

Oct. 15, 1935.

G. E. PERREAULT

2,017,130

LIGHT VALVE

Filed April 5, 1934

2 Sheets-Sheet 1

FIG. 1

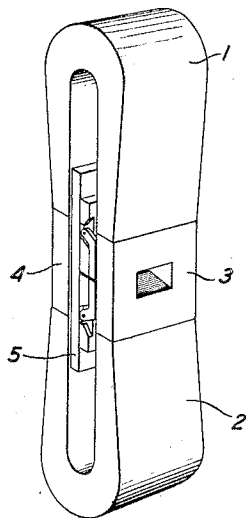


FIG. 2

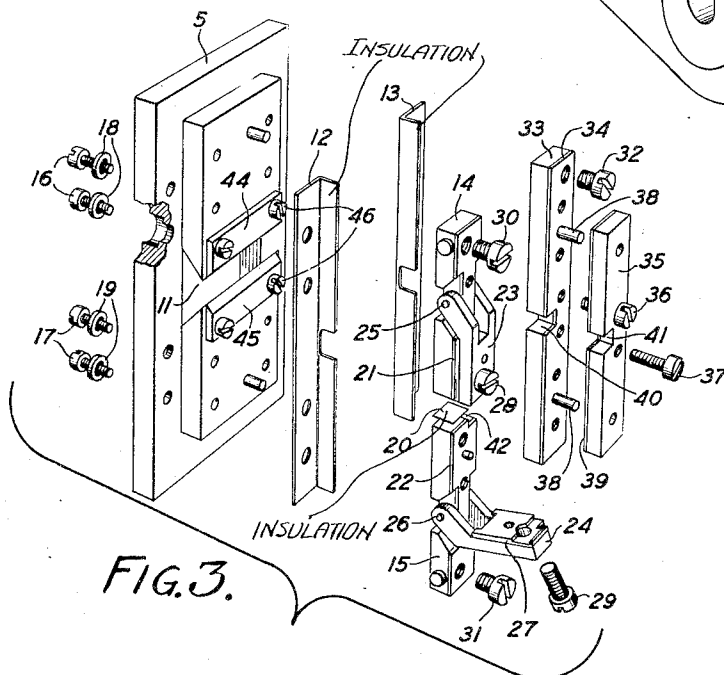
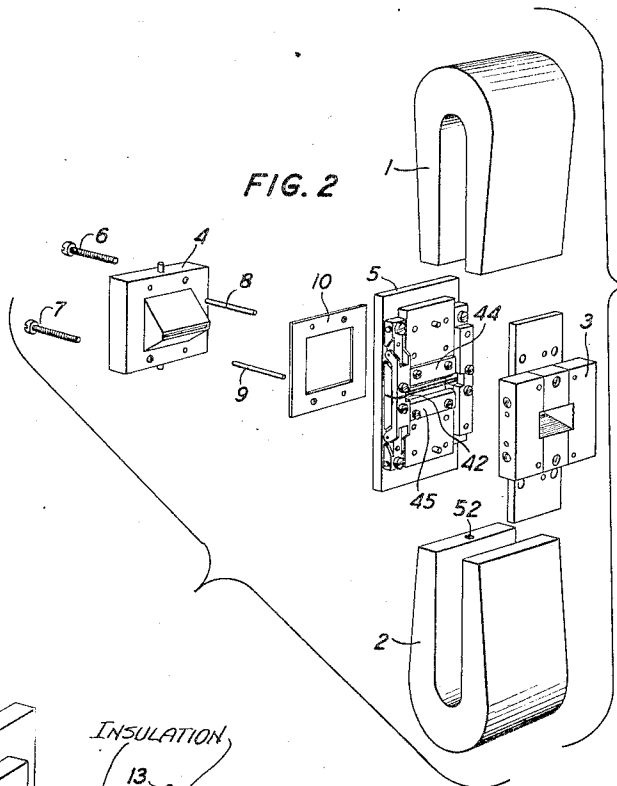


FIG. 3.

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FIG. 4

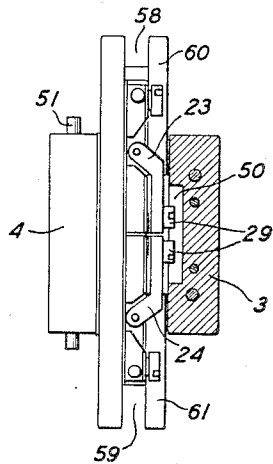


FIG. 5

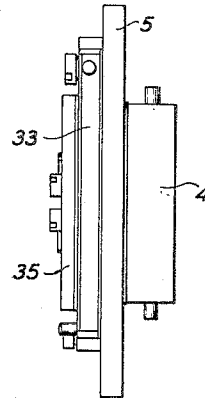
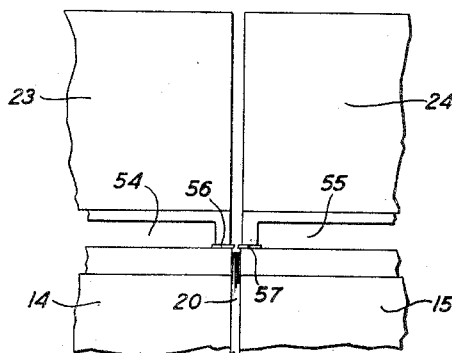


FIG. 6



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## UNITED STATES PATENT OFFICE

2,017,130

## LIGHT VALVE

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Application April 5, 1934, Serial No. 719,119

4 Claims. (Cl. 88—61)

This invention relates to translating devices, such as light valves, and more particularly to improvements in the supporting means for the movable elements of such devices.

5 A type light valve to which this invention is applicable is disclosed in U. S. Patent 1,914,186, June 13, 1933 to E. C. Wentz.

10 In the light valve disclosed in the patent to Wentz the ribbon supporting member has cemented thereto two gold contact metal bridges to which the ends of the ribbons are to be clamped. One of these bridges is divided by means of insulating material. The ends of the ribbons are clamped to the supporting member and bridged by single small bars of insulating material which are secured to the supporting member by screws.

15 Difficulty has been encountered with varying contact resistance between the ribbons and the gold contact metal bridges in the light valve as shown in the patent to Wentz, particularly on the divided bridge. The divided bridge as shown has two gold pieces separated by a piece of insulating material .002 inch wide at the center line of the valve. The single strip of insulating material must hold an end of one ribbon to one side of the divided bridge and an end of the other ribbon to the other side of the divided bridge at a distance apart approximately equal to the width of the insulation piece separating the two portions of the divided bridge.

20 It has been determined by applicant that the difficulty which produces varying contact resistance between the valve ribbons and bridges has been caused by variation in the clamping action of the single clamping unit on the two ribbon ends. As the thickness of each valve ribbon is .0005 inch, any slight difference in the height of the gold strips which make up the divided bridge will cause one ribbon to be well clamped and the other to be poorly clamped.

25 The improvements which are the subject of this invention have for an object the production of a light valve ribbon supporting and clamping means by which a light valve ribbon may be securely clamped in proper position for efficient operation.

30 A feature of the invention lies in the provision of clamping means for the ribbons on the ribbon supporting member whereby each ribbon may be clamped separately in proper spaced relation to the other and to the valve pole piece.

35 In accordance with the invention there are provided two electrically conducting clamping members pivoted to the ribbon supporting member and insulated therefrom. The two clamping members are of such a length that when located in clamping position their free ends will each positively clamp a ribbon to the supporting member independently of the other. Other features

of the invention will appear from the following specification and drawings in which,

Fig. 1 is a perspective view in approximately actual size of the assembled light valve;

Fig. 2 is an exploded view of the light valve 5 shown in Fig. 1;

Fig. 3 is an exploded view of the ribbon supporting member shown in Fig. 2;

Fig. 4 is a side view of the ribbon supporting member with the clamping members in closed 10 position;

Fig. 5 is a side view of the ribbon supporting member showing the solid bridge and single clamping member; and

Fig. 6 is an enlarged view in detail of the 15 free end of the clamping member shown in Fig. 4.

The light valve as shown comprises two horseshoe type permanent magnets 1 and 2 and a unit assembly consisting of two opposed pole pieces 3 and 4 and a ribbon supporting member 20 5. The two pole pieces 3 and 4 and the supporting member 5 are held together as a unit assembly by means of screws 6 and 7 and aligning rods 8 and 9. A shim 10, of predetermined thickness, is inserted between the shoulders of 25 the pole piece 4 and the supporting member 5 to insure the proper location of the ribbons above the face of pole piece 4.

The improvements which are the subject of this invention are shown clearly in Fig. 3, in which 30 is the ribbon supporting member having an aperture 11 therein to receive the face of pole piece 4. Angular pieces of insulating material 12 and 13 may be secured to the member 5 or placed thereon and held in position by means of the 35 clamping action between bridge members and the supporting member 5. Contact bridge members 14 and 15, made of electrically conductive material, form the two sides of a divided bridge and are secured to member 5 by screws 16 and 40 17, respectively. These screws are insulated from the member 5 by washers 18 and 19 of some suitable insulating material. The members 14 and 15 are divided by a small piece of insulating material 20. It will be seen that the members 45 14 and 15 are insulated from the member 5 and from each other.

The ribbon engaging surface of each bridge member is faced with strips of gold contact metal 21 and 22. Secured to members 14 and 15 of the 50 divided bridge are members 23 and 24, made of electrically conductive material and pivotally mounted at 25 and 26, respectively. The ribbon engaging surface of the members 23 and 24 are faced with strips of gold contact metal as shown 55 at 27. The clamping members 23 and 24 are held in clamping position by means of screws 28 and 29, respectively. Electrical connection to a source of sound modulated current is made at the terminals 30 and 31. A third terminal 32 is provided 60

to permit the light valve to be used in certain recording systems requiring two sources of electrical current at the light valve.

At the opposite edge of supporting member 5 a solid contact bridge member 33 is secured thereto by means of screws (not shown) similar to screws 16 and 17. The ribbon engaging surface of the bridge 33 is faced with a strip of gold contact metal 34. A single clamping member 35, made of electrically conductive material, is secured to the member 33 by means of screws 36 and 37. The ribbon engaging surface of the bridge 35 is faced with a strip of gold contact metal 39. Aligning pins 38 fit into holes in the member 35 to insure correct alignment of the cut-out portions 40 and 41 in the members 33 and 35, respectively. The divided bridge has a cut-out portion as shown at 42. The purpose of these cut-out portions in the bridge members is to increase the effective length of the ribbons without increasing the overall size of the light valve used heretofore as shown in the patent to Wentz.

To prevent excessive opening or movement of the ribbons and to provide additional clamping, metal strips 44 and 45 are secured to the supporting member 5 parallel to the ribbons by means of screws 46.

In Fig. 4 the unit assembly including the two pole pieces 3 and 4 and the ribbon supporting member 5 is shown. The pivoted clamping members 23 and 24 are shown in clamping position. The shoulders of the pole piece 3 are grooved as shown at 50 to prevent contact between the pole piece and the screws 29 which are included in an electrical circuit to the ribbons. Projections, as shown at 51, fit into holes, as shown at 52 (Fig. 2), in the horseshoe type magnets 1 and 2.

In Fig. 5 a solid bridge 33 and clamping member 35 are shown in assembled position on the supporting member 5.

As shown in Fig. 6 the insulation piece 20 divides the two bridge portions 14 and 15 of the divided bridge. The gold contact metal strips on clamping members 23 and 24 are grooved as shown at 54 and 55. The ribbons are engaged and clamped to the bridges 14 and 15 by the portions 56 and 57 of the clamping members. By this method of clamping the center portions of the ribbons they are kept from warping or bending at the edges.

As shown in Fig. 4, the grooves 58 and 59, formed by the shoulders of member 5 and the face of spacing members 60 and 61, provides means of mounting and centering the light valve in place in a recording device.

From the description and drawings the advantages obtainable by the use of the improved ribbon supporting member in a light valve, as shown in the patent to Wentz, will be obvious. With the use of the ribbon clamping device constructed in accordance with this invention, each ribbon may be clamped independently of the other and a difference in thickness of the two strips of gold contact metal on the divided bridge does not produce unequal clamping pressure on the two ribbons. It is seen that electrical contact to the ribbons is now made on top and bottom of the ribbons which gives an effective increase of approximately eight times the contact area between the ribbons and the contact bridges.

Applicant does not intend to limit his invention to the specific construction shown and described

herein but means to include other modifications, such as, the use of the separate pivoted clamping means on both bridges of the ribbon supporting member to separately clamp each end of each ribbon to the bridge members.

What is claimed is:

1. In a light valve having a plurality of ribbons suspended therein in spaced relation, in combination, means for supporting said ribbons in said valve, said means comprising an apertured body member, bridge means mounted on said body member to receive the ends of said ribbons in adjusted spaced relation, means for clamping the ends of each ribbon to said bridge member, said means comprising a plurality of clamping arms pivotally mounted at one end thereof to said bridge means, each of said clamping arms having at the free end thereof a ribbon engaging surface the width of which is less than the width of the ribbon engaged thereby, and means to secure said clamping arms in clamping position.

2. In a light valve ribbon supporting unit, in combination, an apertured body member, a plurality of bridge members mounted on said body member at opposite ends of the aperture therein, said bridge members being insulated from said body member, ribbon clamping means pivotally mounted on said bridge members, and terminal means mounted on said bridge members whereby said bridge members and said clamping members may be included in an electrical circuit and means adjacent the ribbon engaging end of said pivoted clamping means for adjusting the clamping pressure exerted by said clamping means on said ribbon.

3. In a light valve having a pair of conductors suspended therein in spaced relation, in combination, means for supporting said conductors in said valve, said means comprising an apertured body member having mounted thereon as a unit structure therewith a pair of aligned bridge members, insulating means separating the ends of said bridge members, means for clamping one end of each conductor to separate bridge members on opposite sides of said insulating means, said means comprising a pair of electrically conductive clamping arms each pivotally mounted at one end thereof to a separate bridge member in a manner to allow the free ends thereof to engage one end of each conductor on separate bridge members adjacent said insulating means.

4. In a light valve having a pair of ribbons suspended therein in spaced relation, in combination, means for supporting said ribbons in said light valve, said means comprising an apertured body member, a pair of electrically conductive bridge members mounted on said body member as a unit structure therewith to receive the ends of said ribbons, said bridge members being insulated from said body member and from each other, separate means associated with each bridge member for clamping an end of one ribbon to said bridge member, said means comprising electrically conductive clamping arms provided with a ribbon clamping surface at one end thereof, the other end of each of said arms being pivotally mounted on said bridge members, separate adjustable means for securing each of said clamping arms in ribbon engaging position whereby the clamping pressure exerted by said clamping arms on said ribbons may be independently adjusted.

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