May 11, 1937. H. WARD 2,080,242

ELECTRIC SCREEN

Filed Aug. 26, 1936 2 Sheets-Sheet 1

Fig. 1.

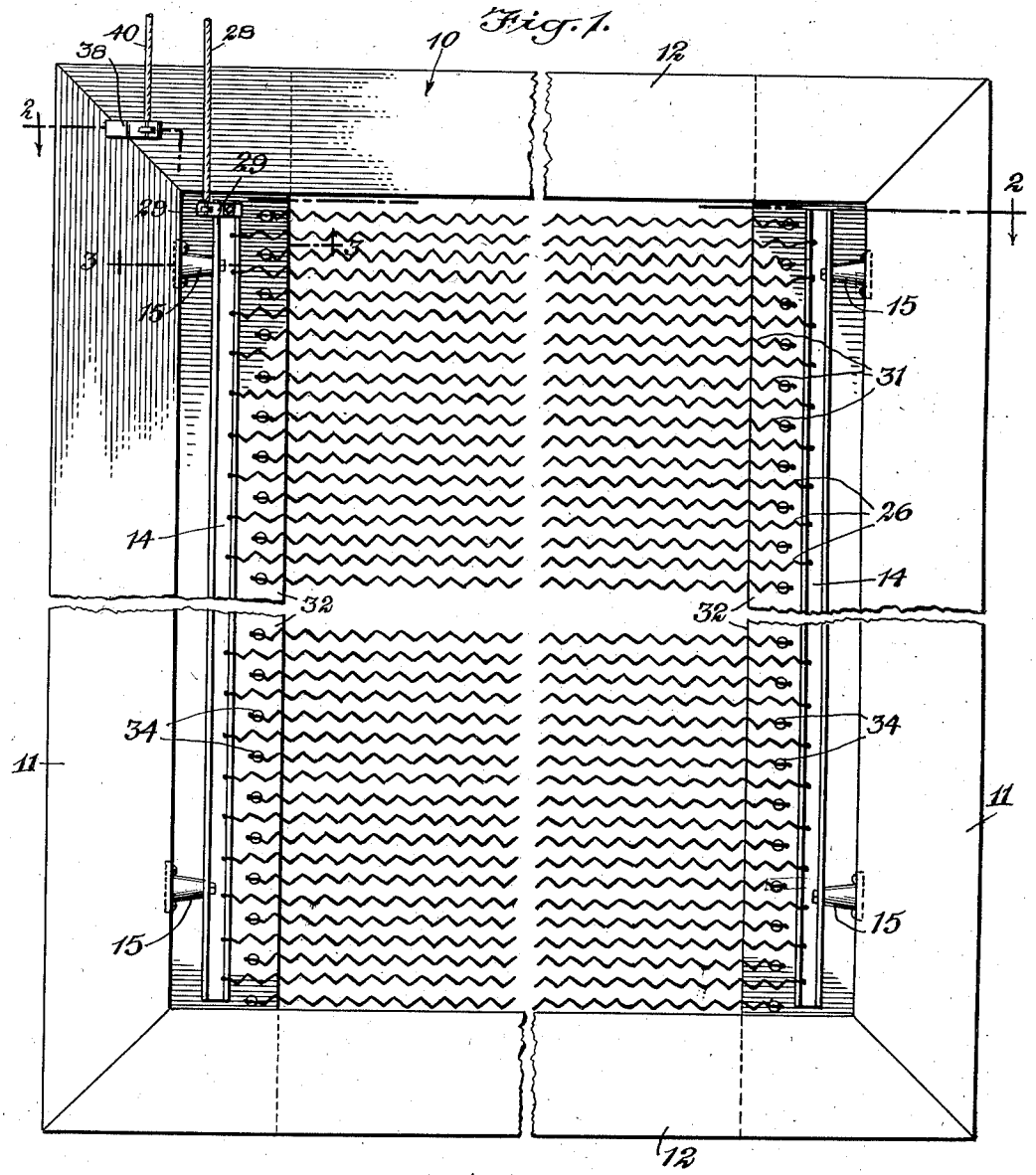
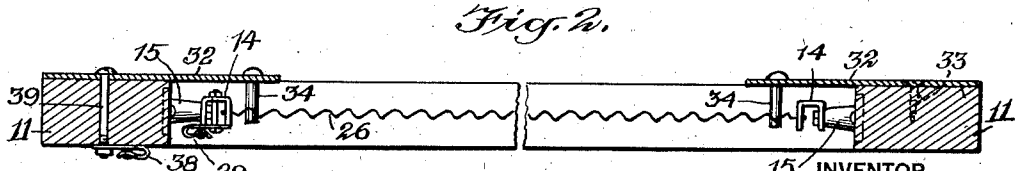


Fig. 2.



WITNESSES

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Fig. 3.

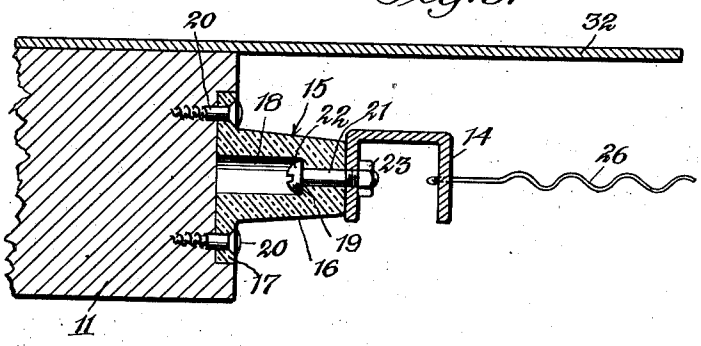


Fig. 4.

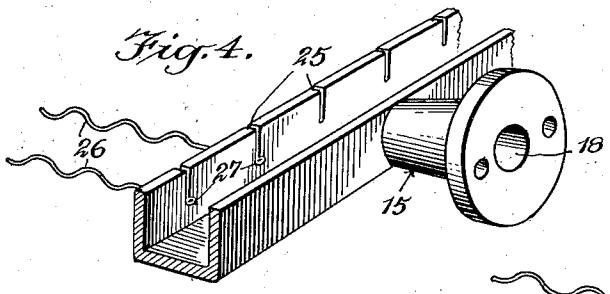


Fig. 5.

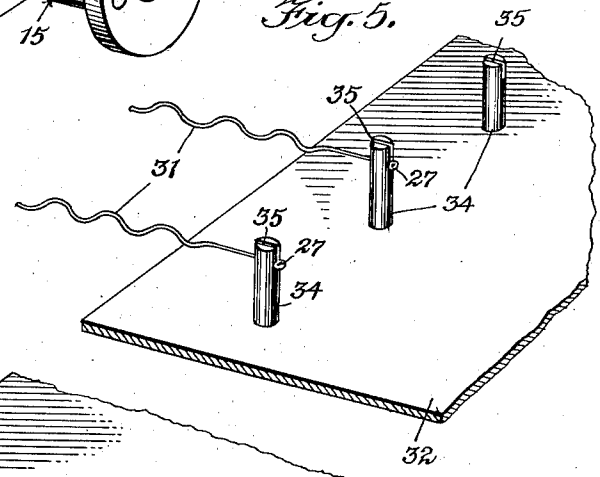
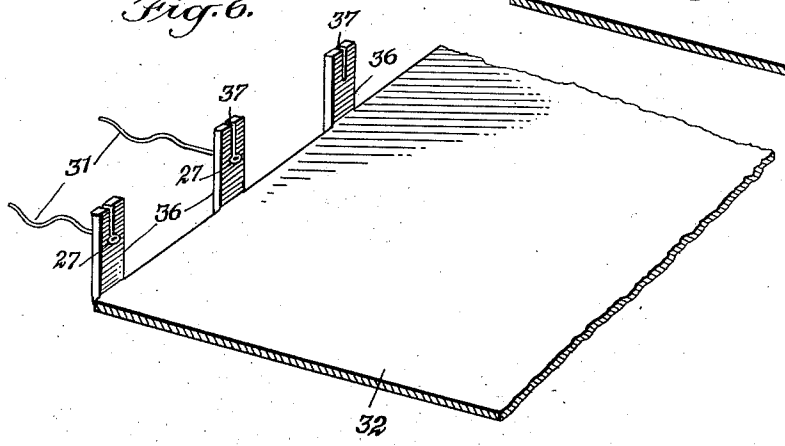


Fig. 6.



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UNITED STATES PATENT OFFICE

2,080,242

ELECTRIC SCREEN

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Application August 26, 1936, Serial No. 97,951

5 Claims. (Cl. 43—112)

This invention relates to improvements in electric screens and has for an object the provision of an improved screen for destroying flies and similar insects.

Electric insect screens of several types have been available prior to my invention. However, difficulties of various kinds have been encountered with these screens. Thus the insulating mechanism was unsatisfactory and short circuits frequently developed especially when the screens became wet as during a rainstorm, and also if one of the wires broke the entire screen became inoperative. Furthermore, many of the screens were inefficient because they formed a visible barrier to the insects or because they failed to attract and even repelled the insects for one reason or another.

It is accordingly a prime object of the present invention to overcome the difficulties heretofore encountered and to provide a satisfactory electric insect screen of improved construction so as to provide effective insulation preventing short circuiting even under adverse conditions, and which will operate in an efficient manner to electrocute a maximum number of insects.

For a fuller understanding of the invention reference should be had to the accompanying drawings which illustrate a preferred form of my invention.

Fig. 1 is an elevation of the screen embodying my invention with the central portions omitted;

Fig. 2 is a sectional view in the direction of the arrows on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view in the direction of the arrows on the line 3—3 of Fig. 1;

Fig. 4 is a detailed view in perspective showing a portion of a channel member with one of the insulators for connecting it to the frame;

Fig. 5 is a perspective view of a portion of one type of supporting plate which may be used in association with my invention; and

Fig. 6 is a view of a modified type of supporting plate.

In the accompanying drawings the numeral 10 indicates a frame made of suitable material, preferably wood, and shaped so as to fit snugly in the opening which is to be screened.

In the accompanying drawings the screen illustrated is suitable for use in a window and accordingly is rectangular in shape and is formed of two upright members 11 suitably connected at heir upper and lower ends to horizontally disposed cross members 12. Across the open portion of the frame I support, in the manner hereinafter described, a plurality of wires of relatively small gage, adjacent wires being of opposite polarity and being spaced apart a sufficient distance to avoid short circuiting but being close enough to electrocute a fly or similar insect attempting to pass between the wires. I have found that the most satisfactory results are secured by disposing the wires in horizontal position.

The mechanism which I employ for thus supporting the wires includes a pair of channel members indicated by the numeral 14, formed of a metal of high electrical conductivity such as bronze, brass, or the like. The channel members are disposed adjacent the sides 11 of the frame and are parallel thereto, each being secured to its respective side member by a pair of spaced porcelain insulators indicated at 15 and positioned adjacent the ends of the channel members.

The insulator should be of very high quality so as to prevent short-circuiting and for this purpose I preferably provide insulators of the type illustrated formed of a body portion 16 frustoconical in shape, provided with a peripheral flange 17 at the base thereof and having a central axial bore 18 extending therethrough, the bore being formed in two sections, a larger section extending from the base of the insulator past the center thereof, and a small section extending from the larger section to the end of the insulator, thereby providing a shoulder 19.

In assembling the device a bolt 21 of suitable size is projected through the enlarged portion of the bore and extended outwardly through the end of the insulator until the head 22 of the bolt engages the shoulder 19. The end of the bolt is then projected through an opening formed in the side of the channel member and is held in position by means of a nut 23 screwed on the end of the bolt. The flange 17 is then preferably countersunk in the inner edge of the frame as indicated most clearly in Fig. 3, and held in position by means of the screws 20 passing through openings formed in the flange and imbedded in the wood of the frame.

The confronting faces of the channel members 14 are provided with slots 25 as indicated most clearly in Fig. 4, the slots in each channel member being positioned in substantially the same horizontal plane and serving to support one group of wires in position across the face of the screen. The wires should be formed of a metal of high electrical conductivity such as brass or bronze, and I preferably employ spring tension wires although other type of wires may be used. Thus I have illustrated coil wires which have been extended outwardly against the tension of the

coils and which are held in position in the slots on the confronting faces of the channel members 14 by means of small loops 27 formed on the two ends of each wire. Instead of spring coil wires straight wires, held taut between the slots in the two channel members, may be employed.

The wires 26 of the first group of wires which are thus supported by the channel members 14 are all connected to one pole of a suitable source of current supply as by means of the lead wire 28 connected at one end to the source of current supply (not shown) and at the opposite end to the spring clip 29 having suitable electrical connection with one of the channel members 14.

A second group of wires preferably formed in the same manner as the first group and indicated by the numeral 31 are arranged parallel to the first group of wires in alternate relation thereto and are spaced therefrom a sufficient distance to prevent short-circuiting but so as to provide for the electrocution of any fly or similar insect that may attempt to pass between the wires. The means for supporting the second group of wires comprises a pair of plates 32 secured adjacent the outer surface of the frame by suitable means such as the screws 33 at the two sides thereof and extending inwardly from the edge of the frame a sufficient distance to overlie the vertical plane of the insulators 15 and the channel members 14 thereby affording protection to those members from adverse external conditions such as driving rainstorms. The metal plates are preferably formed of a metal of high conductivity such as bronze, brass, Monel metal, or the like.

For securing the wires 31 substantially in the same vertical plane as the group of wires 26 and in alternate relation thereto, I provide a plurality of posts 34 secured to the inner surface of the plates 32 by suitable means such as brazing so as to provide strength and insure good electric conductivity, and so spaced that one post projects between each adjacent pair of wires 26 of the first group of wires near the ends thereof as shown most clearly in Fig. 1. Each of the posts 34 is provided with a slot 35 adjacent the upper end thereof so that the wires 31 will be held in position in the slots by means of the loops 27 in the same manner that the wires 26 are held in place.

Instead of the posts 34 I may employ the tongues 36 formed integral with the plates 32 and turned inwardly at right angles thereto. Each of the tongues is provided with a slot 36 adjacent its upper end for receiving the end of the wires 31 and for holding the wires in position as previously described. The second group of wires 31 is connected to the other pole of the source of current supply to which the wires 26 are connected, and for this purpose I provide a spring clip 38 connected by means of bolt 39 to one of the plates 32 and having connection with the lead wire 40 which leads to the opposite pole of the same source of current supply to which the lead wire 28 is connected.

I have found that highly satisfactory results are obtained by employing electric currents of relatively high voltage such as from between 3500 to 5000 volts at 8 to 12 milliamperes, and for this purpose the ordinary house current of 110 volts may be converted by means of a transformer. It will be understood by those skilled in the art, however, that other voltages may be employed. It should be understood that wires of the proper gage and capacity should be employed. I have found that the most satisfactory results are obtained by using wires not larger than 20 gage made of material having a high electric conductivity such as brass or bronze. I have also found that very satisfactory results are obtained by using wires under spring tension as illustrated and described. It is to be understood, however, that wires of different gage and not under spring tension may also be employed.

The screens embodying my invention may be used in many different associations as, for instance, for protecting the entranceways and windows of buildings, such as dwelling houses, barns and the like. An insect seeking to enter through the screen will contact two adjacent wires 26 and 31 completing the circuit therebetween and will thus be electrocuted.

Because of the improved construction herein illustrated and described, my screen will operate for long periods of time without the usual difficulties heretofore encountered with electric insect screens. The insulation will operate satisfactorily preventing short circuits even under the most adverse conditions such as rainstorms and the like.

It should be understood of course that modifications may be made in the illustrated and described embodiment of my invention without departing from the invention as defined in the accompanying claims.

I claim:

1. An electric insect screen comprising a frame, a pair of channel members having slots formed at one side thereof secured to opposite sides of the frame with the slots in confronting relation, each of the channel members being secured to the frame by a pair of spaced insulators, a group of wires connected between the two channel members and supported in the slots thereof, a second group of wires parallel to and spaced from the first group and supported in alternate relation thereto, and means for connecting the first group of wires to one of the poles and the second group of wires to the other pole of a source of electric current.

2. An electric insect screen comprising a frame, a pair of channel members having slots formed at one side thereof secured to opposite sides of the frame with the slots in confronting relation, each of the channel members being secured to the frame by a pair of spaced insulators, a group of wires connected between the two channel members and supported in the slots thereof, a pair of spaced plates secured adjacent the outside of the frame at the two sides thereof in a plane overlying the channel members and insulators so as to afford protection thereto, a second group of wires spaced from the first group and having means for supporting them on said plates in alternate relation to the first group of wires, and means for connecting the first group of wires to one of the poles and the second group of wires to the other pole of a source of electric current.

3. An electric insect screen comprising a frame, a pair of channel members having slots formed in one side thereof secured to opposite sides of the frame with the slots in confronting relation, each of the channel members being secured to the frame by a pair of spaced insulators, each of said insulators comprising a porcelain body secured at one end to the frame and having a central axial bore therethrough, the bore being larger at the frame end than at the other end so as to provide an internal shoulder intermediate the two

ends of the bore and being secured to the channel member by means of a nut and bolt extending through a portion of the channel member and the bore from the shoulder formed therein, a group of wires connected between the two channel members and supported in the slots thereof, a pair of spaced plates secured adjacent the outside of the frame at the two sides thereof in a plane overlying the channel members and insulators so as to afford protection thereto, a second group of wires spaced from the first group and having means for supporting them on said plates in alternate relation to the first group of wires, and means for connecting the first group of wires to one of the poles and the second group of wires to the other pole of a source of electric current.

4. An electric insect screen comprising a frame, a pair of channel members composed of conducting material having slots formed in one side thereof secured to opposite sides of the frame with the slots in confronting relation, each of the channel members being secured to the frame by spaced insulators, a first group of wires having electrical connection between the two channel members and supported in the slots thereof, a pair of spaced plates formed of conducting material secured adjacent the outside of the frame at the two sides thereof so as to overlie the channel members and insulators affording protection thereto, a second group of wires spaced from the first group and having electrical connection with and being supported by said plates in alternate relation to the first group of wires, and means for connecting one of the channel members to one pole and for connecting one of the plates to the other pole of a source of electric current.

5. An electric insect screen comprising a frame, supporting bars secured to the frame by means of spaced insulators, a first group of wires connected between the bars, a pair of spaced plates secured adjacent the outside of the frame and in a position to overlie the bars and insulators and afford protection thereto, a second group of wires spaced from the first group and supported by the plates in alternate relation to the first group, and means for connecting one group of wires to one pole and the second group to the other pole of a source of electric current.

HOWARD WARD.