

No. 765,640.

PATENTED JULY 19, 1904.

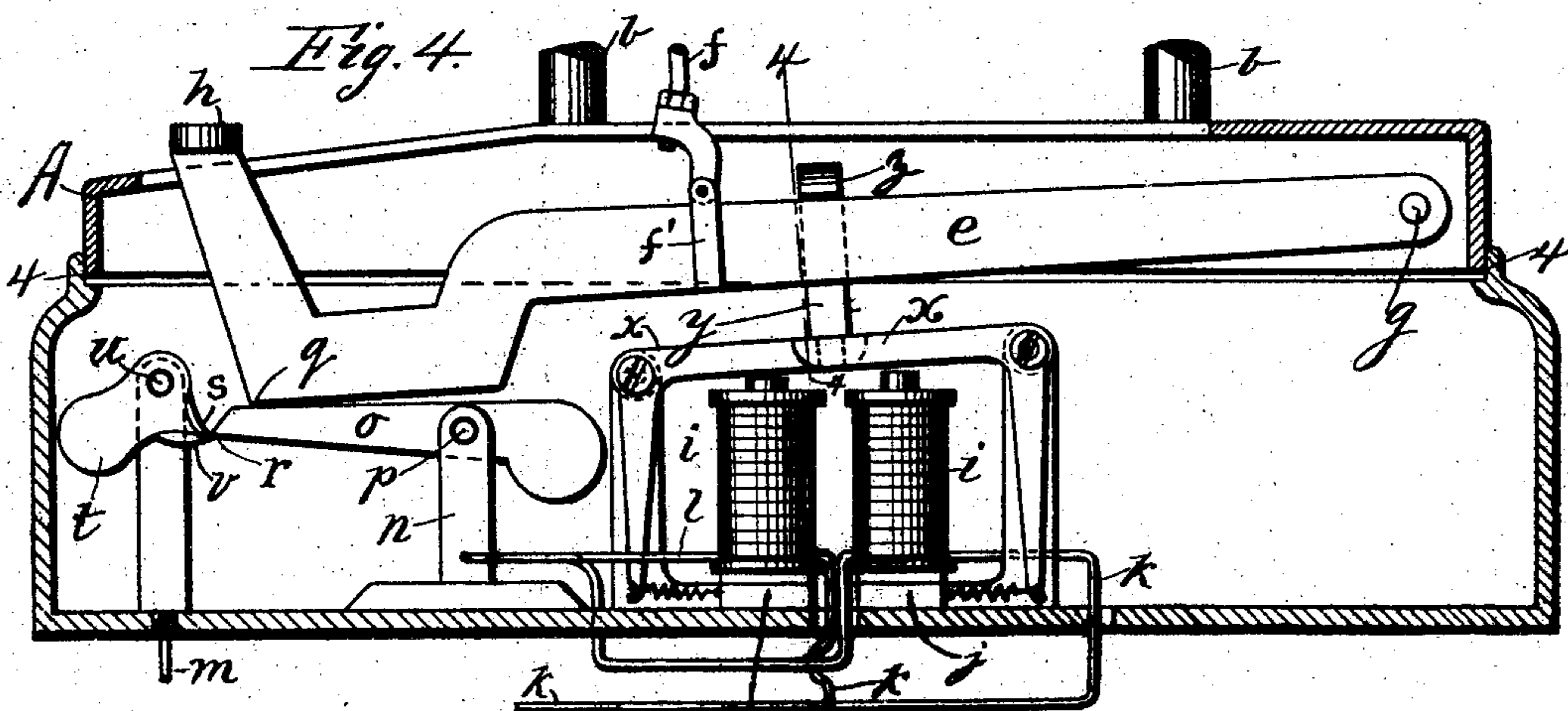
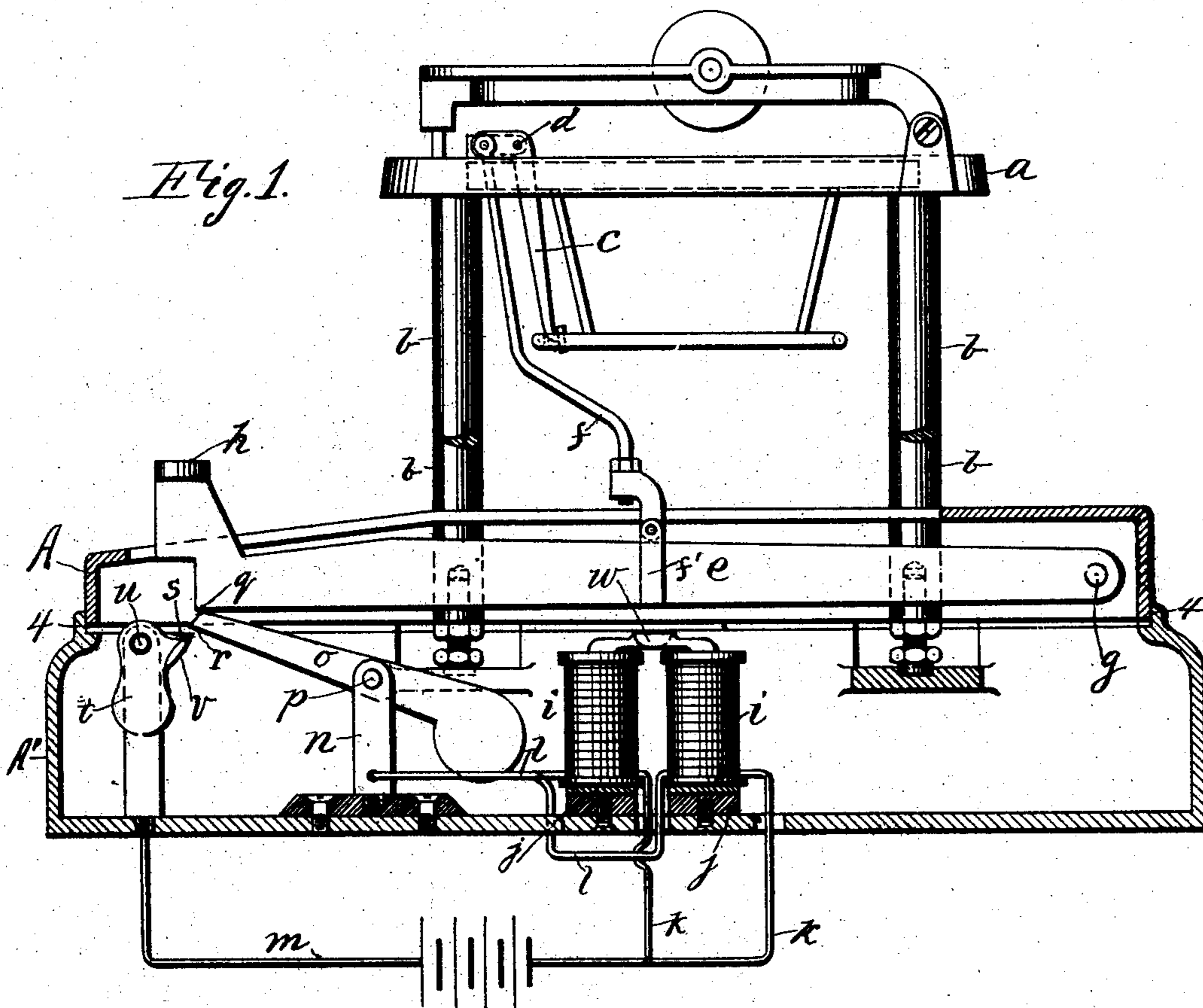
W. G. SPIEGEL.

KEY MECHANISM FOR KEY ACTUATED INSTRUMENTS.

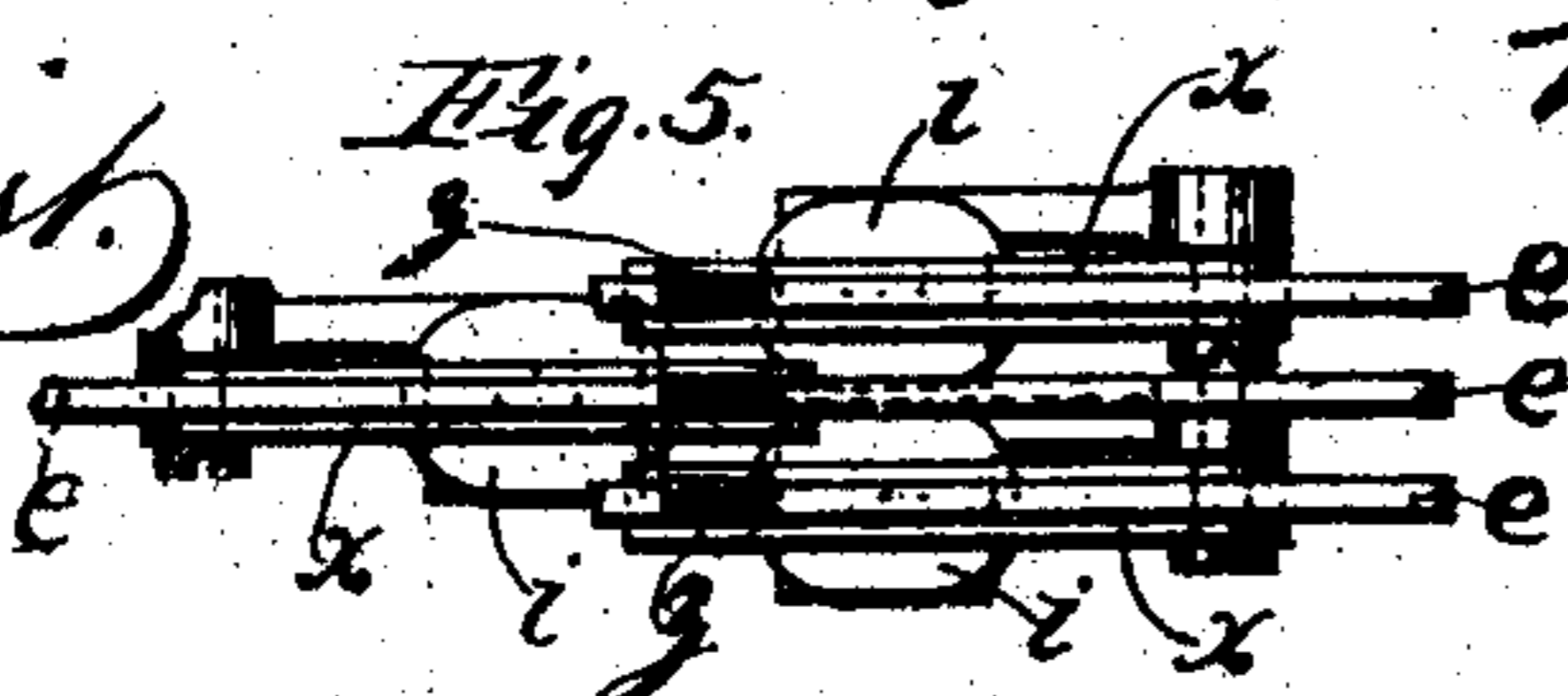
APPLICATION FILED AUG. 29, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:
L. Almquist.
C. Sedgwick



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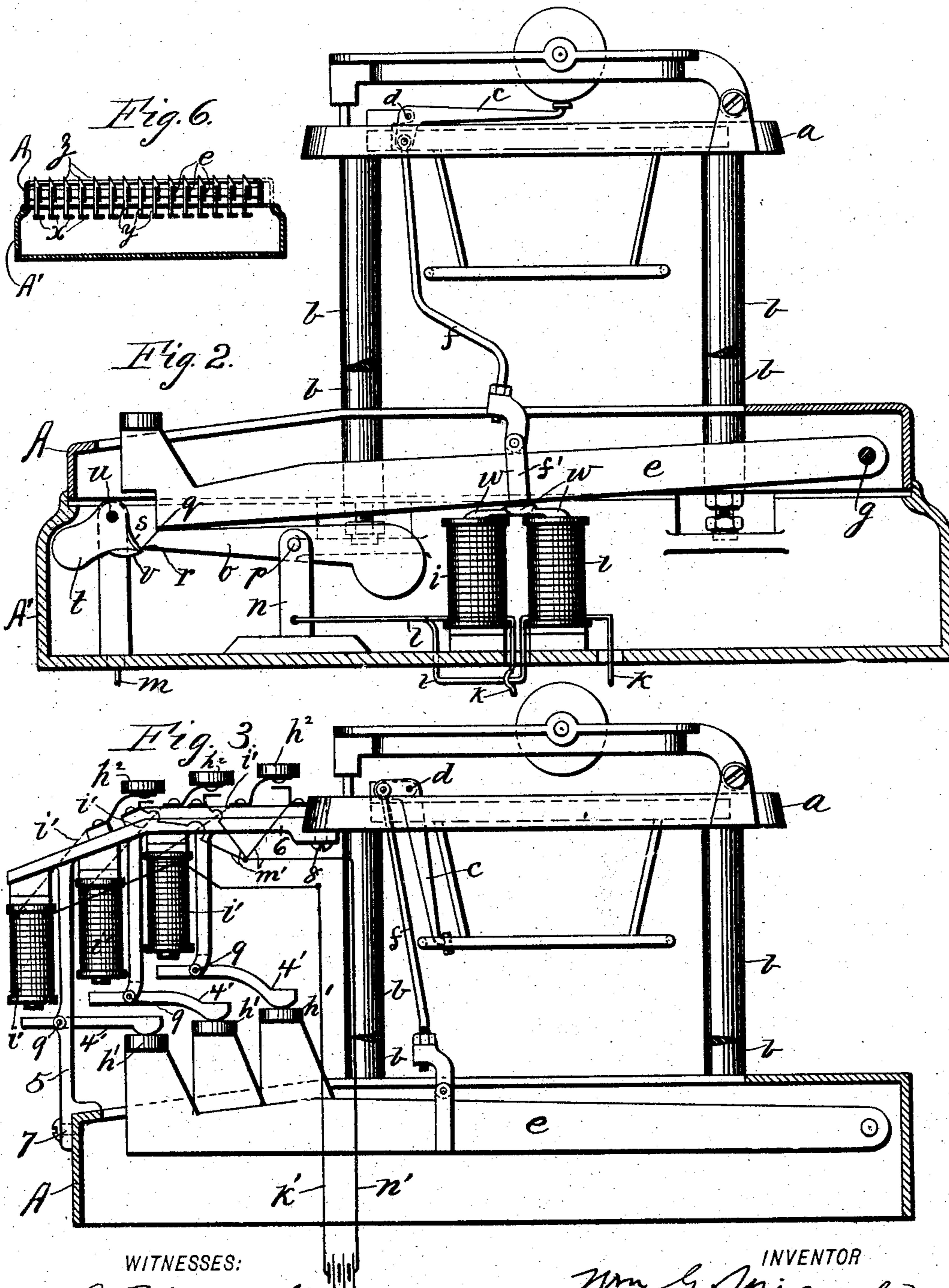
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UNITED STATES PATENT OFFICE.

WILLIAM G. SPIEGEL, OF NEW YORK, N. Y., ASSIGNOR OF TWO-THIRDS
TO SYDNEY H. CARNEY, OF NEW YORK, N. Y., AND WILLIAM WATT,
OF BROOKLYN, NEW YORK.

KEY MECHANISM FOR KEY-ACTUATED INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 765,640, dated July 19, 1904.

Application filed August 29, 1903. Serial No. 171,199. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. SPIEGEL, a citizen of the United States of America, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Key Mechanism for Key-Actuated Instruments, of which the following is a specification.

My invention relates more particularly to type-writing machines, but is applicable to other key-actuated instruments, and is designed to relieve the fingers and arms of the operator of much of the labor of operating the key-levers.

To this end my invention consists of an electromagnet and a battery or other source of electric energy in circuit so combined with each key-lever that only the first and lightest part of the movement of the key-lever has to be made by the operator to close the circuit and the magnet effects the rest and more laborious part of the operation not only to the relief of the operator, but in quicker time, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a vertical sectional elevation of part of a type-writing machine of ordinary construction parallel with the key-levers and a like section of an attachment embodying one form of apparatus for carrying out my invention. Fig. 2 is a view similar to Fig. 1, showing positions of some of the parts in operation. Fig. 3 is a like section as Fig. 1, showing a modified form of the attachment. Fig. 4 is another like section showing another modification. Fig. 5 is a detail of Fig. 4 in plan view. Fig. 6 is a detail, on a reduced scale, in transverse section of Fig. 4 on line 4 4.

A represents the base of a type-writing machine in all the figures; *a*, the type-bar-supporting frame, mounted on pillars *b*, carried by the base A and having the type-bars *c* pivoted on it at *d*, said type-bars being connected to the key-levers *e* in the usual manner by rods *f*. The key-levers are pivoted on the base A at *g* and have the usual keys *h*, all these parts being of common or any approved construction for being wholly oper-

ated in the usual way by the fingers of the operator.

To relieve the operator of the principal part of the labor, and particularly to insure more uniform impressions of the type on the paper and more rapid action, I propose to employ the auxiliary aid of electromagnets in a way to come into action during the first part of the movements of the levers and instantly complete the movements without further aid of the operator and with much less movement of his fingers, enabling him to recover more quickly for the next movement and also finishing the actions of the levers quicker, thus insuring easier and more rapid operation of the machine. The application of such electromagnets may of course be carried out in various ways, and while I have shown herein the most approved form as far as at present devised I do not limit myself to the same, for it is obvious that other means of such application may be devised within the scope of my invention.

The apparatus is to be mounted in a sub-base A', adapted to seat the type-writing-machine base A on it, as shown at 4, so that when placed thereon the key-levers *e* and the coacting parts of the apparatus will come into proper relation with each other for work.

In Figs. 1 and 2 the electromagnets *i*, consisting of single-core magnets, are placed under the key-levers *e*, one to each lever on a suitable insulating-base *j* in such relation that they act, when composed of metal, as the armatures of the magnets; but for machines in which wood levers *e* are used the magnets are adapted for coaction with the metallic rod-connectors *f'* as armatures, as shown in Figs. 1 and 2, with a battery connection *k* and a circuit connection *l* and return-wire *m*. The wire *l* connects with an insulated post *n*, in which a contact-lever *o* is pivoted at *p*, which in this instance is represented as a gravitating lever; but for quicker action a spring may be substituted for the weight. The lever reaches upward and normally bears lightly against the heel of the key-lever at *q* for being depressed in the beginning of the move-

ment of the key-lever under the touch of the operator. Directly below the point r of lever o , but slightly separated from it, is a contact-point s of a gravitating carrier t of said point s mounted on a pivot-stud u , on which said point s can swing clear of point r of lever o to break the circuit, which is closed when points r and s touch, the lever o and carrier t being in the circuit, and the under side v of point s is insulated, so as not to close the circuit when the parts touch each other on return to their normal positions. The carrier t or its equivalent may be actuated by a spring, if desired, for quicker action. The upper surface of contact-point s may have a platinum surface for more reliable contact, if desired.

The single-core magnets are used in order that they may be "staggered," as shown in Fig. 5, to enable them to be arranged in the limited space available under the closely-arranged key-levers, and I have represented the spools in flattened cross-section as a further means of providing for the requisite capacity in the limited space.

Instead of the direct action of the magnet-cores w on the key-levers, as in Figs. 1 and 2, armature-levers x may be interposed, as in Fig. 4, or in any approved way, with suitable attachments for coupling the armature and key-lever, as the rigid arm y of the armature, extending upward and having a hook z bearing on the upper edge of the key-lever to apply force thereon. To enable these hook-headed arms y to be connected and disconnected with the key-levers readily when applying and removing the attachment, provision is made for presenting the machine-base A on the attachment-base A' , so that the key-levers will drop past the hooks, and then shifting it laterally to place the key-levers under the hooks, as shown in Fig. 6, and for shifting it reversely and releasing the key-levers from the hooks when the attachment is to be removed. Another arrangement for application of such auxiliary power to the working of machines of common construction may consist of a frame, as 5 6, adapted for detachable connection to the machine-base A and frame a , as by tap-screws 7 and 8, so as to support the electromagnets i' over the keys h' , with armature-levers 4' suitably pivoted in the frame, as at 9, to be thrust down on keys h' , with contact-closing keys h^2 on the top of part 6 of the attaching-frame in practically the same arrangement as the keys h , said keys being in circuit with the battery connections k' , circuit connections i' , and return-wires m' and n' . It will be seen that, as before stated, various other modifications of such auxiliary power apparatus may be employed.

What I claim as my invention is—

1. The combination with the key-levers of a key-operated instrument having the usual direct connection with the type-levers for op-

erating them, of auxiliary lever-actuating mechanism comprising an electromagnet in operative relation to each lever for actuating it when electrically energized, a source of magnet-energizing force in circuit with the magnets, and circuit closing and breaking contacts, whereby through contact-closing movements by the operator, the magnets operate the levers, and means for automatically breaking the circuits.

2. The combination with the key-levers of a key-operated instrument having the usual direct connection with the type-levers for operating them, of auxiliary lever-actuating mechanism comprising an electromagnet located under the key-levers in operative relation to each lever for actuating it when electrically energized, a source of magnet-energizing force in circuit with the magnets, and circuit closing and breaking contacts, whereby initial movements of the key-levers by the operator close the circuits and the magnets complete the operations of the levers and the circuits are automatically broken for the release of the key-levers.

3. The combination with the key-levers of a key-operated instrument having the usual direct connection with the type-levers for operating them, of auxiliary lever-actuating mechanism comprising an electromagnet and an energizing electric circuit in operative relation to each lever as an armature, for actuating it when electrically energized, and circuit closing and breaking contacts whereby initial movements of the key-levers by the operator close the circuits and the magnets complete the operations of the levers and the circuits are automatically broken for the release of the key-levers.

4. The combination with the key-levers of a type-writing machine, of auxiliary lever-actuating mechanism comprising a subbase to the type-writing machine, electromagnetic means located on said subbase under the key-levers for operating them when electrically energized, a source of magnet-energizing force in circuit with said electromagnetic means, and circuit closing and breaking contacts actuated by said levers to close said circuits, in the initial movements of the levers, and automatically actuated for breaking the circuits, the said magnetic means and contacts being arranged to register with said levers for operative connection with them when the type-writing machine is placed on said subbase.

5. The combination with the key-levers of a type-writing machine having the usual direct connection with the type-levers for operating them, of auxiliary lever-actuating mechanism comprising a subbase to the type-writing machine, an electromagnet on said subbase under each key-lever for operating it when electrically energized, a source of magnet-energizing force in circuit with the mag-

nets, and circuit closing and breaking contacts actuated by said levers to close in the initial movements of the levers, and automatically actuated for breaking the circuits, the said
5 magnets and contacts being arranged to register with said levers for operative connection with them when the type-writing machine is placed in position on said subbase.

10 6. The combination with the key-levers of a type-writing machine, of auxiliary lever-actuating mechanism comprising a subbase to the type-writing machine, an electromagnet on said subbase under each key-lever for operating it when electrically energized, a source

of magnet-energizing force in circuit with the
15 magnets, and closing and breaking contacts also on said subbase, said contacts comprising the lever *o* directly actuated by the key-lever, and the automatically-reversing contact-carrier *t*, said carrier being insulated against
20 contact of lever *o* in its return movement.

Signed at New York this 13th day of August, 1903.

WILLIAM G. SPIEGEL.

Witnesses:

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A. P. THAYER.