Jan. 5, 1937. E. R. HAAS 2,066,469

PUNCHBOARD

Filed June 27, 1936

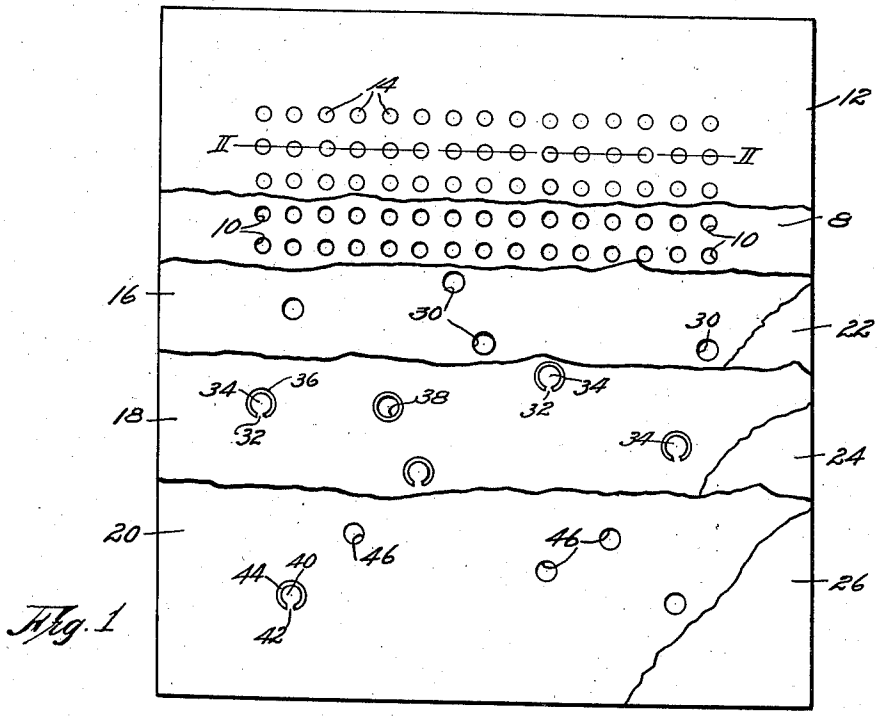


Fig. 1

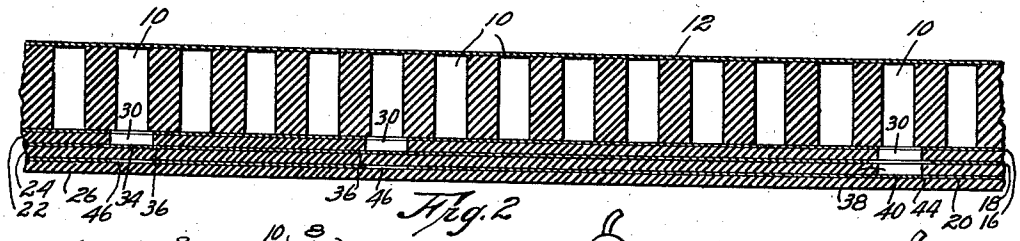


Fig. 2

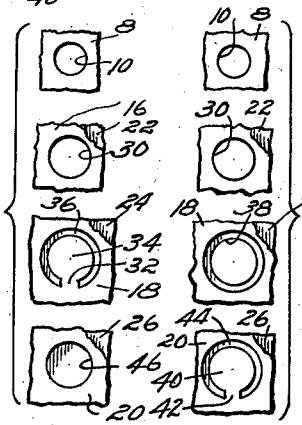


Fig. 5

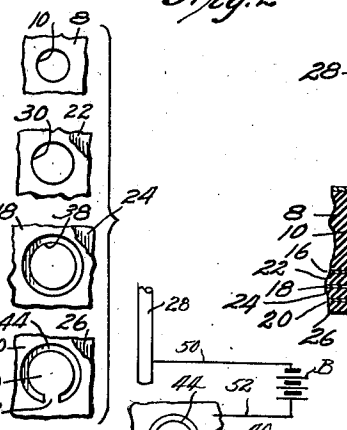


Fig. 6

Fig. 7

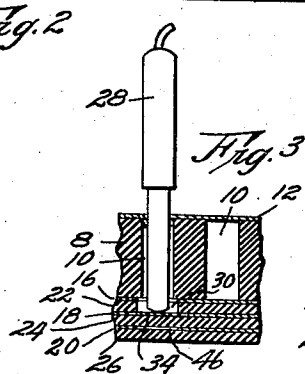


Fig. 3

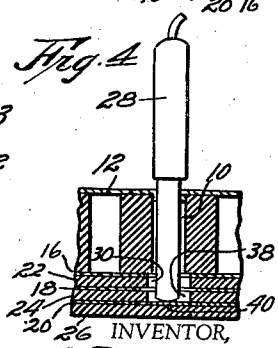


Fig. 4

INVENTOR,
Ellsworth R. Haas.

BY Harvey & Hamilton,

ATTORNEYS.

Patented Jan. 5, 1937 2,066,469

UNITED STATES PATENT OFFICE

2,066,469

PUNCHBOARD

Ellsworth R. Haas, Kansas City, Mo., assignor to Franklin S. Riley, Kansas City, Mo.

Application June 27, 1936, Serial No. 87,709

6 Claims. (Cl. 273—139)

This invention relates to punchboards for electrical game devices of the character, for example, as that shown in United States Letters Patent No. 2,043,291, dated June 9, 1936, which patent has been assigned to the assignee of the invention illustrated and described herein, and the primary object of the present invention is the provision of a control element for electrical game devices, having as component parts thereof, means for completing any one of a number of electrical circuits through the manual manipulation of the operator of a punch which is a part of all of the electrical circuits.

It has been found in game devices of an electrical character, that after a circuit has once been closed by the introduction of a punch into one of a number of perforations in the punchboard, that the same circuit may again be closed, either through the use of the same punch, or by the employment of foreign objects that may be introduced into the punchboard and manipulated to obtain the desired end by an unauthorized action.

One of the primary aims of this invention is the provision in a punchboard for electrical game devices, of a plurality of superimposed sheets of conducting and non-conducting material, each of which is slotted, perforated, and positioned with respect to a perforated board, so that certain circuits in the game device will be closed when the punch is introduced into certain perforations of the master board forming a part of the unit.

A yet further object of the invention is to provide, in a punchboard of the aforementioned character, at least one sheet of conducting material, which has an area set off therefrom in partial isolated relation thereto, so that after the circuit is closed through contacting said isolated area, the same will be completely isolated and insulated from the remaining part of the sheet of conducting material, to the end that reintroducing the punch of the game device into the perforations closed by the isolated area will not again complete the circuit.

Another object of the invention is the provision of a sheet of conducting material in a punchboard for electrical game devices, which has a crescent-shaped opening provided therein to set off an area partially isolated from and connected to the remaining portion of the sheet by a relatively narrow, fusible element, that will melt when the circuit including the said set off area is once closed to operate a particular part of the game device.

A number of very important objects of the invention, respecting the manner of associating a series of sheets of conducting material, each of which is specially formed, will appear during the course of the following specification, referring to the accompanying drawing, wherein:

Figure 1 is a face view of the punchboard, having successive layers broken away to reveal the various laminae thereof.

Fig. 2 is an enlarged, fragmentary, cross sectional view through the board, taken on line II—II of Fig. 1.

Fig. 3 is an enlarged, fragmentary, sectional view through a part of the punchboard, showing the punch of the game device inserted to contact one of the series of sheets of conducting material.

Fig. 4 is a similar view, showing the punch in contact with another sheet of conducting material.

Fig. 5 is a stretch-out view illustrating the structural relation between the laminae of the board below one of the board perforations.

Fig. 6 is a similar stretch-out view showing the structural relation and characters of the laminae below another perforation of the board, and,

Fig. 7 is a wiring diagram.

The punchboard is constructed to present a main board 8, provided with a number of perforations 10, arranged in check-rowed relation and overlaid by a cover sheet 12, that may have printed thereon, circles or similar indicia 14 which indicate the position of perforations 10 therebeneath. The side of board 8 opposite from that covered by paper 12 is overlaid by a number of sheets of conducting material 16, 18 and 20, each of which is backed by a sheet of non-conducting material 22, 24 and 26 respectively. Each sheet of conducting material 16, 18 and 20 forms a part of a normally open circuit of the game device, and a punch 28 is common to all circuits of the game device, so that when any one of the sheets of conducting material is engaged by punch 28, one of the circuits of the game device will be closed.

In some instances where merchandise is dispensed when one of the circuits is closed, it is desirable to render it impossible to again close the same circuit if punch 28 is again introduced into the same perforation of board 8. Sheet 16 underlies board 8 and forms a bottom to close most of perforations 10, and when punch 28 is introduced into any one of the perforations 10 that is bottomed by sheet 16, the circuit having that sheet therein will be closed.

Sheet 18 is insulated from sheet 16 by packing

22 and when punch 28 is introduced into certain of perforations 10, it will pass completely through sheets 16 and 22 to engage sheet 18. To permit such contact, sheet 16 and its backing 22 is provided with a hole 30, in alignment with certain perforations 10, and this hole is bottomed by sheet 18. To preclude touching sheet 16, either when punch 28 is introduced through perforation 10 and aligned hole 30 or through the use of some instrument foreign to the device, hole 30 is made to be larger in diameter than the aligned perforation 10.

After punch 28 has contacted sheet 18 by passing through perforation 10 and aligned hole 30, and after the circuit has been closed by such action, it will be impossible to again close that circuit by re-introducing punch 28 into the same perforation and hole 10 and 30 respectively. Such advantage is, of course, desirable and necessary in game devices with which this board is used, and the novel means for carrying out this feature of the invention is here illustrated to be in the form of a fusible neck 32, which joins area 34 with the remaining portion of sheet 18 prior to the circuit being closed. This neck 32 and area 34 is created by the formation in sheet 18 of a crescent-shaped opening 36, of the nature illustrated in Fig. 5. Provision may be made in the game device for actuating a relay prior to the passing through the circuit of enough electrical energy to fuse neck 32, but in any event, the structure herein provided is capable of completely isolating and insulating area 34 so that the circuit may not again be closed by contacting said area.

The number of holes 30 formed in sheets 16 and 22 are less than the number of perforations 10, and to permit punch 28 to contact the sheet of conducting material 20 when it passes into certain of aligned perforations and holes 10 and 30 respectively, there is formed in sheets 18 and 24, a number of openings 38. The part of opening 38 formed through the sheet of conducting material 18 is greater in diameter than that part of opening 38 formed through backing 24, so that when punch 28 or any other instrument is introduced, it will be impossible to make electrical connection by contacting sheet 18 where perforation, hole and opening 10, 30 and 38 respectively are in alignment. Where such a passage is formed for punch 28, it may engage only sheet 20 to close the circuit, wherein that sheet is positioned, and since it is also desirable to preclude again closing the circuit when it has once been closed by punch 28 passing down through aligned perforation, hole and opening 10, 30 and 38, said sheet is provided with an isolated area 40 in precisely the same manner as areas 34 are formed in sheet 18. A fusible neck 42 is presented and the crescent-shaped opening 44 creates area and neck 40 and 42 respectively. To fulfill the requirement of the game device, the number of openings 38 is less than the number of holes 30.

Fig. 7 diagrammatically illustrates the electrical relation between the sheets of conducting material (20 as an example), punch 28 and a battery B. In the example, when punch 28 is moved to contact area 40, current passes from battery B to wire 50, punch 28, area 40, neck 42, sheet 20, and wire 52 back to battery B. Neck 42 is immediately fused or melted and current can no longer pass through the said circuit. Obviously, any electrical devices may be interposed in this circuit so that the switching action just mentioned might supply energy thereto.

As further insurance against re-introducing punch 28 or a sharp instrument into any one of perforations 10 that may be in alignment with holes 30 for the purpose of piercing the underlying isolated area 34 and backing 24 so as to contact sheet 20, said sheet is provided with windows 46 that are in alignment with aligned perforations 10 and holes 30. Even if punch 28 would pierce through backing 24, it would merely enter window 46 and engage backing 26 and no electrical connection could be made.

A punchboard unit having the structural characteristics herein set forth will guard against closing certain circuits after they have once been closed and will serve in a vast number of ways to insure the game device with which the board is used against duplicate actions where such actions are desirable.

It is conceivable that rearrangement of parts illustrated and described might accomplish other desirable ends, and only one preferred embodiment of the invention has been disclosed.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A punchboard for electrical game devices, having a source of electrical energy, a punch and an electrical circuit including the punch, comprising a laminated body having a plurality of superimposed sheets and a plurality of cavities provided within the body between certain of said sheets, some of said sheets being composed of conducting material and forming a part of the electrical circuit, certain of said sheets of conducting material having partially insulated areas closing one end of certain of said cavities, said areas having connections with the remaining portion of the sheet which fuse to completely isolate said areas when the circuit is closed with one of the areas and its connection forming a part thereof.

2. A punchboard for electrical game devices, having a source of electrical energy, a punch, and an electrical circuit including the punch comprising a laminated body having a plurality of superimposed sheets and a plurality of cavities provided within the body between certain of said sheets, some of said sheets being composed of conducting material and forming a part of the electrical circuit, one of said sheets being provided with crescent-shaped openings therethrough whereby to set off an area thereof partially isolated from and connected to the remaining portion of the sheet by a relatively narrow fusible neck for the purpose specified.

3. A punchboard for electrical game devices, having a source of electrical energy, a punch, and a plurality of electrical circuits each including the punch, comprising a board provided with a plurality of perforations therethrough; a first sheet of conducting material, having a backing of non-conducting material, disposed against one side of the board to close one end of the perforations; a second sheet of conducting material, having a backing of non-conducting material, positioned against the backing of the first sheet of conducting material; and a third sheet of conducting material, having a backing of non-conducting material, against the backing of the said second sheet of conducting material, each of said sheets of conducting material respectively being in one of the electrical circuits of the game device, said first sheet of conducting material and its backing having holes formed therethrough in alignment with certain perforations

of the board, said second sheet of conducting material and its backing having openings formed therethrough in alignment with some of the holes through the first sheet of conducting material and its backing, the portion of said openings formed through the second sheet of conducting material being greater in diameter than the portion of said openings formed through the backing of the said second sheet of conducting material.

4. A punchboard for electrical game devices, having a source of electrical energy, a punch, and a plurality of electrical circuits each including the punch, comprising a board provided with a plurality of perforations therethrough; a first sheet of conducting material, having a backing of non-conducting material, disposed against one side of the board to close one end of the perforations; a second sheet of conducting material, having a backing of non-conducting material, positioned against the backing of the first sheet of conducting material; and a third sheet of conducting material, having a backing of non-conducting material, against the backing of the said second sheet of conducting material, each of said sheets of conducting material respectively being in one of the electrical circuits of the game device, said first sheet of conducting material and its backing having holes formed therethrough in alignment with certain perforations of the board, said second sheet of conducting material and its backing having openings formed therethrough in alignment with some of the holes through the first sheet of conducting material and its backing, said second sheet of conducting material having partially isolated areas thereof in alignment with other holes of the first sheet of conducting material and its backing, said isolated areas being connected to the remaining portion of the second sheet by fusible necks which when individually fused completely isolate the respective area.

5. A punchboard for electrical game devices, having a source of electrical energy, a punch, and a plurality of electrical circuits each including the punch, comprising a board provided with a plurality of perforations therethrough; a first sheet of conducting material, having a backing of non-conducting material, disposed against one side of the board to close one end of the perforations; a second sheet of conducting material, having a backing of non-conducting material, positioned against the backing of the first sheet of conducting material; and a third sheet of conducting material, having a backing of non-conducting material, against the backing of the said second sheet of conducting material, each of said sheets of conducting material respectively being in one of the electrical circuits of the game device, said first sheet of conducting material and its backing having holes formed therethrough in alignment with certain perforations of the board, said second sheet of conducting material and its backing having openings formed therethrough in alignment with some of the holes through the first sheet of conducting material and its backing, said second sheet of conducting material having partially isolated areas thereof in alignment with other holes of the first sheet of conducting material and its backing, said isolated areas being connected to the remaining portion of the second sheet by fusible necks which when individually fused completely isolate the respective area, said third sheet of conducting material having partially isolated areas thereof in alignment with the aligned holes and openings of the first and second sheets of conducting material and their backing, said isolated areas of the third sheet of conducting material being connected to the remaining portion of the sheet by fusible necks which when individually fused, completely isolates the respective area.

6. In a punchboard for electrical game devices, a sheet of conducting material; and a backing of non-conducting material on said sheet, said conducting material having a crescent-shaped opening provided therein to set off an area thereof partially isolated from and connected to the remaining portion of the sheet by a relatively narrow neck.

ELLSWORTH R. HAAS.