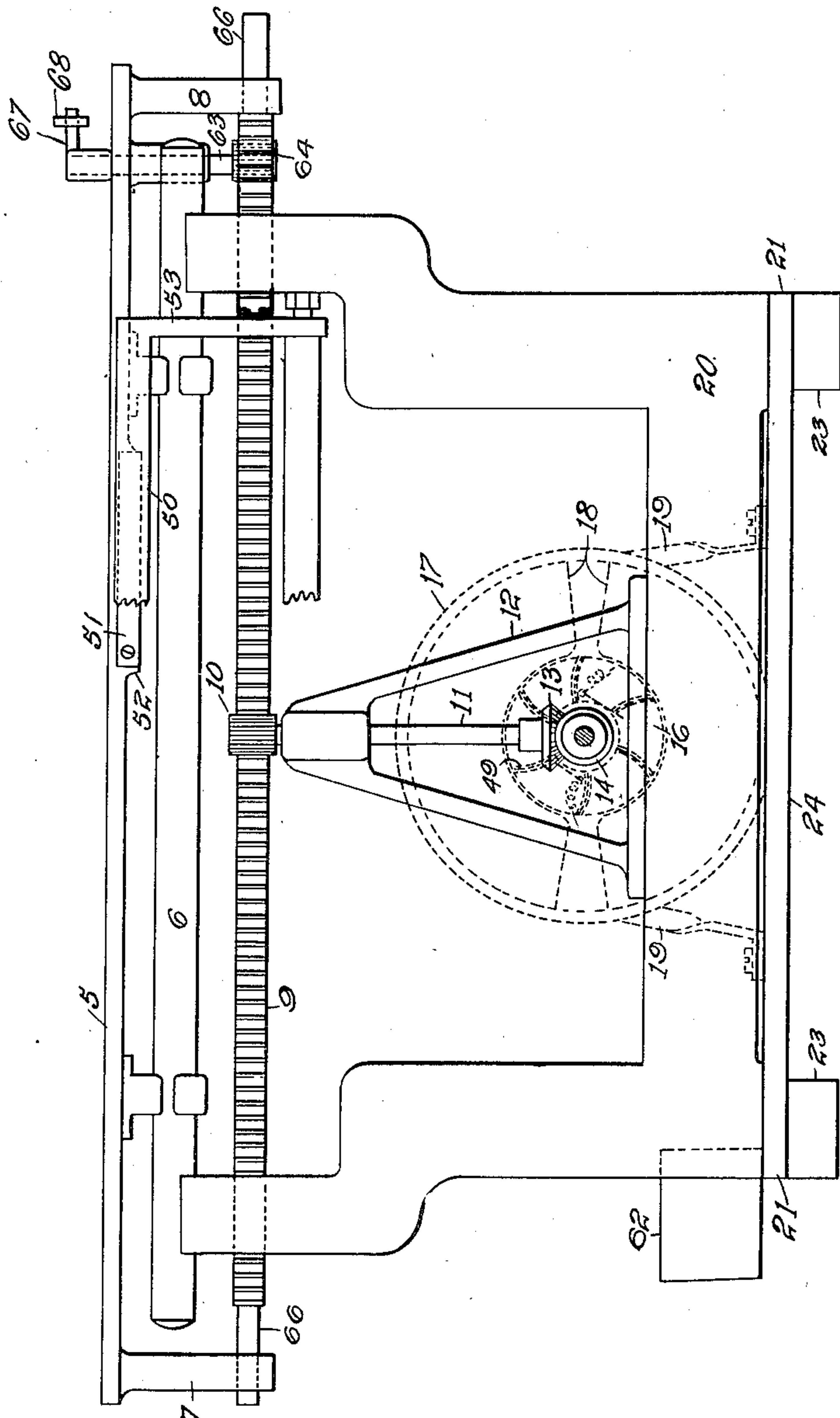


No. 836,932.

PATENTED NOV. 27, 1906.

E. F. KUNATH.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 28, 1906.

3 SHEETS—SHEET 1.



Witnesses
John C. Kopf
Katie Frankfort.

Inventor
Edward F. Kunath
By Attorney
D. B. Hickney

No. 836,932.

PATENTED NOV. 27, 1906.

E. F. KUNATH.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 28, 1906.

83 SHEETS—SHEET 2.

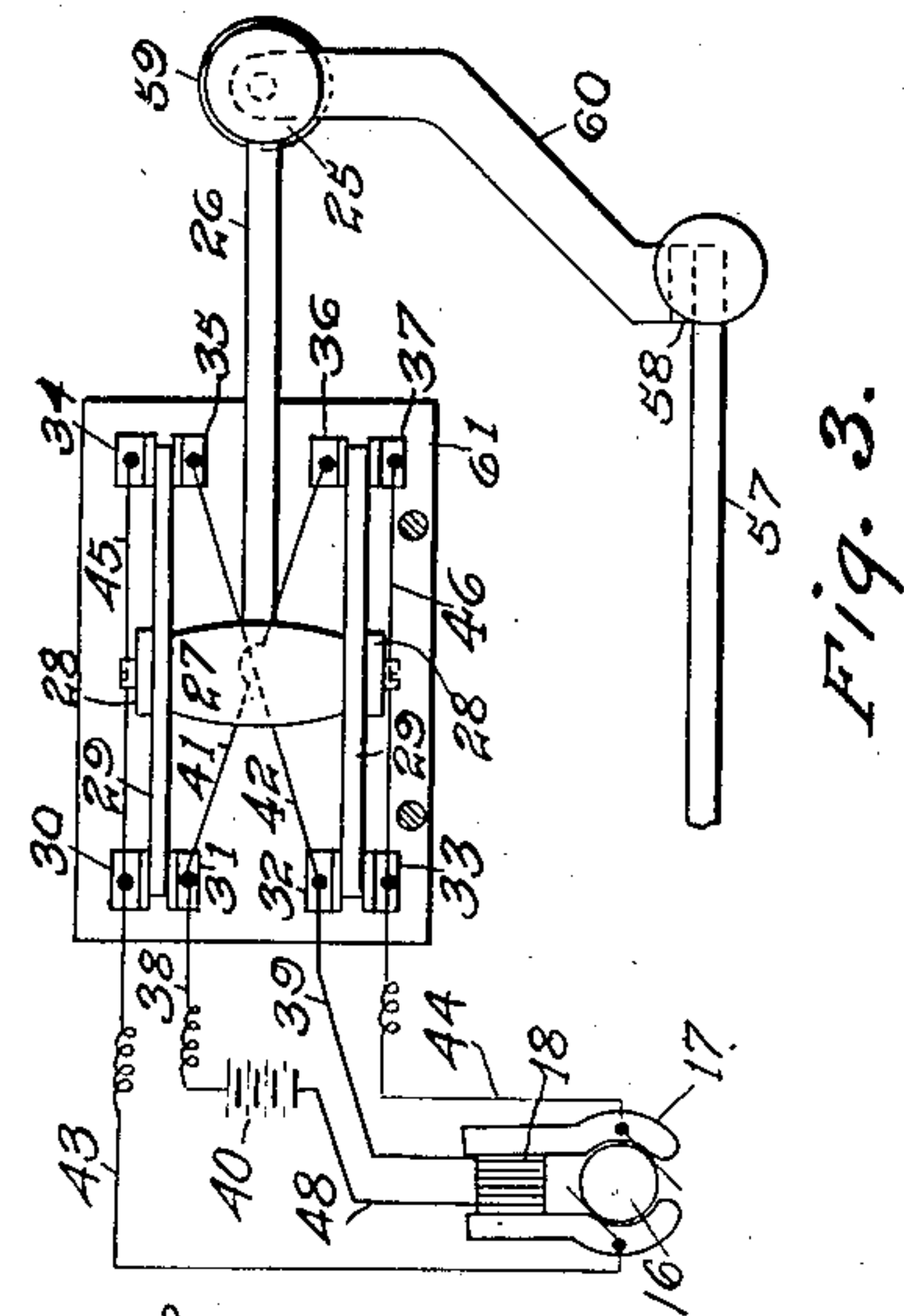
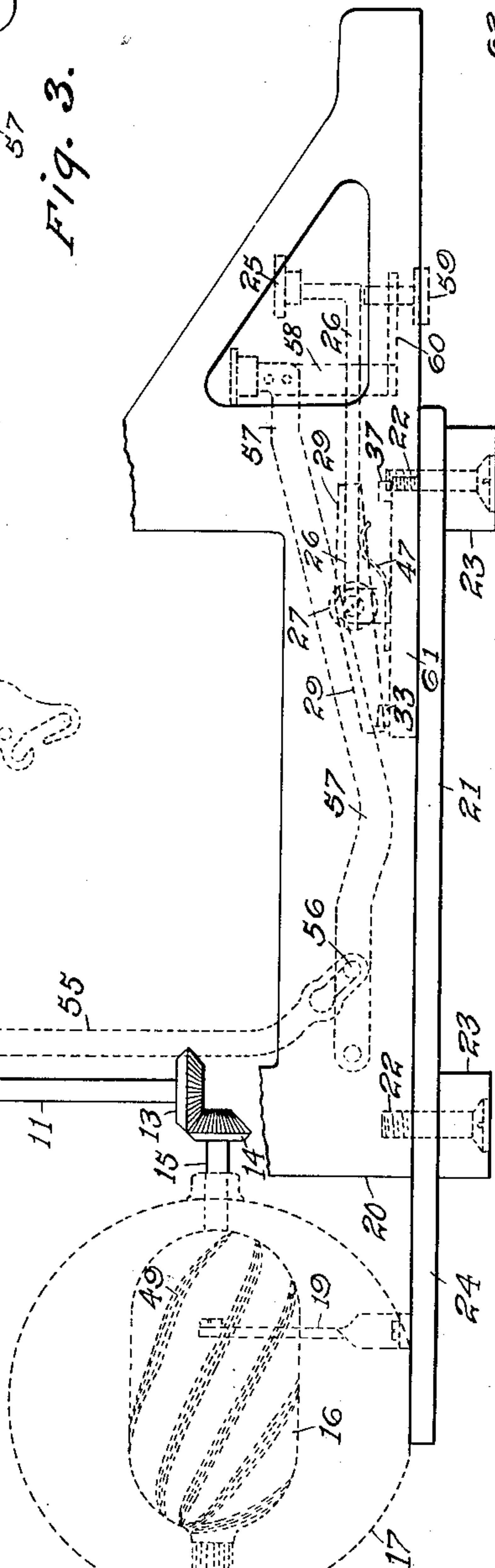


Fig. 2.

Witnesses

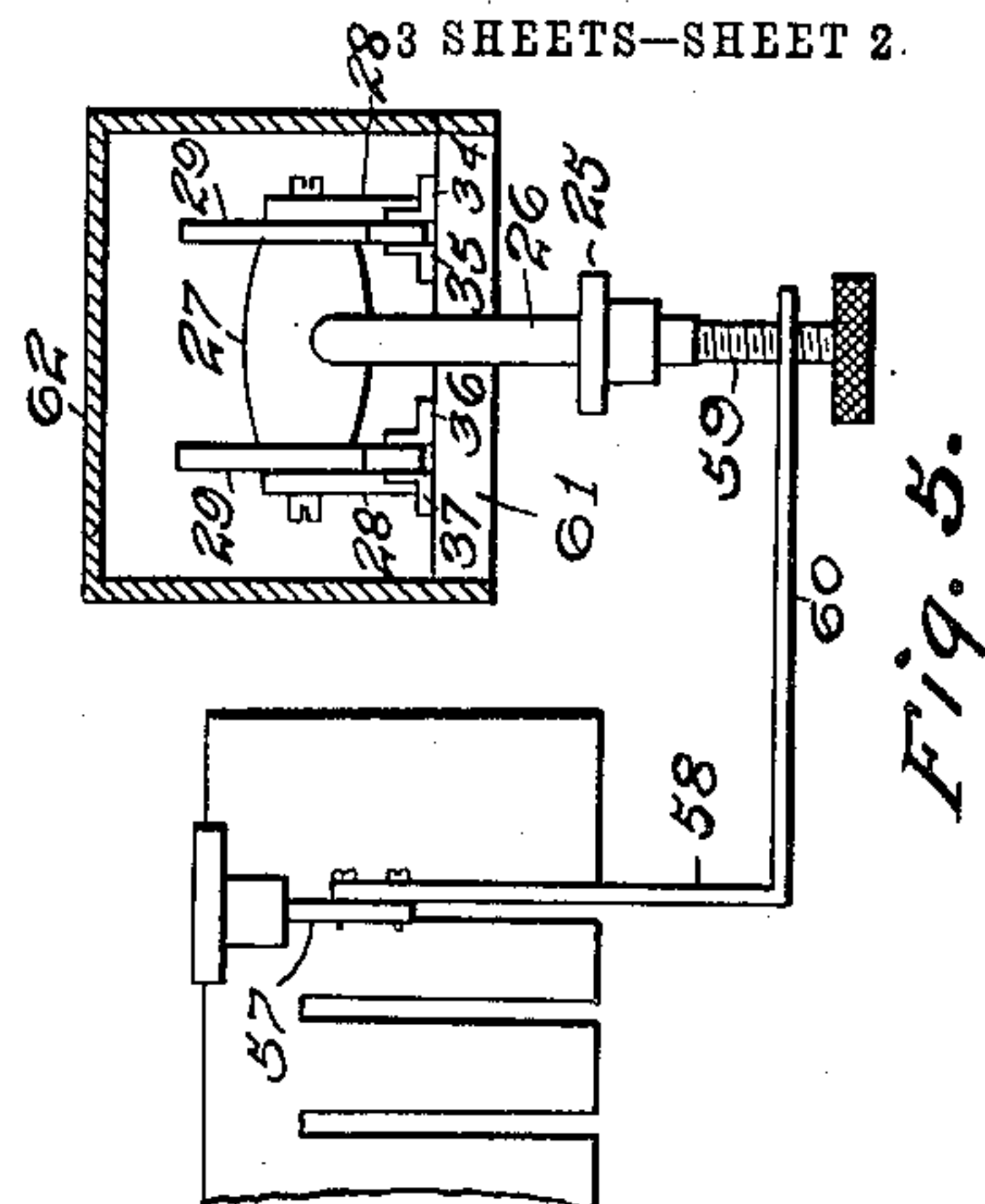
John C. Kopf
Kittie Frankfurt

Fig. 3.



By Attorney.

Inventor
Edward F. Kunath
D. C. Stickney



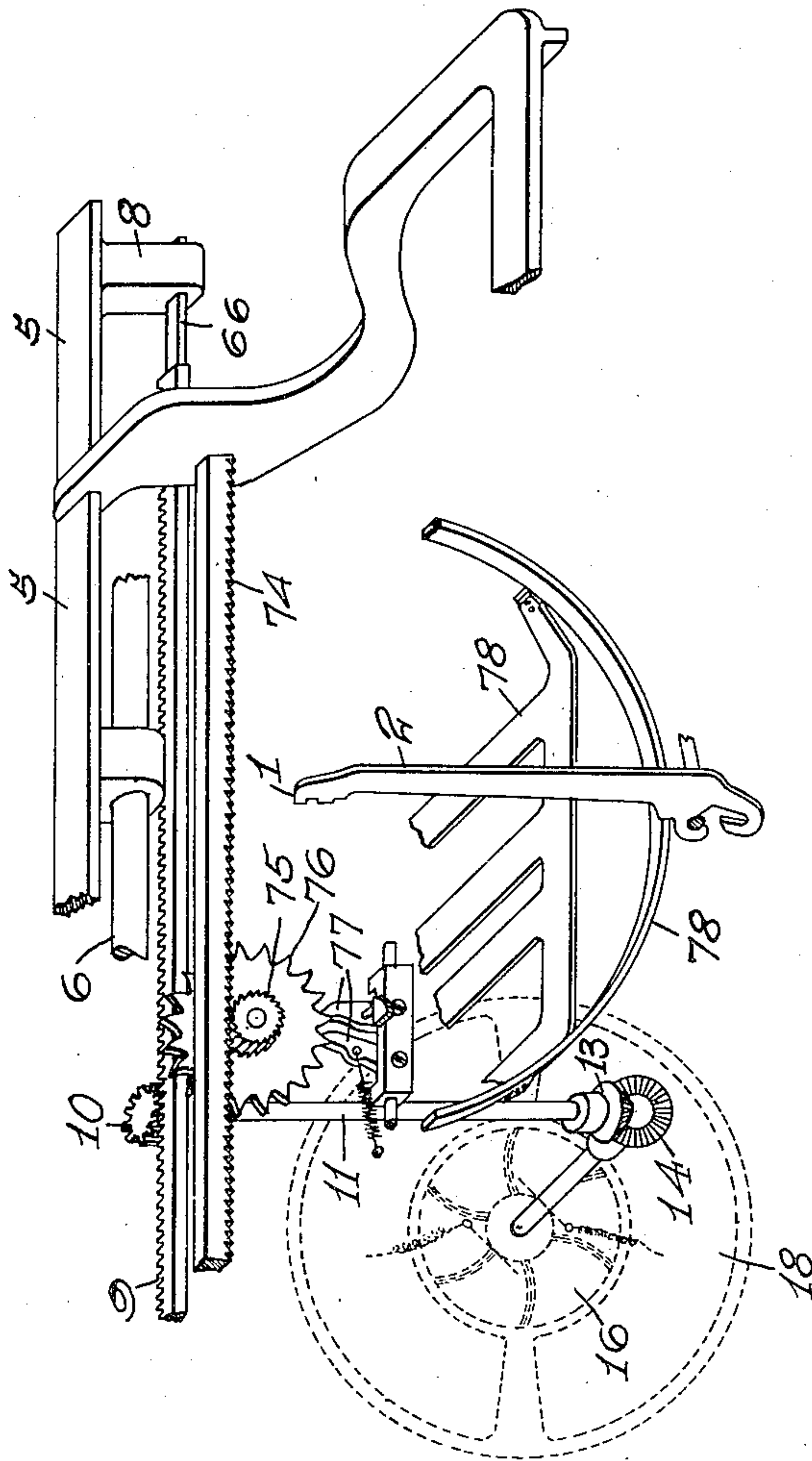
No. 836,932.

PATENTED NOV. 27, 1906.

E. F. KUNATH.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 28, 1906.

3 SHEETS—SHEET 3.

Fig. 6.



WITNESSES
K. Frankfort.
John C. Kopf

INVENTOR
Edward F. Kunath.

BY HIS ATTORNEY

B. C. Stickney

UNITED STATES PATENT OFFICE.

EDWARD F. KUNATH, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO
UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A
CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 836,932.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed March 28, 1906. Serial No. 308,505.

To all whom it may concern:

Be it known that I, EDWARD F. KUNATH, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to means for propelling the letter-feeding carriages of type-writing machines.

The principal object of my invention is to provide convenient means for use upon ordinary type-writing machines, especially those with heavy carriages, for enabling the carriage to be electrically driven in both directions, thereby relieving the operator from the great tax of returning the carriage at the end of each line of writing to begin a new line.

In carrying out my invention I gear an electrical motor to the carriage so as to drive the same in both directions, and I provide at the keyboard a carriage-returning key which normally closes the motor-circuit in a manner to drive the carriage in letter-feeding direction, but which when depressed operates a pole-changing device whereby the direction of the motor is reversed and the carriage driven back to begin a new line, a spring returning both said key and pole-changing device to normal position. I also provide novel means, controlled by said carriage-returning key, for preventing unduly rapid return movement of the carriage. I also provide means for enabling the motor to effect partial rotation of the platen for line-spacing. Other features and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a rear view of an Underwood type-writing machine, showing my improvements applied thereto. Fig. 2 is a side elevation of the machine, partly in section. Fig. 3 is a diagrammatic plan of the carriage-reversing key and connections. Fig. 4 is a reduced plan of a bottom bracket attached to the base of the machine and supporting the motor. Fig. 5 is a front elevation showing the keys, &c., seen at Fig. 3. Fig. 6 is a front perspective view showing the usual carriage-feeding devices.

In the Underwood machine types 1, mounted upon pivoted bars 2, strike against the front side of a revoluble platen 3, having an axle 4 and mounted upon a carriage, a portion of which is seen at 5. The carriage runs upon suitable rails, one of which is seen at 6. In a pair of arms 7 8, depending from the carriage, I mount a rack 9, having teeth on its rear face and in mesh with a pinion 10, the latter fixed upon the upper end of a vertical shaft 11, journaled in a bracket 12. Upon the lower end of the shaft 11 is mounted a bevel-pinion 13, meshing with a pinion 14, provided upon the shaft 15, which carries the armature 16 of a motor 17, the field of which is indicated at 18, Fig. 1. The casing of the motor is supported upon a bracket (seen at Fig. 4) and is provided with suitable stays 19. Said bracket is in the form of the letter U and is of suitable size and form to fit up against the under side of the usual framework 20 of the type-writing machine. It comprises a pair of arms 21, through which pass the screws 22, that I use for fastening the upper feet 23 upon the machine. Said arms are connected by a yoke 24, upon which is seated the motor 17.

The motor is under the control of a key 25, placed at the keyboard of the machine and fixed upon the front end of a lever 26, which extends forwardly from a shaft or hub 27, pivoted in supports 28. Fixed to the ends of said hub 27 is a pair of knives 29, each extending both forwardly and backwardly from the hub. Two pairs of sliding contacts 30 31 and 32 33 are adapted to be engaged simultaneously by the rear ends of the knives, and two pairs of similar contacts 34 35 and 36 37 are provided for the forward ends of the knives; but the latter are so shaped as to be out of engagement with the forward contacts when in engagement with the rear contacts, and vice versa, so that the current does not pass longitudinally of either knife. Normally the rear contacts are engaged by the knives, as at Fig. 2. The inner rear contacts are connected by wires 38 and 39, respectively, to a battery or source of power 40. A wire 41 connects contact 31 across to the inner front contact 36, and a wire 42 connects the rear contact 32 across to the inner front contact 35. The outer rear contacts 30

and 33 are connected by wires 43 44 to the armature 16 of the motor. The wire 45 connects contact 30 with the forward outer contact 34, and a wire 46 makes a similar connection between 33 and 37. Normally the current runs through 38, 31, 30, 43, 16, 44, 33, 32, and 39, back to 40; but the depression of the key 25 lifts the knives out of engagement with the rear contacts and depresses the forward ends into engagement with the front contacts, so that the current runs through the armature in the opposite direction, traversing 38, 41, 36, 37, 46, 44, 16, 43, 45, 34, 35, 42, and 39, back to 40. When the key is released, a spring 47 returns it to normal position together with the knives, Fig. 2. A loop 48 in the wire 39 includes the field-windings 18 of the motor. The windings of the armature extend helically, as at 49, so that substantial uniform torque upon the motor-shaft 15 is secured, whereby uniform pull is secured upon the carriage 5 for its letter-spacing movements.

To prevent unduly rapid return movement of the carriage, the key 25 is preferably made to operate a brake, comprising a bar 50, extending parallel with the run of the carriage and movable forward into contact with a leather facing 51, secured upon a bar 52 of the carriage. The bar 50 is mounted upon the tops of a pair of rock-arms 53, forming a rocking frame, and to a forwardly-extending arm 54 of this frame is connected the upper end of a link 55, Fig. 2, the lower end of which is pivoted at 56 to a key-lever 57. An offset arm 58 extends from the forward end of the lever 57 beneath the carriage-returning key 25, so that a depression of the latter may force down the lever 57 with the link 55, thereby rocking forward the frame 50 53, so that the bar 50 rubs upon the leather facing 51, thus preventing the carriage from attaining undue speed while returning. Preferably a thumb-screw 59 is threaded into the end of the horizontal arm 60 of the offset 58, said screw being adapted to contact with the key 25, and thus affording means for regulating the action of the brake members 50 51. The downward movement of the key 25 is arrested by the contact of the forward ends of the knives with the base 61, upon which the supports 28 are erected, and when the key is in this position the screw 59 may be adjusted so as to secure the desired pressure between 50 and 51. The pole-changing devices may be inclosed in a case 62, (shown in section at Fig. 5,) and said case may be secured upon the frame 21.

For effecting line-space movements of the paper I mount upon one end of the carriage a short vertical shaft 63, having at its lower end a pinion 64 to mesh with a short rack 65, cut upon the front face of the rack-bar 9. Said rack-bar is movable independently of the carriage, having at its ends slides 66,

which are rectangular in cross-section, as seen at Fig. 2, and fit in rectangular holes formed in the lower ends of the arms 7 8. When the pinion 10 begins to rotate in a direction to drive the carriage back or to the left at Fig. 1, the rack alone moves at first, the carriage remaining stationary, and thereby the pinion 64 is rotated and a crank 67, provided upon the upper end of the pinion-shaft 63, is swung rearwardly, thereby drawing back the slide 68, which carries the usual pawl 69 to engage the ratchet 70 for effecting partial rotation of the platen 3. The parts remain in this situation until the key 25 is released and the pole-changing devices return to normal position, whereupon the pinion 10 rotates in the opposite direction and restores the rack 9 to its original position relatively to the carriage, Fig. 1, returning the crank 67 to its forward position and permitting the usual spring 71 to return the slide 68. The latter may be operated when desired by the usual line-space lever, a part of which is seen in section at 72. The slide has a longitudinal slot 73 to receive the crank 67, whereby a line-spacing movement of the slide is permitted independently of said crank 67.

The carriage is provided with a letter-spacing rack 74, meshing with a pinion 75, connected to an escapement-wheel 76, controlled by feeding-dogs 77, operated at the type-bar strokes through the medium of a universal-bar frame 78, actuated by the type-bars 2, all in the usual manner.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim—

1. In a type-writing machine, the combination with a letter-feeding carriage, of a motor having uniform pull or torque and connected to said carriage to drive it in both directions, a key at the keyboard of the machine, means controlled by said key for reversing the direction of said motor, and a spring for returning said key to normal position, in which the parts are set to cause the motor to drive the carriage in letter-feeding direction.

2. In a type-writing machine, the combination with a letter-feeding carriage, of a motor having substantially uniform torque and connected to said carriage, a key, a pair of double knife-switches connected to said key and forming part of a pole-changer included in circuit with the armature of the motor, and a spring for returning said key to normal position in which the circuit is closed for driving the carriage in letter-feeding direction.

3. In a type-writing machine, the combination with an electrical motor having substantially uniform torque, of a letter-feeding carriage connected thereto, a pole-changer in

circuit with the armature of said motor, said pole-changer comprising a pair of contact-knives fixed together and pivoted, and a pair of fixed contacts for each end of each knife, and a key connected to said contact-knives and having a spring for returning the key and knives to a position for closing the circuit, so as to drive the carriage in letter-feeding direction.

4. In a type-writing machine, the combination with a reversible motor, of a letter-feeding carriage connected thereto, a pole-changer in circuit with the motor, a key controlling said pole-changer and normally in position for driving the carriage in letter-feeding direction, and a carriage-brake operated by said key.

5. In a type-writing machine, the combination with a reversible motor, of a letter-feeding carriage connected thereto, a pole-changer in circuit with the motor, a key controlling said pole-changer and normally in position for driving the carriage in letter-feeding direction, a brake for said carriage, and mechanism connecting said brake and said key, so that the latter when it is depressed for reversing the carriage, brings said brake automatically into action.

6. In a type-writing machine, the combination with a reversible motor, of a letter-feeding carriage connected thereto, a pole-changer in circuit with the motor, a key controlling said pole-changer and normally in position for driving the carriage in letter-feeding direction, a brake for said carriage, and mechanism connecting said brake and said key, so that the latter when it is depressed for reversing the carriage, brings said brake automatically into action; said connecting mechanism including a part adjustable for varying the pressure of the brake.

7. In a type-writing machine, the combination with a reversible motor, of a letter-feeding carriage connected thereto, a pole-changer in circuit with the motor, a key controlling said pole-changer and normally in position for driving the carriage in letter-feeding direction, a brake for said carriage, and mechanism connecting said brake and said key, so that the latter when it is depressed for reversing the carriage, brings said brake automatically into action; said connecting mechanism including a part adjustable for varying the pressure of the brake, and a stop being provided for arresting the downward stroke of said key.

8. In a type-writing machine, the combination with a reversible motor having substantially uniform torque, of a letter-feeding carriage connected to said motor, a pole-changer in circuit of said motor, a key connected to said pole-changer, a spring for returning the key and pole-changer to normal position in which the circuit is closed for

driving the carriage forward, a carriage-brake controlled by a second tabulator-key, and adjustable means for enabling said pole-changing key to depress said second key.

9. In a type-writing machine, the combination with a reversible motor having substantially uniform torque, of a letter-feeding carriage connected to said motor, a pole-changer in circuit of said motor, a key connected to said pole-changer, a spring for returning the key and pole-changer to normal position in which the circuit is closed for driving the carriage forward, a carriage-brake controlled by a second tabulator-key, adjustable means for enabling said pole-changing key to depress said second key, and adjustable mechanism including an arm extending from the tabulator-key and having an adjustable screw to be engaged by the pole-changing key.

10. In a type-writing machine, the combination with a carriage having a rack, of a pinion meshing with said rack, an electrical motor connected to said pinion, and a pole-changing key for controlling said motor, and escapement devices controlling the movements of said rack and motor in one direction.

11. In a type-writing machine, the combination with a carriage having a rack, of a pinion meshing with said rack, a shaft for said pinion, a motor geared to said shaft, escapement devices controlling the advance movements of said rack and motor, and a key for reversing said motor and carriage.

12. In a type-writing machine, the combination with a carriage having a rack, of a pinion meshing with said rack, a shaft for said pinion, a motor geared to said shaft, and a key for reversing said motor; said rack being mounted upon said carriage for a short endwise movement, and a line-spacing mechanism operable by said rack.

13. In a type-writing machine, the combination with a carriage having a rack, of a pinion meshing with said rack, a shaft for said pinion, a motor geared to said shaft, and a key for reversing said motor; said rack being mounted upon said carriage for a short endwise movement, and a line-spacing mechanism operable by said rack, and including a pinion engaging the rack-bar, a shaft upon which said pinion is mounted, a crank upon said shaft, and connections from said crank to the usual line-spacing pawl.

14. In a type-writing machine, the combination with a letter-feeding paper-carriage having arms at its ends, of a rack supported by its ends in said arms for a short endwise movement, a pinion meshing with said rack, a reversible motor geared to said pinion, a crank at one end of the carriage connected to the adjacent end of said rack, and line-spacing devices at the same end of the carriage and operated by said crank.

15. In a type-writing machine, the combination with a letter-feeding paper-carriage having arms at its ends, of a rack supported by its ends in said arms for a short endwise movement, a pinion meshing with said rack, a reversible motor geared to said pinion, a crank at one end of the carriage connected to the adjacent end of said rack, and line-spacing devices at the same end of the carriage and operated by said crank; said line-spacing devices being operable by the usual line-space lever independently of said rack.

16. The combination in a type-writing machine having a letter-feeding carriage and a framework, of a motor geared to said carriage, a bracket whereon said motor is supported, said bracket being secured to the under side of the framework by means of screws, and feet also attached to the framework by

means of the same screws; the bracket being between the feet and the base of the machine.

17. The combination in a type-writing machine having a letter-feeding carriage and a framework, of a motor geared to said carriage, a bracket whereon said motor is supported, said bracket being secured to the under side of the framework by means of screws, and feet also attached to the framework by means of the same screws; the bracket being between the feet and the base of the machine and consisting of two side arms through which pass four of said screws and a yoke connecting said arms, the motor being directly attached to said yoke.

EDWARD F. KUNATH.

Witnesses:

JOHN C. KOPF,

KITTIE FRANKFORT.