

No. 774,724.

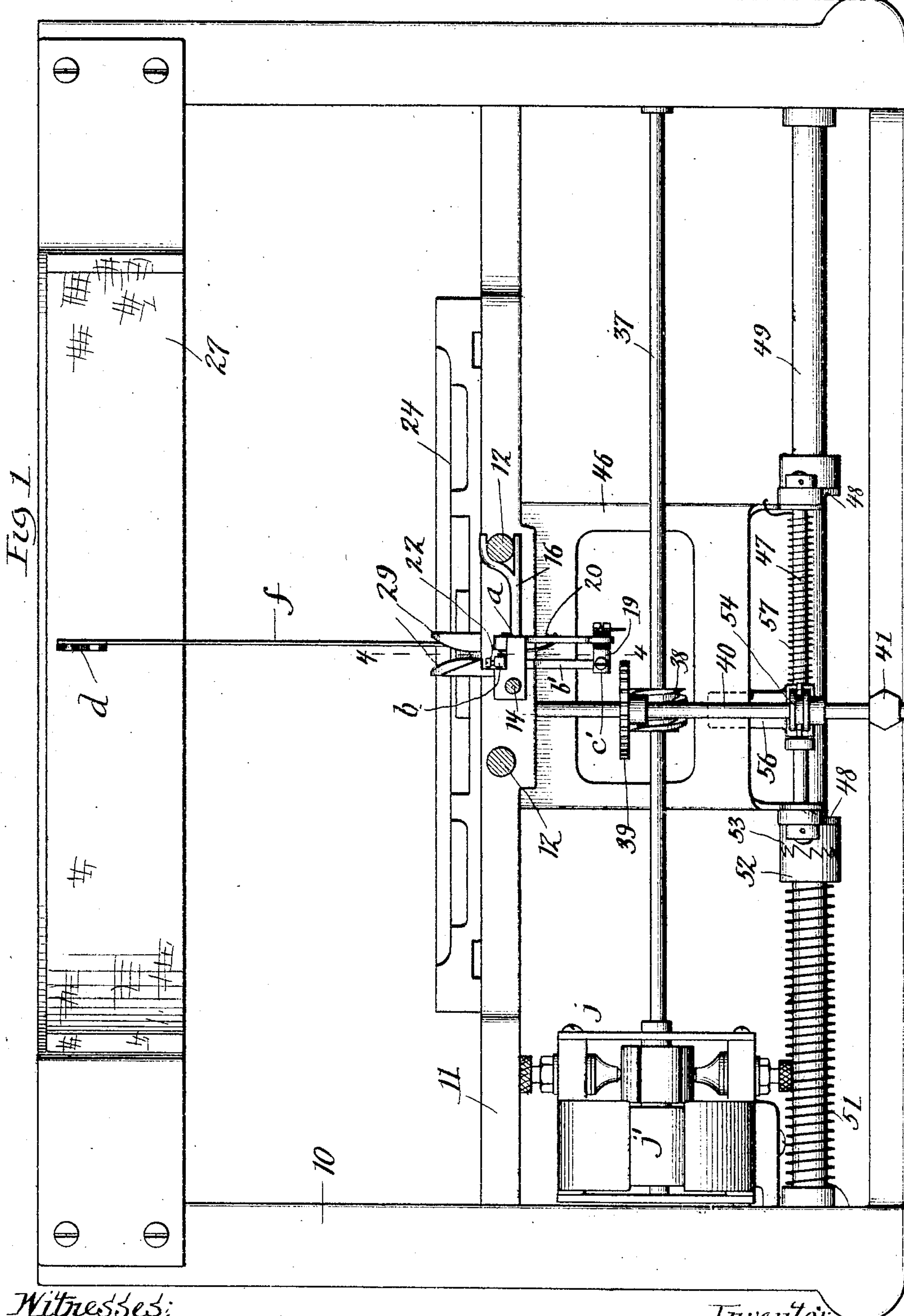
PATENTED NOV. 8, 1904.

A. C. GILMORE.
TELEGRAPHIC TRANSMITTER.

APPLICATION FILED MAY 6, 1903. RENEWED OCT. 14, 1904.

NO MODEL.

4 SHEETS—SHEET 1.



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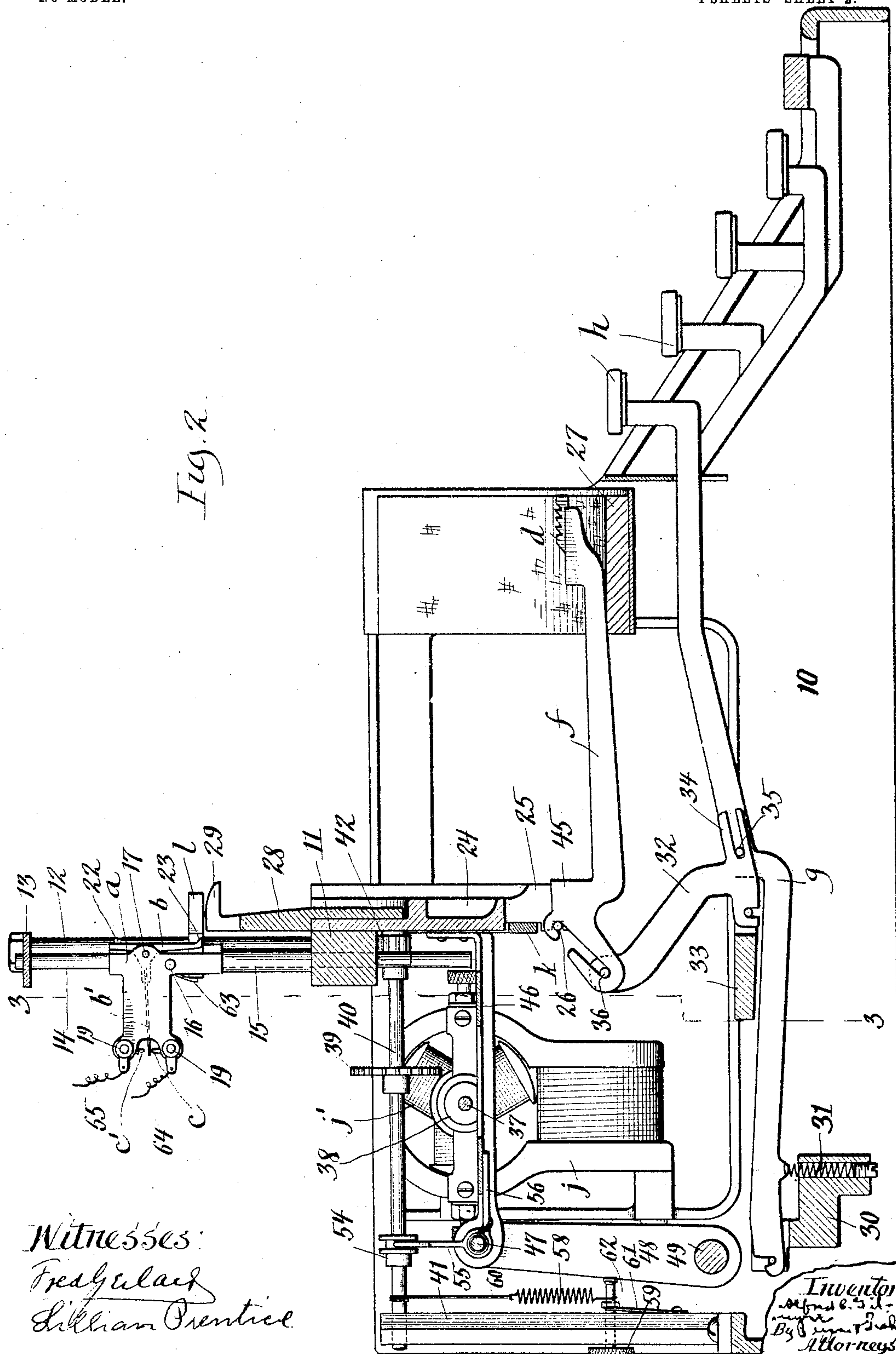
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

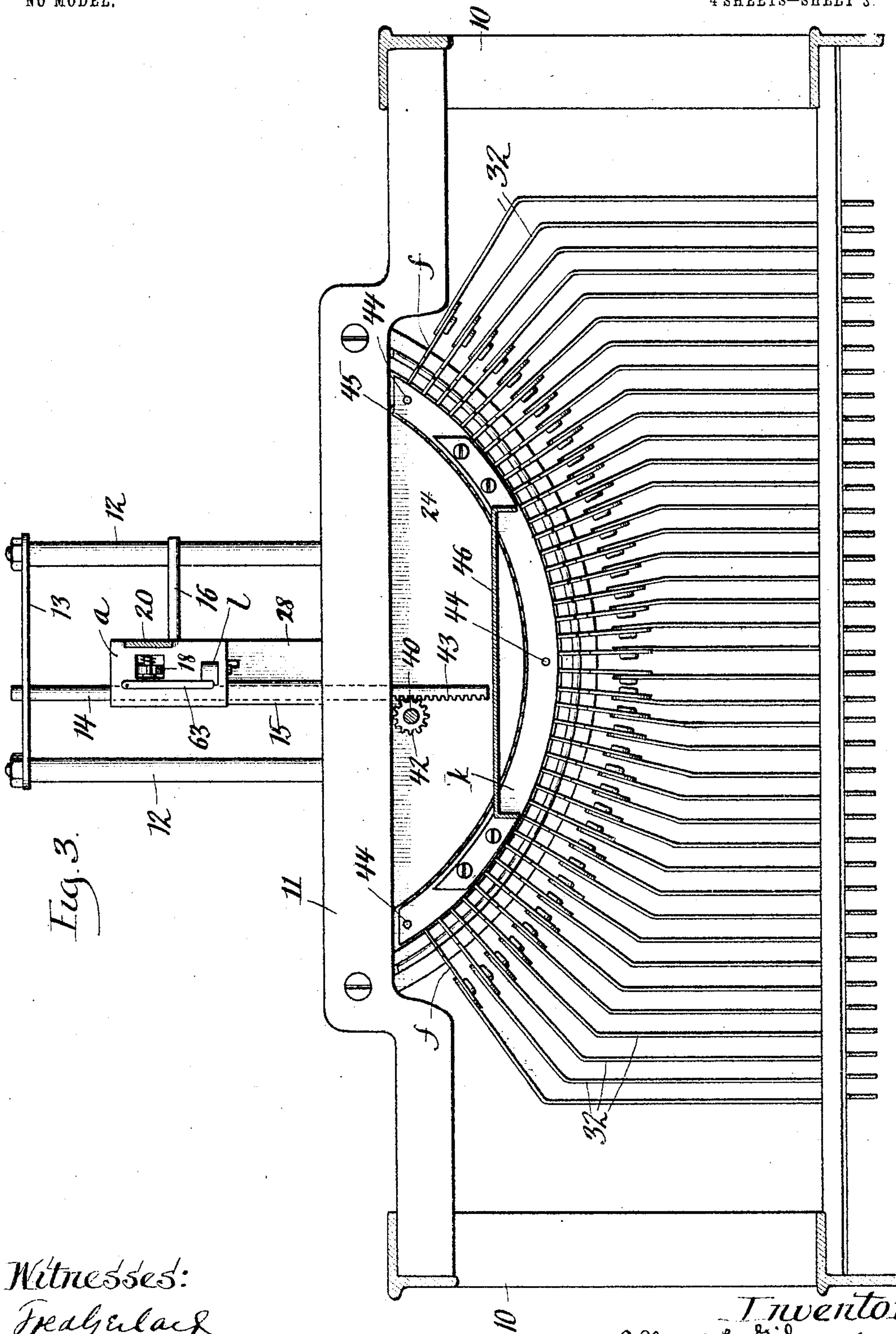


Fig. 3.

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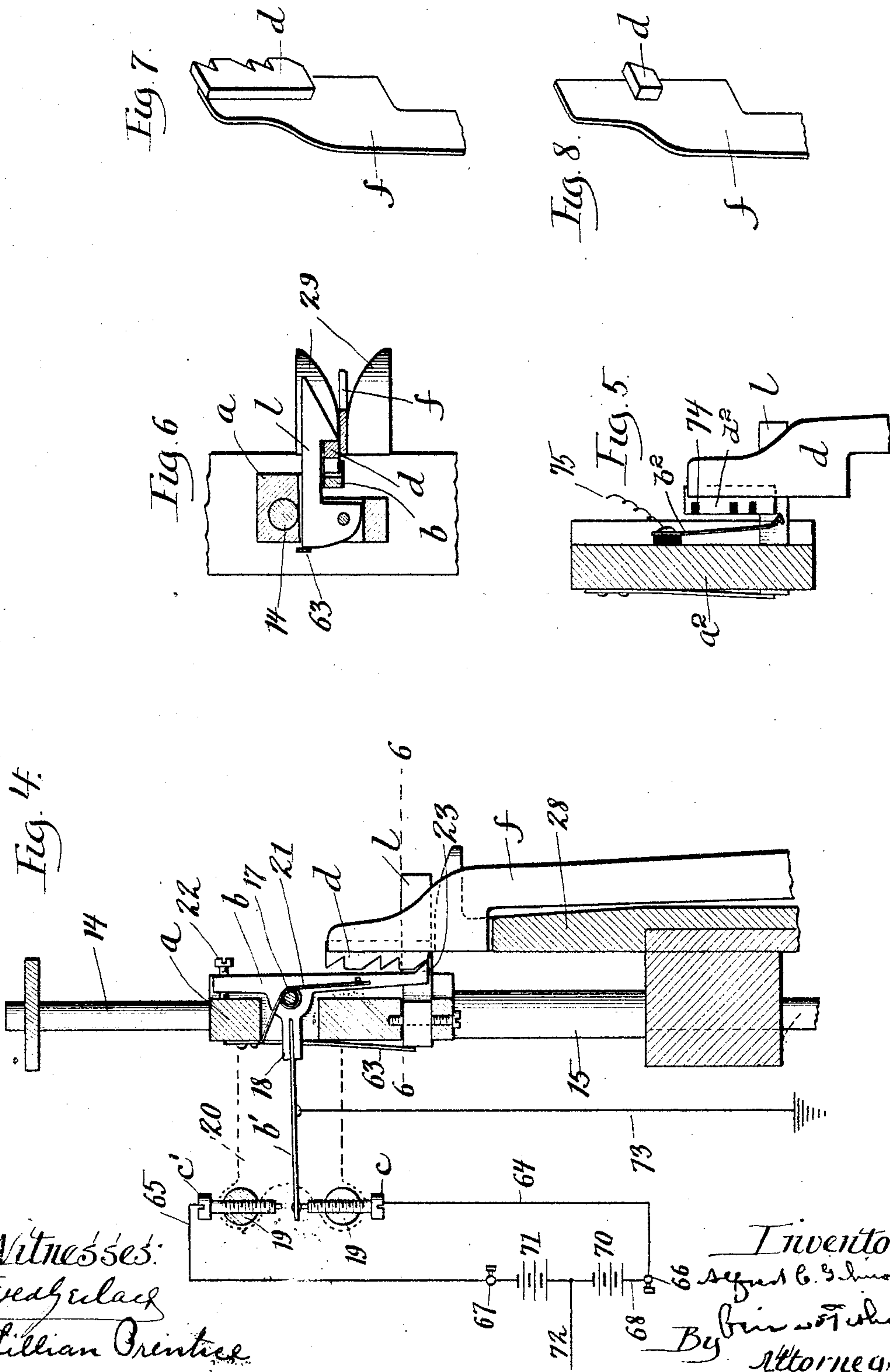
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NO MODEL.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ALFRED C. GILMORE, OF CHICAGO, ILLINOIS.

TELEGRAPHIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 774,724, dated November 8, 1904.

Application filed May 6, 1903. Renewed October 14, 1904. Serial No. 228,440. (No model.)

To all whom it may concern:

Be it known that I, ALFRED C. GILMORE, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Telegraphic Transmitters, of which the following is declared to be a full, clear, and exact description.

The invention seeks to provide a simple and effective code-transmitter for telegraphic use by which signals of the Morse or other code may be rapidly, uniformly, and distinctly transmitted over the line and which is preferably operated by a series of separate finger-key shifters similar to those of an ordinary type-writer.

The improvement is particularly designed for use in connection with automatic printing-receivers with which the separate signals should be rapidly and distinctly transmitted at uniform speed.

The particular form selected to illustrate the invention is shown in the accompanying drawings and set forth in the following description, and the invention is particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of the improved machine. Fig. 2 is a longitudinal section. Fig. 3 is a transverse section on line 3 3 of Fig. 2. Fig. 4 is a detail section on line 4 4 of Fig. 1. Fig. 5 is a view similar to Fig. 4, illustrating the modified construction. Fig. 6 is a detail section on line 6 6 of Fig. 4. Figs. 7 and 8 are detail perspective views of the signal type and bars.

A skeleton frame 10 of the machine is rectangular in form and similar in outline to the base of an ordinary type-writer. Between the upper portions of the sides of frame 10 and intermediate the front and rear thereof extends a cross-bar 11, upon which is mounted a pair of uprights 12, connected at their upper ends by a cross-stay 13. A shifting carrier *a* is fixed upon a rod 14, which slides vertically in ways formed in the cross-bar 11 and cross-stay 13. The downward shift of the carrier *a* and rod 14 is limited by a sleeve 15, fixed to the upper face of the cross-bar 11 and surrounding the rod 14 and upon which the carrier *a* normally rests. The latter is guided

in its vertical shift by a laterally-extending arm 16, which is fixed thereto and which is provided with a forked outer end (see Fig. 1) which engages one of the uprights 12.

Upon the front face of the carrier *a* is mounted a transmitter-switch *b*. (See Fig. 4.) The latter is mounted to swing in a vertical plane upon a pivot-pin 17, fixed to the carrier *a*, and is provided with a rearwardly-extending contact-arm *b'*, fixed to a lug 18 thereon, which projects rearwardly through an opening in the carrier *a*. The contact-arm *b'* of the transmitter-switch is adapted to vibrate between a pair of contact-pins *c c'*, adjustably threaded through posts 19, which are mounted upon but insulated from a rearwardly-extending plate 20, fixed to or formed in piece with the carrier *a*. The contact-pins *c c'* and the transmitter-switch arm *b'* are preferably provided with coöperating contact-points of platinum, and the switch-arm is normally held against contact-pin *c* by a spring 21, coiled about the pivot-pin 17, the extended ends of which, respectively, engage the carrier *a* and transmitter-switch *b*. An adjusting-screw 22, threaded through the upper extended end of the switch *b* into engagement with the face of the carrier *a*, regulates the tension of the spring 21. The lower end of the transmitter-switch, provided with an offset portion 23, having a lower straight face and an upper beveled face, is adapted to coöperate as the carriage *a*, switch *b*, and contacts *c c'* are shifted in vertical direction with one of a series of so-called "signal-type" or actuating devices *d* for the transmitter-switch.

A series of signal-type, one for each of the letters, characters, or words to be transmitted, are provided, and each is formed (see Figs. 7 and 8) with projections having beveled lower faces and straight upper faces, which vary in correspondence with the conventional signal for the letter, character, or word represented by the signal-type. Signal-type illustrated in Figs. 4 and 7 is designed to transmit the signal dash, dot, dash, and dot representing the letter "J." That illustrated in Fig. 8 is designed to send a single dot and represents the letter "E."

Suitable means are provided for mounting

the series of signal-type, together with suitable shifter mechanism for moving any selected one into position to cooperate with the transmitter-switch *b*. The means and mechanism illustrated in the drawings and herein-
 5 after set forth in detail are preferably employed; but other arrangements may be used without departure from the invention.

To the face of the cross-bar 11 is secured a
 10 segment 24, provided on its periphery (see Fig. 3) with a series of radial slots 25. Within the slots and upon a common pivot-rod 26 are mounted a series of signal-bars *f*, to the outer
 15 ends of which are fixed the several signal-type *d*. For the sake of clearness only one signal bar and type is shown; but it will be understood that in the manner similar to the bars and type of a type-writer the several signal-bars *f* are pivoted in circular arrangement
 20 upon the segment 24 about the transmitter-switch *b*, so that the several signal-type *d* are movable to and from a common point adjacent the transmitter-switch. The outer ends of the signal-bars *f*, as in the manner usual with the
 25 bars of the type-writer, normally rest upon a segmental support 27, carried between the sides of the frame. The signal-bars *f* are accurately guided to position as they approach the transmitter-switch by a guide 28, fixed in
 30 upright position upon the segment 24 and having at its upper end a pair of outwardly-flaring projections 29, between which the ends of the signal-bars *f* pass at the end of their movement toward the transmitter-switch.

35 A series of shifters or levers *g* are pivoted at the rear lower portion of the frame upon a common fulcrum-bar 30, and the forward upper projecting ends of the shifters or levers are provided with a series of finger-keys *h*
 40 similar to those of an ordinary type-writer. Cushion-springs 31 normally hold the shifters *g* in uppermost position ready to be struck by the operator. A series of sublevers 32, pivoted upon a common fulcrum-bar 33, are provided at their lower end with forwardly-extending slotted projections 34, which engage
 45 pins 35 upon the sides of the shifters *g*. The upper rearwardly-extending ends of the sublevers 32 are provided with pins 36, engaging slots in the rear pivoted ends of the signal-bars *f*. Play upon the finger-keys *h* in the
 50 manner employed in operating an ordinary type-writer will serve to select and shift the signal-type *d* in proper order into position to cooperate with the common transmitter-switch
 55 *b* in accordance with the desired message to be transmitted. Other shifter mechanism for the signal type and bars *f* may be employed, if desired, without departure from the invention.
 60

Suitable mechanism is provided for moving the transmitter-switch over the signal-type when the latter has been shifted to cooperate with the switch. Such mechanism is preferably
 65 ably operated by a continuously-driven motor

having suitable governor mechanism for maintaining the operation of the motor at the desired speed. In the present machine a small electric motor *j* is employed, (see Figs. 1 and 2,) secured to the inner face of the side of the
 70 frame 10, which is preferably provided with suitable mechanism which may be adjusted to maintain any desired uniform rate of speed—such, for example, as set forth in United
 75 States Letters Patent No. 695,203, granted to me April 22, 1901. The motor-shaft 37, whereon the armature *j'* is mounted, extends across the machine and is journaled at opposite ends in the motor-frame and in the side
 80 of the machine-frame 10. On the motor-shaft 37 and about midway between its ends is fixed a worm-gear 38, arranged to cooperate with a worm-wheel 39, mounted upon a shaft 40
 85 above the worm-wheel. The inner end of shaft 40 is journaled in the upper portion of the segment 24, and its outer end is journaled in an upright 41, secured to the back portion of the machine-frame. Shaft 40 is also mounted
 90 so as to be capable of a slight longitudinal shift to throw the worm-wheel 39 into and out of engagement with the worm-gear 38 upon the continuously-rotating motor-shaft 37. Upon the inner end of the shaft 40 is fixed a
 95 pinion 42, (see Figs. 2 and 3,) which engages the teeth of a rack 43, formed upon the lower end of the vertically-shifting rod 14. Gear 42 is broad enough to engage the teeth of rack 43 at all times—*i. e.*, either when the shaft 40 and gear-wheel 39 are in normal position disengaged from the continuously-rotating worm-gear 38 or when these parts have
 100 been shifted to engage the worm wheel and gear.

Any suitable mechanism may be provided under control of the shifters for the signal-type to shift the worm-wheel 39 into engagement
 105 with the gear 38, so that rod 14 and carrier *a* may be vertically shifted to move transmitter-switch *b* over the selected signal-type. Such means in the present instance is controlled by a segmental universal bar *k*, (see
 110 Figs. 2 and 3,) mounted upon the rear face of the fixed segment 24 by a series of pins 44, so as to be capable of a slight amount of lateral shift. The universal bar *k* is arranged, as shown, opposite the upper portions of the
 115 slots 25 in the segment 24, within which slots the signal-bars *f* are pivoted and in such position that the universal bar will be engaged and shifted whenever one of the bars *f* is
 120 actuated by a shoulder 45 (see Fig. 2) on each of the signal-bars. A shifting plate or open frame 46 is secured to the rear face of the universal bar *k* and extends horizontally and rearwardly therefrom. The outer end of the
 125 frame is pivotally sustained by a rod 47 between a pair of rock-arms 48, mounted upon and extending upwardly from a rock-shaft 49. The latter is journaled at the rear portion of the machine-frame, between the sides thereof,
 130

and about the shaft is coiled a spring 51, (see Fig. 1,) which normally holds the rock-arms 48 and shifter-plate 46 in forward position with the universal bar *k* against the rear face of the segment 24. The spring 51 extends between the frame of the machine and a loose collar 52, having ratchet-teeth engaging similar teeth upon a collar 53, fixed to the shaft. By turning the collar 52 the tension of the spring 51 may be properly adjusted.

The shaft 40 is provided near its rear end with a grooved collar or sleeve 54, which is engaged by the upper forked end of a shifter-arm 55, mounted upon the rod 47 between its ends. A forwardly-extending arm 56, formed in piece or connected to the shifter-arm 55, is normally held into engagement with the lower face of the shifting plate 46 by a spring 57, coiled about the rod 47, with its opposite ends projecting, respectively, beneath the plate 47 and the arm 56.

Whenever one of the signal-bars and its type are moved to position to cooperate with the transmitter-switch by the depression of the corresponding finger-key and shift-lever, the abutment 45 on the inner end of the signal-bar engages the universal bar *k* and moves plate 46 and rock-arms 48 against the tension of the spring 51, and the shifter-arm 55 moves shaft 40 longitudinally to bring the worm-wheel 39 into engagement with the teeth of the continuously-rotating worm-gear 38, so that rod 14 and carriage *a* are shifted vertically to move the transmitter-switch over the selected signal-type. If the worm-wheel 39 as it is thus shifted does not properly engage with the turns of the worm-gear 38, the shifter-arm 55 and the parts connected thereto will yield, momentarily compressing the spring 57, until the further movement of the worm-gear enables the wheel 39 to shift into engagement therewith. The selected signal-bar and its type are held in shifted position until the transmitter-switch *b* has passed over the type and completed the signal. When the signal-bar *f* and its shift-lever *g* are returned to normal position by the shift-lever spring 31, the universal bar *k* is released and spring 51 will return the shifter-arm 55 to normal position and throw the worm-wheel 39 out of engagement with its operating worm-gear 38. Carriage *a* and rod 14 and its operating-shaft 40 will then be returned to normal position by a spring 58, connected at one end to a rotatable adjusting-pin 59 and at the other end to a cord 60, connected to the shaft 40, and which is coiled up thereon to place the spring 58 under tension as the shaft 40 is rotated to shift the carrier *a* and transmitter-switch *b* upwardly. The tension of the spring 58 may be adjusted by turning the pin 59. A stiff leaf-spring 61 engages a collar 62 upon the pin 59 with sufficient friction to hold the pin in adjusted position.

The selected signal-type may be held in

shifted position by the operator until the signal is completed; but in order that the machine may be operated rapidly and with a quick staccato touch automatic means are preferably provided for holding the selected signal-type in shifted position, such means being arranged to release the same at the instant the signal is completed. Such means preferably comprises a latch *l*, (see Figs. 4 and 6,) pivoted within an opening in the carrier *a* and yieldingly held in position by a leaf-spring 63, fixed to the carrier and engaging the rear end of the latch. As the selected type is shifted into position to cooperate with the transmitter-switch *b* it engages the outer beveled end of the latch *l*, shifts it laterally against the tension of its spring 63 until the shoulder thereon engages the outer edge of the type *d* and holds it in position. Latch *l* then moves upwardly with carrier *a* and transmitter-switch *b* until the end of the switch and the latch have passed above the end of the shifted signal-type. The signal-bar *f* and type *d*, together with the shift-lever *g*, are then at once shifted back to normal position by the spring 31. Gear-wheel 38 is disengaged from worm-wheel 39, and spring 58 operates to return carrier *a* and transmitter-switch *b* back to normal position. Latch *l* thus serves to automatically hold the type in shifted position and to release the moved parts for quick return to normal at the end of the completed signal.

The several signal-type *d* vary in length in keeping with the different lengths of the several signals; but the release of the parts to normal position occurs as soon as the transmitter-switch *b* has passed over the selected type, whatever its length may be. Hence the movements of the carrier *a* and transmitter-switch *b* and the time consumed to transmit the signals vary in accordance with the varying lengths of the separate signals, the shorter signals being used for the most frequently-occurring characters. Hence the automatic release at the instant the signal is completed, whatever its length, conduces to the rapid transmission of the message. Another advantage incident to the present construction is that after a key has been operated to transmit a signal a second key cannot be operated to transmit another signal until the first signal is completed. By this means it is not possible to overlap or confuse the transmission of signals, as with some prior key-operated transmitters.

With the form of transmitter-switch illustrated in Fig. 4, in which the switch-arm *b'* is vibrated between a pair of oppositely-disposed contact-pins *c c'*, messages may be transmitted over the line by current-reversals, as with the well-known Wheatstone transmitter, without necessitating the use of a pole-changer. Contact-pins *c c'* are connected by flexible conductors 64 and 65 to binding-posts 66 and

67, which are connected by wires 68 and 69 to unlike poles of batteries 70 and 71, the other poles of the batteries being connected to the line 72. The transmitter-switch is grounded
 5 on the machine, which in turn is connected to ground or to a return-wire by a conductor 73. Then as the transmitter-switch *b* is drawn over the notched face of the signal-type *d* switch-arm *b'* is vibrated between the contact-
 10 pins *c c'* to transmit the signal by current-reversals through the line. This arrangement is particularly advantageous for the operation of automatic printing-receivers or for use in duplex telegraphy. Moreover, bat-
 15 teries 70 and 71 may be of different strengths, and the transmitter can be therefore used in quadruplex telegraphy, or, if desired, conductor 64 may be disconnected, and the signals are then transmitted by making and
 20 breaking the circuit between the switch-arm *b'* and the contact-pin *c'*. The abrupt faces on the projections of the signal-type *d* cooperate with the abrupt face of dog 23 upon the transmitter-switch *b* to render the signals
 25 distinct.

In Fig. 5 is illustrated a modified form of signal-type and transmitter-switch in which the signal-type *d''* is provided with a straight face, and the transmitter-switch *b''*, which is
 30 shifted over the face of the signal-type, comprises a spring-held brush mounted upon but insulated from the carrier *a''*. Strips 74 of insulating material are inserted in the face of the signal-type *d''*, and this insulation varies
 35 in accordance with the varying signals to be transmitted. For example, the particular type illustrated in Fig. 5 is designed to transmit a dash, dot, dash and dot, the conventional signal for the letter "J." In this instance
 40 the transmitter-switch *b''* is connected to the line-wire by a flexible wire 75, and the signal-type and frame are grounded or connected to the return-wire.

It is obvious that numerous changes could
 45 be made in the details of structure without departure from the essentials of the invention, which is believed to consist, broadly, in providing a series of signal-type, a transmitter-switch, and selective shifting mech-
 50 anism for effecting the cooperation of any selected type with the common transmitter-switch. The invention is also believed to prevent the first instance of an automatic transmitter in which a transmitter-switch is
 55 automatically vibrated by a signal-type between a pair of oppositely-disposed contacts to transmit the signal by current-reversals without necessitating the use of a pole-changer.

Having described my invention, what I
 60 claim as new, and desire to secure by Letters Patent, is—

1. In telegraphic transmitters, the combination with a common transmitter-switch, of a series of independently-mounted signal-type

movable to and from a common position to 65 cooperate with said transmitter-switch and a series of finger-key shifters corresponding to and selectively operating said signal-type.

2. In telegraphic transmitters, the combination with a common transmitter-switch, of 70 a series of independent signal-bars pivoted in circular array about said transmitter-switch and shiftable to and from the same, signal-type mounted on said bars and a series of finger-key shifters corresponding to and op- 75 eratively connected to said signal-bars.

3. In telegraphic transmitters, the combination with a series of signal-type of varying lengths, of a common transmitter-switch, shifter mechanism arranged to effect the coop- 80 eration of any selected signal-type with said transmitter-switch and mechanism for effecting a variable relative movement between said transmitter-switch and the selected signal-type in accordance with the varying lengths 85 thereof.

4. In telegraphic transmitters, the combination with a common transmitter-switch, of a series of signal-type of different lengths movable to and from said common transmit- 90 ter-switch, a series of shifters corresponding to and operating said type and mechanism controlled by each of said shifters for effecting a variable relative movement between said transmitter-switch and the selected signal- 95 type in accordance with the different lengths thereof.

5. In telegraphic transmitters, the combination with a series of signal-type of different lengths shiftable to and from a common posi- 100 tion and with a series of corresponding key-shifters therefor, of a common transmitter-switch variably movable over the signal-type when in shifted position in accordance with the different lengths of said type, operating 105 devices therefor and means controlled by the movement of each of said shifters for tripping said devices into operation.

6. In telegraphic transmitters, the combination with a series of independent signal- 110 bars pivoted in circular array, signal-type mounted thereon and movable therewith to and from a common position and with a series of operating key-shifters for said bars, of a common transmitter-switch movable over the 115 signal-type when in shifted position, operating mechanism therefor and a universal member actuated by the movement of each of said shifters for tripping said mechanism into operation. 120

7. In telegraphic transmitters, the combination with a series of signal-type, of a common transmitter-switch, shifter mechanism arranged to effect the cooperation of any selected signal-type with said transmitter- 125 switch, a continuously-driven member arranged to effect the relative movement between said transmitter-switch and the selected type

and means controlled by said shifter mechanism for connecting said member to the part operated thereby.

8. In telegraphic transmitters, the combination with a common transmitter-switch, of a series of signal-type shiftable to and from said transmitter-switch, a series of operating-shifters corresponding thereto, shifter mechanism for effecting a relative movement between said transmitter-switch and the shifted signal-type, a continuously-driven shaft and devices controlled by each of said shifters for connecting said shifter mechanism to said shaft.

9. In telegraphic transmitters, the combination with a series of signal-bars pivoted in circular array, signal-type carried by said bars and shiftable to and from a common position and with operating key-shifters for said signal-bars, of a common transmitter-switch movable over a signal-type when in shifted position, operating mechanism therefor, a continuously-driven motor-shaft and a universal member controlled by the movement of each of said shifters for coupling said mechanism to said shaft.

10. In telegraphic transmitters, the combination with a series of signal-type shiftable to and from a common position and with a series of operating-shifters therefor, of a common transmitter-switch movable over the shifted signal-type, a continuously-driven motor-shaft, a worm-gear on said shaft, a worm-wheel operatively connected to said transmitter-switch and a universal member controlled by each of said shifters for throwing said worm-wheel into engagement with said worm-gear.

11. In telegraphic transmitters, the combination with a series of signal-type shiftable to and from a common position and with a series of operating-shifters therefor, of a common transmitter-switch movable over the shifted signal-type, a worm-wheel and shaft geared to said transmitter-switch, a continuously-driven motor-shaft, a worm on said shaft, a universal member controlled by each of said shifters and a spring-held shifter-arm connected to said universal member for throwing said worm-wheel into gear with said worm.

12. In telegraphic transmitters, the combination with a series of signal-type of different lengths, of a common transmitter-switch, shifter mechanism arranged to effect the co-operation of any selected signal-type with said common transmitter-switch and means automatically and variably acting in accordance with the different lengths of the selected type to hold the parts in shifted position until the signal is completed.

13. In telegraphic transmitters, the combination with a common transmitter-switch, of a series of signal-type of different lengths movable to and from said common transmitter-

switch, a series of key-shifters corresponding to and operating said type, mechanism controlled by each of said shifters for effecting a variable relative movement between said transmitter-switch and the selected signal-type in accordance with the different lengths thereof to complete the signal and a latch for holding the selected signal-type in shifted position and arranged to release the same for return to normal as soon as the signal is completed.

14. In telegraphic transmitters, the combination with a series of independent signal-bars pivoted in circular array, signal-type mounted thereon and movable therewith to and from a common position and with a series of operating-shifters for said bars, of a common transmitter-switch movable over the signal-type when in shifted position to complete the signal, operating mechanism for said transmitter-switch, a universal member actuated by the movement of each of said shifters for tripping said mechanism into operation and a latch for holding the selected signal-type and said universal member in shifted position and arranged to release the same when the signal is completed.

15. In telegraphic transmitters, the combination with a series of signal-type of different lengths shiftable to and from a common position and with a series of corresponding operating-shifters therefor, of a common transmitter-switch variably movable over the signal-type when in shifted position to complete the signal-operating devices therefor, means controlled by the movement of each of said shifters for tripping said devices into operation and a latch movable with said transmitter-switch arranged to engage the selected signal-type for holding the same in shifted position and arranged to release the same for return to normal as soon as the signal is completed.

16. In telegraphic transmitters, the combination with a pair of contact-terminals connected to one side of the line by separate branch wires and with a transmitter-switch shiftable between said terminals, of a carrier whereon said transmitter-switch and said contact-terminals are mounted, of a series of signal-type movable to and from a common position adjacent said carrier and provided with a series of projections for vibrating said transmitter-switch, a series of key-shifters for said signal-type and mechanism controlled by each of said shifters for operating said carrier to move said transmitter-switch over the shifted signal-type and complete the signal.

17. In telegraphic transmitters, the combination with a pair of contact-terminals connected to one side of the line by separate branch wires and with a transmitter-switch shiftable between said terminals, of a series of signal-type movable to and from a common position adjacent said transmitter-switch and

a series of operating key-shifters for said signal-type.

18. In telegraphic transmitters, the combination with a pair of contact-terminals, of a
5 common transmitter-switch shiftable between said terminals, a series of independently-mounted signal-type movable to and from a common position to cooperate with said transmitter-switch and each provided with projections
10 for vibrating the same and a series of shifters corresponding to and selectively operating said signal-type.

19. In telegraphic transmitters, the combination with a pair of contact-terminals, of a
15 common transmitter-switch shiftable between said terminals, a series of signal-type of different lengths movable to and from said common transmitter-switch and provided with a series of projections for vibrating the same,
20 a series of shifters corresponding to and operating said signal-type and mechanism controlled by each of said shifters for effecting a variable relative movement between said transmitter-switch and the selected signal-
25 type in accordance with the varying lengths thereof to complete the signal.

20. In telegraphic transmitters, the combination with a pair of contact-terminals, a common transmitter-switch movable between said
30 terminals, a carrier whereon said switch and contact-terminals are mounted, a series of signal-type of different lengths movable to and from said carrier and provided with projections for operating said transmitter-switch, a
35 series of operating-shifters for said signal-type, mechanism for operating said carrier to variably shift the transmitter-switch over the selected signal-type in accordance with the different lengths thereof and a universal member
40 controlled by each of said shifters for tripping said mechanism into operation.

21. In telegraphic transmitters, the combination with a pair of contact-terminals and with a common transmitter-switch movable between said terminals, of a series of signal-
45 type of different lengths movable to and from said common transmitter-switch and provided with projections for vibrating the same, a series of operating-shifters for said signal-type, mechanism controlled by each of said shift-
50 ers for effecting a variable relative movement between said transmitter-switch and the selected signal-type in accordance with the different lengths thereof and a latch for holding the selected signal-type in shifted position
55 and arranged to release the same as soon as the signal is completed.

22. In telegraphic transmitters, the combination with a pair of contact-terminals, of a transmitter-switch shiftable between said ter-
60 minals, a carrier whereon said switch and terminals are mounted, a series of independent signal-bars pivoted in circular array about said carrier, signal-type of different lengths mounted on said bars movable therewith to
65 and from said carrier and provided with a series of projections for vibrating said transmitter-switch, a series of operating-shifters for said signal-bars, mechanism for variably shifting said carrier to move the transmitter-switch
70 over the selected signal-type, a universal member controlled by each of said shifters for tripping said mechanism into operation and a latch mounted on said carrier arranged to engage the selected signal-type and hold it and
75 said universal member in shifted position and arranged to release said parts for return to normal as soon as the signal is completed.

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