

903,443.

A. T. BROWN & J. H. BARR.
TYPE WRITING MACHINE.
APPLICATION FILED MAY 18, 1906.

Patented Nov. 10, 1908.
4 SHEETS—SHEET 1.

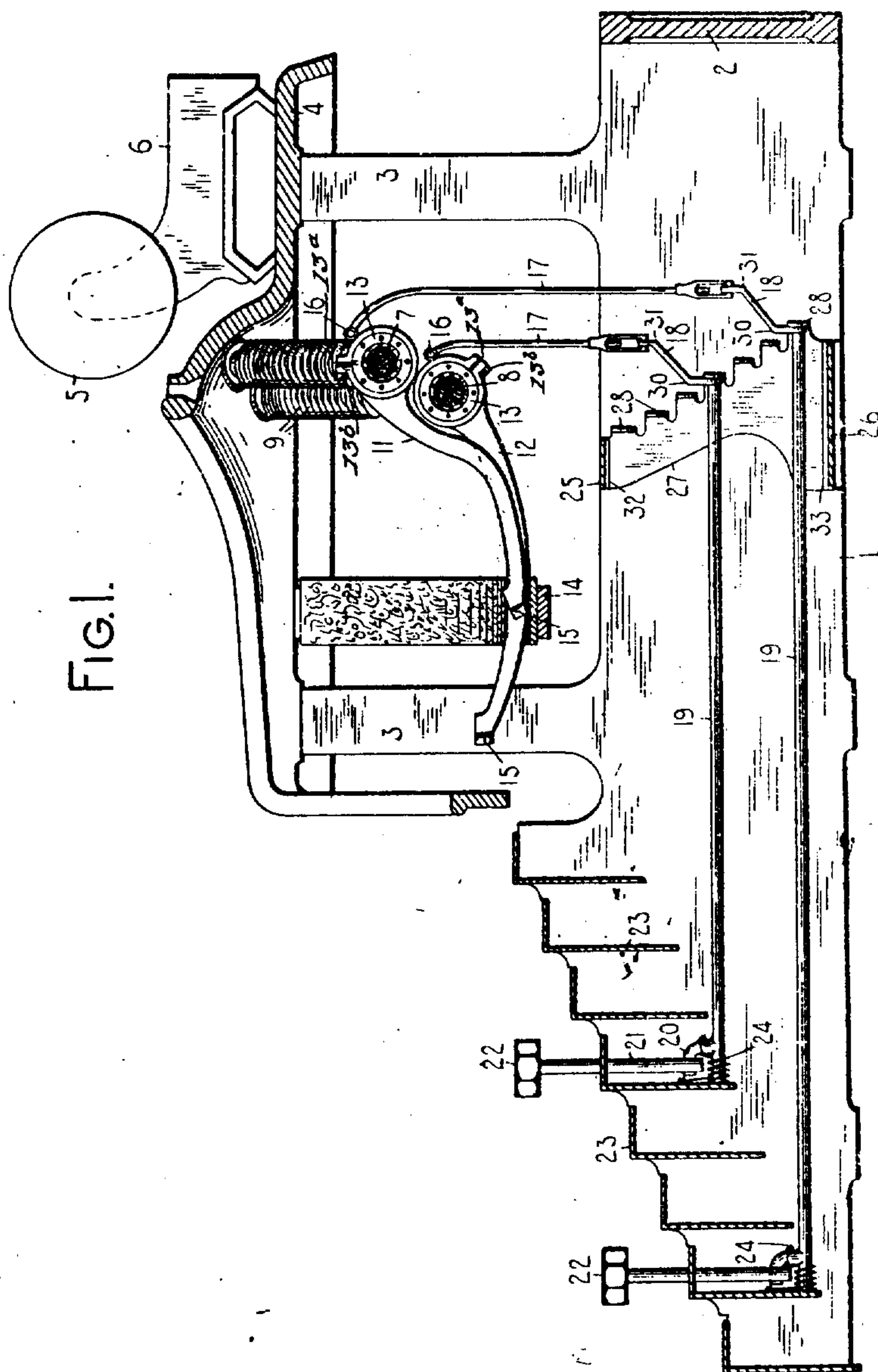


FIG. 1.

WITNESSES:

W. F. Hammer,
R. H. Strother.

INVENTORS.

Alexander T. Brown and John H. Barr

BY

Jacob Felsch

ATTORNEY.

903,443.

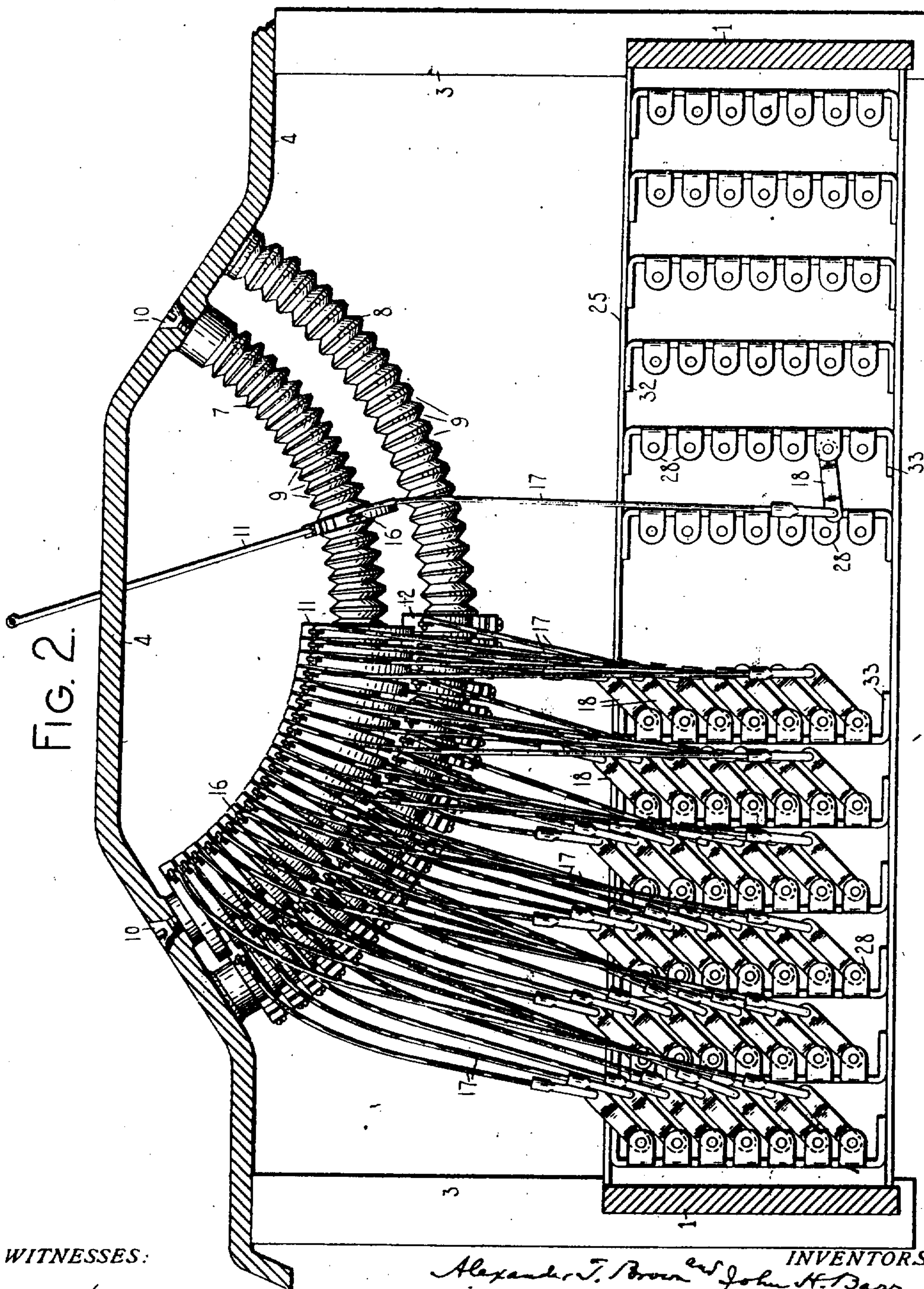
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4 SHEETS—SHEET 2.



WITNESSES:

W. F. Hammer
R. H. Strother

Alexander T. Brown *John H. Barr*

BY *Jacob Falbel*
ATTORNEY.

A. T. BROWN & J. H. BARR.

TYPE WRITING MACHINE.

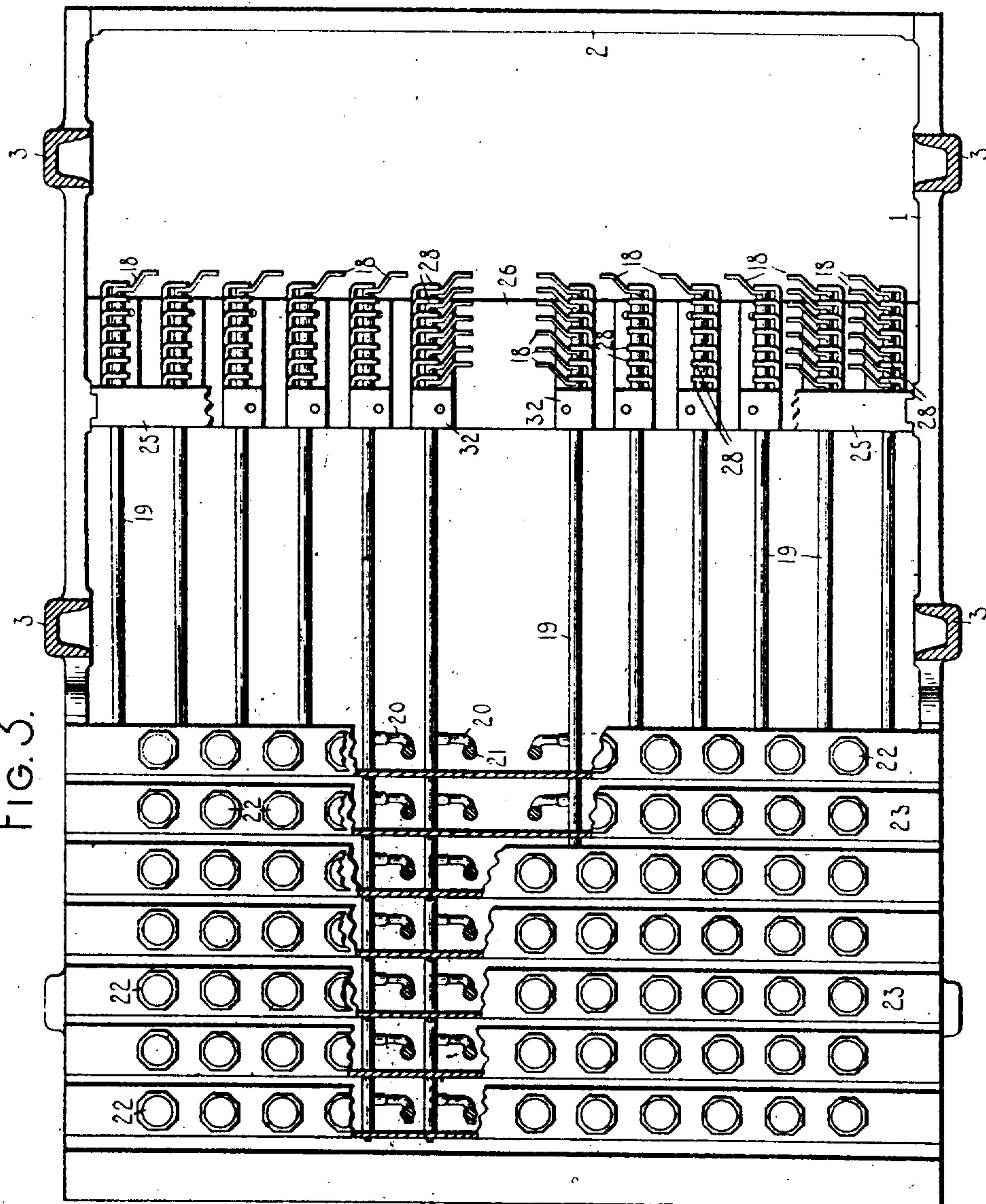
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4 SHEETS—SHEET 3.

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FIG. 3.



WITNESSES:

W. F. Hammer

R. H. Strother

INVENTORS.

Alexander T. Brown and *John H. Barr*

BY

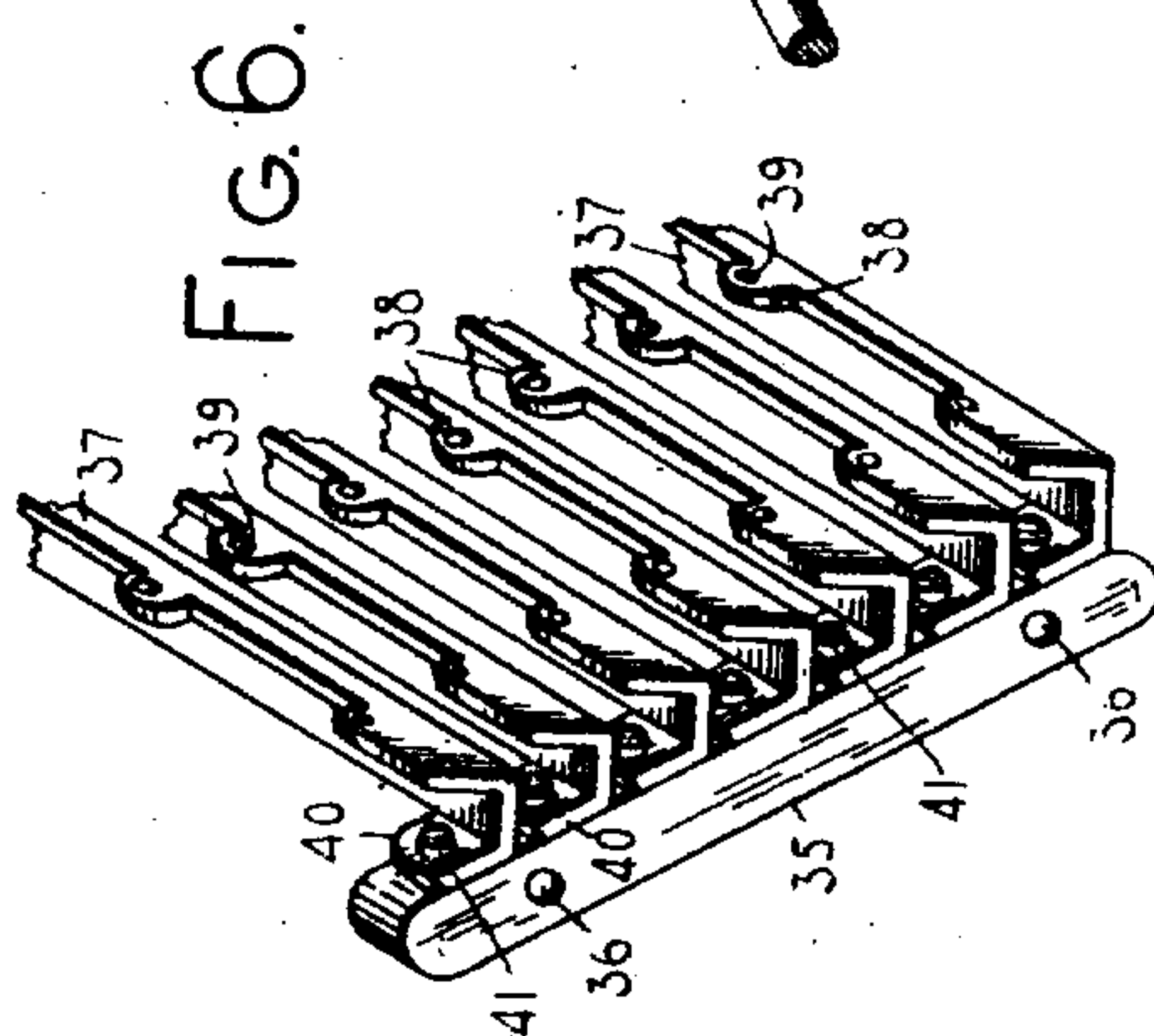
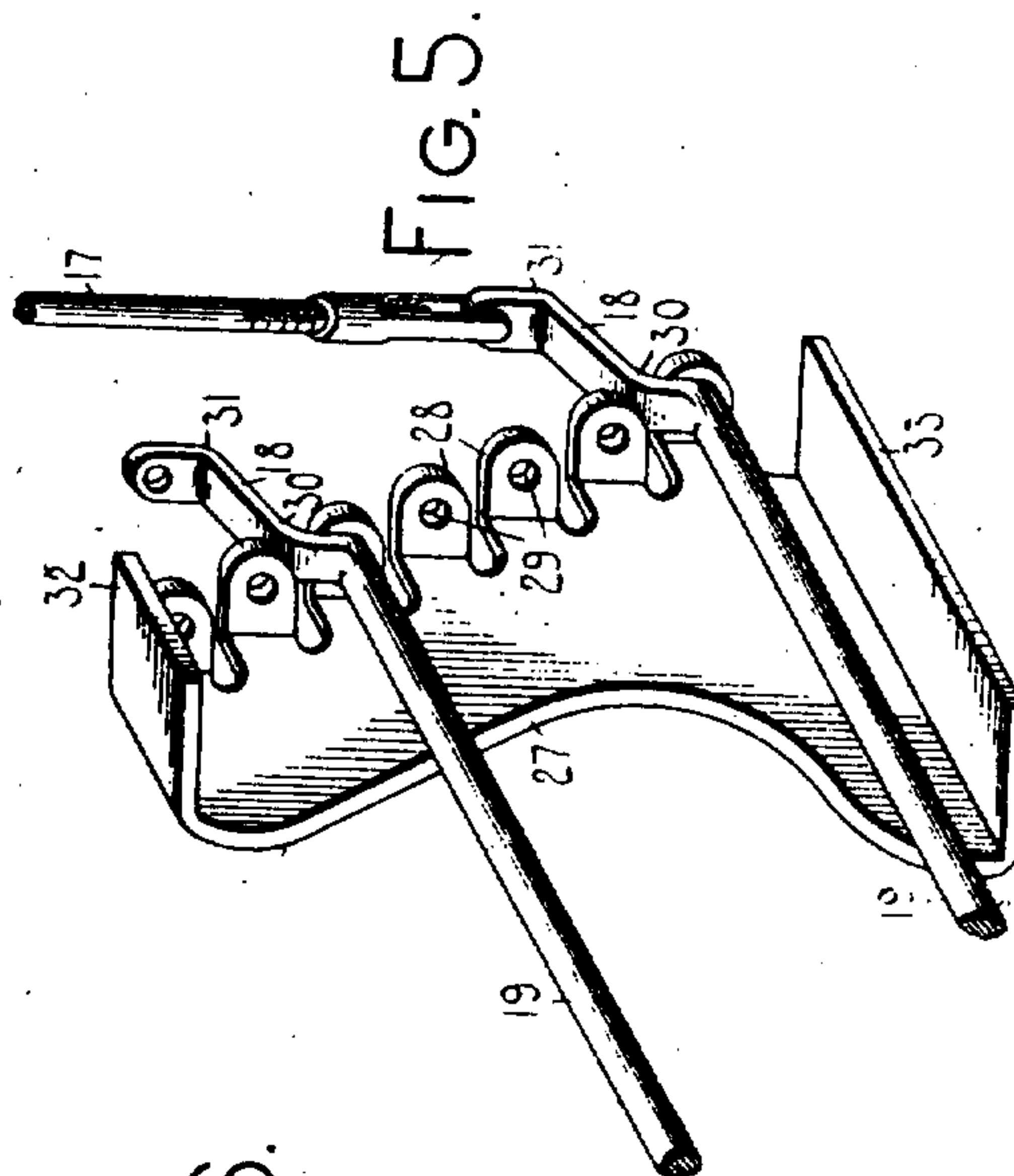
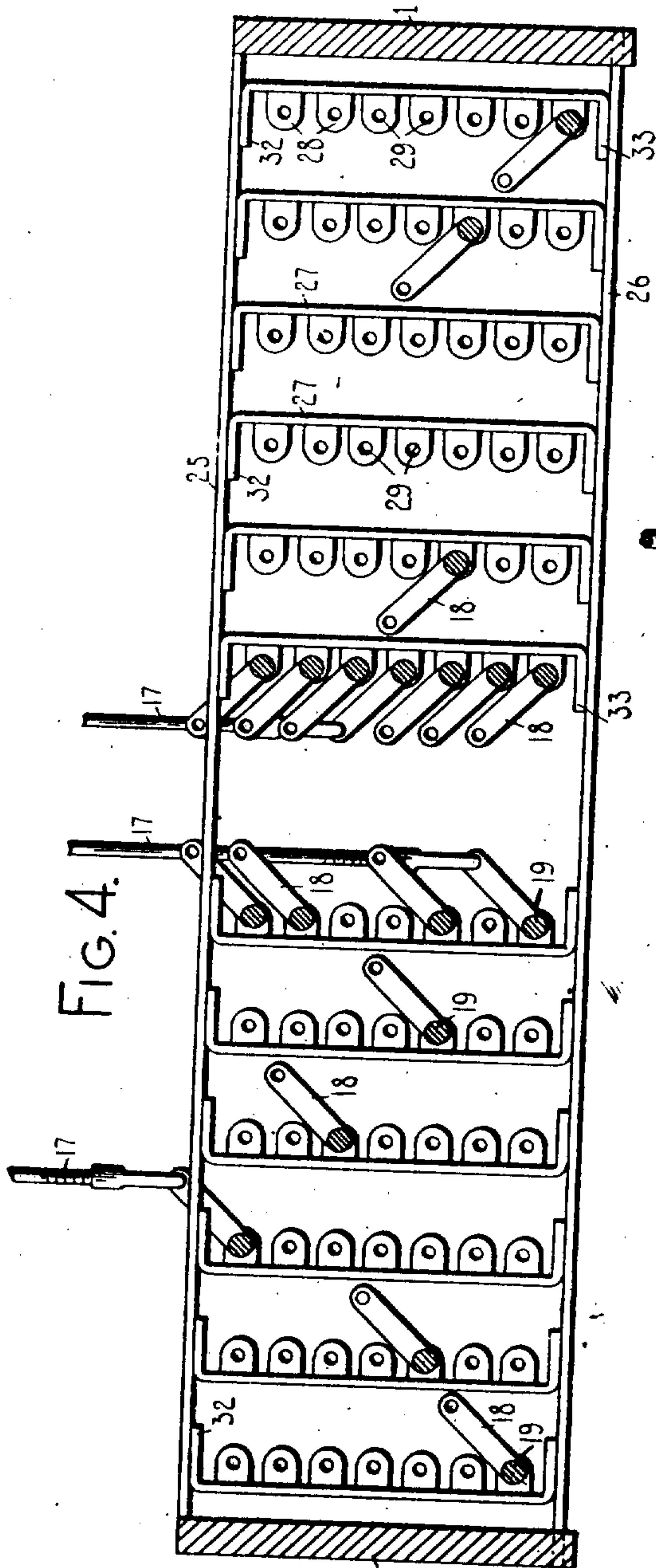
James H. Barr

ATTORNEY.

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TYPE WRITING MACHINE.
APPLICATION FILED MAY 18, 1905.

Patented Nov. 10, 1908.
4 SHEETS—SHEET 4.



WITNESSES:

W. A. Hammer
R. H. Trotter

Alexander T. Brown & John H. Barr INVENTORS.
BY *James F. Fabel* ATTORNEY.

UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN AND JOHN H. BARR, OF SYRACUSE, NEW YORK; SAID BARR ASSIGNOR OF HIS RIGHT TO THE SMITH PREMIER TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 903,443.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed May 18, 1905. Serial No. 261,045.

To all whom it may concern:

Be it known that we, ALEXANDER T. BROWN and JOHN H. BARR, citizens of the United States, and residents of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

Our invention relates to typewriting machines and more especially to the type and key actions of such machines, and it has for its object to provide improved mechanism of this character.

Our invention consists in certain features of construction and combinations and arrangements of parts all of which will be fully set forth herein and particularly pointed out in the claims.

One embodiment of our invention is illustrated in the accompanying drawings, in which

Figure 1 is a front to rear vertical sectional view of a typewriting machine; Fig. 2 is a rear view in transverse vertical section; Fig. 3 is a top plan view showing the key action, the upper part of the typewriter being sectioned away; Fig. 4 is a view in transverse vertical section of a portion of the key action as seen from the back of the machine; Fig. 5 is an isometrical detail view of a portion of said key action; and Fig. 6 is an isometrical view of a modified form of framing for the key action.

We have shown our invention applied to a front-strike machine, it being more especially designed for use in machines of this character; but most of the features of the invention are also applicable to other styles of typewriting machines.

The main frame of the machine shown in the drawings comprises a base portion consisting of side plates 1 connected together by a back plate 2. Posts 3, rising from the side plates, support a top plate 4. A platen 5 is mounted on a carriage 6 which is adapted to move back and forth across the machine on rails mounted on the top plate. Said carriage may be drawn across the machine by the usual spring drum or by any suitable means and the motion of said carriage may be controlled by any suitable step by step de-

vice. The details of the means for supporting and controlling the carriage have not been shown in this case as they form no part of the present invention.

One of the objects of the present invention is to mount a large number of type bars in a front strike typewriting machine and the machine shown in the present case comprises eighty-four such type bars arranged in two series mounted on two separate type bar segments, which occupy substantially the same angular space with reference to the printing point. As shown in the present case that part of the top plate just in front of the carriage is arched or dome-shaped and two type bar segments 7 and 8 are secured at their ends to the under side of this portion of the top plate, the segment 7 being of less radius and nearer to the printing point than the segment 8. Each of the type bar segments 7 and 8 consists of a curved rod or bar of circular cross section and having cut in its surface a series of annular V-grooves 9 each of which lies in a plane which passes through the center of the segments. The segment 7 as shown in Fig. 1, is preferably situated slightly nearer the back of the machine than the segment 8. The segments are secured to the top plate 4 by screws 10 which pass through the top plate and are threaded into the ends of the segments. A series of type bars 11 is mounted on the segment 7 and a second series of type bars 12 on the segment 8. Each of the type bars is formed at its pivoted end with an eye which encircles the segment and which is internally grooved to form a ball race which coöperates with one of the grooves 9 which also constitutes a ball race. Anti-friction balls running in these coöperating ball races constitute ball bearings for the several type bars. The details of the construction of the ball race in the eye may be varied in any way without departing from our invention. As shown in the present instance, said ball race is formed by two rings 13 threaded into the eye of the type bar, one of said rings being threaded in from one side and the other from the other side, and each of said rings being beveled on its inner side so that the two rings together form a V-groove in which the anti-friction balls run.

The eye of each type bar is cut through as shown at 13^a and said eye may be tightened about the bearing rings by tightening a screw 13^b. This particular construction of ball bearing type bar is not of our joint invention, but is the sole invention of John H. Barr. Said bearing is more fully shown and described and is claimed in the application of said John H. Barr, filed March 16th, 1905, Serial No. 250,444.

The free ends of the type bars normally rest in engagement with a cushioned rest or support 14. The type bars 11 are shorter than the type bars 12 and are preferably made of the curved form shown in Fig. 1 so that the free ends of these type bars rest on the same support 14 as the type bars 12 without interfering with the enlarged pivot ends of said type bars 12. The arrangement is such that in the basket type bars 11 and 12 alternate with each other. Each of the type bars 11 and 12 has at its free end a socket 15 in which is mounted a single type, not shown. Each of the type bars 11 and 12 has projecting from its pivot end an ear 16 to which is pivoted the upper end of a link 17, the lower end of which is pivoted to an arm 18 projecting from the rear end of one of a series of rock shafts 19 each of which has projecting therefrom near its forward end an arm 20 to which is pivoted the lower end of a key stem 21 having a key 22 mounted on the upper end thereof. The rock shafts 19 are journaled at their forward ends in angled frame plates 23 which are secured at their ends to the side plates 1 of the main frame and which together constitute the keyboard of the machine. Each of the key stems 21 passes through a suitable opening in the horizontal portion of its frame plate 23. Each of the rock shafts 19 is provided with a returning spring 24 which is coiled about said rock shaft at its forward end and which is connected at one end to the frame plate 23 and at the other end to the arm 20. The construction is such that if any key be depressed its rock shaft 19 will be oscillated and the link 17 connected therewith will operate the corresponding type bar to print.

The rock shafts 19 are journaled at their rear ends in a frame work provided for the purpose. Two strips or bars 25 and 26 extend across the base portion of the machine beneath the segments 7 and 8, being secured at their ends to the side plates 1. A series of vertical frame plates 27 are secured at their upper ends to the strip or bar 25 and at their lower ends to the strip or bar 26. Each of the vertical frame plates 27 has projecting therefrom a series of ears 28 each having an opening 29 in which one of the shafts 19 is journaled. In the present instance there are eighty-four rock shafts 19 arranged in seven horizontal rows or tiers, having twelve rock shafts in each tier. Said rock shafts are also

disposed in vertical rows or tiers of seven rock shafts each, and each of these vertical tiers is supported by one of the frame plates 27. The ears 28 are arranged step fashion as best shown in Fig. 1, the highest one on each plate 27 being nearest the front of the machine and the lower ones successively nearer the back of the machine. It results from this arrangement that each of the arms 18 may project from its rock shaft 19 in front of the corresponding ear 28 and back of the ear 28 next above it. Each of the arms 18 is bent toward the back of the machine at 30 and in the opposite direction at 31, so that the point at which the link 17 is pivoted to the arm 18 is at some distance back of the ear 28 in which the corresponding rock shaft 19 is journaled. The advantage of this arrangement will be understood by reference to Fig. 2 in which the single type bar on the right hand side of the figure is shown in operated position. It will be perceived that the arm 18 connected with this type bar stands back of the ear 28 in the same horizontal tier and projecting from the next frame plate 27 to the left. By forming these arms 18 with the off-set bend which has been described, any interference between these parts is avoided. The stepped arrangement of the ears 28 also contributes to avoiding interference between the various links 17, some of these links being nearer the back of the machine than others. As will be seen by reference to Figs. 1 and 2, said links 17 are curved in various ways which also contributes toward avoiding interference between the different links and also makes said links elastic, which improves the touch on the keys.

By reference to Fig. 2 it will be seen that when the parts are in normal position the arms 18 are inclined upward at a considerable angle with the horizontal and that when a key is fully depressed and the type bar fully operated said arms are but little past the horizontal position. The result of this arrangement is a key that has a greater mechanical advantage over the type bar during the first part of its stroke than it has during the latter part, thus giving an easy start to the type bar and a considerable increase in the speed of the type bar relative to the key during the latter part of the stroke. This is a great advantage especially in front strike typewriters where the first part of the motion of the key not only has to overcome the inertia of the type bar but also has to lift said type bar against gravity.

We prefer to arrange the rock shafts 19 in two sets, one on each side of the center of the machine, so that the arms 18 and 20 of each rock shaft extend from said rock shaft towards the center of the machine.

It will be observed that the present typewriter is a full key board machine, that is to say, there is a separate key for each type.

In such machines it is usual to arrange the lower case keys near the front of the key board and the upper case keys and other keys that are used comparatively infrequently near the back of the key board. It will be observed that those keys near the front of the machine are connected with rock shafts 19 near the bottom of the machine and those keys near the back of the key board are connected with the upper rock shafts. It will also be observed that the short type bars 11 are connected with the lower rock shafts and the long type bars 12 are connected with the upper rock shaft. It will thus be seen that those keys which are used most frequently are connected with the shorter and lighter type bars.

The cross bars or strips 25 and 26 and the vertical frame plates 27 are preferably made of sheet metal, the ears 28 being bent off from the edge of the plates as clearly shown in Fig. 5. Each of the frame plates 27 has bent off therefrom at its upper end a horizontal portion 32 and at its lower end a horizontal portion 33, these horizontal portions being secured to the strips 25 and 26 respectively by rivets or other suitable means.

In Fig. 6 we have illustrated a modification of the framework for supporting the rear ends of the rock shafts 19. An inclined bar 35 is secured to the under side of each of the frame plates 1 by screws or rivets passing through openings 36 in said bar. The two bars 35 are joined by a series of horizontal sheet metal angle-strips or bars 37, each formed with a series of ears 38 having openings 39 therein in which the shafts 19 are journaled. Each of the strips 37 is formed at its end with an ear 40 through which passes a headed screw 41 which is threaded into the bar 35 and supports the strip 27. It will be perceived that according to this modification a frame piece 37 is provided for each horizontal tier of rock shafts, whereas according to the form shown in the other figures of the drawings a frame piece 27 is provided for each vertical tier of rock shafts.

The type bar system and arrangement shown and described in this application is not of our joint invention but is the invention of John H. Barr and is claimed in the application of said John H. Barr, filed May 26th, 1905, Serial No. 262,395.

Various changes may be made in the details of construction and arrangement without departing from the gist of our several improvements.

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

1. In a typewriting machine, the combination of a series of key-operated rock shafts, extending from front to back of the machine, stepped bearings for the rear ends of said rock shafts, arms projecting from said rock shafts near their rear ends, links connected

with said arms, and type bars operated by said links, those links that are connected with the lower rock shafts standing back of the ends of the upper rock shafts of the series.

2. In a typewriting machine, the combination of a series of keys, a series of rock shafts operated by said keys, arms projecting from said rock shafts near the rear ends thereof and bent back so that the free end of each of said arms is back of the rear end of its rock shaft, links pivoted to said arms, and type bars operated by said links.

3. In a typewriting machine, the combination of a series of keys, a series of rock shafts operated by said keys, a frame in which the rear ends of said rock shafts are journaled, arms projecting from said rock shafts and having their free ends standing back of said frame, links connected with said arms, and type bars operated by said links.

4. In a typewriting machine, the combination of a series of keys, a series of rock shafts operated by said keys, a frame in which the rear ends of said rock shafts are journaled, the bearings for the lower rock shafts being nearer the back of the machine than those of the upper rock shafts, arms projecting from said rock shafts near the rear ends thereof, the free end of each of said arms standing back of the end of its rock shaft, links connected with said arms, and type bars operated by said links.

5. In a typewriting machine, the combination of a series of keys, a series of horizontally disposed, key operated rock shafts, and a frame in which the rear ends of said rock shafts are journaled, said frame comprising two bars or strips, and a series of cross pieces having bearings for said rock shafts, those bearings near the bottom of the frame being nearer the back of the machine than those near the top of the frame.

6. In a front strike typewriting machine, the combination of a series of type bars segmentally arranged below the printing point in two sets, the type bars of one set being shorter than those of the other, a series of keys, a series of key operated rock shafts, the keys near the front of the key board being connected with the lower rock shafts of the series, and said lower rock shafts being connected with the shorter type bars, and the keys near the back of the keyboard being connected with the upper rock shafts, and said upper rock shafts being connected with the longer type bars.

7. In a front strike typewriting machine, the combination of two segments, one of shorter and the other of longer radius; type bars pivotally mounted on said segments, the type bars on one segment alternating with those on the other; a series of rock shafts arranged in horizontal tiers and each rock shaft having an arm; links, each connected at one end to a type bar and at the other end

to one of said arms; and keys for operating
said rock shafts, the rock shafts of the upper
tiers being connected with the type bars on
the segment of greater radius and the rock
5 shafts of the lower tiers being connected with
the type bars on the segment of less radius.

Signed at Syracuse, in the county of Onon-

daga, and State of New York this 10th day
of May A. D. 1905.

ALEXANDER T. BROWN.

JOHN H. BARR.

Witnesses:

E. E. CORY,

A. L. HINMAN.