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F. W. FRANCIS.

SWITCHING APPARATUS FOR TELEPHONIC OR OTHER SWITCHBOARDS.

APPLICATION FILED AUG. 12, 1901.

NO MODEL.

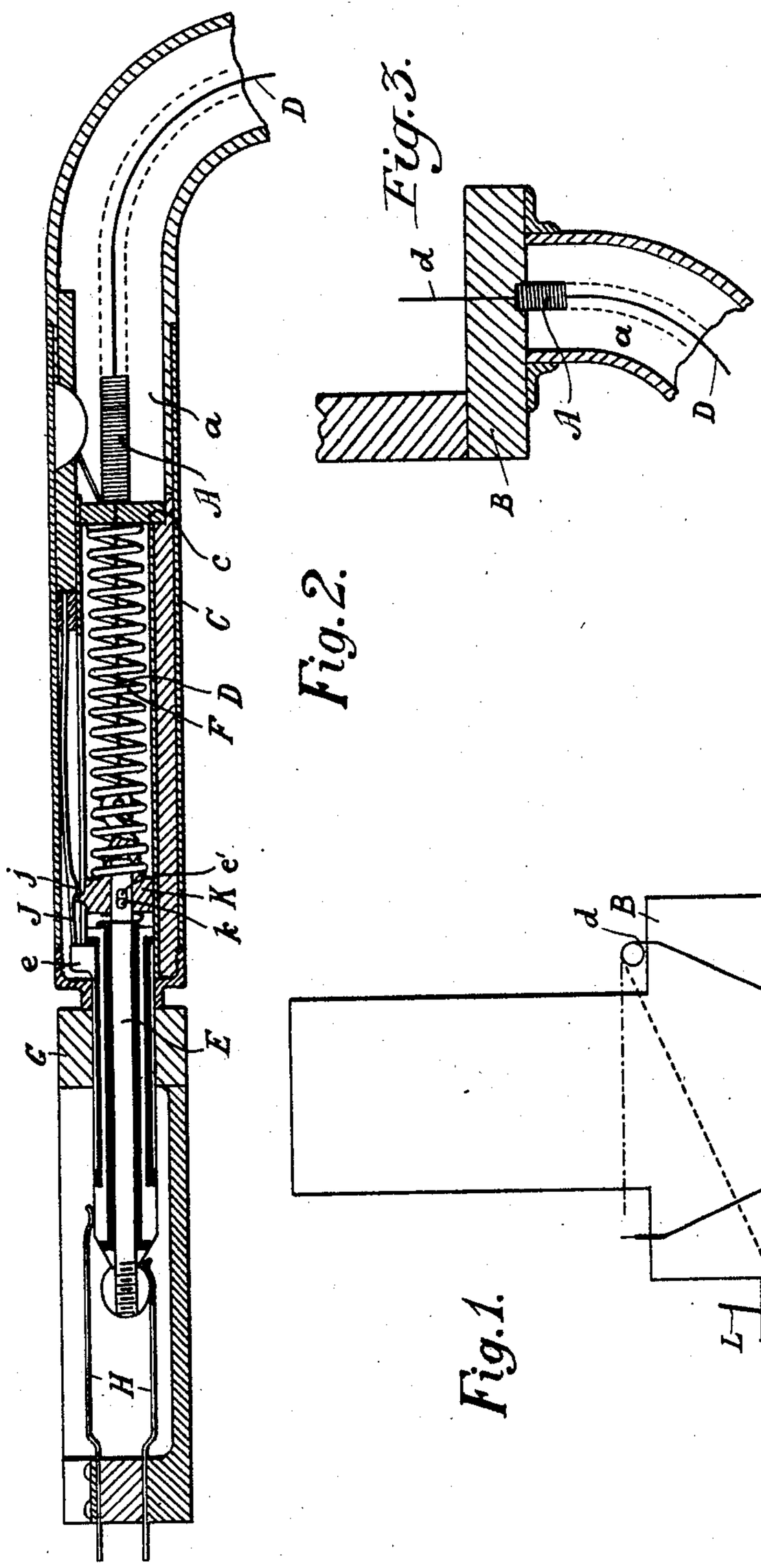

Fig. 2.

Fig. 3.

Fig. 1.

Witnesses.

S. Wills.

H. Smith

Inventor.

Frederic W. Francis

by

Charles Bauer

Attorney.

No. 745,341. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

FREDERIC W. FRANCIS, OF LONDON, ENGLAND.

SWITCHING APPARATUS FOR TELEPHONIC OR OTHER SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 745,341, dated December 1, 1903.

Application filed August 12, 1901. Serial No. 71,835. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC WILLIAM FRANCIS, a subject of the King of Great Britain and Ireland, residing at Audley House, Brockley Hill Park, Forest Hill, London, England, have invented new and useful Improvements in Switching Apparatus for Telephonic or other Switchboards, of which the following is a specification.

This invention relates to improvements in connection with switching apparatus for telephonic and other switchboards, and has for its object to facilitate the removal or disconnection of the plugs from the jacks into which they have been placed by the operator. This removal has hitherto been accomplished by the operator either pulling the cord to which the plug is attached or by reaching out or up and pulling the plug itself out of the jack, all of which necessitates the expenditure of considerable time and labor not only in actually disconnecting the plug, but often also in tracing the plug that is to be disconnected. My invention is intended to obviate these defects in the operation of telephones by providing means which may be actuated by the operator, in which event said means would be in close and convenient proximity to the operator, or which are automatically actuated without the intervention at all of the operator; and for this purpose my invention consists in the application of a practically-incompressible flexible tube, which may be a closely-wound wire helix, and a wire, cord, or equivalent running freely through said flexible tube, the parts being so arranged and the plug being of such suitable construction that the pulling or actuation of said wire effects the removal or disconnection of the plug from the jack.

As already indicated, the plug which I employ is of special construction. Telephonic-switchboard plugs as hitherto used have a part at the front end, known as the "sleeve" end, which is the part to be inserted into the jack, and another part, known as the "body," by means of which the plug is grasped by the operator, both the sleeve end and body forming the complete plug and consisting practically of one piece. The plug which I employ has also a sleeve end, to be inserted into the jack, and a body, but with this difference, that the sleeve end is capable of being telescoped or drawn into the body, the two parts being normally kept in extension or distended by a suitable spring and the dimensions of the sleeve end and body being such that when the former has been inserted the proper distance into the jack the front end or edge of the body will be in contact with the face of the jack, so that it is only necessary to telescope or draw the sleeve end into the body, when the complete plug will have been disconnected from the jack and will fall away.

In order that my invention may be readily understood, I make reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic view showing a switchboard and plug, which latter is carried by the usual cord. Fig. 2 is a sectional side elevation, on an enlarged scale, showing one of my improved telescopic plugs inserted in its jack; and Fig. 3 is a sectional side elevation showing the cord *a*, flexible tube A, and wire D attached to the cord-fastener shelf.

In carrying my invention into practice I employ a practically-incompressible flexible tube A, which may consist of a closely-wound wire helix, as shown, and which in practice would be situated within the usual cord *a*, one end of which flexible tube is fixed to a suitable part of the cord-fastener shelf B, and the other end of which flexible tube presses against a disk or equivalent *c* with which the body C of the plug is formed or provided. Passing freely through said flexible tube A is a wire or equivalent D, one end of which is attached indirectly, as will be hereinafter described, to the rear end of the sleeve portion E of the plug, and the opposite end *d* of which wire projects beyond the end of the flexible tube A where the latter is attached to the cord-fastener shelf B. The sleeve portion E of the plug (which is the part that is inserted into the jack) is made separate from and is adapted to be drawn or telescoped into the body C of the plug, a spring F pressing at one end against the

disk *c* of the body C and at its other end against the inner end of the sleeve portion E, normally causing the latter to project out of the body C of the plug, as shown. If now the end *d* of the wire D be pulled or actuated, the incompressibility of the flexible tube A will cause the force exerted to be transferred to the sleeve end E of the plug, which end E will be drawn or telescoped into the body C, and thus removed or disconnected from the jack G.

As the jack G and its springs H (all of which are of usual construction) offer some fairly considerable frictional resistance to the insertion of the sleeve end E of the plug, which would cause the compression of the spring F unless made unduly stiff, I provide said end E with a catch or projection *e*, adapted to slide in a slot formed in the body C when said part E is being drawn in, as hereinbefore described. To a convenient part of said body C, I fix a spring-pawl or equivalent J, having a cam-piece or the like *j*, and at the rear or inner end of the part E of the plug and adapted to slide thereon I provide a sleeve or equivalent K, having a pin *k*, which passes through a slot *e'* in the part E.

The wire or equivalent D is attached to the sleeve K, and the arrangement of the parts is such that when the wire D is pulled the sleeve K will be drawn rearward on the part E until its pin *k* encounters the end of the slot *e'*. In the meantime, however, the upper part of the sleeve K (which may be provided with a pin or the like for the purpose) will have come in contact with the cam-piece *j*, and thereby raised the spring-pawl J out of engagement with the catch *e*, and if the pull on the wire D be continued the part E will be drawn or telescoped into the body C. When the wire D is released, the spring F will cause all the parts to resume their normal position, as shown. Without pulling the wire D the spring-pawl J will prevent the part E being pushed or telescoped into the body C, so that when inserting said part into the jack it will be held firmly in its position.

The end *d* of wire D would in practice be connected to a chain or equivalent, (indicated in dotted lines in Fig. 1,) the opposite end of which would be situated in more or less close proximity to the operator, who need only pull this chain to disconnect the plug instead of having to first trace the relative plug and disconnect it from the jack in the hitherto usual manner, and the labor necessary and the time required in operating would thereby be considerably reduced. Instead of the operator pulling the wire or chain in the manner described I may provide a suitable lever, the operation of which will pull or actuate said wire, or I may attach said wire or the chain or equivalent to the usual operating-lever L.

The various electrical connections and insulations, as well as the conducting-wires necessary for the working of the telephone, are carried out and arranged in any usual manner, and they do not form part of my invention.

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

1. In switching apparatus the combination of a telescopic plug, a practically-incompressible flexible tube and a wire running freely through said tube, all for the purposes and substantially as set forth.

2. In switching apparatus the combination of a plug consisting of a sleeve end and a body part, the sleeve end being adapted to be telescoped or drawn into the body part of such plug and normally held in its extended position by a spring, a practically-incompressible and flexible tube situated between and pressing against the body part of the plug and that part of the switchboard to which the fixed end of the cord is attached, a wire running freely through said flexible tube and fixed at one end to the sleeve end of the plug and projecting at its other end beyond the end of said flexible tube, all for the purposes and substantially as set forth.

Dated this 3d day of August, 1901.

FREDERIC W. FRANCIS.

Witnesses:

HY. IMRIE,

H. ADAMS.