F. FISHER.

ELECTRIC LINE SWITCH.

APPLICATION FILED DEC. 1, 1909.

1,017,527.

Patented Feb. 13, 1912.

3 SHEETS—SHEET 1.

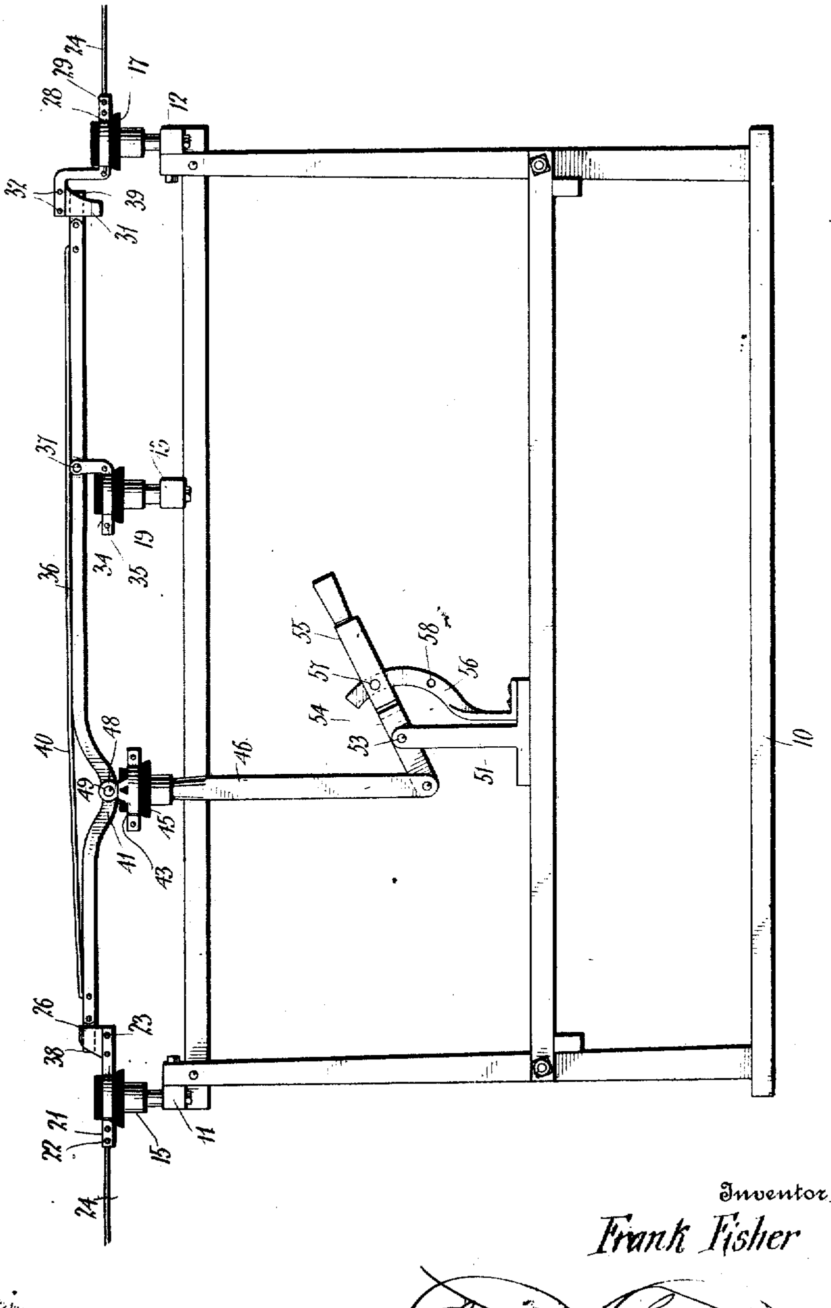

FIG. 1

Witnesses

[illegible]

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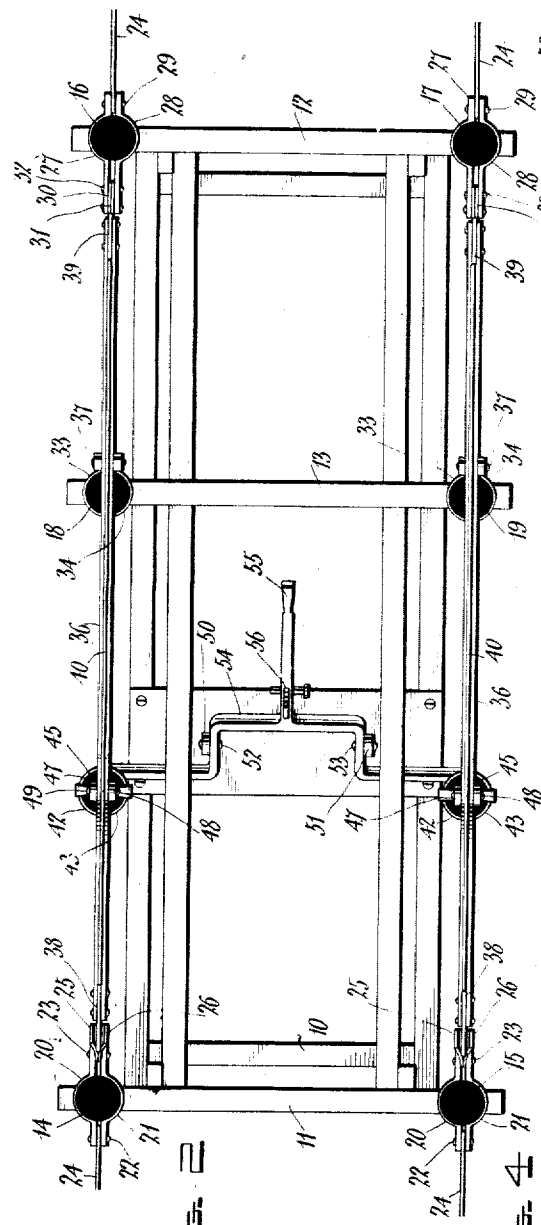

FIG. 2

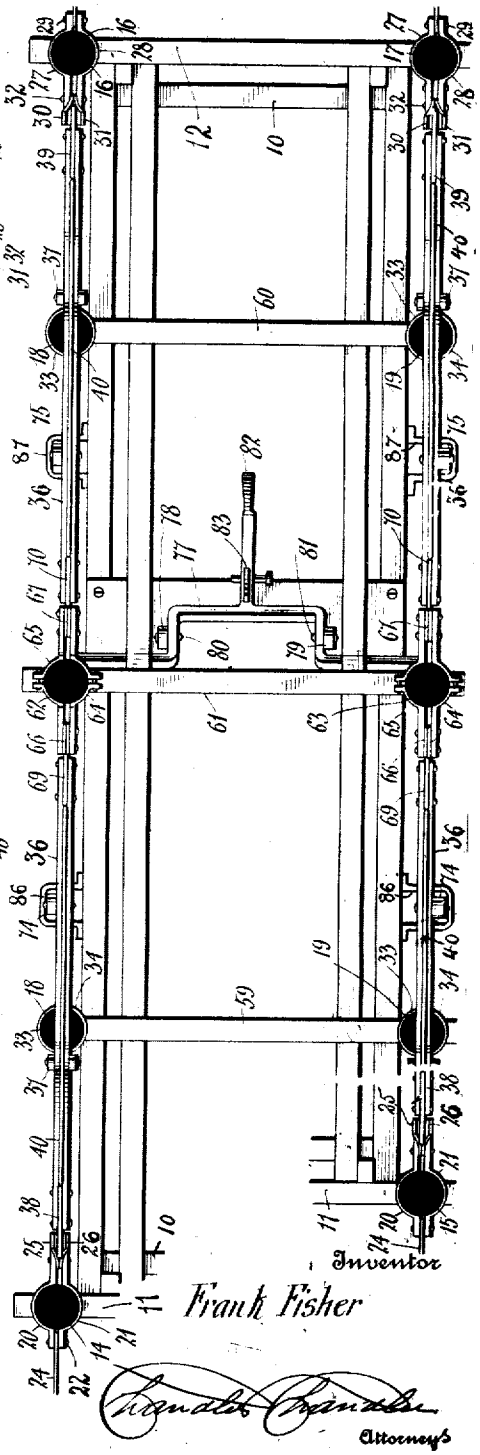

FIG. 4

Witnesses

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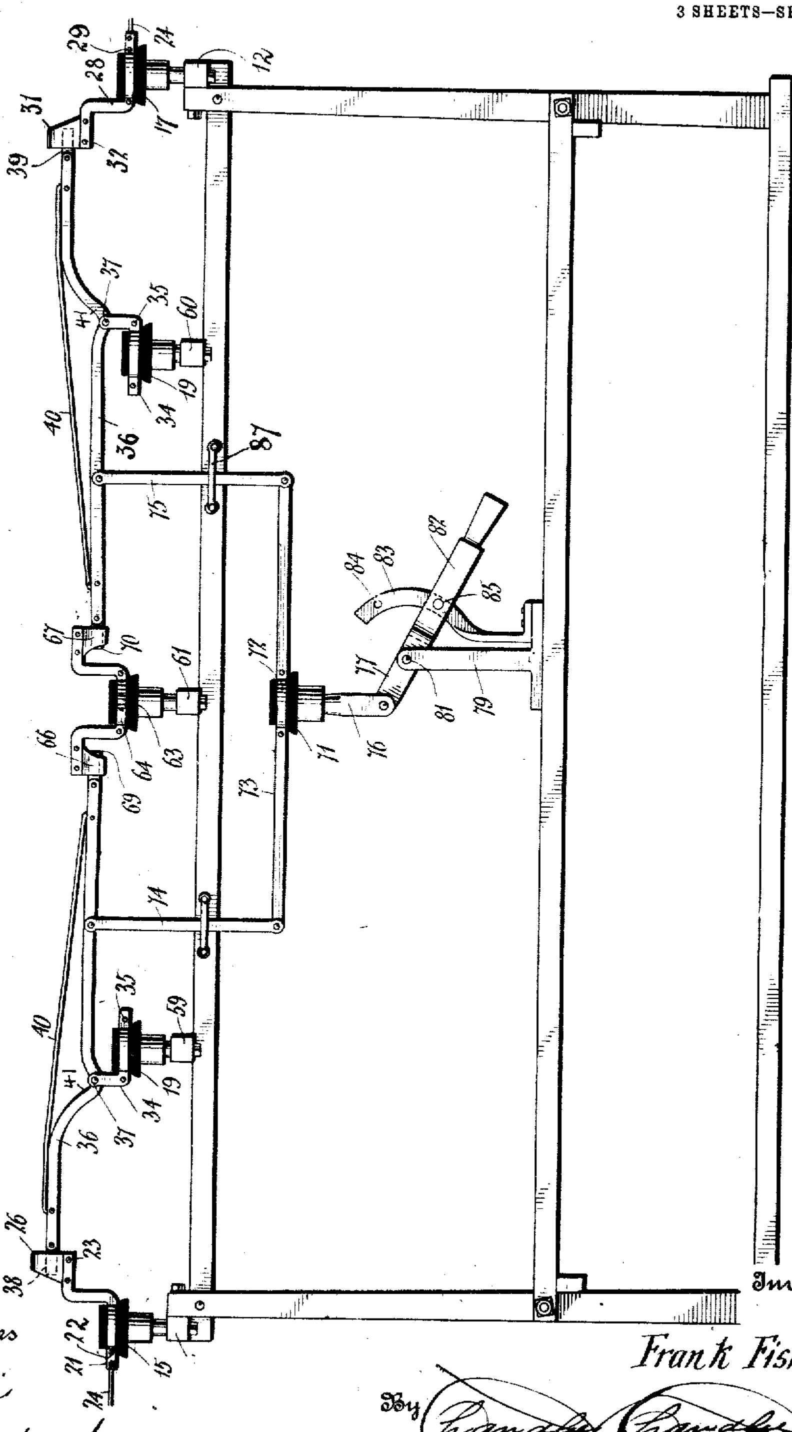
3 SHEETS—SHEET 3.

FIG. 3



Witnesses

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ELECTRIC-LINE SWITCH.

1,017,527. Specification of Letters Patent. Patented Feb. 13, 1912.

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To all whom it may concern:

Be it known that I, FRANK FISHER, a citizen of the United States, residing at Reardan, in the county of Lincoln, State of Washington, have invented certain new and useful Improvements in Electric-Line Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in electric switches which may be employed in connection with various electrical appliances such as trolley lines, conductor wires whereby electrical power is transmitted from place to place, and the like, and has for one of its objects to simplify and improve the construction and increase the efficiency and utility of devices of this character.

Another object of the invention is to provide a simply constructed device which may be arranged at any convenient point, and which may be applied to single or double lines without material structural changes in the parts and applicable more particularly to high tension circuits.

With these and other objects in view, the invention consists in certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims; and, in the drawings illustrative of the preferred embodiment of the invention, Figure 1 is a side elevation of the improved device arranged in connection with a single line. Fig. 2 is a plan view of the parts shown in Fig. 1. Fig. 3 is a side elevation of the improved device arranged in connection with a double line. Fig. 4 is a plan view of the parts shown in Fig. 3.

The improved device may be located at any convenient point, and is generally supported upon a suitable frame work, and this frame work may be of any required size or of any suitable construction, but for the purpose of illustration a conventional supporting frame is represented at 10, and includes a plurality of transverse supporting members 11—12 located at the ends of the frame and an intermediate transverse member 13. Rising from the end member 11 are two supports or standards 14—15, while similar supports or standards 16—17 and 18—19 are supported respectively upon the transverse members 12 and 13. The members are constructed of suitable insulating material and each is provided with an encircling bearing channel near its upper end to support suitable clamping devices, and as the clamping devices which are carried by the members 14—15 are precisely alike, like reference characters are employed for both. The clamping devices above noted comprise reversely curving bands 20—21 bearing within the channels of the members 14—15 and coupled at their terminals by transverse bolts 22—23, the main line wires, represented at 24 being coupled by the bolt 22 between the members 20 and 21 at one end, while spring contact plates 25—26 are coupled thereto by bolts 23, the plates 25—26 being directed upwardly, as shown. Similar clamping devices are carried by the members 16—17 and each consists of curved clamp members 27—28 supporting the line wires 24 by them at one end by a bolt 29 and supporting downwardly directed spring contacts 30—31 by clamp bolts 32 at their opposite ends, as shown. The members 18—19 are also provided with clamping devices comprising curved plates 33—34 and connected together at one end by a bolt 35 and upturned at their opposite ends and pivotally supporting an arm 36 by a bolt 37. The arm 36 is preferably formed of two portions placed side by side, and between the arm portions at one end is secured a contact plate 38 adapted to engage between the spring contacts 25—26, and with a similar contact plate 39 secured between the arm portions at the opposite end and operating between the contact plates 30—31. A conductor wire 40 is connected at its ends to each of the contact members 38—39, as shown. By this arrangement it will be obvious that when the arm 36 is so arranged that the contact members 38—39 are in electrical connection with the contacts 25—26 and 30—31 the current will be continuous between the two portions of the line wires 24. If, however, the arm 36 be tilted upon its pivot 37 the circuit will be broken by disengaging the plates 38—39 from the spring contacts, and one feature of the improved device is the means whereby this movement of the arm 36 is accomplished and this mechanism will now be described.

The arm members 36 are depressed at one point as shown at 41 and pivotally connected to the arm at this depressed point is a clamp device formed of reversely curving bands 42—43 fitting in annular channels in insulating devices 45 supported upon up-

right members one of which is represented at 46. Each of the band members 42 is provided with an upwardly directed standard 47 while each of the band members 43 is provided with a similar standard 48, the standards extending upon opposite sides of the depressed portion 41 of the arm 36 and secured thereto by a transverse bolt 49. By this means the vertical members 46 are pivotally coupled to the arms 36 and insulated therefrom. Rising from the lower portion of the frame work 10 are two standards 50—51, and pivoted at 52—53 to these standards is a yoke member 54 with a lever arm 55 extending centrally from the yoke frame. By this means it will be obvious that the vertical movement of the lever 55 will produce corresponding vertical movement of the upright members 46 and thus actuate the arms 36. Rising from the frame work 10 adjacent to the lever arm 55 is a curved guide member 56 having transverse apertures 57—58, while the lever arm 55 is provided with a transverse aperture adapted to alternately register with the apertures 57—58. The aperture 57 is so located that the aperture of the lever arm will register therewith when the arm 36 is in its operative position, or with the contacts 38—39 in engagement with their respective contacts, as shown in Fig. 1, and if it is desired to lock the arm in its closed position, a bolt or other suitable locking device may be inserted through the registering apertures. The other aperture 58 will be so located that it will register with the aperture in the lever arm when the latter is in its depressed position, and hold the arm 36 with its contact members disconnected from the spring contacts, and the lever arm may be locked in open position if preferred by a locking member passing through the aperture 58.

The improved device may be applied at any desired point in the circuit and is simple in construction, can be inexpensively manufactured and applied, and adapted without material structural changes to line wires of different kinds and to line wires employed for different purposes.

In Figs. 3 and 4 the improved apparatus is arranged for use in connection with two or more lines, and is substantially the same except that two of the arms 36 are employed arranged end to end and a single operating means arranged to simultaneously actuate both arms. As many of the parts employed in the modified or double structure are the same as those employed in the single structure illustrated in Figs. 1 and 2, like reference characters are employed for like parts in each.

In the double or modified structure two of the intermediate transverse members are employed and indicated by the characters 59—60, and connected to these transverse members are the insulator devices 18—19 with the arms 36 coupled thereto in the same manner as shown in Figs. 1 and 2. The terminal transverse members 11—12 are provided respectively with the insulator members 14—15 and 16—17 and each provided with spring contacts 25—26 and 30—31, the only difference being that the contacts are both directed upwardly instead of one upwardly and one downwardly as shown in the single structure. The frame 10 in the double structure is likewise provided with a central intermediate transverse member 61 carrying insulator members 62—63, and each of the insulator members is provided respectively with encircling clamp members 64—65 constituting conductors and carrying spring contacts 66—67 at two opposite sides. The arms 36 are provided at their outer ends with the contact plates 38—39 in the same manner as in the single structure shown in Figs. 1 and 2, and at their inner ends the arms 36 are provided with contacts 69—70 engaging respectively with the spring contacts 66—67. The arms 36 are provided with the depressed portions 41 as in the structures shown in Figs. 1 and 2 and pivoted at 37 to the insulator members 19 in the same manner as in the structure shown in Figs. 1 and 2, as shown. Located beneath the transverse members 61 and likewise beneath the insulator members 62—63 are two other insulator members one of which is shown at 71 and provided with a clamp device 72 and including a longitudinally extending bar 73, the bar being coupled at its ends by links to the lever arms 36, one pair of the links being represented at 74—75. It will be understood that each pair of the arms 36 is provided with one of the insulator members 71, the bars 73 and a pair of the links 74—75, but one pair only of the links and bars are shown. The insulator members 71 are each connected to a vertical member, one of which is shown at 76, and the two vertical members are coupled by a transversely extending yoke frame 77, and rising from the frame work 10 are spaced standards 78—79 pivoted at 80—81 to the yoke frame. The yoke frame is provided with an intermediate lever arm 82 by means of which the yoke frame is actuated and the members 76, 71, 73 and 74—75 actuated to operate the arms 36, as will be obvious. The lever arm 82 operates through a curved guide member 83 having spaced transverse apertures 84—85 which register with a corresponding aperture in the lever arm 82 to receive a locking bolt or other similar device so that the lever arm 82 may be locked in either its elevated or depressed position, to hold the contacts 38—39 and 69—70 in or out of engagement with the spring contacts in the same manner as the similar mechanism illustrated in Figs. 1 and 2.

It will be noted that the pivots 37 are located nearer to the contacts 31—32 than to the contacts 25—26 in Figs. 1 and 2 and nearer to the contacts 25—26 than to the contacts 69—70 in the modification shown in Figs. 3 and 4, so that the arms 36 will be released from their respective contacts at an earlier period at one end than at the other, so that the arc will be broken first on one side. In the modified or double pole structure illustrated in Fig. 3 the links 74—75 may be provided with guides 86—87 if found necessary.

The improved device is simple in construction, can be applied without material structural changes to line wires of various forms and to line wires employed for various purposes.

What is claimed is:—

1. In a device of the class described, a supporting frame, a plurality of standards of insulating material spaced apart and arranged in pairs, said pairs being located at the terminals of the frame and at intermediate points thereon, clamp devices carried by said terminal standards, line wires coupled to said terminal clamp devices at one end, electric contacts carried by said terminal clamp devices at the opposite ends, two arms pivoted at opposite sides of said frame and in alinement with said terminal standards, electric contacts carried by said arms and engaging respectively with the contacts of said standards, a lever arm mounted in said frame, a segment carried by said frame and over which said lever arm operates, connecting means between said lever arm and said contact carrying arm, and means for coupling said lever to said segment.

2. In a device of the class described, a supporting frame, line wires connected to said frame and each provided with an electric contact, an arm mounted to swing upon said frame and provided with electric contacts at its ends adapted to be engaged with and disengaged from the contacts of said line wires, a conductor element between the contacts of said swinging arm, a standard carried by said frame, a lever arm swinging from said standard, a segment carried by said frame and over which said lever arm operates, connecting means between said lever arm and said swinging contact carrying arm, and means for coupling said lever arm to said segment.

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

FRANK FISHER.

Witnesses:
C. H. FINROW,
JOSEPH GUTH.