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G. S. PFLASTERER.

ELECTROMECHANICAL SLOT FOR SIGNALS.

APPLICATION FILED AUG. 29, 1907.

2 SHEETS—SHEET 1.

Fig. 2.

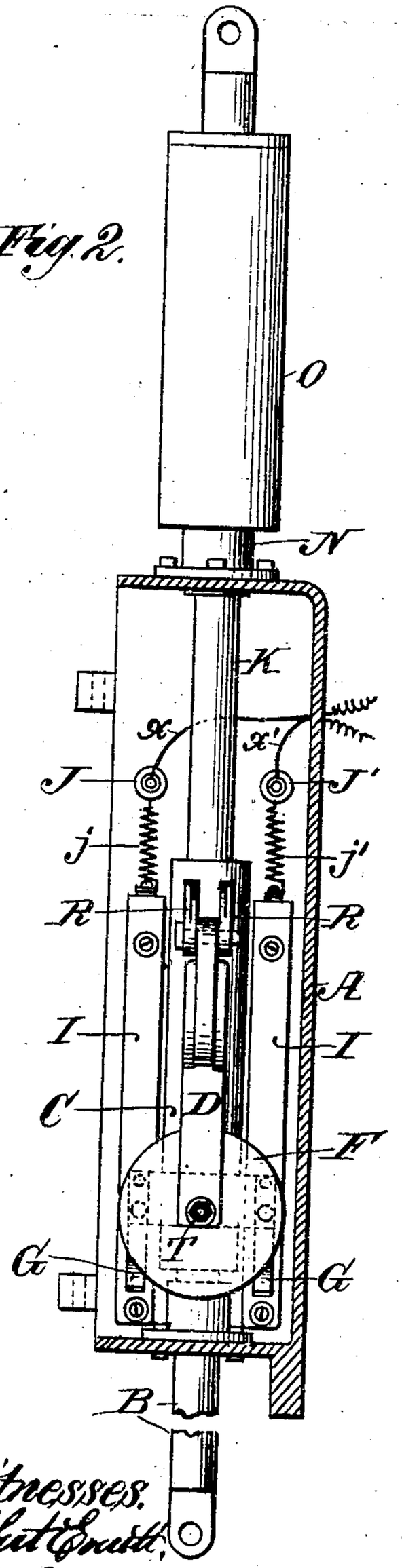
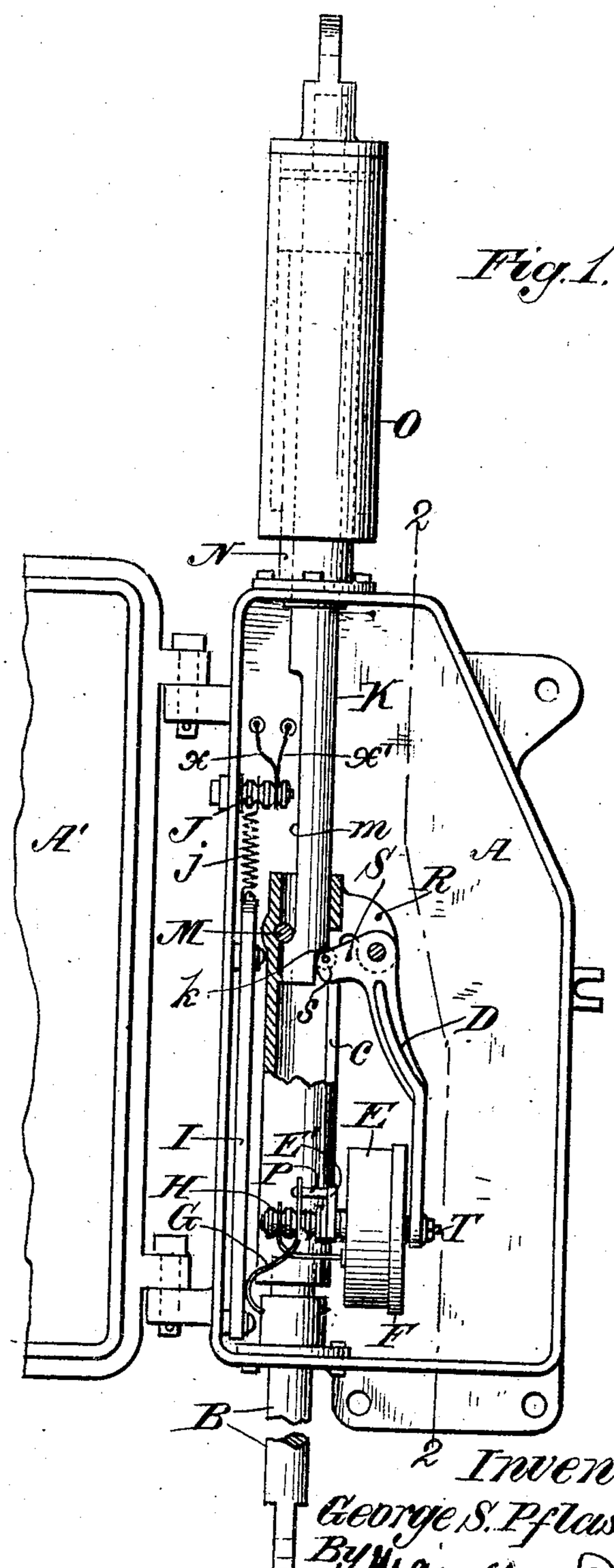


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

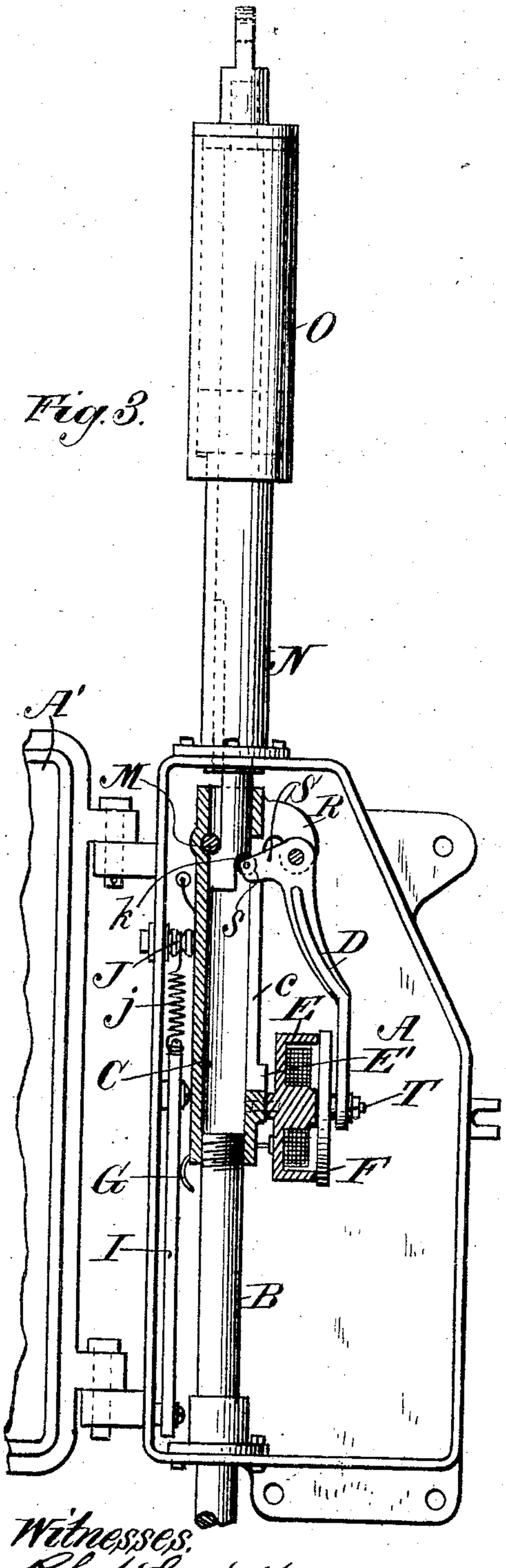
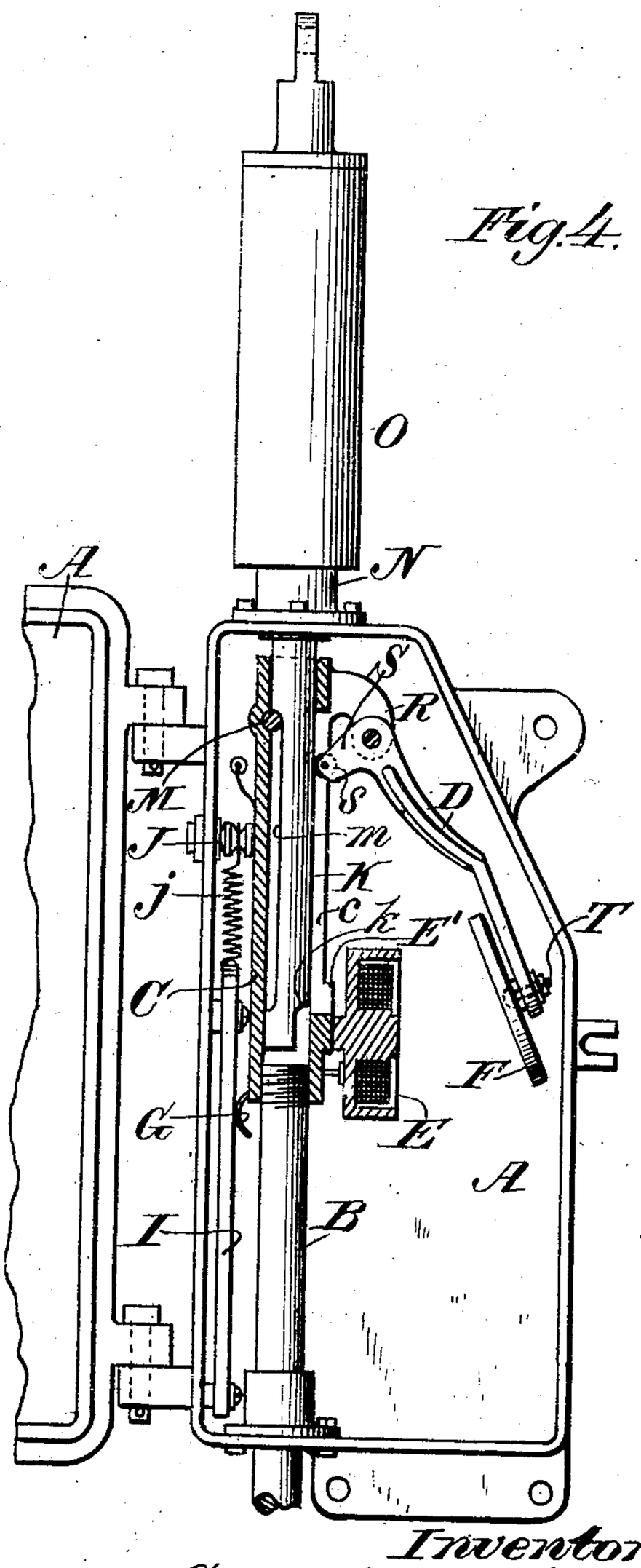


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE SAMUEL PFLASTERER, OF NASHVILLE, TENNESSEE.

ELECTROMECHANICAL SLOT FOR SIGNALS.

No. 880,398. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed August 29, 1907. Serial No. 390,609.

To all whom it may concern:

Be it known that I, GEORGE SAMUEL PFLASTERER, of Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Electromechanical Slots for Signals, of which the following is a specification.

My invention relates to that type of signal operating mechanism, known as "electric slot" or "electro-mechanical slot", for use more particularly on railways, in which a signal set for safety or "clear" is, through the intermediary of electrically controlled appliances, shifted, or permitted to shift, automatically to danger, upon reversal of the normal condition of the electric circuit in which the governing electro-magnet forming part of said appliances is included. This result is attained by providing, at some point in the signal operating mechanism between the signal and the signal cabin, a break controlled by the electric "slot" mechanism—the break, when closed, permitting the signal to be mechanically operated from the signal cabin, and, when open, permitting that part of the operating mechanism on the signal side of the break to move independently of that part of said mechanism which is on the cabin side of the break. Mechanism of this type is, broadly considered, not new with me.

My invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

I have omitted from the drawings the connections beyond the "slot" to the cabin and the signal respectively. These form no part of my invention, and are well known to those skilled in the art to which the invention pertains.

In the accompanying drawings forming part of this specification—Figure 1 is a front elevation, partly in section, of the "slot" mechanism and its inclosing case, with the door open. Fig. 2 is a sectional side elevation of the same on line 2—2, Fig. 1, with the door removed. Fig. 3 is a sectional elevation in the same plane as Fig. 1, with the parts in the position they occupy when the signal is at "clear". Fig. 4 is a like elevation, with the parts in the position they assume, when the signal has automatically shifted to "stop".

A is the case, provided with a door A′ and adapted to be secured to the post or support to which is pivoted the signal blade or semaphore, as usual in devices of this character.

B is the lower operating rod, adapted to be connected through suitable intermediaries with the operating lever in the signal cabin. This rod passes up through a suitable bearing in the bottom of the case, wherein it can slide up and down; and on its upper end is mounted and firmly attached the cylindrical tube or sleeve C, which moves with, and forms in effect a prolongation of, the operating rod B. In the present instance the two parts are attached together by a screw joint, the screw threaded upper end of the rod B screwing into the internally screw threaded lower end of the sleeve or tube C.

K is the upper operating rod, which enters the sleeve C from the upper end thereof and extends down therein a comparatively short distance when in normal position as indicated in Figs. 1 and 3. The sleeve C is of such length that when the upper rod K is in this position, there is sufficient interval between the lower end of the upper operating rod and the top of the lower operating rod B, to permit the upper rod to drop the distance requisite to allow the automatic shifting of the signal from "clear" to "stop".

The upper operating rod K is held in its elevated position in the sleeve C (as in Figs. 1 and 3) by a dog formed of a short arm S on the upper end of a lever D pivoted at its top between ears R formed on and projecting laterally from one side of the sleeve C—this dog standing at an angle to the lever D and projecting towards and passing into the sleeve through a vertical slot *c* in the side thereof, and entering a lateral recess in the lower end of the operating rod K, so as to lie just under and in contact with the shoulder *k* which bounds the upper end of said recess. Thus when the lever D is held in place in the position shown in Figs. 1 and 3, the upper operating rod K will rest upon and be upheld by the dog S—in the end of which, where it contacts with the rod K, is a small roller *s* to reduce friction. The lever D owing to the manner in which it is hung, tends by gravity to assume a position in which the dog S will thus engage the rod K. When, however, the lever D is not held in place in the position shown in Figs. 1 and 3, then the weight of the rod K and the signal device to which it is connected will swing the lever D on its pivot outwardly away from the sleeve, in a direction and far enough to carry the dog S out of engagement with the upper rod K. The latter, thus released, will at once drop from

the position shown in Fig. 3, to that shown in Fig. 4, thus accomplishing the automatic shifting of the signal.

The lever D is maintained in the position shown in Fig. 3, by electric instrumentalities. Opposite to the lower end of the lever D is an electro-magnet E (consisting as customary, of a core box and a contained coil of any resistance desired) which is made fast to a base plate E′ on the side of the sleeve C—this base plate being firmly secured to, or formed in one with, the sleeve C. On the lower end of the lever D is mounted an armature F in a position to come opposite to and meet the electro magnet—the armature being, as usual in such cases, loosely connected to a lever by a threaded pin T, or otherwise, so that it may make good contact with the magnet, irrespective of any slight variation in the adjustment of the latter.

On the base plate E′ are two binding posts H, electrically connected, one to one terminal and the other to the other terminal of the coil of the magnet. Connection with the outside electric circuit in which the electro-magnet is included, is maintained through two spring contact strips G, each mounted on and electrically connected to its appropriate binding post. Each spring contact strip has its own contact plate I, these plates being of such length, and secured to the inside of the case A in such position, that their spring contact strips (which move up and down with sleeve C) will maintain contact with them throughout the whole stroke of the lower operating rod.

The contact plates are connected to the outside circuit by coils $j\ j'$ leading from them respectively to binding posts J J′, to which are connected the leading-in wires $x\ x'$ from the outside circuit.

"Slot" contacts thus constructed and arranged are sliding self-cleaning contacts, simple in construction and efficient in action.

In order to steady and hold upright at all times the spring contact strips G, I prolong them above the point at which they are attached to the binding posts H, and secure their upper ends to steady pins or posts P attached to the base plate E′.

The upper operating rod K carries the usual dash pot arrangement for easing the drop, passing for this purpose up through the tubular part N which is fast to the top of the case A and constitutes the inner member of the dash pot—the cylinder O which constitutes the outer member of the dash pot being fast to the upper end of the rod K of the upper operating rod K adjoining the cross pin. Normally, or when the upper operating rod is in elevated position, the pin M rests against the shoulder at the lower end of the groove *m*, this being in order that, when, under these conditions, the lower operating rod is pulled down, the upper operating rod, by the cross pin M, will be pulled down also, thus allowing the signal to be mechanically pulled to stop position by the operator in the cabin, if desired. The length of the groove is such that the upper rod when released may automatically drop to stop position before the upper terminus of the groove is met by the cross pin.

In Figs. 1 and 2 the parts are shown in the position they normally occupy when the signal is in stop or danger position—the lower operating rod B being in retracted position, and the sleeve C being locked to the upper operating rod by the dog S of armature lever D, which is held in that locking position by closure of the circuit in which the electric magnet E is included.

To put the signal to "clear" the lowering operating rod is mechanically raised, together with its sleeve C which thus carries with it the upper operating rod K, the parts finally assuming the position shown in Fig. 3, in which position, so long as the circuit which includes the electro-magnet E is closed, the signal will be held at "clear" or "safety". The continuity of the circuit within the case A is maintained always by the plates I and sliding contact spring strips G whatever the position of the sleeve C, whether up or down.

If while the parts are in the position shown in Fig. 3 (in which the signal is at "clear") the magnet E becomes deënergized from any cause, as by the opening of the track relay included in the outer circuit or otherwise, the armature lever D will be released, the weight of the upper operating rod and "spectacle casting" etc. with which it is connected will have the effect of forcing the dog S (and consequently the armature lever) outwardly far enough to disengage the upper operating rod, which latter will at once drop, and the signal will consequently shift automatically to "stop" position. The parts in this position are shown in Fig. 4. After the signal has thus automatically shifted to "stop" position, it cannot be reset to "clear" without first returning the lower operating rod and its sleeve C to their lower position shown in Fig. 1. But even then, the lower operating rod will be ineffective for this purpose so long as the magnet E remains deënergized; because

upper operating rod whenever the sleeve C rises.

Under my improved arrangement the inclosing case or shell of the "slot" mechanism is a fixture, being permanently attached to the post or other support provided for it. The signal operating appliances, viz: the upper and the lower operating rods, the dog for locking them together and the electro-magnet and armature lever for controlling the dog, are the members which travel up and down in the case—the dog, the electro-magnet and the armature lever being all of them mounted on the sleeve C and thus being carried by and moving up and down with the lower operating rod B of which the sleeve forms part. The dog may be made separate from the armature lever, and may be separately mounted on the sleeve in a position to be actuated by the armature lever. But for the sake of simplicity of construction and enhanced efficiency of action, I prefer to form it in one with the armature lever as shown. The slot *c* in the sleeve C is made of considerably greater length than is needed merely for an opening through which the locking dog may work. This is for the purpose of reducing weight.

In practice the sleeve is made preferably with four such slots—one for each quarter of its circumference. The lower operating rod B is in fact a rod having a tubular upper portion, or in other words a guideway, to receive the lower end of the upper operating rod. This guideway, as a matter of convenience, consists of a sleeve or tube C made separate from the solid portion of the rod and then secured to the same. This however is a mere matter of structural detail which manifestly can be a varied without departure from my invention.

The device thus constructed has fewer parts and is therefore cheaper to manufacture and maintain than other "slots" of which I have knowledge. And these parts are so located and arranged that they can be readily inspected and reached by the operator. The electric contacts are, as before said, sliding self-cleaning contacts; and the armature is so mounted on the sleeve that it is restored to normal position by gravity, without dependence upon springs or other extraneous mechanical appliances for this purpose. The cross pin M in the upper part of the sleeve furnishes a simple and convenient arrangement whereby so long as the circuit of the electro-magnet E remains in normal condition, the signal can be mechanically pulled from "clear" to "stop" position, whenever desired.

Having described my improvements and the best way now known to me of carrying the same into practical effect, I state in conclusion that I do not limit myself strictly to the structural details hereinbefore set forth in illustration of said improvements since manifestly the same can be varied in a number of particulars without departure from the spirit of the invention: but

What I claim herein as new and desire to secure by Letters Patent is as follows:

1. The supporting case, the lower operating rod movable up and down therein and provided at its upper end with a sleeve, and the upper operating rod entering and movable up and down in said sleeve, in combination with the lever formed as an elbow lever pivoted at its elbow to the upper end of said sleeve having a depending longer arm and a shorter arm which enters the sleeve through a slot therein in position to engage, as a dog, the upper operating rod, an armature mounted on said longer arm, and an electro-magnet mounted on the lower portion of the sleeve and interposed between said sleeve and the armature.

2. The combination with the lower operating rod having a tubular upper portion or guide-way, and the upper operating rod entering and movable up and down therein and provided on one side with a vertical groove of a length at least equal to the drop of said rod in automatically passing from "clear" to "stop" position, of electro-magnetically controlled appliances carried by the lower operating rod for interlocking the upper and lower operating rods, and a cross pin in the tubular portion of the lower operating rod extending transversely across and through said groove in the upper operating rod, substantially as and for the purposes hereinbefore set forth.

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

GEORGE SAMUEL PFLASTERER.

Witnesses:
ED CHAVANNES,
W. S. LYNCH.