Dec. 15, 1936. T. C. CAMPBELL ET AL 2,064,290

SUPPORT FOR WIRES

Filed March 23, 1934 2 Sheets-Sheet 1

FIG. 1

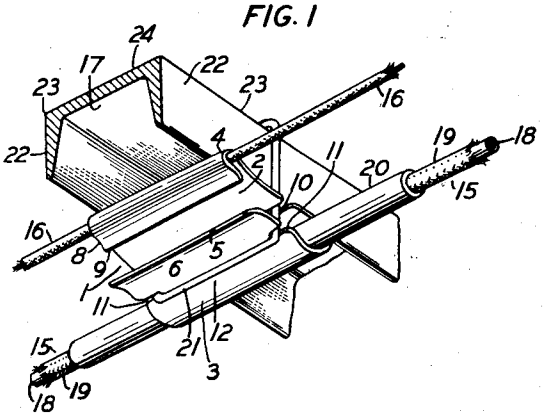


FIG. 2

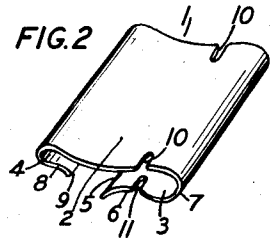


FIG. 3

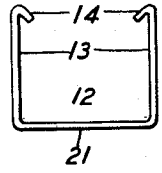


FIG. 4

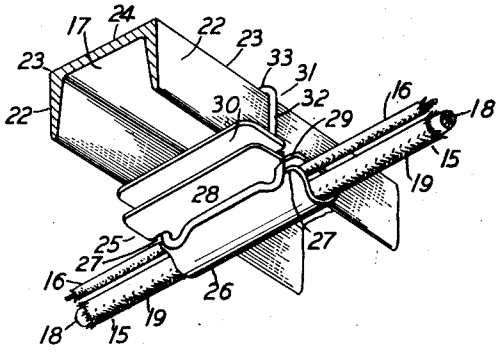


FIG. 5

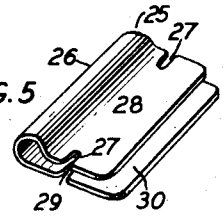
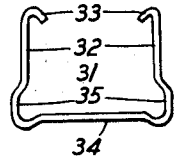


FIG. 6



INVENTORS: T.C.CAMPBELL
C.H.WHEELER
H.W.BOWLY

BY J. MacDonald

ATTORNEY

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SUPPORT FOR WIRES

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FIG. 7

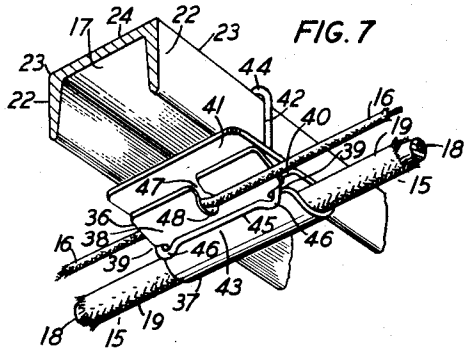


FIG. 10

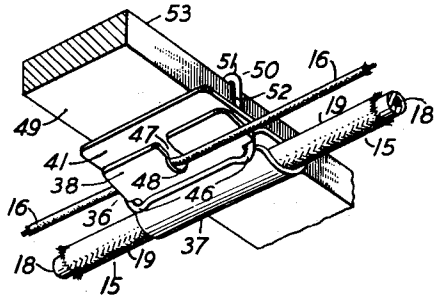


FIG. 8

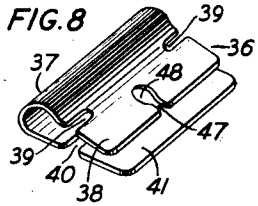


FIG. 9

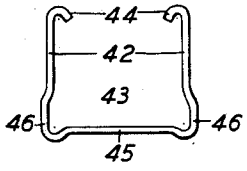


FIG. 11

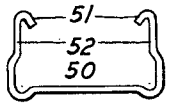


FIG. 12

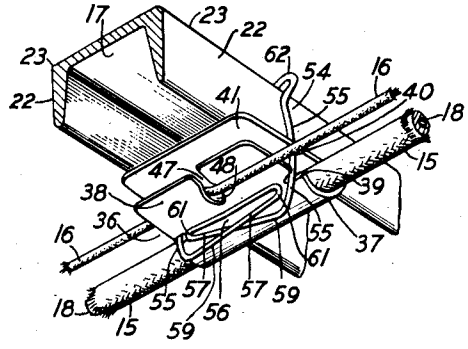


FIG. 13

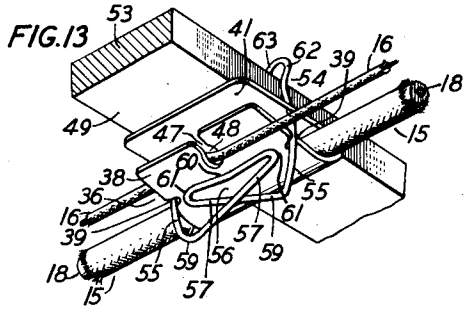


FIG. 14

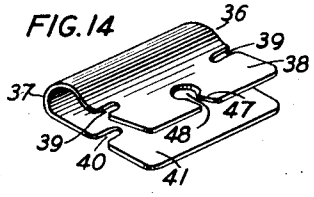
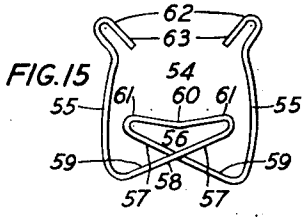


FIG. 15



INVENTORS: T.C.CAMPBELL
C.H.WHEELER
H.W.BOWLY

BY J. MacDonald

ATTORNEY

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UNITED STATES PATENT OFFICE

2,064,290

SUPPORT FOR WIRES

Thaddeus C. Campbell, Rutherford, Clyde H. Wheeler, Midland Park, and Heyward W. Bowly, Summit, N. J.; said Campbell and said Wheeler assignors to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York, and said Bowly, assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application March 23, 1934, Serial No. 717,090

5 Claims. (Cl. 248—72)

This invention relates to supports for wires and more particularly to a support for wires used in electric signaling systems.

The object of this invention is to provide an improved clamp for supporting wires of such systems on suitable frames.

A feature of the invention resides in a folded saddle member of resilient material for supporting wires which may be clamped to a beam by means of a clip.

Another feature of the invention resides in a wire clip for clamping the saddle member to a beam and which maintains the saddle member tightly clamped in place.

In one embodiment of the invention, one of the folds of the saddle member is slotted to permit insertion of a wire after the saddle member has been clamped to a beam.

In the drawings Fig. 1 is a view in perspective and partly in section of one embodiment of the invention removably attached to a beam and viewed from beneath the beam;

Fig. 2 is a view in perspective of the saddle member employed in Fig. 1 and viewed from above the saddle member;

Fig. 3 is an elevational view of the wire clip employed in Fig. 1;

Fig. 4 is a view in perspective and partly in section of another embodiment of the invention removably attached to a beam and viewed from beneath the beam;

Fig. 5 is a view in perspective of the saddle member employed in Fig. 4 and shown in reverse position relative to the position occupied in Fig. 4;

Fig. 6 is an elevational view of the wire clip employed in Fig. 4;

Fig. 7 is a view in perspective and partly in section of still another embodiment of the invention removably attached to a beam and viewed from beneath the beam;

Fig. 8 is a view in perspective of the saddle member employed in Fig. 7 and shown in reverse position relative to the position occupied in Fig. 7;

Fig. 9 is an elevational view of the wire clip employed in Fig. 7;

Fig. 10 is a view in perspective and partly in section of the embodiment of the invention as shown in Fig. 7 but with the wire holder removably attached to a flat bar and viewed from beneath the flat bar;

Fig. 11 is an elevational view of the wire clip used in Fig. 10;

Fig. 12 is a view in perspective and partly in section of still another embodiment of the invention removably attached to a beam and viewed from beneath the beam;

Fig. 13 is a view in perspective and partly in section of the embodiment of the invention shown in Fig. 12 but with the wire holder removably attached to a flat bar and viewed from beneath the flat bar;

Fig. 14 is a view in perspective of the saddle member employed in Figs. 12 and 13 and shown in reverse position relative to these figures; and

Fig. 15 is an elevational view of the wire clip employed in Figs. 12 and 13.

Where wires of a system are to be supported in elevated position, it is desirable to have holders for the wires spaced along the wires at predetermined points and attached to supporting members. The supporting members may be beams in a building structure, or braces or other supports in a framework. The exact location or position to be occupied by wires of a system may not be known at the time a building or framework is constructed. It is therefore desirable to have holders for wires so constructed that the holders may be readily attached to or detached from supporting members in a building or framework. The wires above mentioned may be, for instance, wires of a fire detecting system and may comprise a low melting point conductor and a return wire for the system running parallel with the low melting point conductor.

This invention provides a saddle to hold wires of a system and a wire clip to clamp the saddle to a beam or other support.

In Fig. 1 the saddle 1 is a folded sheet folded as shown in Fig. 2 and having an inwardly bowed central portion 2, a long fold 3 on one end and a shorter fold 4 on the other end. The long fold 3 is of larger radius than the shorter fold 4 and terminates in a downwardly turned free edge 5. The long fold 3 is inwardly bowed at 6 towards the inwardly bowed central portion 2 and between the point of fold 7 and the downwardly turned free edge 5 and is spaced from the central portion 2. The shorter fold 4 is inwardly bowed at 8 towards the central portion 2 and terminates in a downwardly directed free edge 9 and is spaced from the central portion 2. Near the point of fold 7 of the long fold 3 notches 10—10 are provided in the edges of the central portion 2 of the saddle 1. The notches 10—10 are aligned with notches 11—11 provided in the edges of the long fold 3. The saddle 1 may be made of sheet metal or insu-

lating material but preferably should be made of some resilient material so that when the long fold 3 is pressed toward the central portion 2 by means of a clip to be subsequently described there will be developed in the saddle 1 at the fold 3 a certain amount of spring pressure.

To hold the saddle 1 against the beam or other support, a U-shaped wire clip 12 shown in Figs. 1 and 3 is provided. The legs 13 of the wire clip are slightly longer than the thickness of the beam and at the free ends are turned inwardly and downwardly to form hooks 14. The distance between the innermost free end portions of the hooks 14—14 should be slightly less than the width of the beam or other support to which the clip 12 is to be attached.

Assuming that two wires of a fire detecting system are to be maintained in an elevated position in a building structure or a frame having open cross beams, the wire holder of this invention may be used to support the wires of the system as shown in Fig. 1. In this figure, the wires 15 and 16 are supported in the saddle 1 in spaced relationship and the saddle 1 is clamped to a channel iron beam 17 by means of the U-shaped wire clip 12. The beam 17 is shown inverted as is the usual position of channel iron beams in building structures and metal framework constructions where channel iron beams are used. The hooks 14—14 of the legs 13—13 of the U-shaped wire clip 12 extend over the upper edges of the beam 17 and engage the top flat surface of the beam. A convenient way of applying the support of this invention is to insert one of the wires in the support before the support is attached to the beam. For instance, the wire 15 which is a low melting point conductor 18 covered with insulating material 19 and enclosed in an insulating sleeve 20 is inserted between the long fold 3 and the central portion 2 of the saddle 1 and rests in the large radius folded portion 7. The wire clip 12 is then assembled with the saddle 1 by passing the legs 13—13 upwards through the notches 11 in the long fold 3, thence through the notches 10 in the central portion 2. When placed in this position, the closed end 21 of the wire clip 12 engages the under surface of the long fold 3 and extends between the notches 11—11 of the long fold 3. By bringing the support along the fire detection wire 15 to a position directly below the beam 17 and by pressing the support upward against the beam 17 the legs 13 of the wire clip 12 will be made to pass upward along the sides 22—22 of the beam 17, the inwardly bent portions forming the hooks 14—14 on the free ends of the legs 13—13 bearing against the sides 22—22 of the beam 17 until the upper edges 23—23 of the beam are reached. The legs 13—13 of the wire clip 12 having been slightly spread apart during the application of the support to the beam 17 will spring inwardly towards each other when the hooks 14—14 pass beyond the upper edges 23—23 and will engage the top surface 24 of the beam 17. In pressing the support upwards against the downwardly extending sides 22—22 of the beam 17 the long fold 3 of the saddle 1 is pressed towards the central portion 2 and sufficient spring pressure is built up in the long fold portion 3 of the saddle 1 to keep the saddle 1 tightly clamped against the beam 17. The fire detection wire 15 is supported in an area to be protected by placing the fire detection wire in the supports of this invention and by clamping the supports in the manner above described to spaced beams such as the beam 17 in the building or frame.

After the fire detection wire has been installed in the required area a return wire 16 may be run parallel with the fire detection wire 15 by placing the return wire 16 in the shorter fold 8, as shown in Fig. 1. In this figure, the fire detection wire 15 and the return wire 16 are held by the saddle 1 in spaced relationship. If the saddle 1 is made of insulating material the insulating sleeve 20 is not required.

In the embodiment of the invention shown in Fig. 4 a saddle 25 of simpler construction than the saddle in Figs. 1 and 2 is employed to hold the fire detection and return wires of the system. The saddle 25 in Fig. 4 is made by making a single long radius fold at 26 in a flat sheet of resilient material and by providing notches 27—27 in the lower leaf 28 of the saddle 25 shown in Fig. 4 and notches 29—29 in the upper leaf 30 of the saddle 25 aligned with the notches 27—27. The saddle 25 is shown in Fig. 5 as being inverted with respect to the position shown for it in Fig. 4 to clearly illustrate that the leaf 28 is shorter than the leaf 30 and that the long radius fold 26 is offset from the planes of the leaves 28 and 30 so that a substantially flat surface will be presented by the leaf 30 to the lower extremities of the downwardly extending side walls 22—22 of the beam 17. The saddle 25 is clamped to the beam 17 by a substantially U-shaped wire clip 31 having legs 32—32 terminated at the free ends in inwardly and downwardly directed hooks 33. The distance between the innermost extremities of the hooks 33—33 should be slightly less than the width of the beam and the legs 32—32 should be slightly longer than the thickness of the beam. The closed end of the clip 31 has an upwardly offset straight portion 34 to bear against the lower leaf 28 of the saddle 25. The straight portion 34 is joined to the legs 32—32 by long radius outwardly directed bent portions 35—35 of sufficient length to accommodate the two folds of the saddle 25 without pressing one of the leaves of the saddle towards the other. To support a fire detecting wire 15 and a return wire 16 of a system, the two wires are placed side by side in the long radius fold 26 of the saddle 25. The wire clip 31 is then placed with the legs 32—32 in the notches 27—27 and 29—29 of the lower and upper leaves 28—30 of the saddle 25. The support with the two wires clamped therein is then pressed upward against the lower extremities of the downwardly extending side walls 22—22 of the beam 17. Further upward pressure of the support against the beam 17 will bring the hooks 33—33 of the legs 32—32 of the wire clip 31 over the upper edges 23—23 of the beam 17. During this upward pressure of the support against the beam 17 the lower leaf 28 of the saddle 25 is pressed toward the upper leaf 30 to develop in the lower leaf 28 sufficient spring pressure to maintain the hooks 33—33 pressed against the top surface 24 of the beam 17 when the support is released. The support is thus clamped against the lower extremities of the downwardly extending side walls 22—22 of the beam 17.

In the embodiment of the invention shown in Fig. 7 the saddle 36 is formed by making a long radius fold 37 in a flat sheet of resilient material. The lower leaf 38 of the saddle is notched at 39—39 and notches are provided at 40—40 in the upper leaf 41 of the saddle 36 to accommodate legs 42—42 of a substantially U-shaped wire

clip 43. The legs 42—42 of the wire clip 43 are slightly longer than the thickness of the beam and the free ends of the legs 42—42 are bent inwardly and downwardly to form hooks 44—44. An upwarly offset straight portion 45 is provided at the closed end of the wire clip 43 and this straight portion 45 is joined at each end to a leg 42 by a long radius outwardly bowed portion 46.

In the outer edge of the lower fold 38 of the saddle 36 a notch 47 is provided. The notch 47 terminates at its inner end in a substantially round aperture 48.

A fire detection wire 15 and a return wire 16 for the system may be supported from the beam 17 with the device shown in Fig. 7. In using this device the fire detection wire 15 is first placed in the folded portion of the saddle. The legs 42—42 of the wire clip 43 are then passed through the notches 39—39 of the lower fold 38 and the notches 40—40 of the upper fold 41 of the saddle 36. The saddle 36 holding the fire detection wire 15 is then pressed upwardly against the lowermost extremities of the downwardly extending side walls 22—22 of the beam 17 till the hooks 44—44 pass over the upper edges 23—23 of the beam 17. In pressing the support upward against the beam 17 the hooks 44—44 engage the downwardly extending side walls 22—22 of the beam 17 to cause the legs 42—42 to be slightly spread apart and to build up sufficient spring pressure in the outwardly bowed portions 46—46 to bring the legs 42—42 back to vertical position after the hooks 44—44 pass over the upper edges 23—23 of the beam 17. This insures engagement of the hooks 44—44 with the upper surface 24 of the beam 17 when the upward pressure on the support is discontinued and spring pressure built up in the lower fold 38 is exerted against the straight portion 45 of the wire clip 43. After the fire detection wire 15 has been suspended from the beam 17, the return wire 16 may be clamped in the saddle 36. To secure the return wire 16 in the saddle 36 the upper and lower leaves 41 and 38 respectively are wedged apart at their free ends sufficient to permit passage between the leaves of the return wire 16. The return wire 16 is then placed between the upper leaf 41 and the lower leaf 38 of the saddle for half the length of the saddle and then is passed through the slot 47 in the lower leaf 38 and into the aperture 48. The return wire 16 then runs for the remaining half length of the saddle below the lower leaf 38. When the wedge is removed from between the leaves 41 and 38 of the saddle, the return wire 16 is clamped between the upper and lower leaves 41 and 38 for half the length of the saddle and cannot be accidentally dislodged therefrom. As shown in Fig. 7 the return wire 16 passes between the upper and lower leaves of the saddle for half the length of the saddle, thence downward through the aperture 48 of the lower leaf 38 and along the underside of the lower leaf 38.

In Fig. 10 the same arrangement as shown in Fig. 7 is shown as applied to a flat bar 49 instead of an inverted channel iron beam 17. When the support is to be applied to a flat bar which is not sufficiently thick to permit use of the comparatively long legged wire clip 43 shown in Fig. 9, a wire clip 50, such as shown in Fig. 11, having legs 52—52 which are shorter than the legs 42—42 of the clip 43 is used to clamp the saddle 36 to the flat bar 49. With the exception of the wire clip 50 and the flat bar 49 the parts shown in Fig. 10 are identical with those shown and described with reference to Fig. 7. The hooks 51—51 of the legs 52—52 engage the upper surface 53 of the flat bar 49 and the spring pressure built up in the lower leaf 38 keeps the saddle 36 clamped tightly to the flat bar 49.

In the embodiment of the invention shown in Fig. 12 a saddle 36, which is identical in construction to the saddle 36 shown in Figs. 7, 8 and 10, is clamped to a beam 17 by means of a wire clip 54. The wire clip 54 as shown separately in Fig. 15 is substantially U-shaped. The legs 55—55, however, are outwardly bowed and a substantially triangular loop 56 is formed at the closed end of the clip. The triangular loop 56 extends upwards within the space between the leg members 55—55. The apex of the triangular loop 56 extends downward and the downwardly extending arms 57—57 are crossed at the apex 58 and are continued on downwardly by extensions 59—59 to the lower ends of the legs 55—55. The upper side of the triangular loop 56 is substantially horizontal but is downwardly bowed at 60 to prevent movement of the ends 61—61 of the upper side of the triangular loop 56 away from the lower leaf 38 of the saddle 36 when the support is applied to a beam or bar. The upper free end portions of the legs 55 terminate in inverted U-shaped hooks 62—62. The free ends 63—63 of the hooks 62—62 are directed downwardly and inwardly and are spaced apart a distance slightly less than the width of the beam to which the device is to be attached. The legs 55—55 of the clip 54 are made longer than the thickness of the beam 17 or the thickness of the flat bar 49, as shown in Fig. 13, but not long enough to engage the top surface of either the beam 17 or the flat bar 49 without compression of the triangular loop 56 when the wire clip 54 is assembled with the saddle 36.

On applying the support shown in Fig. 12 to a beam 17 the fire detection wire 15 is placed between the leaves 38 and 41 of the saddle 36 and is moved into the long radius fold 37. The legs 55—55 of the wire clip 54 are then inserted through the notches 39—39 of the lower leaf 38 and through the notches 40—40 of the upper leaf 41 of the saddle 36. The support is then brought directly under the beam 17 and is pressed upward against the lower extremities of the downwardly projecting sides 22—22 of the beam 17 until the free ends 63—63 of the hooks 62—62 of the wire clip 54 pass beyond the upper edges 23—23 of the beam 17. In pressing the support upward against the beam 17 the free ends 63—63 of the hooks 62—62 engage the downwardly projecting sides 22—22 of the beam 17 and cause the legs 55—55 of the wire clip to be slightly spread apart to build up within the legs 55—55 sufficient spring pressure to cause the hooks 62—62 to snap inwardly over the upper edges 23—23 of the beam 17 when the free ends 63—63 of the hooks pass beyond the upper edges 23—23 of the beam 17. The triangular loop 56 in the wire clip 54 is elongated and somewhat flattened in the operation of pressing the support upward against the beam 17. Sufficient spring pressure is built up in the triangular loop 56 to keep the support tightly clamped to the beam 17. After the support containing the fire detection wire 15 has been clamped to the beam 17 the return wire 16 is placed in the saddle by spreading the free ends of the lower leaf 38 and the upper leaf 41 of the saddle 36 apart, by in-

serting the return wire 16 between the upper and lower leaves and by passing the return wire 16 through the notch 47 and into the round aperture 48 of the lower leaf 38. In the operation of inserting the return wire 16 in the support the free ends of the upper and lower leaves of the saddle 36 may be conveniently spread apart by inserting a screw-driver between the free ends of the leaves of the saddle. When the return wire 16 has been inserted between the leaves of the saddle and through the slot 47 in the lower leaf 38 and the screw-driver is removed from between the leaves, the return wire 16 will be clamped between the leaves 38 and 41 for half the length of the saddle and will pass under the lower leaf 38 for the remaining half length of the saddle 36.

In Fig. 13 the support is shown as applied to a substantially thin flat bar 49. In this application of the device the free ends 63—63 of the wire clip 54 engage the upper surface 53 of the flat bar 49. The saddle 36 is clamped against the under surface of the flat bar 49 and the triangular loop 56 of the wire clip has been elongated and compressed sufficient to build up within the triangular loop 56 the spring pressure required to keep the saddle 36 clamped against the under surface of the bar. It will be seen that the construction of the wire clip 54 permits clamping of the saddle 36, to beams or other supporting members of various thicknesses, and that the wire clip 54 may be used equally as well in clamping a saddle to a flat bar 49 such as shown in Fig. 13 as in clamping the saddle to a channel iron member 17, such as shown in Fig. 12. The only difference in the device after it is applied is that in Fig. 13 the triangular loop 56 of the wire clip 54 is not elongated and compressed to the same extent as in Fig. 12 due to the difference in thickness of the beam 17 and the bar 49.

It is obvious that the support for wires may be removably attached to a beam, a flat bar or any like member or portion in a building structure or frame. Since in most instances, in practice, the support would probably be attached to a beam or a flat bar the invention is shown and described as being attached to a beam or a flat bar. It is understood, however, that the invention may be attached to any suitable member or portion of a structure. In the claims, therefore, the word beam is to be considered as indicating any member or portion of a structure which is suitable for attachment of the holder thereto.

What is claimed is:

1. A support for wires comprising a folded strip of resilient material, an upper portion and a lower portion of said folded strip extending in parallel spaced relation with each other from the point of fold in said strip, a wire clip, spaced legs in said wire clip passing through said upper and lower portions and terminating in hooks, and a central portion in said wire clip formed into a triangular loop and bearing against an under surface of said lower portion of said folded strip.

2. A support for wires comprising a folded strip of resilient material, an upper portion and a lower portion of said folded strip extending in parallel spaced relation to each other from the point of fold in said strip, a U-shaped wire clip to clamp said folded strip flatwise against a beam, leg portions of said wire clip extending through and upward of said folded strip to engage the beam and a distortable triangular-shaped loop portion formed at the closed end of said wire clip and engaging a lower surface of said lower portion of said folded strip to resiliently press the folded strip flatwise against the beam.

3. A support for wires comprising a folded strip of resilient material, upper and lower portions of said folded strip extending in parallel spaced relation to each other from the point of fold in said strip, a U-shaped wire clip adapted to clamp said folded strip flatwise against a beam, a distortable triangular-shaped loop portion at the closed end of said wire clip, and outwardly bowed legs extending from the triangular-shaped loop portion and having hooked free ends to engage the beam.

4. A support for wires comprising a folded strip of resilient material, upper and lower portions of said folded strip extending in parallel spaced relation to each other from the point of fold in said strip, a connected slot and aperture formed in the free end of said lower portion, a U-shaped wire clip, leg portions of said wire clip extending transversely through said upper and lower portions of said strip, and a looped spring portion at the closed end of said wire clip engaging the lower face of said lower portion of said folded strip, said folded strip being adapted at its point of fold to embrace a wire and said lower portion of said folded strip being adapted to receive a second wire through its connected slot and aperture.

5. A support for wires comprising a folded strip of resilient material adapted to be clamped flatwise against a beam, freely movable portions of said folded strip extending from the point of fold in parallel spaced relation to each other, a wire clip to clamp said folded strip flatwise against the beam, spaced leg portions of said wire clip extending through aligned notches formed in edges of said freely movable portions, hooked free ends on said leg portions adapted to engage the beam, and a compressible loop spring portion connecting said spaced leg portions of said wire clip and bearing against one of said freely movable portions of said folded strip.

THADDEUS C. CAMPBELL.
CLYDE H. WHEELER.
HEYWARD W. BOWLY.