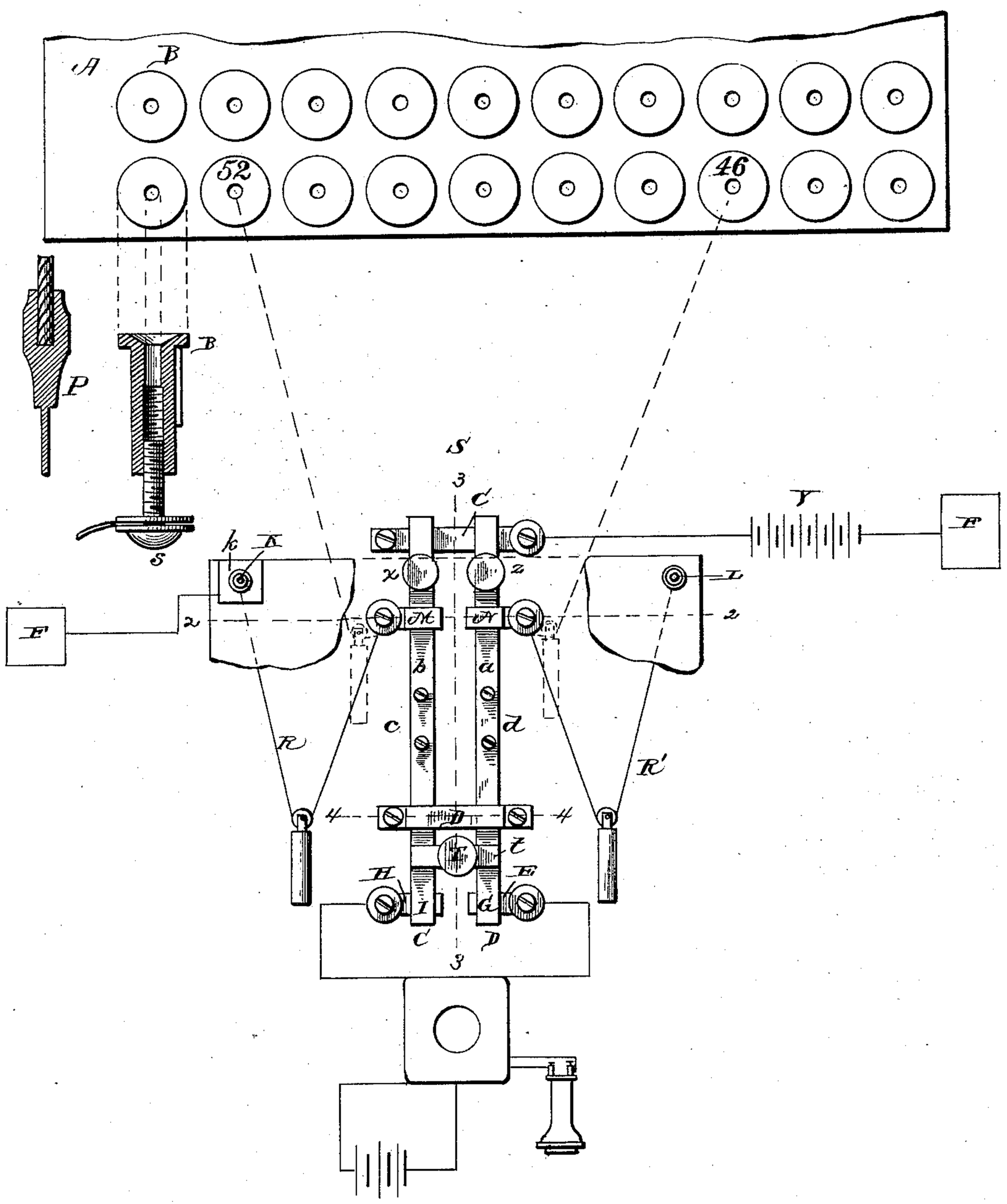
(No Model.) 2 Sheets—Sheet 1.

H. K. GOODWIN.

TELEPHONE SWITCH.

No. 302,330. Patented July 22, 1884.

Fig. 1.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

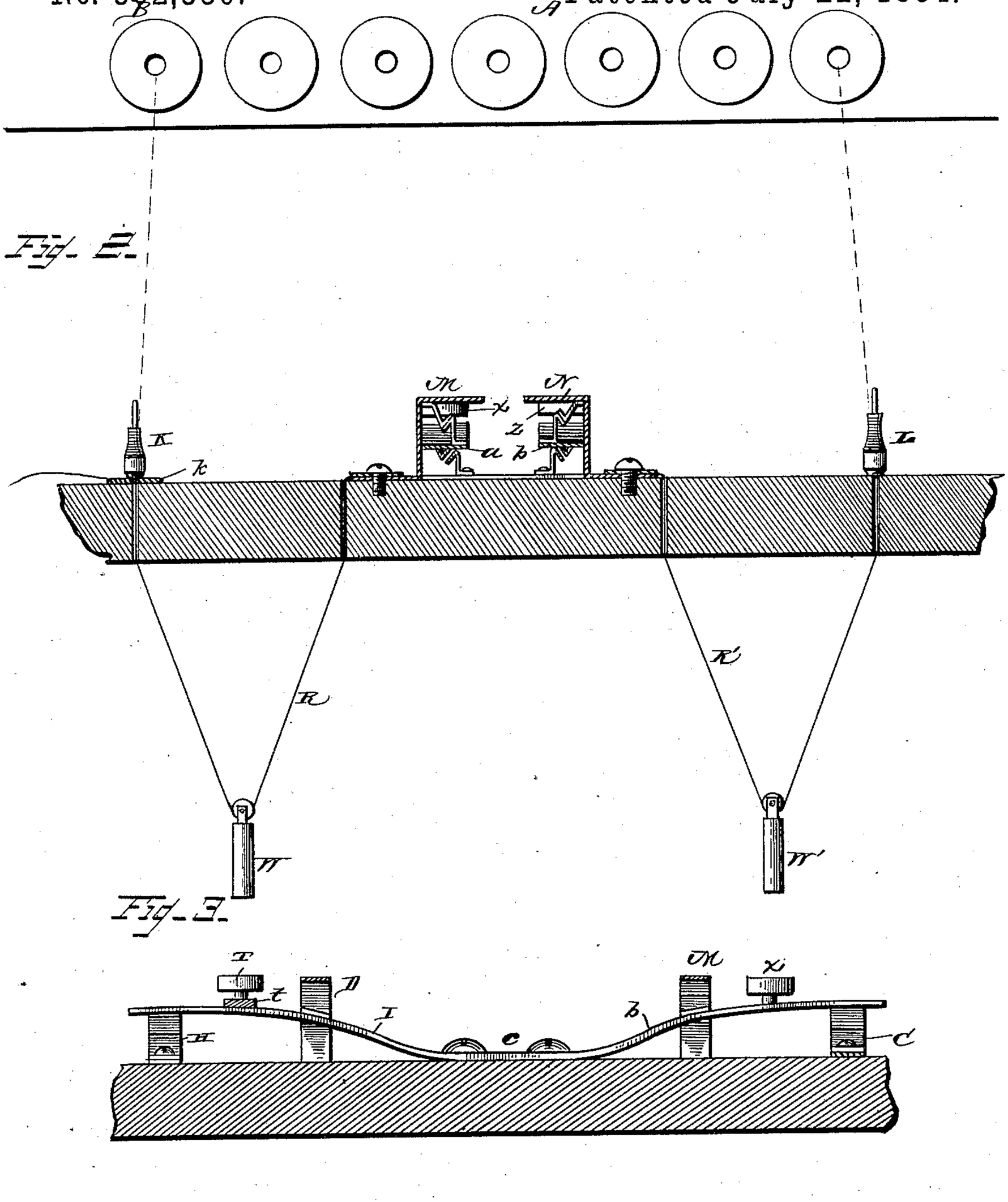
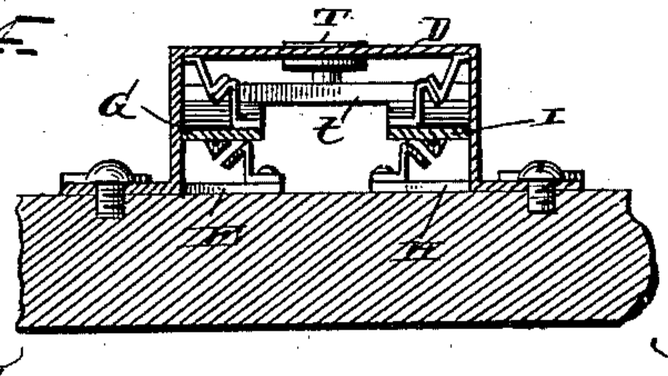


Fig. 3.

Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY K. GOODWIN, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALBERT D. SWAN, OF SAME PLACE.

TELEPHONE-SWITCH.

SPECIFICATION forming part of Letters Patent No. 302,330, dated July 22, 1884.

Application filed February 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY K. GOODWIN, of Lawrence, county of Essex, and State of Massachusetts, have invented a new and useful Improvement in Telephone-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention consists in a compound hand-switch, included in the flexible cord conductor usually employed for connecting any two subscribers at a central-office switch-board, and provided with various connections, whereby any subscribers may be readily connected with another or to ground, and when so connected can be easily signaled or put in telephonic communication with the central-office operator.

In the accompanying drawings, Figure 1 is a general diagrammatic view of the switch-board, with its line-terminals, the connecting-cords, switch, and connections. Fig. 2 shows a section on line 2 2, Fig. 1. Fig. 3 shows a section on line 3 3, Fig. 1; and Fig. 4 shows a section on line 4 4, Fig. 1.

In Fig. 1, A is a section of the switch-board to which each line is brought, the lines terminating in metallic sockets B, adapted to receive metallic plug P. Each socket B has a screw-threaded opening at its lower end, into which screw *s*, to which the incoming line is attached, is run.

S represents my improved connecting-switch, placed on a table or otherwise arranged in the neighborhood of the switch-board, so that the operator has both switch and board within easy reach. Switch S consists of four keys, *a b* and I G, the first two being provided with press-buttons X and Z, respectively, and the last two connected by an insulating-bar, *t*, to which the common press-button, T, is attached. Keys *a* and G are formed of a single piece of spring metal fastened to the base-plate at its center *d*, and thrown up by the resiliency of the metal at each end. Keys *b* and I are similarly made of a single strip fastened at *c*.

Keys *a* and *b* normally rest in contact with their respective back-stops N and M, and when depressed each make contact with the common anvil C, while keys I and G are normally in contact with their common back-stop D, and when simultaneously depressed by button T they make contact with their respective anvils H and E. The various points of contact of the several keys consist of small metallic projections having contact-surfaces inclined at an angle to the line of movement of the switch or key, so that the surface will first meet and then rub slightly on each other, and thereby keep a clean contact-surface. This construction is shown plainly in Figs. 2 and 4.

To M and N, respectively, are connected the flexible conducting-cords R R′, which are normally drawn down beneath the table by the weights W W′, as shown in Fig. 2, their outer ends extending up through perforations in the table, and terminating in metallic plugs K and L, similar to P of Fig. 1. Plug K normally rests down under the influence of weight W upon plate *k*, which is connected to ground F, while plug L rests on the insulating-top of the table. To C is connected one pole of calling-generator V, the other pole being connected to ground; and contacts E and H are connected to the through-terminals of the operator's telephone.

In operation the subscriber calls the central office in any of the usual ways, or by the method set forth in an application filed by me February 9, 1884. The central office, for example, receives a call from subscriber No. 46. He immediately takes plug L and inserts it in socket No. 46 and depresses button T, thus forming a circuit from the subscriber's ground, by line 46, plug L, cord R′, contact N, strip *a* and G, contact E, telephone, contact H, strip I and *b*, contact M, cord R, plug K, plate *k*, to ground F. The operator is thus in communication with the subscriber, and learns that a connection is wanted with, say, No. 52. The operator thereupon takes plug K and inserts it in socket 52, depressing button Z. A circuit is thus formed from ground of subscriber 52 by line to plug K, cord R, contact M, strip *b*, contact D, strip *a*, contact C, calling-battery V, to ground F. No. 52 is thus rung up, and button Z being released, the two lines are left in connection. If necessary, 46 can be called up by depressing button X, just as 52 was called by depressing Z, and at any time, by depressing T, the operator's telephone can be looped

into the line, so that he can ascertain if their conversation is ended or converse with one of them himself.

I am aware that it is not new to provide a stationary switching device consisting of duplicate keys and contacts in the circuit of the flexible connecting-cord, and that the various instruments of the station apparatus may be included at will in the circuit; but I have produced certain definite improvements in such apparatus, which are specified in the claims.

What I claim as my invention is—

1. The combination of a central-office switch-board having line-terminals thereon, a removable conductor adapted to make connection between any two line-terminals, and a stationary switching device included in said conductor, the said device consisting of spring-keys which normally maintain complete the circuit of said conductor, contact-anvils connected with a signaling-battery, and contact-anvils connected with the central-office telephone, respectively, and with which the said keys are adapted to make contact.

2. The combination of a central-office switch-board having line-terminals thereon, a removable conductor adapted to make connection between any two line-terminals, two stationary keys normally in connection with each other and resting against their respective back-stops, said stops being connected, respectively, to the two parts of said conductor, a common anvil for said keys, and a calling-generator connected thereto, whereby a current can be sent from the generator over either main line.

3. The combination of a central-office switch-board having line-terminals thereon, a removable conductor adapted to make connection between any two line-terminals, two keys in the circuit of said conductors normally resting against a common stop, a common press-button for actuating said keys, and two contact-anvils for said keys, connected to the two normally-insulated terminals of the central-office telephone.

4. The combination of a central-office switch-board having line-terminals thereon, a removable conductor having at each end a plug adapted to make contact with a line-terminal, two supports for said plugs, one of which is a metallic plate connected to earth, two keys in circuit of said conductor normally in electrical connection and maintaining the circuit complete, and a calling-generator and central-office telephone, either of which may be included in circuit at will by movement of said keys.

5. The combination of a central-office switch-board having line-terminals thereon, a removable conductor having one terminal adapted to connect with any line-terminal, and the other provided with a normal earth-connection, a switch in the circuit of said conductor which normally maintains the circuit complete, and the two terminals of the central-office telephone in the path of said switch, whereby the central office may communicate with a subscriber at will.

6. The combination of the switch-board, the flexible conductors R R′, and switch S, consisting of the four keys, two contacts connected to conductors R R′ and two connected to the telephone-terminals, the common contact-points C and D, the former being connected to generator V.

In testimony whereof I have hereunto set my hand this 15th day of February, A. D. 1884.

HENRY K. GOODWIN.

Witnesses:

DUNCAN B. CANNON,

W. H. WOODHULL.