This invention relates to circuitry systems, and has for an object thereof the provision of universal wiring systems for interconnecting electrical components.

Another object of the invention is to provide composite component mounting boards or cards having universally connectible points thereon.

Another object of the invention is to provide circuitry mounting boards having pins driven through insulating sheets or cards to connect conductive strips some of which are disposed in parallel positions in between two sheets or cards, and others are disposed in positions extending transversely of the first conductive strips located between other sheets, and pins connecting the strips of the different layers at intersecting points thereof.

A further object of the invention is to provide wiring systems having conductive strips extending along coordinate rows of perforations of interleaving insulating sheets or cards at angles to one another in the different layers between these sheets, and a plurality of pins driven through the perforations in the sheets or cards at points of intersections of the strips and methods of making such wiring systems.

A wiring system illustrating certain features of the invention may include a plurality of insulating sheets or cards having coordinate rows of perforations aligned with one another, conductive strips extending parallelly between two insulating sheets or cards along rows of perforations and conductive strips positioned between another pair of sheets or cards along rows of perforations extending angularly relative to the first-mentioned conductive strips. Pins driven through perforations at the intersections of the rows connect the intersecting strips electrically together and lock the sheets or cards of insulating material together.

A complete understanding of the invention may be obtained from the following detailed description of a wiring system forming specific embodiments thereof when read in conjunction with the appended drawings, in which:

Fig. 1 is a top plan view of a wiring system for connecting a plurality of mounting boards into one system forming one embodiment of the invention;

Fig. 2 is a sectional view taken along line 2-2 of Fig. 1;

Fig. 3 is a perspective view of a wiring system made in accordance with another embodiment of the invention, and

Fig. 4 is an exploded, perspective view of the system shown in Fig. 3.

Referring now in detail to the drawings, there is shown a wiring system or wired mounting board mounting electrical components 11 and interconnecting the components 11 as desired. The composite board 10 includes insulating sheets or cards 13, 14, 15, 16, 17, and 18 (Figs. 3 and 4) having coordinate rows of perforations 19 therein and stacked so that predetermined perforations in one of the sheets are aligned with predetermined perforations in the other sheets. The sheets 13 and 14 have a hole 21 and a socket 22 which are aligned for mounting a tube 23 therein, and conductive strips 25 are positioned between the sheets 13 and 14 along radially disposed rows of perforations relative to the hole 21 and socket 22, the strips 25 may be composed of copper or brass, or the like, and may be coated with solder if desired, or may be bare. The strips 25 also may be secured to one of the sheets 13 and 14 by a suitable adhesive or bonding means.

Conductive strips 31 are positioned between the insulating sheets 14 and 15 and extend along parallel perforations 19 parallel to edges 32 and 33 of sheets 13 and 14. The strips 31 are secured by adhesives or like over the certain desired rows of the perforations 19 in the insulating sheet 14 and card 15. In the present instance, the left-hand strip 31 (Figs. 3 and 4) is secured over the third row of holes 19 of the sheet 14 and card 15, the strip 31 is secured to the sixth row of perforations 19 from the left-hand edge of the card 15 and the other strips likewise secured to every third row of perforations, the last strip being secured over the fifteenth row of perforations 19, there being fifteen rows of perforations extending parallel to the strips 31. Each of the cards 16, 17, and 18 is identical with the card 15 but the strips on card 17 are arranged differently with respect to the strips on card 15 so that strips 36 on the card 17 are not positioned directly below the strips 31 but are offset laterally from the strips 31 one row of perforations on the left-hand side, and are in the next row of perforations for those of the strips 31 on the left-hand side of the strips 36. Similarly, the cards 16 and 18 are turned 180° relative to one another in the plane of the cards so that strips 37 and the row of perforations 19 along which they extend are positioned one row of perforations to the left of strips 36 on the card 16, and there is one row of perforations between the right-hand edges of the strips 38 and the left-hand edges of the next strips 37. One of the strips 38 may be discontinuous and be connected by a resistor 39 (Fig. 2) or other component.

Thus, as viewed in Fig. 1, if a pin is driven through perforations 41 it does not strike any of the conductive strips and may serve as a mechanical interlock between the cards 15 through 18 and as an insulated mounting post for one of the electrical components. Similarly, a pin driven through the perforations 42 will connect the strips 36 and 37. A pin driven through the perforations 43 will connect one of the strips 31 and one of the strips 37. A pin driven through the perforations 44 will connect the strip 31 to one of the strips 38. A pin driven through the perforations 45 will connect at least one of the strips 38 to the strip 36.

The composite boards 10 may be interconnected together by inserting the projecting portions of the cards 16 and 18 between the corresponding ends of the cards 16 and 18 of another board 10 so that the conductive strips 38 of each of the cards 18 are superimposed, and the conductive strips 37 of each of the boards 16 are superimposed. Then pins 51 may be driven through aligned perforations 52 in the overlapping end portions of the cards to connect the strips 37 electrically together and interlock the boards, and pins 55 may be driven through perforations 56 in the overlapping ends of the cards to connect the strips 38 together electrically. Similarly, a third card 20 having projecting end portions of the cards 15 and 17 may be interlaced with the projecting end portions of the cards 15 and 17 of the first card 20 with the strips 31 of one board superimposed over the strips 31 of the other board, and the strips 36 of one of the boards superimposed over the strips 36 of the other board. Pins 61 may be driven through perforations 62 to form electrical connections between the strips 36 and on the boards 17 and the strips 36 on the other board. Pins 65 may be driven through perforations 66 to connect.
the two boards together mechanically. Thus, continuity
between the conductive strips 31 of each of the boards
may be made as well as possible for mounting as many
components as desired on the strips, for example, power
leads or bus bars may be connected to all the strips 31.
Similarly, the strips 36 may be made as long as possible
and extended as far as desired. Also, the strips 37 and 38
of the boards are locked together securely and may be
easily handled and manipulated for manufacturing pur-
poses. The pins 67 may be driven through perforations
68 and serve as a mechanical interlock as do pins driven
through perforations 41. To connect the pins to the con-
ductive strips which are coated with rosin-flux, the pins are
coated with solder and as they perforate the strips, they
push down the edges of the perforations into the holes
in the perforated board into which the pins are entered
so that a good pressure point is connected therebetween.
Then if the pins are heated as by passing an electrical cur-
rent therethrough sufficient to heat the pins and melt the
solder, the solder melts and then is permitted to cool to
solder the pins to the strips that have been driven to.
It is to be understood that the above-described arrange-
ments are simply illustrative of the application of the prin-
ciples of the invention. Numerous other arrange-
ments may be readily devised by those skilled in the art
which will embody the principles of the invention and fall
within the spirit and scope thereof.

What is claimed is:

1. A universal wiring system, which comprises a stack
of sheets of insulating material each having perforations
arranged in a plurality of coordinate rows and aligned
with the perforations in the other sheets, a first group of
conductive strips extending parallelly in one direction be-
tween one pair of the sheets along first parallel rows of
perforations, a second group of conductive strips extend-
ing between another pair of the sheets along second parallel
rows of perforations crossing said first parallel rows of
perforations, a third group of conductive strips extending
parallelly to the first group of strips along rows of perfora-
tions offset from the first rows of perforations, a fourth
group of conductive strips positioned between another pair
of the sheets and extending diagonally relative to the other
conductive strips and crossing the other conductive strips
at perforations in the sheets, and a plurality of electrical
components having leads driven through the perforations
and the strips where predetermined strips cross and
soldered to the strips.

2. A universal wiring system comprising a plurality of
piles of insulating strips having insulating sheets and conduc-
tive strips, alternate ones of the insulating sheets of each pileup hav-
ing portions extending beyond the other sheets of that
pileup and interleaving with and interlocked with similar
portions of another pileup, and means connecting the
strips of the interlocked pileups electrically.

3. A universal wiring system comprising a plurality of
piles, each pileup including a plurality of insulating
sheets having conductive strips on one face thereof, the
strips on each sheet extending parallel to the other strips
on that sheet, alternate sheets on each pileup projecting
beyond the edges of the other sheets of that pileup and the
portions of the conductive strips on the projecting por-
tions extending therealong generally in the direction that
the portions project, the projecting portions of one side
of the sheets of one pileup being interleaved with pro-
jecting portions of one side of the sheets of another pileup,
and pins driven through the interleaved portions of the
sheets of the two pileups to lock them together and also
driven through the conductive strips to connect them elec-
trically together.

4. A universal wiring system comprising a stack of
several sheets of insulating material having aligned spaced
perforations forming parallel rows and extending paral-
lelly, perpendicularly and diagonally relative to one edge
of the sheets, metallic conductive strips extending along
certain of said rows of perforations between the sheets of
insulator material, a first group of conductive strips ex-
tending parallelly to one edge of the sheets and between a
pair of sheets, a second group of conductive strips extend-
ing perpendicularly to said first group, a third group of
conductive strips extending diagonally to one edge of
the sheets and between a third pair of sheets, other groups of
conductive strips between pairs of insulator sheets oriented in the same direc-
tion as one of the aforementioned groups and offset at
least one row of perforations from said group such that no
one strip overlays another, and elongated connectors ex-
tending through the perforations and strips where certain
of the strips cross to connect any one strip to any other
strip to produce a desired circuit.