

R. F. PICKENS.
SUBSCRIBER'S AUTOSWITCHING SYSTEM FOR INTERCOMMUNICATING TELEPHONES.
APPLICATION FILED MAY 19, 1914.

1,152,968.

Patented Sept. 7, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

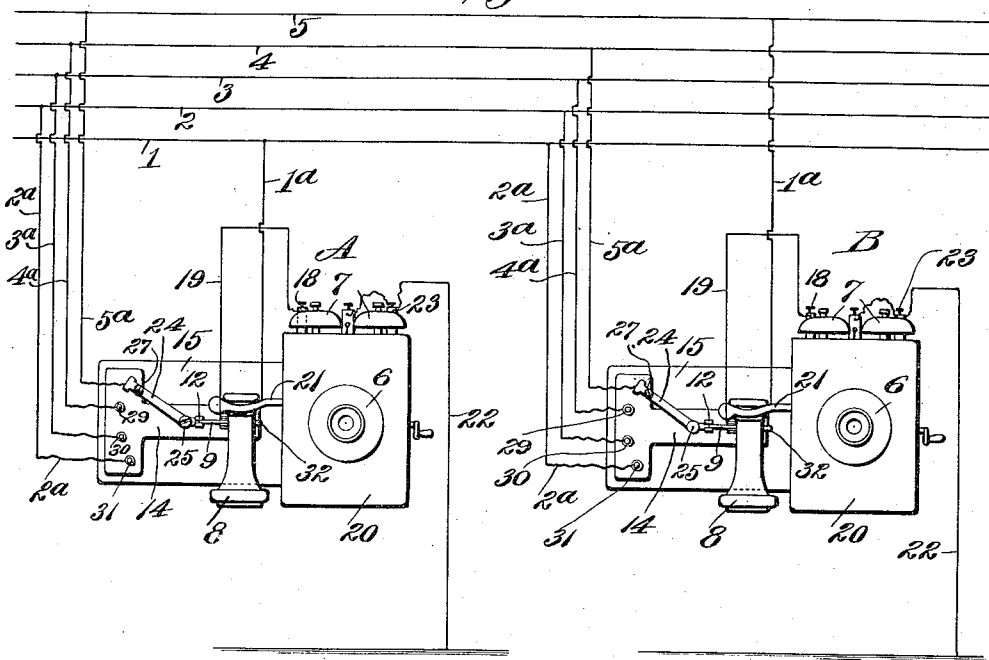
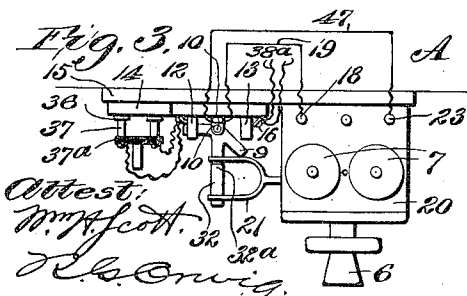
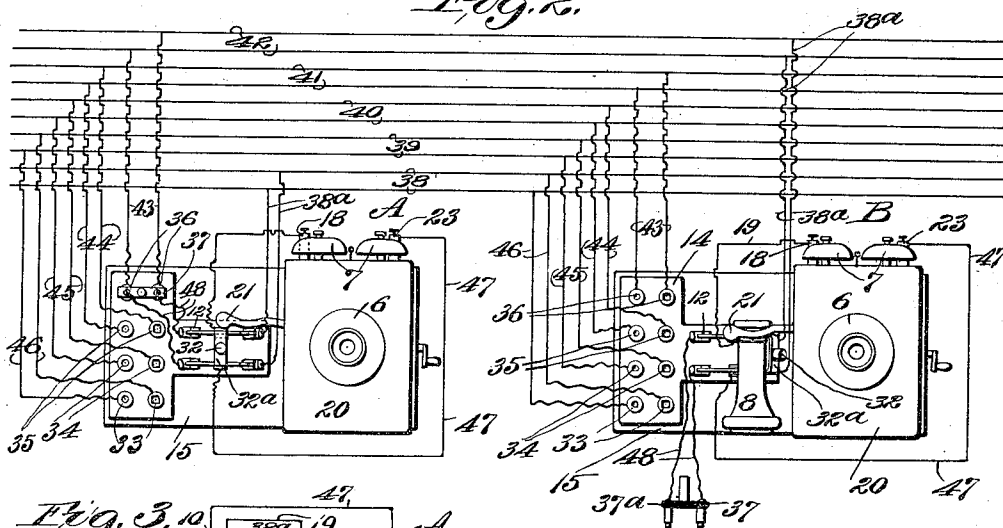


Fig. 2.



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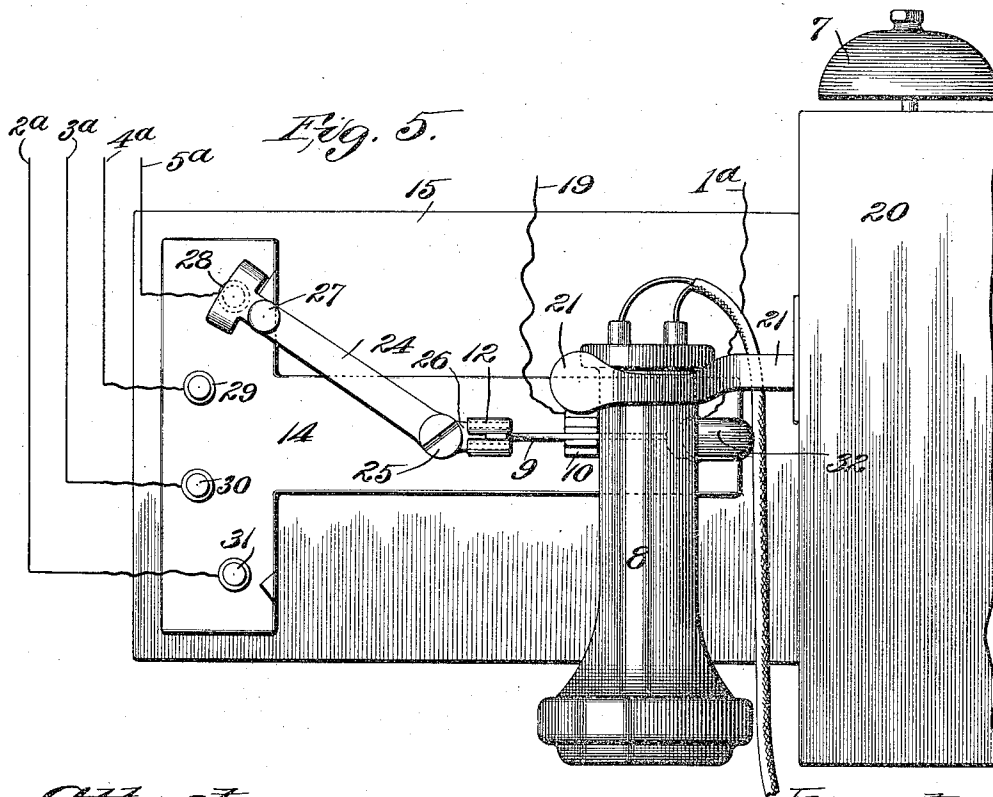
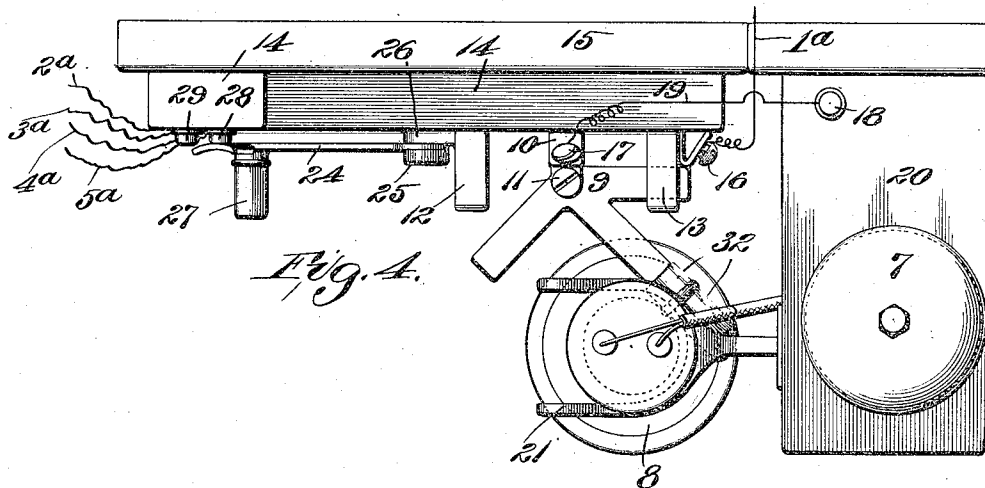
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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SUBSCRIBER'S AUTOSWITCHING SYSTEM FOR INTERCOMMUNICATING TELEPHONES.

1,152,968.

Specification of Letters Patent.

Patented Sept. 7, 1915.

Application filed May 19, 1914. Serial No. 839,651.

To all whom it may concern:

Be it known that I, ROBERT F. PICKENS, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Subscribers' Autoswitching Systems for Intercommunicating Telephones, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved subscriber's auto-switching system for intercommunicating telephones, and consists in the novel construction hereinafter described and specifically designated in the appended claims.

My invention is especially adapted for use on rural party lines.

To understand my invention it is necessary to understand the conditions under which it is to be used.

In many rural districts, several parties or stations are connected on one line (which is used in common by them all and usually from ten to twenty parties on a line). Sometimes one line will not accommodate all who would like to get on it, and it is then necessary to put up another line, in which case the stations are divided between the two lines, which if desired may be run on the same poles. The two lines terminate in a central exchange, and when a party on one line wishes to talk to one on the other line, the two lines are connected at central and the two parties are thus connected over the two lines. But while they are talking they necessarily hold both lines, and if they chance to be far out on the lines the resistance of the lines is so great that the service is unsatisfactory. And besides, it is customary to close the central exchange at 8 o'clock in the evening, and the parties on different lines are thus prevented from communicating from 8 o'clock in the evening until 7 o'clock in the morning.

The object of my invention is to overcome these difficulties.

To avoid the difficulties above mentioned, I consolidate the two lines into what is called an intercommunicating system, by installing at each station a switch which is hereinafter described.

In the drawings: Figure 1 is a diagrammatic view of a plurality of telephone stations connected in accordance with my in-

vention to a plurality of lines by a ground circuit; Fig. 2 is a similar view of a plurality of telephone stations connected in accordance with my invention to a plurality of all metallic lines. Fig. 3 is a diagrammatic plan of the station instruments shown at the left hand of Fig. 2; Fig. 4 is a plan view of the station instruments shown in Fig. 1, with the parts enlarged and partly broken away; and Fig. 5 is a front elevation of the same.

The numerals 1, 2, 3, 4 and 5 (Fig. 1) indicate the main-line wires, which pass through all the stations, or rather are connected thereto by wires 1^a, 2^a, 3^a, 4^a and 5^a. A plurality of stations are indicated by the letters A and B, and there may be any number of such stations and wires on a system. Each station is normally located on a certain line, and when not in use is left connected to that line, and when wanted is called over the line on which it is located. Said main-line wires terminate in the usual central exchange.

Each station is fitted with the usual telephone-set, comprising the transmitter 6, call-bells 7 operated by either a common magneto or by battery, and receiver 8. At each station, also, I locate one of my improved party-calling and receiver-hook "blocking" switches, which will now be described in detail.

The numeral 9 indicates a rocking switch-blade, which is nearly V-shaped in plan view, and pivotally mounted upon a bracket 10 by a screw 11. In the present instance, the pivotal-point of the said switch-blade is located at about midway of the length of said blade, so that when said blade is rocked into one position one of its ends will contact with a contact-spring 12, and when said blade is rocked in an opposite direction its opposite end will come into contact with another contact-spring 13, and connection with said first-mentioned contact spring will be broken. Said bracket 10 and the contact springs 12 and 13 are all electrically insulated from each other by being mounted on a base 14 of porcelain or other suitable insulating material, and said base is in turn mounted upon a board 15; or, if desired, the said insulating base 14 may be secured to the wall or some other object directly back of the said receiver 8. The said contact-spring 13 of the switch-blade 9 is connected through its binding screw 16

to the line 1 by the said wire 1^a; and said bracket 10 is connected (through its binding-screw 17) to the usual binding post 18 of the station telephone set by a wire 19.

5 Said telephone set has, of course, the usual electrical-connections within and upon its box 20 for its call-bells 7 and its receiver-hook 21, and said set is grounded by a wire 22 connected to the binding-post 23.

10 Where only two lines are to be consolidated, one line is connected to the contact spring 12 and the other to the contact spring 13 and in that case the switch block 14 need contain only those two contact points, but

15 where more than two lines are to be consolidated the connections are to be made as hereinafter described.

All (or any number) of the lines 1, 2, 3, 4 &c., are connected to the said "blocking" switch-blade 9 by a radial arm 24, which is pivotally connected by means of a screw or rivet 25 to said contact-spring 12, the latter having a base extension 26 against which said screw urges said radial

25 arm; whereas by such construction said radial arm may be swung around by means of its handle 27 until its free end comes into contact with any one of a series of contacts 28, 29, 30, 31 arranged in a segmental relation upon said insulating base 14, the said

30 wire 2^a being connected to said contact 31, the said wire 3^a being connected to said contact 30, the said wire 4^a being connected to said contact 29, and the said wire 5^a being

35 connected to said contact 28. By manipulating said radial-arm 24, the subscriber at any of the stations A, B, &c., may connect his telephone set to any of the lines 1, 2, 3, &c., and disconnect his set therefrom at will.

40 Said "blocking" switch-blade 9 is provided with a suitable handle 32, by means of which it may be rocked in making and breaking connections with said contact-springs 12 and 13.

45 The operation of the "ground" system above described is as follows: The normal condition of the parts is, of course, with the receiver 8 on its hook 21, and with the handle 32 of said "blocking" switch-blade

50 thrown to the right, as shown in Figs. 1, 4 and 5, at which time all the subscribers on line 1 will be connected to the central exchange, and may be called therefrom over said line; the current passing from the latter

55 to said wire 1^a, thence to said binding-screw 16 of said contact-spring 13, thence to said switch-blade 9, thence to said bracket 10, thence to said binding-screw 17, thence by way of wire 19 to said binding-post 18, thence to the call-bell connections, to the said binding-post 23, and

60 thence to the ground by way of said wire 22. If the subscriber at one station desires to call the subscriber at another station, the

65 handle 32 of the said switch-blade 9 at said

calling station is thrown to the left, which will compel the receiver 8 at the said calling station to be removed from its hook, and also disconnect said switch-blade from said

70 contact-spring 13 which is connected to said radial arm 24 of said calling station, thereby breaking the bell-circuit through said wire 1^a, and the main line 1, but (if said radial arm 24 at the calling station is in the position shown in Fig. 1) establishing

75 the circuit through said contact-spring 12, screw 25, radial arm 24, contact 28 and wire 5^a to main-line 5, whence current passes over the wire 1^a of the called station and thence through its contact-spring 13, switch-

80 blade 9, bracket 10, screw 17, wire 19, binding-post 18 and thence through the call-bell connections of the called station, thereby causing its bell to ring, the same as if the call had been made by the operator at the

85 central exchange. From the call-bell connections of the called station the current of course passes to the ground over wire 22, thus completing the circuit from said calling station A to said station B.

90 By merely adjusting the radial-arm 24 at the calling station, it may be placed in connection with any of the contacts 29, 30, 31, &c., and the desired station on any of the lines 2, 3, 4, 5, &c., may be called by pro-

95 ceeding in the manner above described.

I here call attention to an important part of my invention, which is the receiver "blocking" switch-handle arrangement shown more clearly in Figs. 4 and 5, in

100 which it will be seen that the handle 32 of said switch-blade 9 necessarily stands directly across the path of the receiver while the latter is being replaced upon its hook 21, and "blocks" the entrance of the receiver

105 between the forks of said hook, with the result that before the receiver can be replaced on said hook the user will be compelled to throw said switch-handle to its normal position, and thereby connect the telephone to

110 the line to which it is apportioned, ready for a call from the central exchange or from another station.

It is obvious that if a user should forget to throw said switch-handle 32 to its normal

115 position, as described, after having called another station, as described, such oversight would leave the calling station disconnected, so that it could not be called by another station, and hence the importance of the

120 "blocking" switch-handle arrangement.

The all-metallic line system.—In the all-metallic line arrangement illustrated in Figs. 2 and 3, the invention is essentially the same as that above described in connection with

125 the ground-wire system, but the contacts on said base 14 are in the form of pairs of plug-sockets 33, 34, 35, 36, &c., into which is inserted a double plug 37 whenever it is desired to connect the individual plug-sockets

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of any pair with the corresponding pair of wires forming the main line. The numerals 38, 39, 40, 41 and 42 indicate the pairs of main-line wires of a plurality of main lines.

5 The said double plug 37 is provided with the usual handle, and also with the usual body of insulating material 37^a for the purpose of separating the individual plugs composing the pair. Said pair of plug-sockets
10 33 is connected to its pair of main line wires by a pair of wires 46, and the said pair of sockets 34 is connected to its pair of line wires by a pair of wires 45; the said pair of sockets 35 is connected to its pair of line
15 wires by a pair of wires 44, and the upper pair of sockets is connected to its pair of line wires by a pair of wires 43. In this all-metallic line arrangement the said switch-blade 9 and its connections are used
20 in duplicate, that is two switch-blades are mounted one below the other, in the manner previously described as to the contact-springs 12 and 13, and said double switch-blades are mechanically connected (but insulated)
25 by a body of insulation 32^a. The upper switch-blade bracket 10 is connected to the said binding-post 18 of the station telephone-set by the wire 19, and the lower switch-blade bracket is connected to the
30 binding-post 23 of said set by a wire 47. A pair of wires 38^a connect the upper and lower contact-springs 13 to their pair of main-line wires in each set. A pair of flexible wire-cords 48 connect the plugs of said
35 double plug 37 to the upper and lower contact springs 12.

The operation of the all-metallic system.—

The operation of the all-metallic system is, obviously, the same in all essentials as that
40 of the ground-line system previously described, and need not be elucidated except to say that the double-plug 37 and the series of plug-sockets 33, 34, &c., are used in the manner described in calling the various stations.
45 It will be observed that in Figs. 2 and 3 the "blocking" handle 32 is shown thrown to the left, in position for calling a station, and in position to "block" the placing of the receiver on its hook 21. A skilled
50 mechanic can readily trace the path of the current through the various lines and connections, and I therefore do not deem it necessary to trace the path of the current through said lines and connections in the
55 all-metallic system.

I do not limit myself to the exact construction herein shown and described, as it is evident that the same may be varied by skilled mechanics without departing from
60 the scope of my invention.

I am aware that the broad idea of an intercommunicating telephone system is not new, but as a rule the switching device of all systems known to me is made in connection
65 with the telephone box, and to install a

system as herein described with those devices it would be necessary to put in a new telephone set at each station, and a principal object of my invention is to provide
70 ways and means whereby two or more telephone lines may be consolidated into an inter-communicating system without going to the expense of putting in a new telephone set at each station. Furthermore, in some
75 of the intercommunicating telephone systems of the prior art, careless users neglect to replace the connecting-wedge or plug where it properly belongs, after conversing over another line; thereby leaving the telephone disconnected from the line to which
80 it belongs. I have effectually overcome this objection by placing the handle 32 of my "blocking" switch directly in the way of the receiver 8, so that in replacing the receiver on its hook 21, the user, no matter
85 how careless he may be, is actually compelled to throw said handle to its normal position, and to thereby restore the telephone to the line to which it belongs. In order that the said switch-handle 32 may
90 have just the right amount of "throw" to make and break the circuit through its switch-blade 9 and the connecting-springs 12 and 13, and, at the same time, cause the said handle to obstruct the replacement of
95 said receiver on its hook, it is essential that the said blade be made with two ends or arms which shall project one on each side at the special but different angles shown in
100 Fig. 4.

I claim—

1. In a telephone system having a plurality of stations, a line wire, calling and telephone instruments in each station, said
105 telephone instruments having the usual receiver hook, means at each station whereby the telephone user thereat may communicate with another station, and a party line switch having a handle arranged to stand directly
110 across the path of the telephone receiver while the latter is being replaced upon its hook to block the entrance of the receiver between the forks of said hook until said handle is moved to a position which will
115 restore its telephone to the line on which it belongs.

2. In a party line telephone system, the combination of a plurality of main lines, a plurality of stations connected to said lines, calling and telephone instruments in each
120 station, said telephone instruments having the usual receiver hook, means at each station whereby the telephone user thereat may communicate with other stations, and a party line switch at each station having a handle
125 arranged to stand directly across the path of the telephone receiver while the latter is being replaced upon its hook to prevent the receiver being placed upon said fork until said switch has been thrown to a position
130

which will restore its telephone to the line on which it belongs.

3. In an intercommunicating telephone system, a plurality of lines, a telephone set
5 having the usual receiver-support and receiver, and a substantially V-shaped switch-blade having a mechanical portion arranged to "block" the path of said receiver in its
10 movement of being replaced upon said receiver-support during the time that said re-

ceiver is removed from said support, and until said switch-blade is moved to restore the telephone to the line on which it belongs.

In testimony whereof, I have signed my name to this specification, in presence of two
15 subscribing witnesses.

ROBERT F. PICKENS.

Witnesses:

E. L. WALLACE,
JOHN C. HIGDON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."