangers. The platen 25 is at the top in this figure. A flat spring is adjusted by two screws against the outside hanger at the left side. The same means may be applied on the right side and when all the hangers are in position the two springs work against each other and hold the type bars and hangers tight. Fig. 3 is a front view of a section of the bell crank stands (13) in position relatively to the type bar hangers in Fig. 2. Fig. 4 is a bell crank. Fig. 5 is a bell crank stand. Fig. 6 is an enlarged sectional view of the segment. Fig. 7 is an enlarged sectional view of a type bar and type bar hangers taken on the line $x-x$ of Fig. 6. Fig. 8 is an enlarged view of a cone step. Fig. 9 is a side view of a type bar. Fig. 10 is a sectional view of a type bar, taken on the line $v-v$ of Fig. 9. Fig. 11 is a side view of a type bar hanger. Fig. 12 is a diagonal view of a section of the bell crank stand box. Fig. 13 is a perspective view of one of the bell cranks near one end of the series, and the adjacent stand block or hanger.

Referring to Fig. 1, the bed piece is designated as 1. It has a circular shaped raised piece projecting toward the front of the machine to which is fastened by screws the hanger plate 2 which is a flat circular shaped piece, wider than the raised bed piece, both edges of the hanger plate projecting over the raised bed piece, forming a T-shaped holder for the type bar hangers 3 which slip on the hanger plate from either end. The type bar hanger is cut out forming two hooks, one to fit over each edge of the hanger plate, as shown in Figs. 1 and 7. The type bar hangers are wedge shaped, being tapered down from the thick side which is at the outside circle of the hanger plate to the thin edge of the inner circle, and on a line parallel to the adjacent type-bars on either side of the hangers, the shape of the hangers forming the curve to the segment. The type bearing ends of the type bars point to one

common center or focal point when thrown toward the platen. The type bar hanger is one separate blade between two type bars.

In one hole through each hanger rest the shanks of two ball cone steps 4, the heads of which set against the flat surface on either side of the hanger. The shanks are short and do not touch each other. The cone step is flat on the inside of the head. The outside of the head has a concaved bevel edge which with the cone step in the adjacent hanger forms the track for the balls to run in; this is the inside track. The outside track is a grooved edge in the type bar on the inside of the large circular hole in the hub, the pressure of the cone steps against the balls from the spring adjustments at either end of the segment having a tendency to throw the balls in an outward direction against the track in the type bar, thus holding the type bar firmly and tight in all positions, making it unnecessary to have a guide or any other obstruction for type or bars to strike against, at or near the printing point, allowing free swing of the type bar forward and back with no hindrance to perfect alinement of the type. The short arm of the type bar is connected by a draw rod 10 to the upright arm of a bell crank 11 hung forward of the segment and under the type bars when they are at rest.

The bell crank has two arms running at right angles with each other from a hub and working on a pivot 12 in the stand 13 which is a flat piece of metal cut out at the top, making the thin end of the stand and the hub of the bell crank combined equal in thickness to the thick end of the bell crank stand, making a close joint with no side movement when the bell cranks and stands are placed in position, the long flat side of each stand against the short flat side of the adjacent stand.

On a pivot set in the cut-out part of the stand swings the bell crank. The bell crank stands are held in the stand box which is circular shaped on the top with the low part of the curve in the center, and the high points on the ends. The bell crank stand box consists of two clamping members, one forward, the other back of the bell crank stands. The ends of the box are attached to one of the clamping members. The clamping members are drawn together by screws at the bottom and ends. A groove is cut in one of the clamping members on the inside of the box. The groove is cut on a circle like the top of the box and runs the full length of the box, the distance from the groove to the top of the box being the same at all points. The groove is for holding the bell crank stands up to their proper heights. A pin 14, projecting out near the bottom of the stand, fits in the groove and forms the curve to the row of bell crank stands, the

said curve being necessary to hold the bell cranks all in the same position in relation to the type bars they are connected with. The upright arms of the bell cranks used in the center of the machine or low part of the curve are straight. The upright arms of the bell cranks at each side of the center have a gradual bend toward the center at a point near the top just below the hole for the draw rod that connects the type bar to the bell crank. The object of the bend in the arm is to have the hole in the arm parallel with the hole in the short arm of the type bar it is connected with, so there will be no cramp or twist in the draw rods, all of which are the same shape and size, and pull in the same direction relatively with the type bars they are engaged to operate. It will be observed that the bell cranks at the extreme ends of the row have the greater bend, and as they are hung nearer the center the bend diminishes until the upright arms are straight. The horizontal arms of the bell cranks project forward and are all straight.

The forward ends of the arms are connected to the key levers by draw rods of different lengths, the shorter rods in the center of the machine and the longer ones at the sides. The key lever swings on its fulcrum at the rear end, the front end bearing the key. A depression of the finger key 24, mounted on lever 21, connected by strap 20 and swivel 19 and draw rod 18 to horizontal arm of bell crank 11, upright arm of bell crank connected by draw rod 10 to short arm of type bar 7, throws type 8 against the platen 25. The bell cranks for use at either end of the stand box may be made with a wide bearing pivot 12 solid in the hub as shown in Fig. 13. For this form of construction a slot 20 is cut through and running lengthwise of the stand block, the long end of the bell crank pivot passing freely through the slot in the stand block nearer the end of the stand box, said pivot bearing in a hole in the end piece of the stand box; the other end of the pivot bearing in a hole in a stand block at the same point where the pin 12 projects from in the other style of stand block. As each stand block toward the end of the row is at a higher elevation it will allow the pivot bearing in the upper part of one stand block to pass through the slot 20 in the adjacent stand block of higher elevation, the slot in the stand block being nearer the bottom.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent,

1. In a typewriting machine, the combination of a series of type bars, ball bearings for said type bars, and hangers in which the stationary members of said ball bearings are detachably mounted, and means for afford-

ing a relative motion of the hanger arms so that any type bar and its bearing may be removed as an entirety from the hangers.

2. In a typewriting machine, the combination of a series of type bars, hangers for said type bars and bearings for said type bars comprising stationary bearing members detachably secured to said hangers, and means for affording a relative motion of the hanger arms so that any type bar and its bearing may be removed as an entirety from the hangers.

3. In a typewriting machine, the combination of a series of type bars, ball bearings for said type bars, and hangers in which the stationary members of said ball bearings are detachably mounted, each of said ball bearings comprising an internally grooved eye in the type bar, a stationary hub having an external groove and anti-friction balls running in the grooves; means for detachably securing said hubs to the hangers, and means for affording a relative motion of the hanger arms so that said hubs may be removed from said hangers.

4. In a typewriting machine, the combination of a series of type bars, ball bearings for said type bars, and hangers in which the stationary members of said ball bearings are detachably mounted, each of said ball bearings comprising an internally grooved eye in the type bar, a stationary hub having two beveled sections forming an external groove, anti-friction balls running in the grooves, means for detachably securing said hubs to the hangers, means for affording a relative motion of the hanger arms to permit said hubs to be removed, and means for holding said hub sections together when detached.

5. In a typewriting machine, the combination of type bars; hangers for said type bars; ball bearings for said type bars, the stationary member of each of said ball bearings comprising two coned bearing pieces and means for connecting them together; means for detachably securing said stationary bearing members in said hangers, and means for affording a relative motion of the hanger arms to permit the coned bearing pieces to be removed.

6. In a typewriting machine, the combination of a support, and a series of hangers mounted on said support, each hanger having two arms one formed to hook over and behind said support and the other formed to hook under and behind said support.

7. In a typewriting machine, the combination of a type bar segment, a series of type bar hangers, each formed with two arms to hook around the edges of said segment with freedom to slide, type bars mounted between said hangers, and means for pressing said hangers toward one another from either side of the system.

8. In a typewriting machine, the combi-

nation of a type bar having an internally grooved eye, a bearing for said type bar comprising two coned pieces together forming an externally grooved hub within said eye, anti-friction balls running in the grooves in the hub and eye, means for supporting said coned pieces, and a spring for pressing said coned pieces toward each other.

9. In a typewriting machine, the combination of a type bar segment, a series of type bar hangers mounted on said segment with freedom to slide sidewise, a series of type bars, one type bar supported between each two hangers, and a spring pressing the series of hangers together.

10. In a typewriting machine, the combination of type bars, type bar hangers having hooks or lugs, and a hanger supporting plate attached to a bed-piece, each edge thereof projecting beyond the bed-piece so that the type bar hangers and hooks may grip around from front to back of the plate.

11. In a typewriting machine, the combination of a platen, a group of type bars hinged between wedge-shaped hangers attached to a segment plate forming a segment of type bar joints, bearing balls and cone steps included in said type bar joints, and a spring at either end of the segment for holding the type bars, balls, cone steps and type bar hangers in cooperative relation.

12. In a typewriting machine, a sectional stand for a series of levers comprising a series of long flat blocks, each being cut out in one side and the blocks arranged side by side with the cut-out of one block against the flat side of the adjacent block, and a pivot projecting from each block into the opening formed by the cut-out; and a stand box in which the series of blocks is clamped in position.

13. In a typewriting machine, a stand for a number of levers to oscillate parallel with each other and at different elevations, comprising a series of blocks to which said levers are pivoted, a support for said blocks having grooves cut therein, and pins or lugs projecting from the several blocks into said grooves to control the heights of said blocks.

14. In a typewriting machine, the combination of a series of levers pivoted at different elevations and a series of blocks to which said levers are pivoted, a support for said blocks having two sides or clamping members, a groove in one of said clamping members, and pins or lugs projecting into said groove to regulate the height of the several blocks.

15. In a typewriting machine, the combination of a series of levers pivoted to swing in parallel planes at different elevations, a series of blocks to which the several levers are pivoted, said blocks being arranged side by side, and certain of said blocks having slots therethrough and certain

of said levers being formed with long pivots each of which is pivoted at one end in one of said blocks, said pivots extending through said slots in adjacent blocks.

16. In a typewriting machine, the combination of a segmentally arranged series of levers and a series of hangers in which said levers are pivoted, a segmental support

for said hangers having a groove therein, and pins or lugs projecting from said hangers into said groove whereby the position of the hangers on the segment is controlled.

JAMES H. O'BRIEN

Witnesses:

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CHAR. D. CROWLEY.