

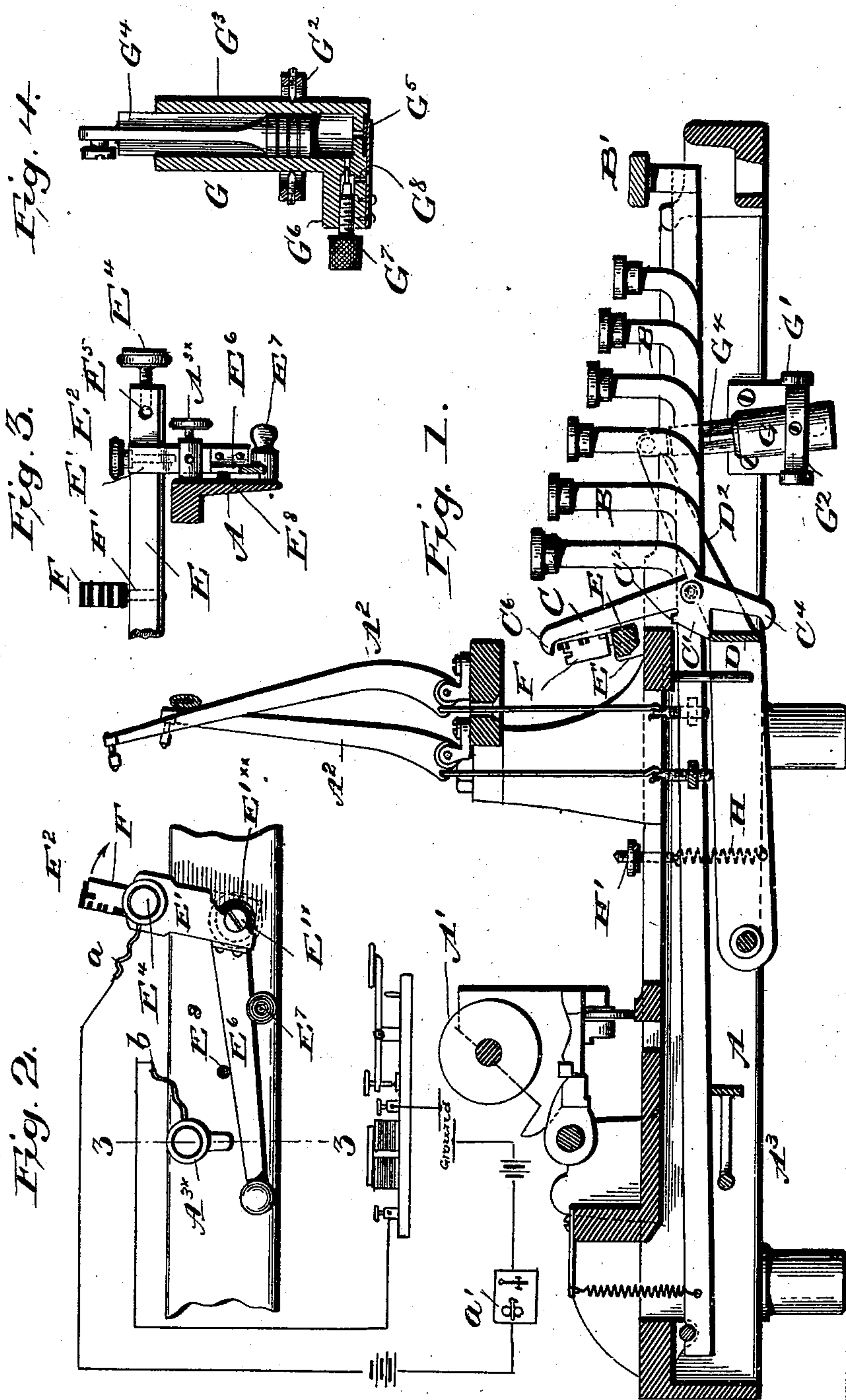
(No Model.)

2 Sheets—Sheet 1.

C. SPIRO.  
TELETYPE.

No. 545,637.

Patented Sept. 3, 1895.



*Witnesses:*

L. C. Hills.  
C. A. Bond

*Inventor:*

Charles Spiro,  
By E. B. Stocking *Att'y.*

2 Sheets—Sheet 2.

No. 545;637.

Patented Sept. 3, 1895.

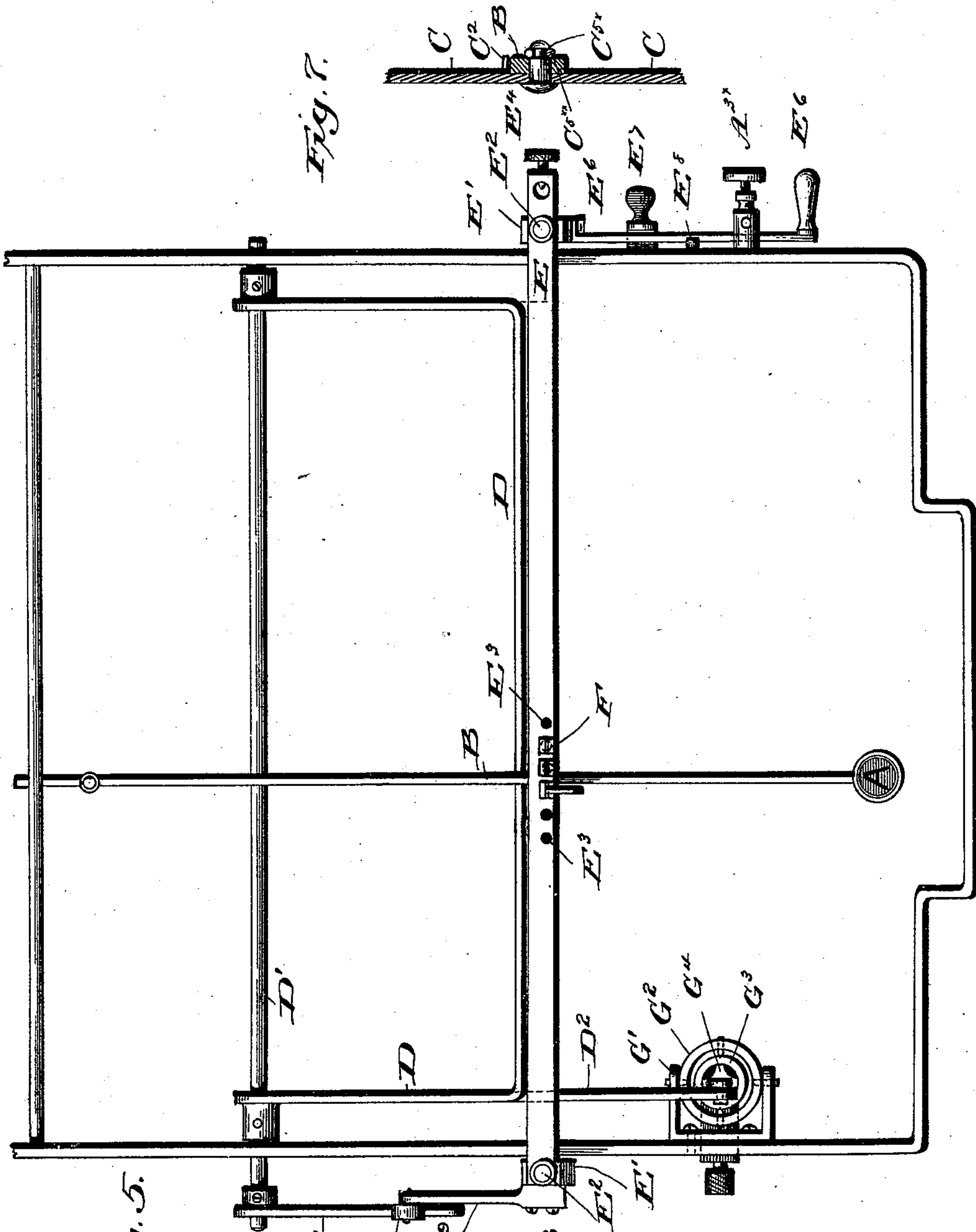


Fig. 2.

*Fig. 5.*

Witnesses:  
L. C. Hills.  
E. A. Bond

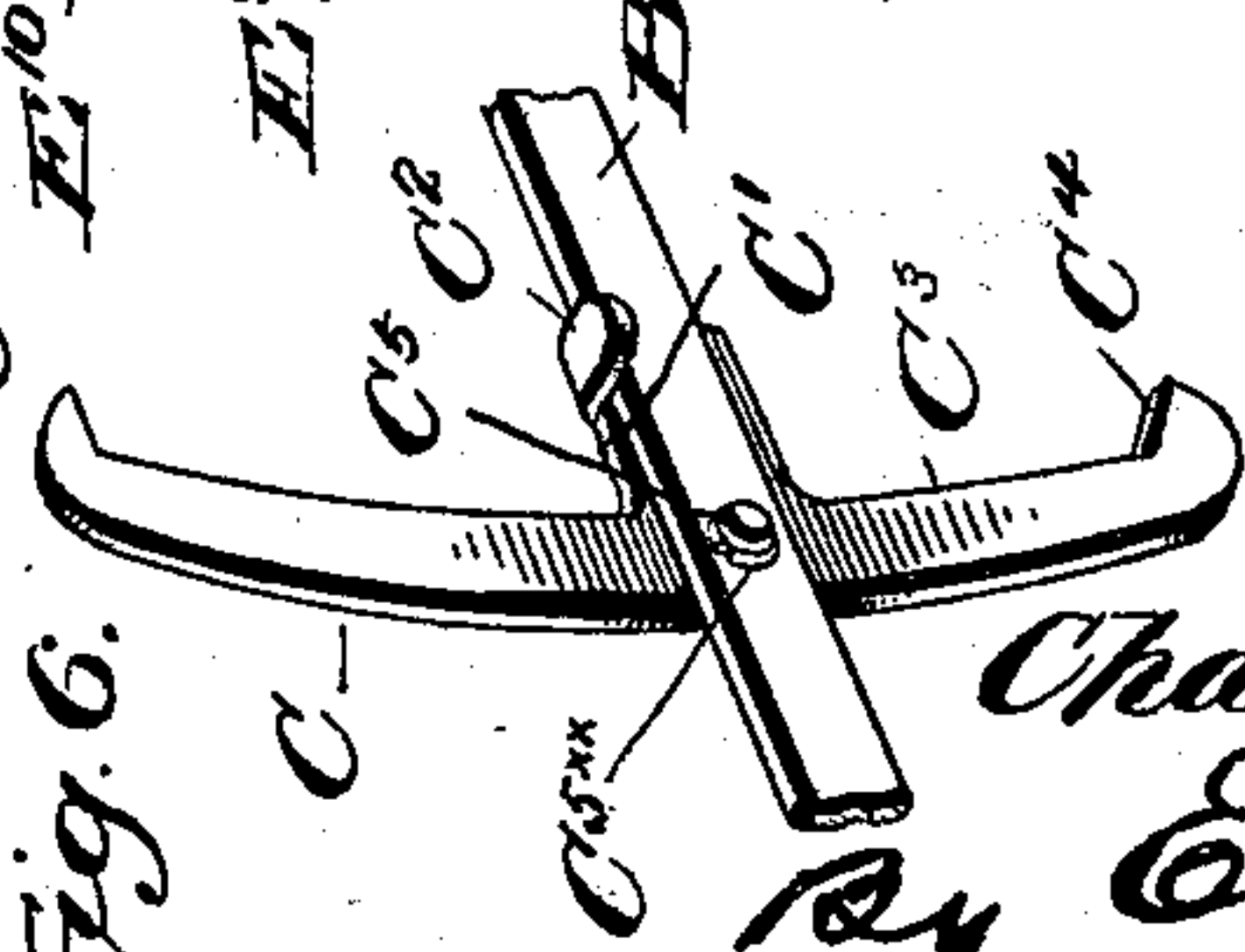



Fig. 6.

 *Inventor*  
*Charles Spiro*  
*E. B. Stocking*  
*Atty.*



# UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

## TELETYPER.

SPECIFICATION forming part of Letters Patent No. 545,637, dated September 3, 1895.

Application filed December 18, 1894. Serial No. 532,279. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES SPIRO, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Teletypers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to "teletypers," by which term I designate type-writing machines which are provided with electro mechanical devices for transmitting electrical signals, whereby during the printing of a message on  
15 a type-writer said message is electrically transmitted to a distant station and received there in the form of the well-known Morse or equivalent code-signals. This class of machines, which I designate as "teletypers," is to  
20 be distinguished from a mechanical electrical apparatus comprising a type-writer at each end of the line and operating to print on the receiving type-writer the message printed upon the sending type-writer.

25 My invention as herein disclosed is an improvement upon those disclosed in my pending applications filed and numbered, respectively, October 9, Serial No. 525,413, and October 15, Serial No. 525,941.

30 Generally speaking, the objects of the invention disclosed herein are to simplify and render more readily applicable as an attachment to a type-writer of any ordinary construction the elements involved in the code-signal-producing mechanism, to render it  
35 impossible in the ordinary operation of the teletyper to confuse the signals transmitted by the prevention of the operation of any of the key-levers until after the completion of  
40 the production and transmission of a code-signal through the medium of a previously-depressed key-lever, and to arrange and mount the signal devices so as to be collectively and as a whole thrown out of operative connection  
45 with the type-writer *per se* in order that the latter may be used independently of the former, as well as to permit the independent use of the telegraphic instrument or sender, which is intended to be placed in proximity  
50 to the type-writer and to be electrically connected therewith.

Other objects and advantages of the invention will hereinafter appear, and the novel

features thereof will be particularly pointed out in the claims.

I deem it advisable to state a distinction  
55 which I make between a code-signal device and a telegraphic instrument or sender. The latter should be understood as being an instrument comprising the well-known Morse  
60 key and sounder which is used by telegraph-operators, while a signal-producing device is to be understood as an automatic mechanism for producing signals such as those of the  
65 Morse code.

Referring to the drawings, Figure 1 is a longitudinal vertical section through the principal elements of a type-writing machine provided with my signal-producing attachment. Fig. 2 is an enlarged detail showing the mechanical and electrical connections of the attachment to the type-writer. Fig. 3 is an elevation of the parts shown in Fig. 2, the frame and throw-off lever being in section on the line 3 3 of Fig. 2. Fig. 4 is a vertical section of a pneumatic  
70 retarding device which is employed. Fig. 5 is a top plan of the frame of the machine and of the devices comprised in the signal-producing attachment. Fig. 6 is a perspective of a portion of a key-lever and the pivotally-mounted contact-arm. Fig. 7 is a section through the pivot of the contact-arm.

Like letters of reference refer to like parts throughout the several views of the drawings.

A is the framework, A' the platen, A<sup>2</sup> type-bars adapted to make impressions on the platen, A<sup>3</sup> the universal bail, B the key-levers, and B' the space-bar of any ordinary type-writer, these parts all being of usual construction and performing their usual functions.

One of the most important features of my invention lies in the utilization of each of the key-levers as the place at which to mount the contact-arm of the electrical signal-producing devices of the attachment, whereby I directly employ the movements of the key-lever in producing signals. This method of construction obviates the necessity of employing not only connecting devices to transmit to a contact-arm the motions required and derived from the key-levers, but also does away with the necessity of providing a support of some kind for said arm independently of the key-levers.

Referring to Figs. 1, 6, and 7, it will be seen



that the contact-arm C is pivotally mounted directly upon the key-lever B. The nature of this connection, so far as carrying the contact-arm by the key-lever, so as to cause it to co-operate with any electrical signal device properly located with relation to said arm, is concerned, might be otherwise than a pivot. The arm might be rigidly connected to the lever and formed of resilient material having the nature of a spring contact-arm. It will be noted, also, that the contact-arm is extended horizontally, as at C', laterally in the form of a tongue or stop, as at C<sup>2</sup>, and longitudinally, as at C<sup>3</sup>, and at the end of said extension it has provided thereon an inclined or cam face bend or projection C<sup>4</sup>, these latter extensions C<sup>3</sup> C<sup>4</sup> being below the pivot C<sup>5</sup>, which serves to connect the contact-arm with the key-lever. The upper end of the arm is in the form of a hook, as shown at C<sup>6</sup>. These various extensions of the contact-arm are for the purpose of performing functions which would not be performed if the arm were rigidly connected with the key-lever, as above stated; but in either form of arm the simplicity of construction and the direct utilization of the movement of the key-lever are secured, so that in this regard I do not limit my invention to a contact-arm movably connected with the key-lever.

The pivot C<sup>5</sup> may be of any usual construction; but I prefer to employ a construction which will permit the ready application of an arm to a key-lever which is provided with a perforation for the passage of the pivot.

By referring to Fig. 7 it will be seen that the arm C carries the pivot C<sup>5</sup> and that the latter has a circumferential groove C<sup>5x</sup>, into which is sprung a split ring C<sup>5xx</sup>. This is the preferred form of pivotal connection, because the only change in a key-lever is the provision of a hole for the pivot, which is so slight as not to weaken the lever, so that it can be used whether the attachment is provided or not and so that the provision of the attachment can be made by simply passing the pivot of the arm through the lever *in situ*, a special pliers being employed to force the spring-ring over the end of the pivot into the annular groove and against the side of the key-lever, thus holding the parts permanently in operative position and yet removably for inspection or other purpose.

D is the universal bail of the signal attachment of the machine. By reference to Fig. 1 it will be seen that the cross-bar of the bail rests within the projections C' and C<sup>4</sup> of the contact-arm, which projections are below the key-lever, so that upon the depression of any key-lever the extension C' of a contact-arm strikes the bail D, which moves the arm on its pivot, so as to carry its end C<sup>6</sup> backward away from signal devices hereinafter described to prevent contact with said devices during the downstroke of the key-lever. In the same movement the lower end C<sup>4</sup> of the arm C is thrown under the bail, and in this condi-

tion the contact-arm, key-lever, and bail thereafter move downward together, in which downward movement or stroke the type-bars A<sup>2</sup> carry the type to the platen to print an impression thereon. On the upward movement of the key-lever, bail, and arm the cam-face projection or hook C<sup>4</sup> contacts with the lower edge of the bail with a tendency, by reason of the cam-face, to slide away from the lower edge of the bail, which keeps the upper end of the arm in contact with the signal-producing device proper, hereinafter described.

The signal-producing devices *per se* are mounted upon a bar E, which in turn rests in pivotally-supported arms E', carried by the frame of the machine, one at each side and in front of the keyboard, as seen by the operator. A thumb-screw E<sup>2</sup> or other device may be employed to retain the bar in position. For ease of removal the bar rests in open slots formed in the arms E'.

The signal-producing devices F are mounted upon the bar E, it may be in any suitable manner; but in this instance I have provided each device F with a screw-threaded extension F', fitting screw-threaded apertures E<sup>3</sup> in the bar E, whereby the device F may occupy a more or less elevated position with relation to the bar for the purpose of adjusting the keys of the keyboard in a common horizontal plane, or, rather, of adjusting the signal devices, which naturally vary in the length of their operating faces, each in such a horizontal plane that they will not throw the keys of the keyboard out of a common horizontal plane existing in each row thereof after they have once been adjusted in a manner common in type-writers.

The signal device F may be of any usual well-known construction so far as its operative face is concerned. I construct the same of electrically-conductive material, with lateral grooves in its working face, filled with insulating material and spaced so as to produce an electrical signal when a contact-arm travels over said face, the arm and signal being in proper electrical connection. The upper end of the device F is also covered with insulating material F<sup>2</sup> for a purpose hereinafter described. A thumb-screw E<sup>4</sup>, intersecting an aperture E<sup>5</sup> at one end of the bar E, serves for an electrical connection, while a similar binding-post A<sup>3x</sup> is secured to the frame A for the companion electrical connection. The arms E' are insulated from the frame, the pivot E'<sup>x</sup> of said arms passing through a sleeve E'<sup>xx</sup>, of insulating material, into the frame A, as clearly shown in Fig. 2.

A throw-off lever E<sup>6</sup> projects from one of the arms E' for the purpose of oscillating the arms and the bar E to throw the latter out of operative relation with the contact-arms C when it is desired to use the type-writer independently of the signal devices thereon. By reference to Fig. 3 and also Fig. 1 a rotatable stop E<sup>7</sup> is seen, having a flattened surface, against which the throw-off E<sup>6</sup> will rest



when the contact-arms and signal devices are co-operatively arranged. A slight turning of the stop, which is of non-conducting material, forces the throw-off against a companion stop  $E^8$ , of like material, which co-operates therewith to lock the signal devices in operative position.

The signal-bar-supporting arm  $E'$  at the other side of the machine is provided with a projecting arm  $E^9$ , having at its end an anti-friction-roller  $E^{10}$ , of insulating material. This roller contacts with an arm  $E^{11}$ , rigidly mounted on the shaft  $D'$  of the universal bail  $D$ , so that when the throw-off  $E^6$  is raised to move the signal devices out of co-operative position with the contact-arms the bail  $D$  is depressed below a point where the key-levers would contact therewith in the ordinary use of the type-writer. At the same time an extension  $D^2$  of the bail  $D$  is lowered and renders the retarding device  $G$  inoperative temporarily, as will hereinafter appear. In this operation of these devices the contact-arms are all, as before, carried with and supported by the key-levers, their lower extensions and ends  $C^4$  traversing the front surface of the bail  $D$ , or at least moving through a space not extending vertically beyond said face. This particular feature, however, is not material, as the signal devices are thrown out of reach of the contact-arms  $C$  proper.

The retarding device  $G$  may be of any desired construction so long as it performs the function of rendering the upward movement of the key-lever and the contact-arm carried thereby only so rapid as will produce the signal in a manner to be conveniently read by sound at the receiving station. Of course if the signal-receiving device should automatically inscribe the signal the upward movement of the key-lever and contact-arm could be much more rapid; but as this invention is intended to be used in connection with existing telegraphic plants and Morse-key instruments some retarding device will be necessary.

In a bracket  $G'$ , secured to the frame of the machine, a gimbal-ring  $G^2$  is supported, and within the ring is a cylinder  $G^3$ , the piston  $G^4$  of which is pivotally connected to the extension  $D^2$  of the bail  $D$ . The piston is fluted, as clearly shown, and the cylinder is provided at one end with an outwardly-opening spring-valve  $G^5$  (see Fig. 4) and a perforated offset  $G^6$ , having a pin-valve  $G^7$  therein to regulate the admission of air into the cylinder at the upstroke of the piston, the air entering at the aperture  $G^8$ . This construction permits of a sudden entrance of the piston within the cylinder, occurring on the downstroke of a key-lever, and a more or less slow exit of the piston on the upstroke of the key-lever in accordance with the adjustment of the valve. The upward movement of the bail  $D$  is caused by a spring  $H$ , Fig. 1, extending therefrom to an adjusting-screw  $H'$ , seated in the frame of the machine, whereby the tension of the spring  $H$  may be regulated. A spring and ad-

justing-screw may be applied at each side of the machine.

A conducting-wire  $a$  is connected with the bar  $E$  by the binding-screw  $E^4$ , and a conducting-wire  $b$  is connected with the frame of the machine by the binding-post  $A^3$ . The circuit may be as follows, it being diagrammatically illustrated in Fig. 2: The wire  $a$  extends from the signal-bar  $E$  to battery, from thence to the telegraphic instrument  $a'$  at the receiving station, and from thence to earth. The wire  $b$  extends to the telegraphic instrument at the sending station and from thence to earth. A signal produced by the teletyper is reproduced in the telegraphic instruments at both stations.

When the signal-bar is in operative position with relation to the contact-arms, the operation which takes place at the depression of a key-lever having been described, it now remains to describe the operation during the upward or return movement of the key-lever. The depression of a key-lever carries with it the contact-arm and terminates with the lower extension and cam-face  $C^4$  of the arm bearing on the lower edge of the bail. As the upward stroke begins the cam-face has a tendency to ride off from the edge of the bail, thereby insuring a rubbing contact of the upper end  $C^6$  along the face of the code-signal device  $F$  agreeing with the character belonging to the key-lever, thereby sending through the line the character which has been printed upon the paper on the platen. All of the remaining contact-arms of the machine rest with their lower extensions in contact with or immediately in front of the face of the bail  $D$ , thereby so disposing of the upper ends of said arms in a vertical plane immediately over the companion signal device  $F$  of each arm that should another key-lever be depressed before the absolute completion of the production of the signal by the first key-lever depressed the second key-lever will be stopped immediately by the hook  $C^6$  at the upper end of the arm  $C$ , carried by said key-lever, coming in direct contact with the upper end of its companion signal device, which, being insulated, acts simply as a mechanical stop and prevents electrical connection at that point. This automatic locking of all but the single key-lever in use is an important feature of my invention, and it may be accomplished in various ways, differing in detail only from the principle involved in that shown and described herein. I therefore do not limit my invention in this regard to the specific details of construction disclosed. This feature is equalled in importance by the primary effect of the depression of a key-lever witnessed in the withdrawal of the contact-arm  $C$  from its signal companion device  $F$ . These features, in connection with numerous others herein described, render the machine as a whole one that does not require hardly any degree of skill whatever in its use beyond that required in the operation of any



ordinary type-writer, and as from the necessity of reduction of speed in the return movement of each key-lever time is necessarily provided this teletyper can be operated successfully by a person not skilled in the use of a type-writer proper, and correct readable code-signals will be given and transmitted and recorded by such a non-expert operator and with a speed as rapid as can be read by sound by an expert receiver.

What I claim as new is—

1. The combination of a key lever of a typewriting machine, a contact arm pivotally supported thereon and extended above and below said lever, a co-operating electric signal producing device located above the lever, a co-operative mechanical contact arm controlling device arranged below the lever, substantially as specified.

2. The combination with the key lever of a typewriting machine, of a contact arm pivotally carried thereby and provided with projections one near the pivot and the other at the lower extremity of the arm, and an arm-controlling device arranged below the key lever which, by contact therewith at the top of said projection moves said contact arm in one direction and by contact at the bottom moves said arm in the opposite direction, substantially as specified.

3. The combination with the key levers of a typewriting machine, of contact arms one upon each key lever, and an arm controlling device located below the lever and contact devices constructed and arranged to prevent the operation of all of said contact arms except that mounted upon the key lever of the system which is depressed, substantially as specified.

4. The combination with a key lever of a typewriting machine, of a contact arm pivotally mounted thereon, a stationary electrical signal device arranged normally in the path of the contact arm, and a contact arm controlling device adapted to throw the arm during a downward movement of the key lever out of contact with said signal producing device, substantially as specified.

5. The combination with the series of key levers of a typewriting machine each of which is provided with a contact arm, of a series of electrical contact devices arranged in the path of said contact arms so as to prevent a movement of the key levers carrying said arms after the depression of one of said key levers, substantially as specified.

6. The combination with a series of key levers of a typewriting machine and of a contact arm mounted on each of the same and of a series of cooperating contact devices arranged normally in the path of said arm to prevent the depression of any key of the series after one of the same has been depressed, of a contact arm controlling device having a broad face for retaining the locked locking contact arms with the signal producing devices, substantially as specified.

7. The combination with the key lever of a typewriting machine having a pivotally mounted contact arm terminating at each end with a hook or projection, of a relatively fixed cooperating contact device and of a relatively movable arm controlling device or bail co-operating with the opposite end of the contact arm, substantially as specified.

8. A key lever provided with a pivoted contact arm having a lateral extension and a stop adapted to impinge against the lever, in combination with an electrical signal device and with an arm controlling device, substantially as specified.

9. A key lever provided with a pivoted contact arm having a stop adapted to abut against the lever to limit the movement of the arm in one direction, in combination with a device co-acting with the lever below its pivot and limiting its movement in the opposite direction, substantially as specified.

10. A key lever and a contact arm pivotally mounted thereon and having an extension at its free end below the lever, in combination with a pivoted bail adapted to engage and operate said extension, substantially as specified.

11. A key lever and a contact arm pivotally mounted thereon and having an extension below its pivot terminating at its free end in an offset, in combination with a pivoted bail for operating said extension and offset, substantially as specified.

12. The combination of a series of key levers each provided with a contact arm pivotally mounted thereon and extended above and below the same, a series of signal devices one for each arm above the pivot and means below the pivot for preventing the simultaneous contact of more than one arm of the signal devices, substantially as specified.

13. The combination with a platen type bar and connecting rod, of a key lever provided with a contact arm, a cooperating contact device located to normally lock the arm and means for unlocking by changing the path of the contact arm during the printing movement of the key lever, substantially as specified.

14. A key lever provided with a contact arm and an electrical signal device for normally locking said arm, combined with a pivoted bail and cooperating devices for moving said arm away from and out of mechanical contact with said signal device upon the initial movement of the key lever and a contact device arranged in the path of said contact arm to prevent a movement of the other key levers after the depression of a single key, substantially as specified.

15. A key lever provided with a contact arm pivotally mounted on and extended below said lever and having projections in combination with a wide pivoted bail for engaging said projections and unlocking the contact arm and its key lever, substantially as specified.



16. A key lever provided with a contact arm pivotally mounted on and extended below said lever and having projections, a pivoted bail and a retarding device connected with said bail, substantially as specified.

17. The combination of a key lever carrying a contact arm and a bail and retarding device mounted in gimbal joints and connected with the bail, substantially as specified.

18. The combination with a series of key levers of a typewriting machine, of a series of contact arms mounted one upon each key lever, a removable signal-device-carrying-bar, and a series of electrical signal producing devices all carried by said bar one for each contact arm adjustably mounted with relation to the said arms whereby the required adjustment of the key levers and keys as to their levels is not interfered with in the adjustment of the signal producing devices, substantially as specified.

19. The combination of a typewriting machine, a key lever having a contact arm co-operating code signal devices, an oscillating bar carrying said devices, and means for locking said bar out of operative position, substantially as specified.

20. The combination with a key lever and its operatively connected printing characters, of a contact arm pivoted upon the key lever and a signal device arranged to automatically operate by said contact arm pivoted upon the key lever after an impression has been made by the printing character, said arm being automatically moved out of mechanical contact with the signal device by a downward movement of the key, substantially as specified.

21. The combination with a key lever provided with a pivoted contact arm mounted on the key lever and code signal devices and means constructed and arranged to automatically move said arm out of mechanical and electrical engagement with said signal device during the down stroke of the key lever and to automatically produce a mechanical and electrical connection with said device during the up stroke of said lever, substantially as specified.

22. The combination of a series of key levers each provided with a pivoted contact arm, a series of signal devices one for each arm and a pivoted bail engaging said arm for automatically preventing simultaneous contact of more than one arm with its co-acting device, substantially as specified.

23. The combination with the key-board and type-bar systems of a typewriter and with its universal bail, of a series of contact arms mounted on the key lever a series of independently vertically adjustable signal devices and a rocking bar removably mounted and carrying said signal devices, substantially as specified.

24. The combination with the set of key levers of a typewriting machine and with their connected printing mechanism, of a system of contact arms carried by the key levers, a pivotally mounted bar carrying signal producing devices, a broad faced bail co-operating with the contact arm and means for tilting said bar and means for depressing said bail, substantially as specified.

25. The combination with a typewriter, of a pivotally mounted signal producing mechanism comprising a universal bail and a pivoted throw-off constructed and arranged to throw said mechanism out of operative position and said bail automatically beyond the limit of movement of the key levers of the typewriter, substantially as specified.

26. The combination of a typewriting machine, a signal producing mechanism comprising a pivoted bail arranged to be actuated by the movement of a key lever of the typewriting machine and a pivoted throw-off constructed and arranged to throw said mechanism out of electrical connection and at the same time to automatically throw the universal bail of said mechanism out of the path of the key lever, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES SPIRO.

Witnesses:

E. H. BOND,  
L. C. HILLS.