No. 876,136. PATENTED JAN. 7, 1908.

J. H. BIRCH & J. S. FOLEY.

TYPE WRITING MACHINE.

APPLICATION FILED OCT. 19, 1906.

4 SHEETS—SHEET 1.

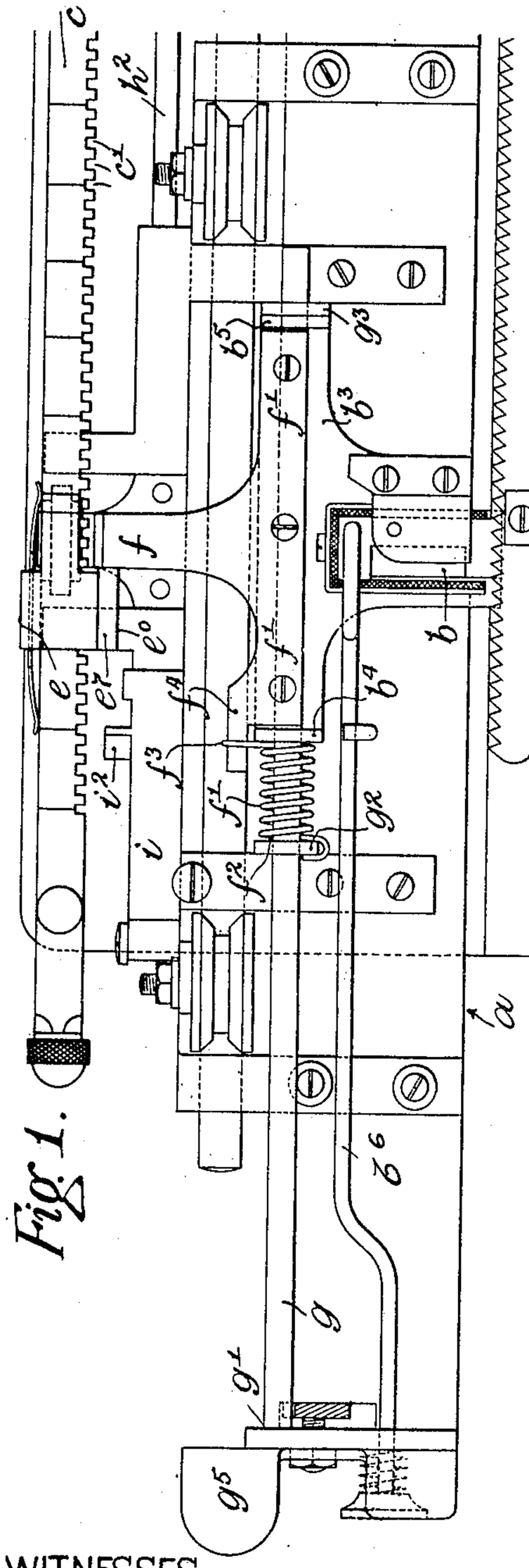

Fig. 1.

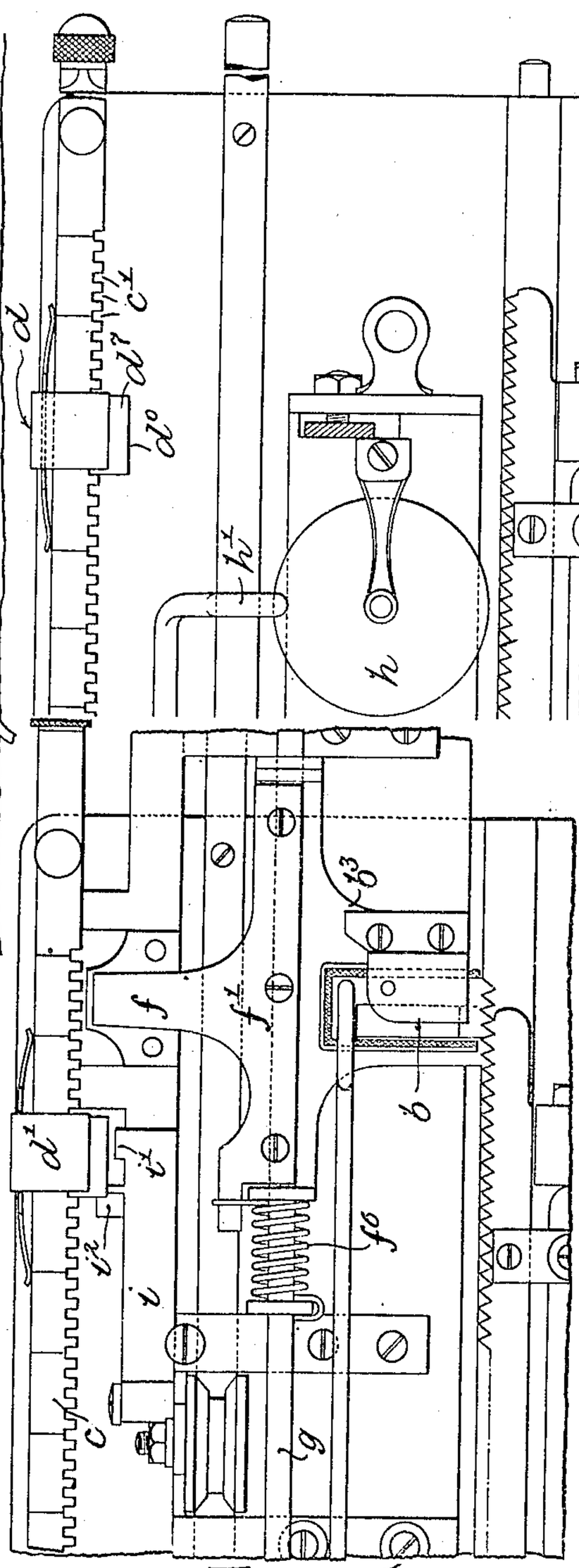

Fig. 4.

WITNESSES

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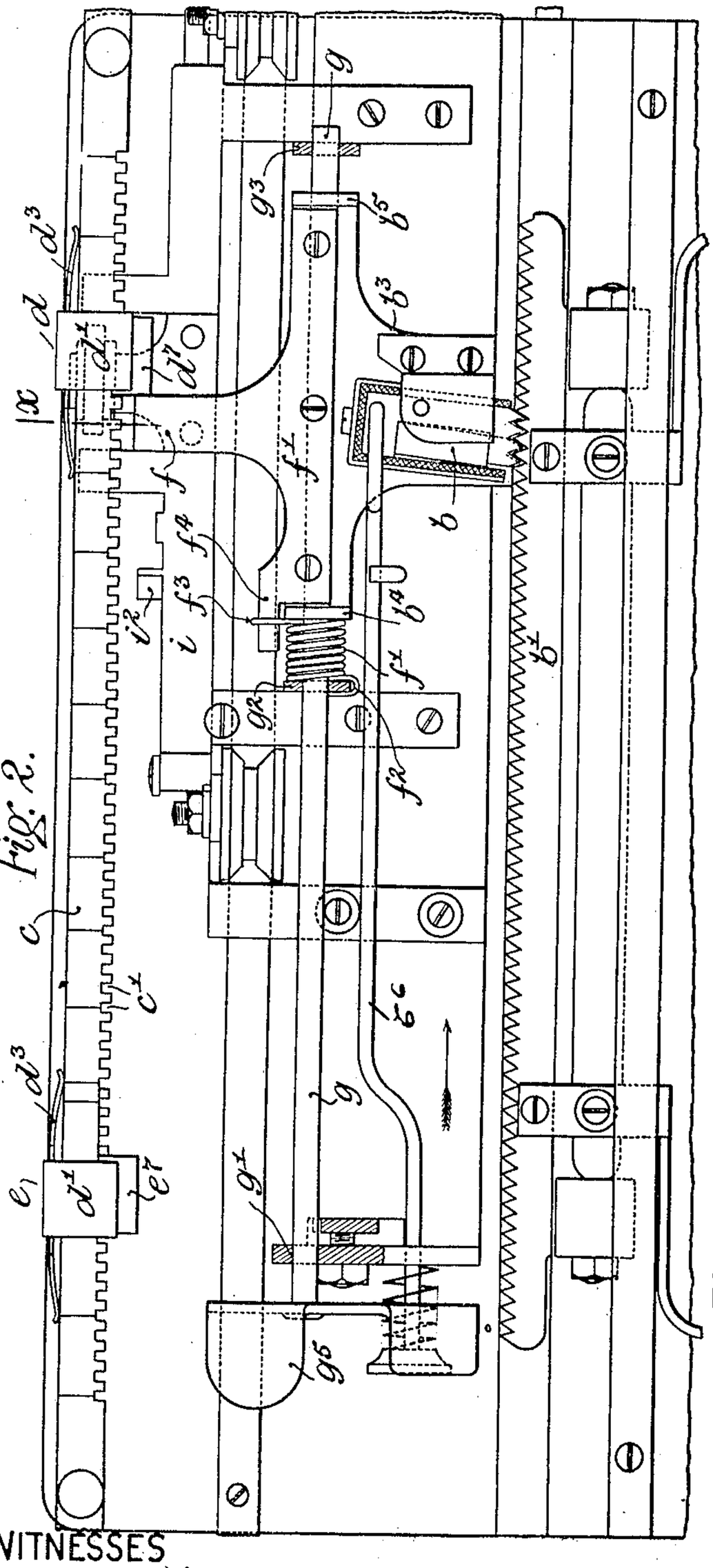

Fig. 2.

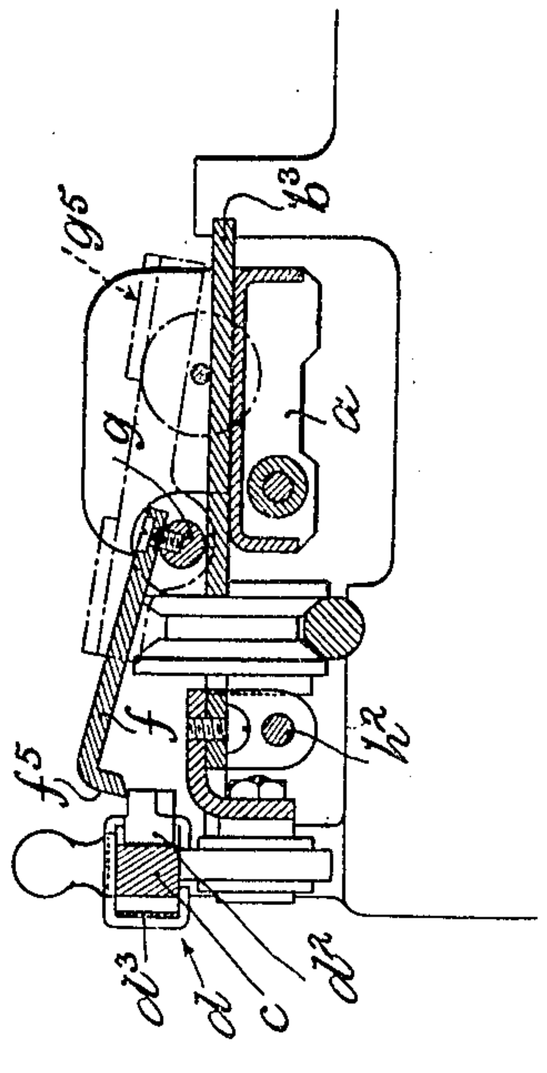

Fig. 4.

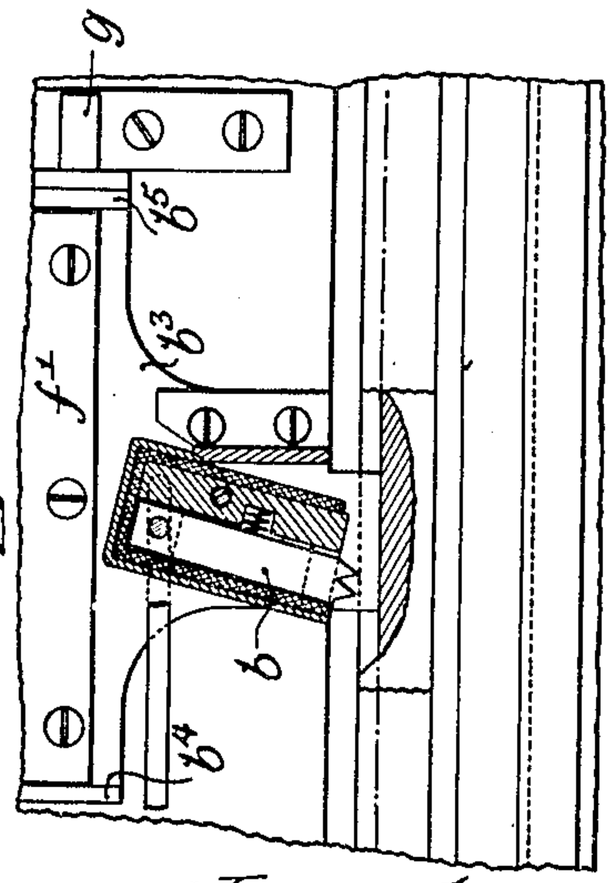

Fig. 5.

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4 SHEETS—SHEET 3.

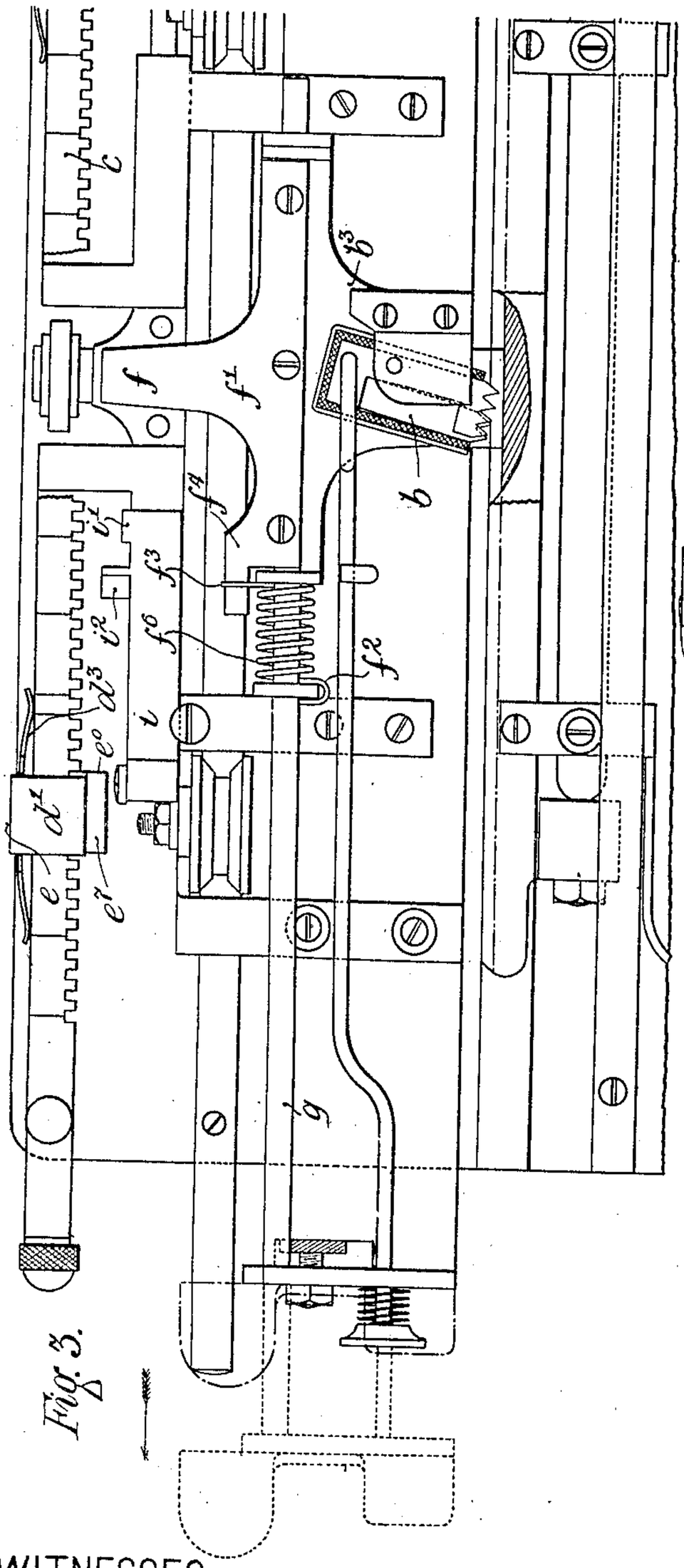

Fig. 3.

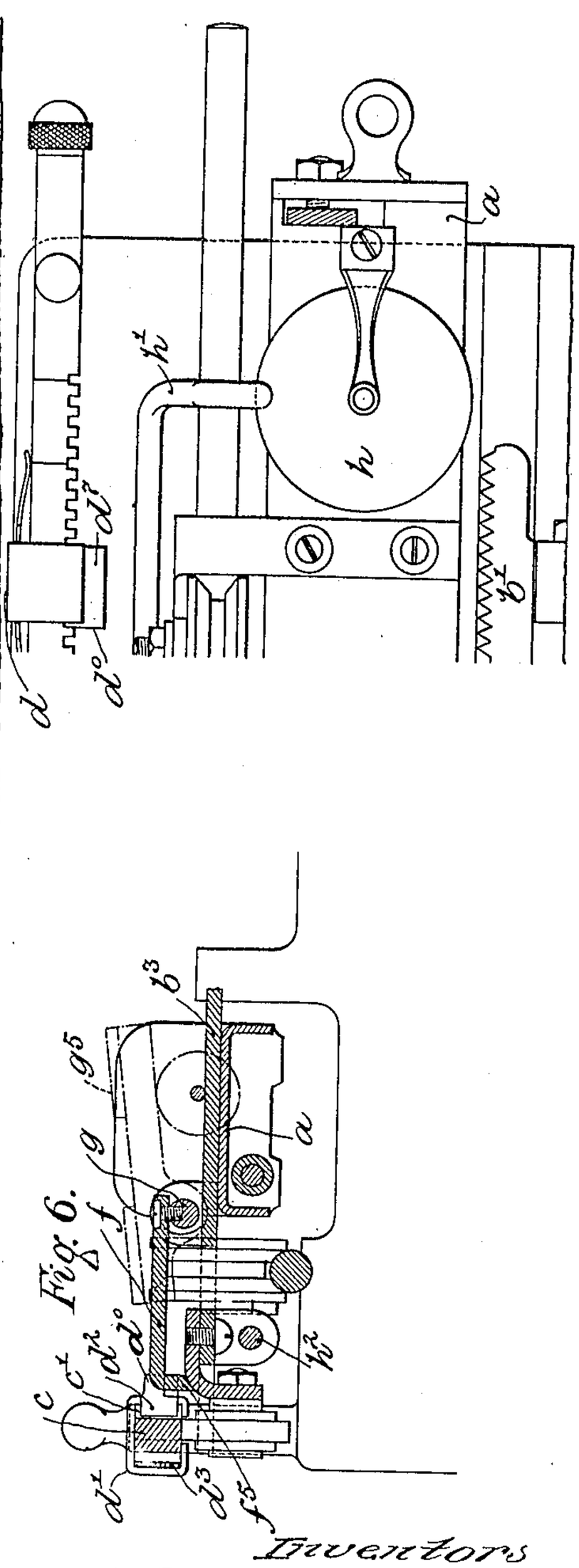

Fig. 6.

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4 SHEETS—SHEET 4.

Fig. 8.

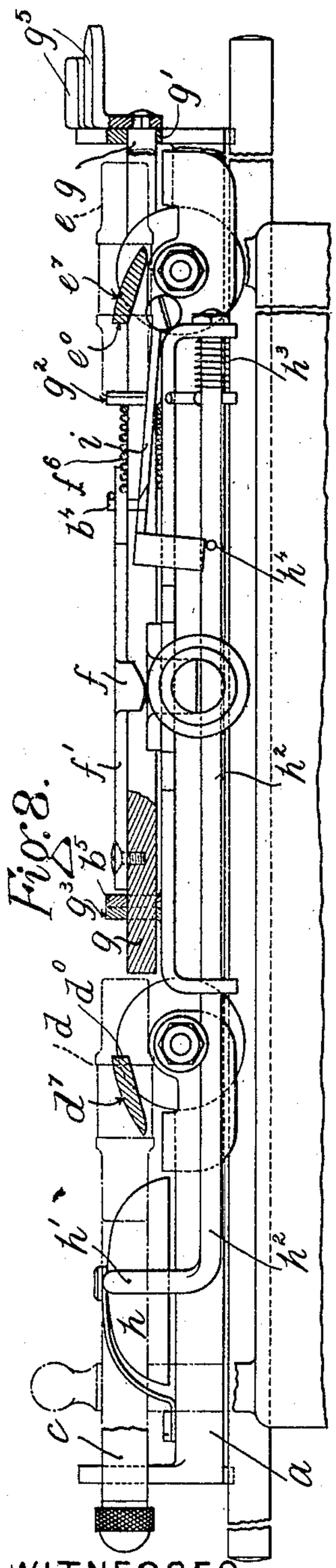

Fig. 9.

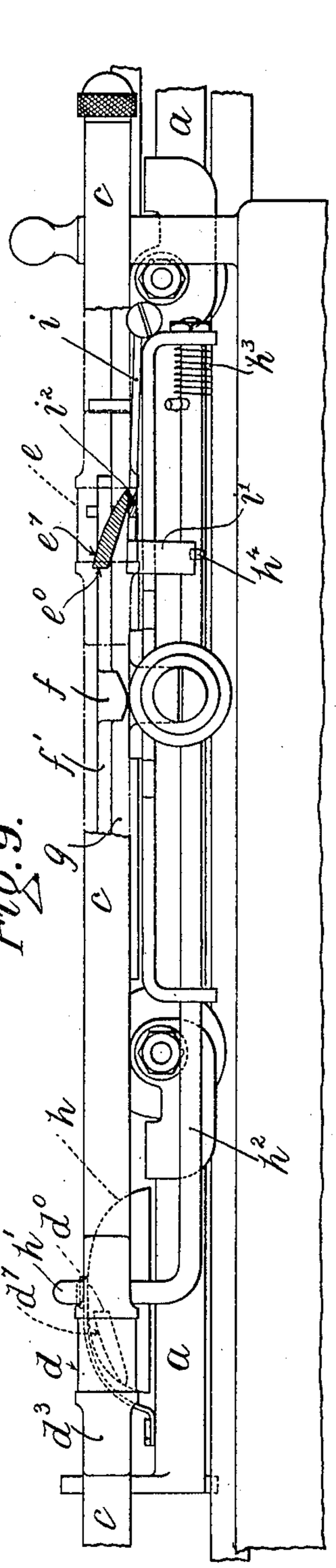

Fig. 11.

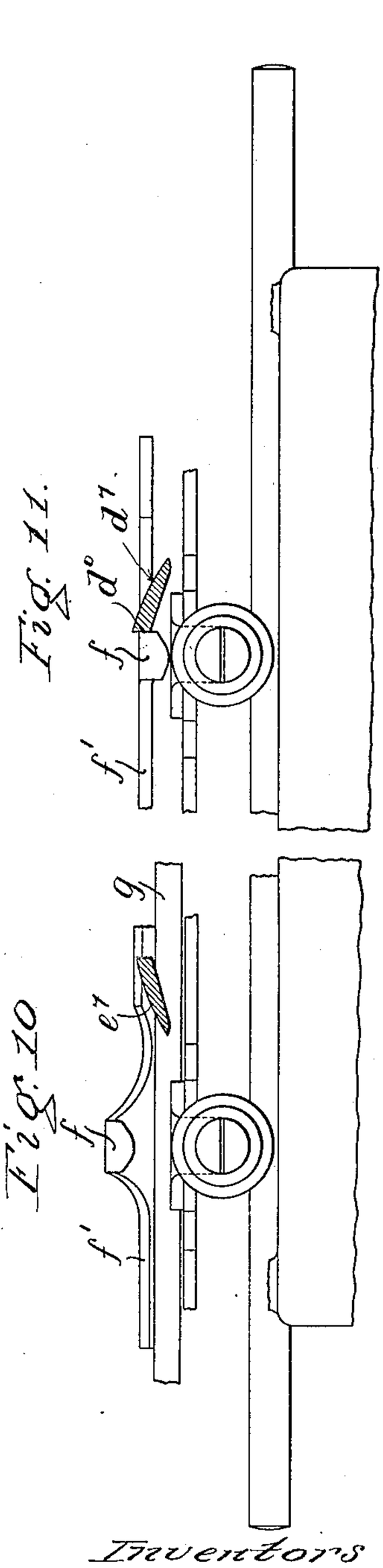

Fig. 10.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN HENRY BIRCH AND JAMES SAMUEL FOLEY, OF WEST BROMWICH, NEAR BIRMINGHAM, ENGLAND.

TYPE-WRITING MACHINE.

No. 876,136. Specification of Letters Patent. Patented Jan. 7, 1908.

Application filed October 19, 1906. Serial No. 339,684.

To all whom it may concern:

Be it known that JOHN HENRY BIRCH and JAMES SAMUEL FOLEY, subjects of the King of Great Britain, residing at High Street, West Bromwich, near Birmingham, England, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention has relation to typewriting machines, and has for its object to provide such machines with improved adjustable arrangements for limiting the traverse of the carriage and for regulating or determining the width of the marginal spaces on either or both of the right and left hand sides of the paper which are to be left clear or unprinted-upon when the machine is being operated.

According to the present invention the right and left hand marginal stop devices and the coöperating mechanism which is mounted upon the traversing carriage of the machine are so constructed and arranged as not only to admit of the adjustment of the said stops so as to provide for margins of any suitable width being left on either or both sides of the paper, but they also enable the operator, by the manipulation of a simple release key, to disengage or throw out of gear that part of the mechanism which is mounted upon the carriage so as to admit of the latter being traversed or moved on beyond either of the stops when it is required for the printing to be continued into either the right or left hand margin or into both margins. Further, the said improved mechanism comprises simple and efficient means whereby one of the margin stops is utilized for the purpose of ringing the alarm-bell when the carriage is approaching the end of its traverse between the said stops, together with a spring-buffering arrangement for cushioning the carriage and preventing shock and damage to the machine by the concussion which is set up when the operator runs the said carriages back against the right-hand margin stop before commencing to print a fresh line.

In the accompanying drawings the invention is shown applied to a typewriter of that class in which the platen is mounted upon a traversing carriage arranged at the back of the machine between the type-bar housing and the margin rail and in which the types are adapted to strike upon the top of the said platen, the latter being traversed by a traction spring and controlled in its traversing movement from right to left by an escapement mechanism coöperating with a rack-rod and space bar in the ordinary and well known manner.

Figure 1 of the said drawings represents a plan of the back part of a typewriter embodying our improvements, the platen being removed from its carriage in order to show more clearly the arrangement of the adjustable stops on the stationary margin rail, the coöperating stop on the traversing carriage, the stop release mechanism, the bell-ringing mechanism and the means provided for buffering the carriage or taking up shock when the operator pushes the carriage back against the right-hand margin stop prior to commencing writing upon a new line. This view shows the positions assumed by the several parts when the carriage is arrested in its traverse from right to left by the abutment of the stop device on the said carriage against the left hand stop on the margin rail; it being understood that the carriage is traversed in this direction with an intermittent or step-by-step movement under the influence of the traction spring controlled by the escapement and spacing bar mechanism. Fig. 2 is another plan, showing the positions assumed by the parts when the carriage is pushed back by hand in the direction indicated by the arrow and the carriage-stop is brought up forcibly against the right-hand stop on the margin-rail. This view also shows how the buffering spring of the carriage is compressed for absorbing any shock that may be occasioned during this movement. Fig. 3 shows another view in plan, similar to Figs. 1 and 2, but showing the carriage in a midway position between the right and left hand margin-rail stops and the escapement disengaged by the escapement-release key so as to disassociate the carriage from the space-bar mechanism and admit of it being drawn towards the left hand margin stop by its traction spring under control of the left hand of the operator who, by maintaining pressure upon the release key, keeps the escapement clear of the rack-rail until the said carriage has been drawn into the desired position. Fig. 4 is a further plan showing the positions of the parts when the carriage has been pushed beyond the right hand margin stop after the stop-mechanism release key has been actuated. When the carriage is in this position the machine will write upon the left

hand margin of the paper. Fig. 5 is a view showing the escapement in horizontal section and a plan of the platform on which said escapement is mounted. Fig. 6 is a transverse vertical section of the carriage-stop and escapement platform upon the dotted line *x* Fig. 2, but the escapement itself is omitted to avoid complication. Fig. 7 is a similar sectional view but shows the position into which the said carriage stop may be raised by the stop-mechanism release key in order to admit of the traversing movement of the carriage being continued beyond the margin rail stop. Fig. 8 is an elevation, partly in section of the back of the carriage (without the platen) with the margin rail broken away in order to show more clearly the arrangement of the stop release mechanism which is operated when it is desired for the carriage to pass beyond either of the margin stops. The figure also illustrates the arrangement of the bell-ringing mechanism. Fig. 9 is another elevation which includes the margin rail and shows the bell-ringing mechanism in operation. Fig. 10 is a detail view showing how the carriage stop coöperates with the margin stop for arresting the movement of the carriage, while Fig. 11 is a similar view showing the position into which the carriage stop is placed by the actuation of the stop-release mechanism in order to admit of the carriage being traversed beyond the margin stop.

The same letters of reference indicate corresponding parts in the several figures of the drawings.

In the machine represented in the said figures, the platen is mounted upon a carriage *a*, adapted to traverse to and fro along the back of the machine and to be supported and kept in position by a special arrangement of anti-friction rollers, guide rails and other devices which form no part of the present invention but are fully described in the specification of my British Letters Patent of 1905 No. 26232. This carriage is connected with a traction spring (not shown) the tendency of which is to draw the same from left to right with an intermittent or step-by-step movement which is controlled in the usual way by an escapement device *b*, coöperating and intermittently engaging with an oscillating rack rail b^1 connected with the spacing bar and writing keys of the machine and adapted to admit of the carriage being drawn along by the spring to the extent of one tooth of the rail b^1 when the latter is shifted momentarily from engagement with the escapement at each time the said spacing bar or one of the keys is depressed. The escapement is moved out of engagement with the rail b^1 by a spring-controlled shifting bar b^6 so that the carriage can be shifted manually to its initial position.

c is a graduated margin-rail which is arranged upon the fixed frame or body part of the machine and at the back of the traversing platen carriage and whose front or inner edge is formed at regular intervals with notches c^1 corresponding to the number of letters which the machine is designed to print in one line. Two margin stops *d* and *e* are fitted upon this rail for coöperating with a stop-arm on the carriage to regulate respectively the width of the right and left hand margins, and they each consist of small slides or boxes d^1 which take over the rail and are capable of a slight play in a direction at right angles to the length of the said rail to admit of the engagement and disengagement of a retaining or locking tooth or stud d^2, which is carried inside the said slide, with one or other of the rail notches c^1, and the back of each slide is fitted with a spring tongue d^3 which, by bearing against the rear edge of the said rail draws and retains the locking tooth into its engagement with the notches, but such spring is capable of yielding to finger pressure applied to the back of the said slide to admit of the disengagement of the locking tooth when the slide requires to be shifted for readjusting the width of the margin. The stops-proper are carried at the fronts of the slides so as to project inside the margin rail and they consist of short inclined ribs or feathers d^0, e^0 sloping respectively in opposite directions (see Figs. 8 and 9) from the inner to the outer ends of the slides and it is against the inner and elevated ends of these stops that the coöperating stop fitting *f* on the carriage is adapted to impinge on the traversing parts reaching the limits of their prescribed movement either from right to left under the influence of the carriage-traction spring or in the contrary direction by the return movement which is obtained when the operator presses against the left hand end of the carriage in opposition to the said spring.

The carriage is fitted with a rock-shaft *g* slidably and rotatably mounted in suitable bearings g^1; g^2, g^3 in a position parallel with the margin rail and having fixed rigidly to it, the carriage stop-arm *f* which normally lies in a horizontal plane and is extended at right angles from the shaft, rearwardly towards the inner edge of the margin rail so that its rearward end comes between and is adapted to impinge alternately against the stops which are carried by the adjustable slides. The said rock shaft also has secured to it a plate or bracket b^3 which carries the escapement device *b*, said plate being suspended from the shaft by ears b^4, b^5 which rest respectively against the opposite ends of the shank f^1 of the arm in such a manner that although the shaft *g*, arm *f* and plate b^3 with escapement *b* are capable of making a collective sliding movement relative to the carriages, the arm *f* and shaft *g* may also

make an upward angular movement independently of the escapement and its bracket-plate when the lever or stop-mechanism release key g^5, which is made fast to the right-hand end of the rock-shaft, is operated. This arm f has arranged in connection with it, an open-coiled torsion spring f^1 which surrounds the rock shaft so that one end f^2 bears against and is made fast to the bracket ear g^2 on the body of the carriage while the other end bears against the bracket b^4 of the bracket plate b^3 so that when in its normal and expanded condition the pressure exerted endwise by the spring against the said plate forces the latter against the rock-shaft bearing g^3 and maintains the slidable parts g, f, b^3 in the positions shown in Figs. 1, 3 and 4, but should the stop-arm f be violently driven against the right hand margin stop at the end of its return movement by hand, then the said spring serves as a buffer for absorbing or taking up the shock, as when the arm is brought up against the stops, the compression and shortening of the spring admits of the carriage and platen being carried on a short distance independent of the stop arm and escapement, but this additional movement is opposed and buffered by the spring and the carriage is finally arrested when its coils are closed as represented in Fig. 2 while when the end pressure applied by the operator's hand is relieved from the carriage the coils of the spring open out and restore the said carriage and platen to the normal positions shown in Figs. 1, 3 and 4. In addition to buffering the relative movement of the parts above referred to and maintaining them in the ordinary relationship to one another when the carriage is stationary or is traversing from right to left, the said spring is also utilized torsionally to preserve the stop arm in its normal horizontal position in line with the abutment ends of the margin rail stops, for which purpose that end which abuts against the escapement bracket plate is provided with a projecting end f^3 which bears against the top of a lateral extension f^4 from the stop arm f, and constantly tends to depress the same below its normal horizontal plane in which it is, however, maintained by its bent-down extremity f^5 taking an abutment against a part of the carriage framing (see Fig. 6) but when the stop mechanism release key g^5 is depressed and the stop arm is tilted upwards into the angular position shown in Fig. 7 by the partial rotation of the rock shaft, then the extension f^4 carries with it the projecting end of the spring and renders the same torsionally active for depressing the stop arm again when the pressure on the release key is relieved. The left-hand end of the rock shaft is extended beyond the carriage to carry the said stop mechanism release key or lever g^5 which is arranged conveniently for manipulation by the thumb or finger of the operator's left hand and whereby (when it is desired for the carriage to be traversed beyond either the right or left hand margin stops so as to enable the machine to print in the corresponding margin) the operator may impart the necessary partial rotatory movement to the shaft in opposition to the spring and raise the rear end of the stop-arm above the stop-piece on the margin slide as shown in Fig. 7 and the left hand part of Fig. 10. The carriage may then be moved on beyond the stop to any desired extent as shown in Fig. 4 and when the finger is removed from the release key, the rock shaft spring restores both the shaft and its arm to their normal positions, while when the carriage is returning or being moved in the opposite direction, then, on the rear end of the stop arm being brought against the inclined top surface (e^7, d^7) of the stop-rib or feather (e^0, d^0) on the margin slide, the said inclined surface will act as a stationary cam and will raise the said arm until it has cleared the stop, when the rock shaft torsion spring again restores the stop arm to its normal position.

The inclined stop-pieces of both margin slides have the same action, and their disposition at opposite angles admits of the stop-arm being raised by the left hand stop when the carriage is being traversed from left to right after the machine has been used for printing in the left-hand margin, while the right hand stop acts in a similar manner during the movement of the carriage in the opposite direction after printing in the right hand margin. The inclined stop of the left hand margin-slide is also utilized to operate the mechanism for ringing the alarm bell h, and for this purpose, the bell clapper or striker h^1 is carried by a rotatable rod h^2 supported by the carriage and provided with a torsion spring h^3 whose tendency is to take and retain the said striker against the dome of the bell. This rod carries at a suitable point a stud or laterally-projecting piece h^4 while the carriage has pivoted to it, a gravitating arm or bell-control lever i which is adapted to make a limited angular movement in a vertical plane and carrying a depending piece i^1 which impinges against the stud or projection h^4 of the rotatable or rolling striker rod and is retained there by gravity. In their normal positions, which are clearly shown by Fig. 8, this stud and depending part of the gravitating arm maintain the end of the said arm at a sufficient distance above the frame as will permit of it making its prescribed angular movement. The said arm or lever is mounted upon the carriage in a plane which is parallel with the margin rail but set forwards therefrom to a suitable distance as shown in Figs. 1 to 4, and that edge which is adjacent to the said rail is

provided with a stud or rearwardly extending ear i^2 and when the machine is being operated and the carriage in its traverse towards the left hand of the machine, is about bringing its stop-arm up to the left hand margin slide *e*, this extension of the bell-controlling lever is taken under the inclined stop-piece or rib of the said slide and is depressed thereby, and made to carry the lever *i* down with it, as shown in Fig. 9. This lever then acts upon the rolling striker rod through the medium of the stud h^4 and imparts a partial rotation thereto which lifts the striker off the dome of the bell and simultaneously renders active the torsion spring h^3, so that when by the continued traverse of the carriage the stud is taken clear of the inclined stop-ring, the bell-control lever *i* is freed or released, and the torsion spring reacts to rotate the rolling rod and drive the striker against the dome and ring the bell and at the same time to restore the parts of the bell ringing mechanism to their normal positions.

After the bell has been sounded, the torsion spring takes the lateral extension of the gravitating bell-control lever into such a potion that, at the commencement of the return movement of the carriage from left to right, the said extension will impinge upon the inclined topside of the left hand stop and ride idly over the inclined top of the same without imparting any movement to the bell striker rod which may be provided with a suitable stop for limiting the rotating or rolling movement which it is capable of making under the influence of the torsion spring.

Having fully described our invention, what we desire to claim and secure by Letters Patent is:—

1. A type-writing machine comprising a platen carriage, a rock shaft supported by the carriage and capable of independent movement relative thereto, a carriage stop arm and escapement bracket mounted upon said rock shaft, and a spring interposed between said relatively movable parts to maintain them in their normal positions and to act as a buffer.

2. A type-writing machine comprising a platen carriage, a marginal rail stop or stops, a stop on the carriage coöperating with the rail stop or stops, a rock shaft supported by the carriage, an arm mounted on the rock shaft and constituting a carriage stop, and a torsional spring mounted on the rock shaft for preserving the normal position of the carriage stop in line with the marginal rail stop or stops, for restoring the same to such normal position after it has been raised for clearing a margin stop and to constitute a buffer when moving the carriage to its initial position, combined with means for actuating the rock shaft to move the carriage stop out of the path of the rail stop or stops.

3. A type-writing machine comprising an adjustable margin rail stop or stops, a platen carriage stop carried thereby, coöperating with the rail stop or stops, a rock shaft supported by the carriage and provided with an arm to constitute the carriage stop, said arm normally positioned in the platen of the rail stop or stops, means for rocking said shaft to move the carriage stop out of the plane of the rail stop or stops, a torsional spring mounted upon said rock shaft and adapted to normally maintain said arm in the path of the marginal stop or stops and for restoring said arm to its operative position after the rock shaft has been actuated to raise said arm to admit of the further travel of the carriage to provide for marginal writing, a lever fulcrumed to the carriage and adapted to be depressed by its passage under the said stop projection for rendering active the spring, a bell-ringing mechanism controlled by the lever, and a bell-striker adapted to be operated by said spring when the lever clears the said projection, said lever on the return movement of said carriage adapted to be moved over past the margin stop without affecting the ringing mechanism.

4. A type-writing machine comprising an adjustable margin rail stop or stops, a platen carriage stop carried thereby, coöperating with the rail stop or stops, a rock shaft supported by the carriage and provided with an arm to constitute the carriage stop, said arm normally positioned in the platen of the rail stop or stops, means for rocking said shaft to move the carriage stop out of the plane of the rail stop or stops, a spring, a lever fulcrumed to the carriage and adapted to be depressed by its passage under the said stop projection for rendering active the spring, a bell-ringing mechanism controlled by the lever, and a rotatable shaft carrying the bell-striker and provided with a torsion spring, and a contact adapted to be acted upon by the control lever when the latter is depressed.

In testimony whereof we have hereunto set our hand in presence of two subscribing witnesses.

JOHN HENRY BIRCH.
JAMES SAMUEL FOLEY.

Witnesses:
HENRY L. KERVELL,
IDA B. SODER