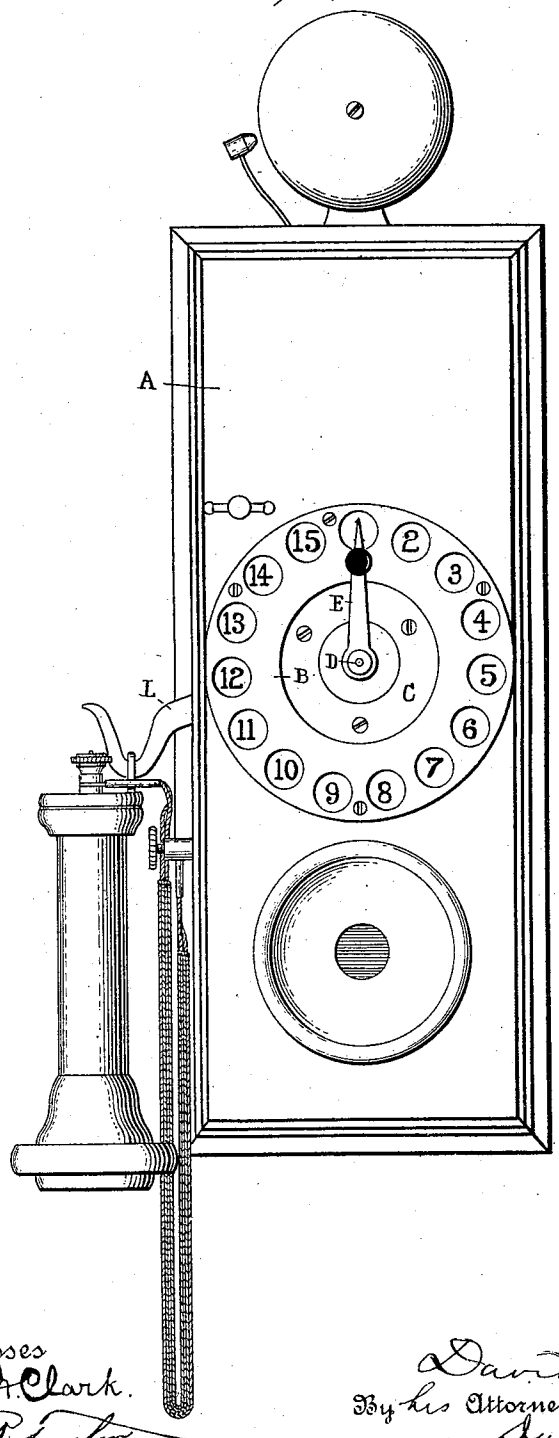
(No Model.) 3 Sheets—Sheet 1.

# D. ROUSSEAU.

## TELEPHONE SWITCH.

No. 567,170. Patented Sept. 8, 1896.

Fig. 1.




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# D. ROUSSEAU.

## TELEPHONE SWITCH.

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Fig. 2.

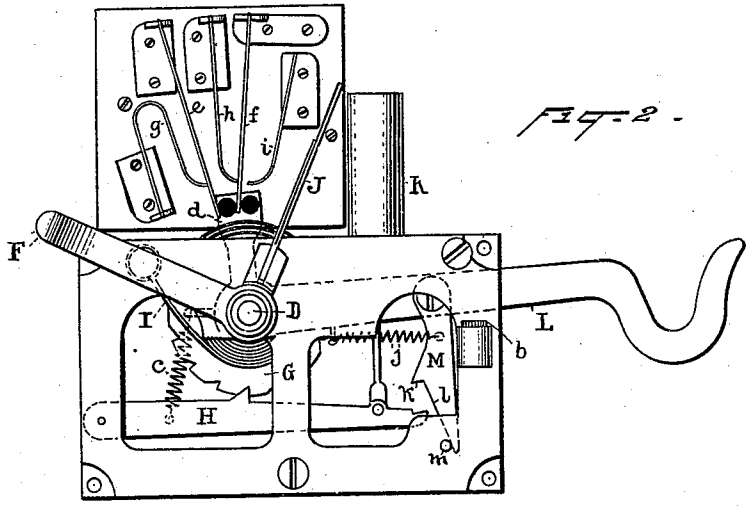



Fig. 3.

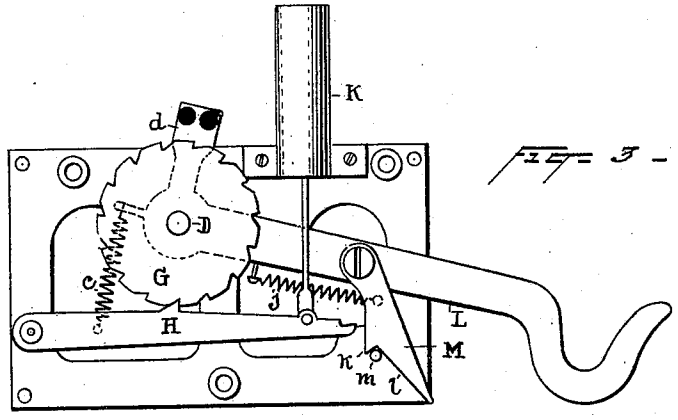
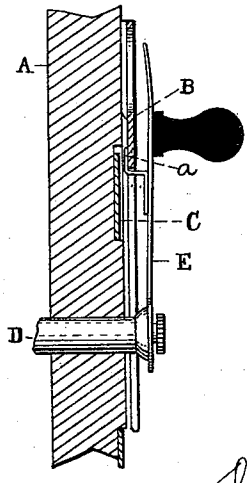



Fig. 4.




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# D. ROUSSEAU.

## TELEPHONE SWITCH.

No. 567,170. Patented Sept. 8, 1896.

Fig. 5.

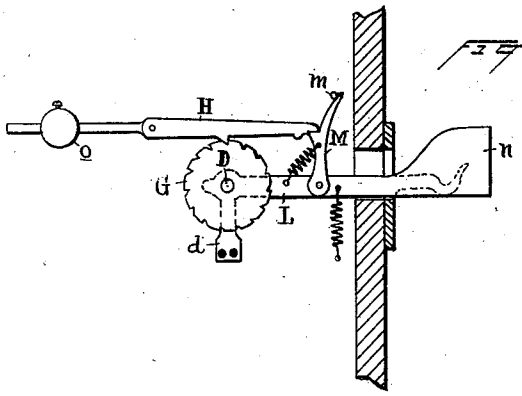



Fig. 7.

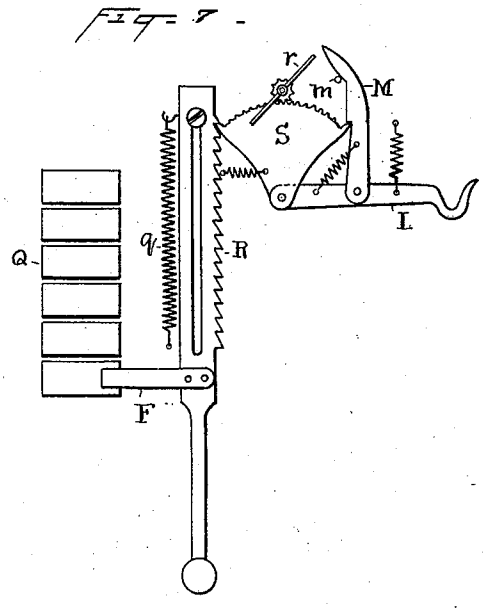
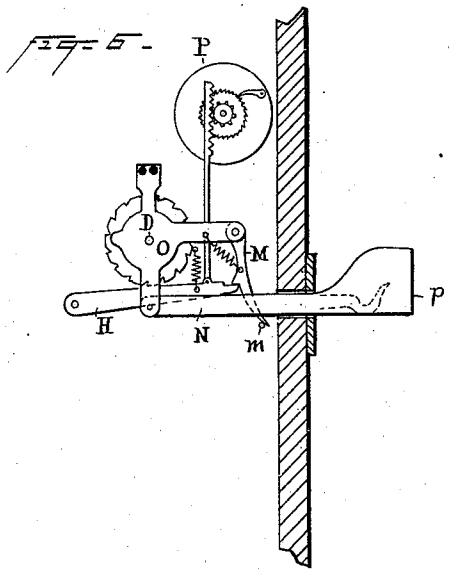



Fig. 6.




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# UNITED STATES PATENT OFFICE.

DAVID ROUSSEAU, OF NEW YORK, N. Y.

## TELEPHONE-SWITCH.

SPECIFICATION forming part of Letters Patent No. 567,170, dated September 8, 1896.

Application filed March 18, 1895. Serial No. 542,101. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID ROUSSEAU, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Telephone-Switches, of which the following is a specification.

The object I have in view is to produce a telephone-switch for enabling communication to be established by the subscriber with a number of telephone-stations, which will be simple in construction and effective in operation, will require the minimum number of manipulations by the user, and will be automatically restored to its normal position when the user has finished talking.

In carrying out my invention I employ, as usual, a range of contact-plates with which the lines running to the several stations are connected, and over which travels a switch-arm which is moved onto the proper contact-plate by the operator of the calling-telephone. The switch-arm is held in the position to which it is moved by a pawl and ratchet against the tension of a spring, which is strained by the moving of the switch-arm. The pawl or detent which holds the switch-arm in the position to which it is adjusted is released by the operation of hanging the receiving-telephone on its hook, which operation likewise shifts the circuit connections, as usual, from the talking to the signaling arrangement. The pawl or detent is withdrawn by hanging the telephone on its hook by a dog, which is tripped and releases the detent, so that the detent returns into engagement with the ratchet, but this return movement is retarded by any suitable device, so that the switch is given time to return to its normal position before the detent engages the ratchet. A further feature of my switch is a construction whereby the handle or pointer by means of which the switch-arm is moved is also utilized as the push-button for closing the signaling-circuit.

The invention consists in the several devices and combinations of parts more particularly hereinafter set out in the claims.

In the accompanying drawings, forming a part hereof, Figure 1 is a front view of a telephone set embodying my invention, showing the receiver hung upon its hook. Fig. 2 is an elevation from the rear side of the switch mechanism with the switch-arm turned partly around, so as to disclose the contact-springs for shifting the circuit connections, and with the telephone-receiver removed from the hook. Fig. 3 is an additional view showing the position of the parts with the telephone-hook depressed. Fig. 4 is a section on the line of the operating-handle and through the plates with which it coöperates to open and close the signaling-circuit. Figs. 5, 6, and 7 are views, partly diagrammatic, of modified constructions.

Referring to Figs. 1, 2, 3, and 4, A is the cover of the telephone set, upon which are mounted two circular plates B C, insulated from each other and separated a short distance, as shown in Fig. 4. The contact-plate B is in the talking-circuit and the contact-plate C is in the signaling-circuit. D is the main shaft of my switch, which passes through the cover A and carries on its outer end the operating handle or pointer E, which is made of spring metal and is provided with a contact-tongue *a*, projecting under the plate B and normally in contact with the under side of that plate. By depressing or pushing in the handle or pointer E the contact-tongue *a* is separated from the plate B and makes contact with the plate C. This movement of the handle or pointer effects the closure of the signaling-circuit to the station with which the apparatus is connected and rings the bell at that station, as will be well understood. By this construction of the switch handle or pointer the operator is enabled, after turning the pointer to the proper station, to call up that station by simply depressing the handle, the plates B C being in the same relation to the handle and its contact-tongue *a* in all positions of adjustment of the handle. The shaft D at its inner end carries a switch-arm F, which moves over a circular range of contact-plates, (not shown,) as usual, which contact-plates are connected with the several stations. Upon the shaft D is a ratchet-wheel G, with which engages a tooth on the detent-lever H, which prevents the shaft from being turned except in one direction and holds it at any position of adjustment. A helical spring I returns the shaft to its normal position and a stop-arm J, strik-

ing a rubber-tipped stop *b*, determines the position of rest of the parts. The spring I is given an initial tension, so that the shaft D is returned quickly and positively to the position of rest when released. The detent-lever H is connected by a link with the plunger of a dash-pot K, which retards the return movement of the detent-lever, which return movement is effected by a spring *c*. L is the telephone-hook, which is a lever pivoted upon the shaft D and lifted by the spring *c*. The telephone-hook carries an arm *d*, provided with pins of insulating material, which coöperate with two contact-springs *e f*, moving them between other contact-springs *g h i*, for shifting the circuit connection from talking to signaling connections, and vice versa, by the movement of the telephone-hook, as will be well understood. The telephone-hook is provided with a dog M, pivoted thereon and drawn inwardly by a spring *j* toward the end of the detent-lever H. This dog has a tooth *k*, which engages the end of the detent-lever when the telephone-hook is moved downwardly. The end of the dog M has an inclined surface *l*, engaging with a pin *m*, tending to throw the dog outwardly and away from the end of the detent-lever and acting to disengage the dog from the detent-lever just before the telephone-hook reaches its lowermost position, which is determined by the striking of the tooth *k* on the pin *m*. When the telephone is hung on the hook, the parts are in the position shown in Fig. 3, the detent being in engagement with the ratchet-wheel. The switch-handle may now be turned to any point of adjustment, as, for instance, that shown in Fig. 2, and the telephone-station connected with the plate on which the switch-arm rests can be called by depressing the switch handle or pointer. The telephone being removed from the hook, the parts will be in the position shown in Fig. 2, the switch not being disturbed by the upward movement of the telephone-hook. After the conversation is ended the user will hang his telephone on the hook, when the depression of the hook will cause the dog M to engage the detent-lever H, depressing that lever and disengaging the ratchet-wheel, when the spring I will throw the shaft D and the switch-arm F around until the stop-arm J strikes the stop *b*, when the switch-arm will be upon the contact-plate for the particular station. The further downward movement of the telephone-hook will trip the dog M, releasing the detent-lever H, which will return with a retarded movement and engage the ratchet-wheel. This retarded movement of the detent-lever prevents the engagement of the ratchet-wheel and the arresting of the parts before they have returned to their normal position.

Many devices for accomplishing the automatic restoration of the switch by hanging the telephone on its hook could be employed without departing from the spirit of my invention. In Fig. 5 the telephone-hook is stationary, and the lever L, which corresponds with the telephone-hook lever of Figs. 1, 2, and 3, is provided with a hood *n*, covering the telephone-hook, which hood it is necessary to raise in order to hang the telephone on its hook. The raising of the hood *n* moves the lever L and accomplishes the results accomplished by the movements of the lever L in Figs. 1 to 3. In Fig. 5 is also illustrated a modification of the means for retarding the return movement of the detent-lever H. In this figure the detent-lever is provided with a counterbalancing weight *o*, which does not quite counterbalance the weight of the lever, but causes the return movement of the lever to be retarded. In Fig. 6 is shown another modification, in which the telephone-hook is likewise stationary and is covered by a hood *p* on the end of a sliding rod N, which is connected at its inner end with a rocking arm O, pivoted on the shaft D and carrying the dog M. In order to hang the telephone on the hook, the hood *p* must be pushed inwardly, thus moving the rocking arm O and giving the dog M the required movements. For retarding the return movement of the detent-lever a heavy fly-wheel P is provided, which is connected through a rack and pinion and a pawl and ratchet with the detent-lever, so that the downward movement of the detent-lever will not move the wheel, but the upward movement of the detent-lever will be retarded by the movement of the wheel.

In Fig. 7 is shown a further modification, in which, instead of using a rotating switch, there is provided a straight range of contact-plates Q, over which the switch-arm F travels. Switch-arm F is carried by a sliding bar R, drawn in one direction by a spring *q* or by gravity, or both, and pushed in the other direction by the hand. The position to which the bar R may be adjusted by hand is maintained by a detent-segment S, whose movement is retarded by the fan *r*. The dog M, carried by the telephone-hook L, withdraws the detent-segment from engagement with the ratchet-teeth on the bar and allows the bar to return to its normal position when the telephone is hung on the hook.

It will be observed that in all these modifications the same essential idea is embodied as is embodied in the preferred form of construction, namely, the switch is automatically restored by hanging the telephone on its hook, and this is accomplished in each instance by a detent which is tripped by the hanging of the telephone on its hook and has a retarded return movement which enables the switch-arm to be thrown by a spring to its normal position.

What I claim is—

1. In a telephone-switch, the combination with a switch-arm, and means tending to maintain the same in its normal position, of a detent-lever for locking the switch-arm at various points of adjustment, means con-

trolled by the hanging of the telephone on its hook, for moving the detent-lever a sufficient distance from its locking position, and a retarding device for retarding the movement of the detent-lever toward its locking position, whereby the switch-arm will be free to return to its normal position, substantially as set forth.

2. In a telephone-switch, the combination with a switch-arm, and a spring tending to maintain the same in its normal position, of a ratchet connected with the switch-arm, a detent-lever engaging with said ratchet for locking the switch-arm at various points of adjustment, a dog controlled by the hanging of the telephone on its hook, for disengaging the detent from said ratchet and moving said detent a sufficient distance from said ratchet, and a retarding device for retarding the return movement of the detent toward said ratchet, whereby the switch-arm will be free to return to its normal position, substantially as set forth.

3. In a telephone-switch, the combination with the switch-arm, a spring for returning it to its normal position, the ratchet and detent-lever for holding it at various positions of adjustment, means for retarding the return movement of the detent-lever, the dog moved by the hanging of the telephone on its hook and engaging the detent-lever, and the pin for releasing the detent-lever from the dog, substantially as set forth.

4. In a telephone-switch, the combination of a base, a metal plate secured to said base, a second metal plate above said first plate and overlapping the same, a handle or pointer moving above said plates, and a tongue mounted on said handle located between the two plates and normally in engagement with one of said plates, said handle or pointer being movable toward the other plate, whereby contact of said tongue with the latter may be made at any position of movement of said pointer, substantially as set forth.

5. In a telephone-switch, the combination of a base, an arc-shaped metal plate secured to said base, a second arc-shaped metal plate above said plate and overlapping the same, a handle or pointer pivoted to said base and moving above said plates, a tongue mounted on said handle located between the two plates and normally in engagement with one of said plates, said handle or pointer being movable toward the other plate, whereby contact of said tongue with the latter may be made at any position of movement of said pointer, substantially as set forth.

6. In a telephone-switch, the combination of a base, a metal plate secured to said base, a second metal plate above said first plate and overlapping the same, a handle or pointer moving above said plates, a tongue mounted on said handle located between the two plates and normally in engagement with one of said plates, said handle or pointer being movable toward the other plate, whereby contact by said tongue with the latter may be made at any position of movement of the pointer, a switch-arm moving coincidently with said pointer, and a series of contact-plates carried on said base to which the various circuits are connected, and with which said switch-arm makes contact, substantially as set forth.

This specification signed and witnessed this 13th day of March, 1895.

DAVID ROUSSEAU.

Witnesses:
EUGENE CONRAN,
W. PELZER.