

F. R. SOMMERMEYER.
 STAGE EFFECT CONTROLLING DEVICE FOR USE IN CONJUNCTION WITH MOTION PICTURE MACHINES.
 APPLICATION FILED AUG. 5, 1916.

1,379,654.

Patented May 31, 1921.
 4 SHEETS—SHEET 1.

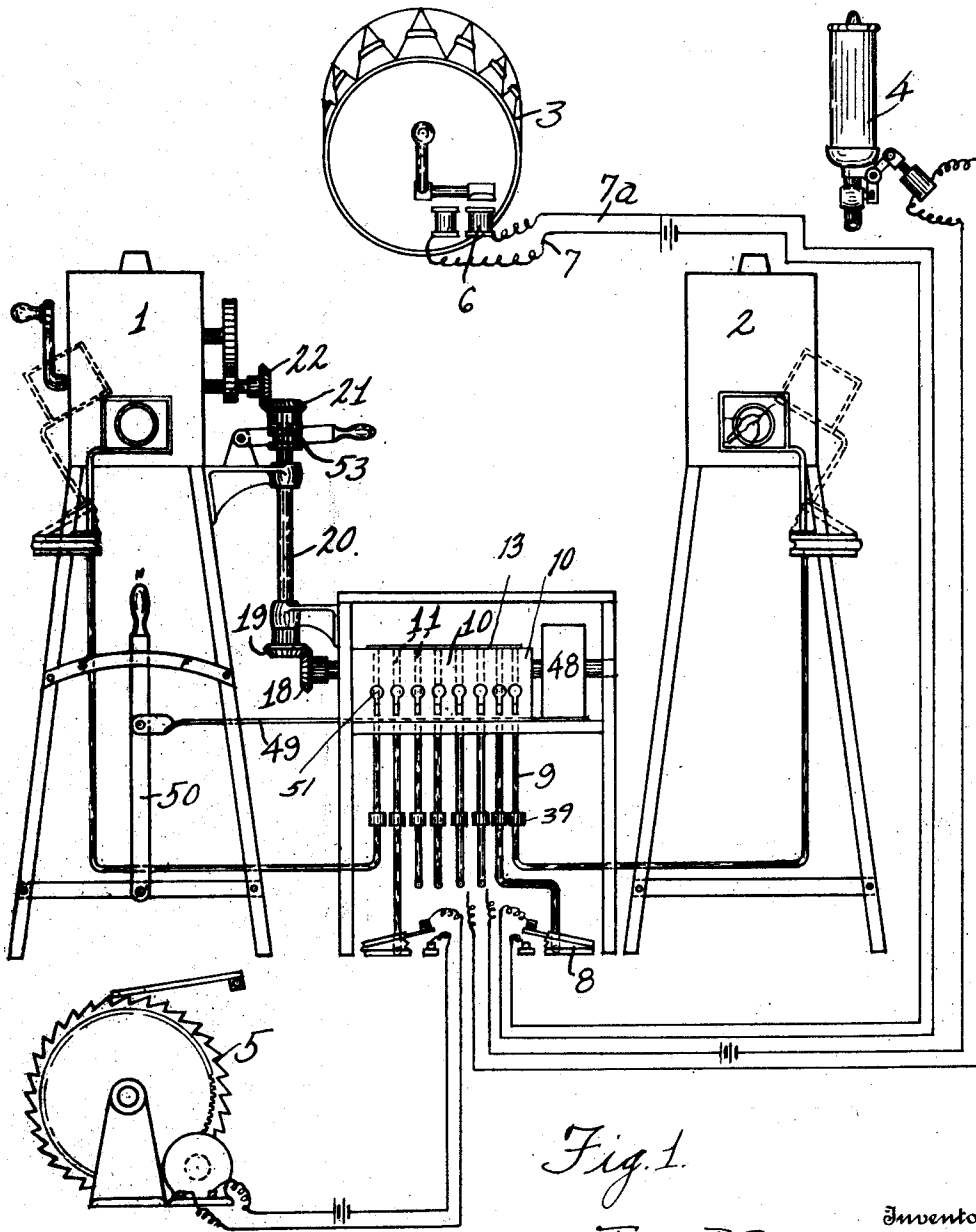


Fig. 1.

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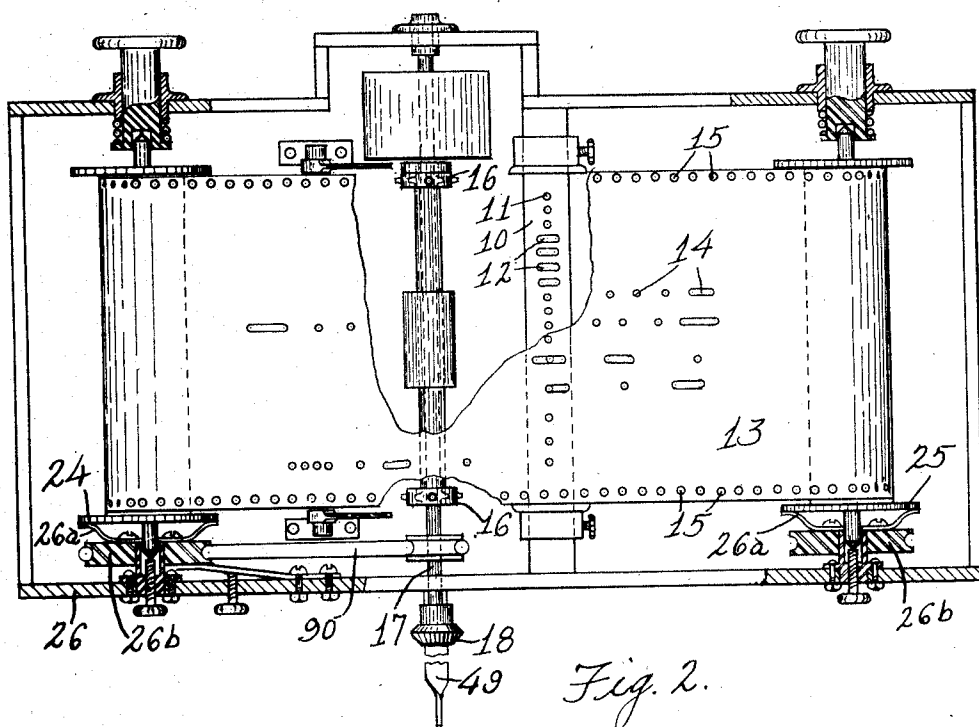


Fig. 2.

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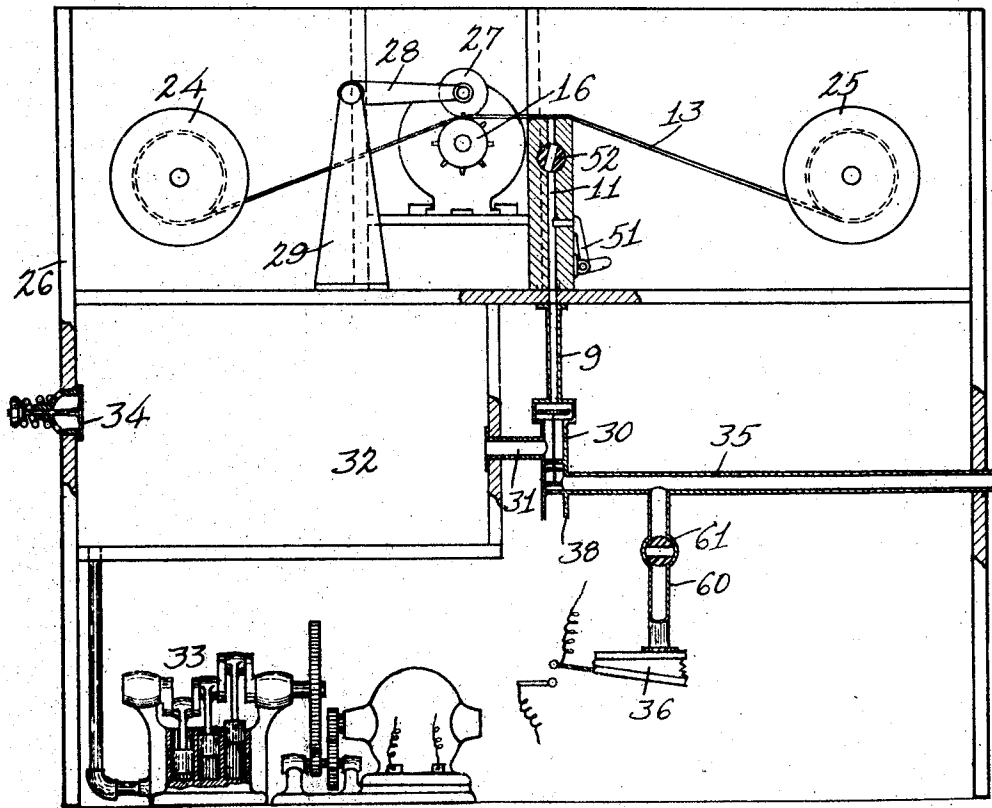


Fig. 3.

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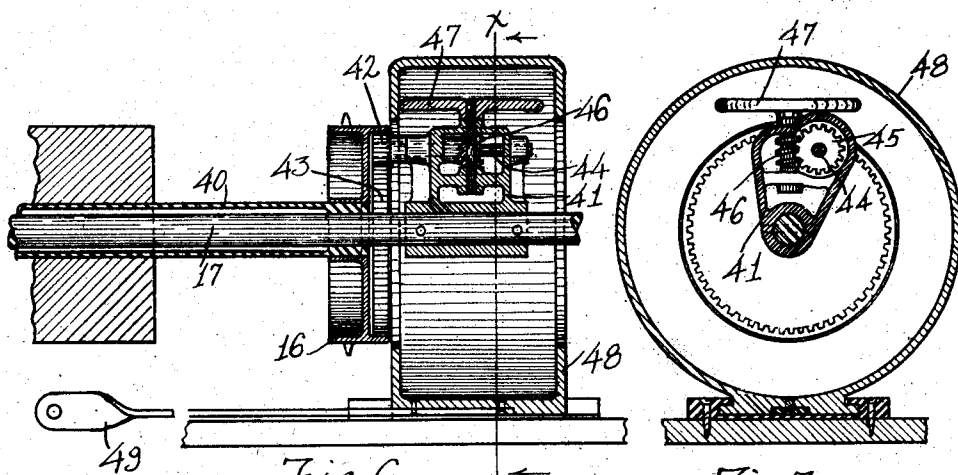
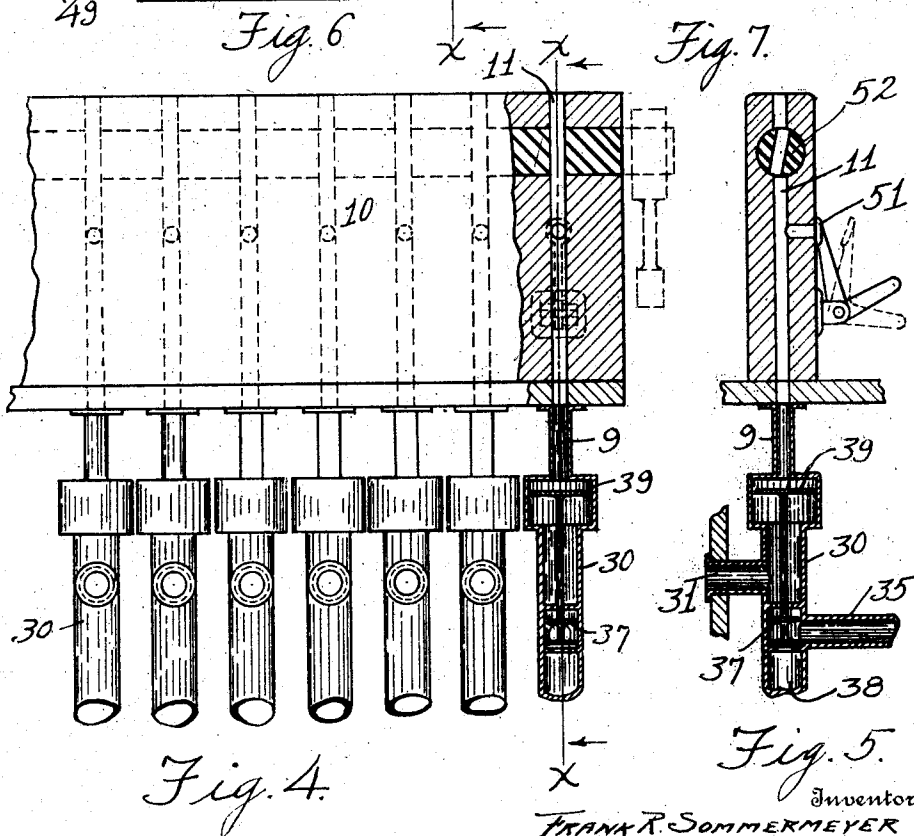
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STAGE-EFFECT-CONTROLLING DEVICE FOR USE IN CONJUNCTION WITH MOTION-PICTURE MACHINES.

1,379,654.

Specification of Letters Patent.

Patented May 31, 1921.

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To all whom it may concern:

Be it known that I, FRANK R. SOMMERMEYER, a citizen of the United States, residing at Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and useful Improvement in Stage-Effect-Controlling Devices for Use in Conjunction with Motion-Picture Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to motion picture apparatus, and its object is a method and means for automatically producing effects such as sounds, calls, lights, colors, etc., natural and in addition to the scene displayed and at the proper time interval in relation to the movement of the film in the projecting machine. An additional object is a control device for such sound or other effect-producing apparatus operable in conjunction with the projecting machine and in synchronism with the movement of the picture film.

In its preferred form, a pump or other adaptable device is utilized to exhaust air from a chamber having an air tube connected with each of the various effect-producing devices and communicating with a tracker board and a perforated strip running thereover which controls the connection of the various tubes with the exhaust chamber, and this strip is moved in synchronism with the movement of the picture film so that the desired effect or sound is produced at time interval during the display of any particular scene. An object of the invention resides in the mechanical arrangement of such air control of the various instrumentalities utilized to produce the desired effects in conjunction with the display scene or scenes, and other objects of the invention are involved in the peculiar arrangement of parts operable in conjunction with the tracker board and perforated strip.

These and other objects and the several novel features of the invention in its preferred form are hereinafter more fully de-

scribed and claimed and shown in the accompanying drawings in which—

Figure 1 is a general view somewhat diagrammatic in form illustrative of the invention.

Fig. 2 is an enlarged view showing the perforated strip and tracker board and mechanism for operating the strip in timed relation with the moving picture film.

Fig. 3 is a vertical section of the tracker board showing the exhaust chamber and the tubes connected therewith and mechanism for exhausting air from the chamber.

Fig. 4 is a detail showing a portion of the tracker board and the arrangement of the tubes communicating therewith.

Fig. 5 is a cross section thereof taken on line *x—x* of Fig. 4.

Fig. 6 is a detail in section of the apparatus used to maintain the perforated strip in synchronism with movement of the film.

Fig. 7 is a vertical section taken on line *x—x* of Fig. 6.

Similar characters refer to similar parts throughout the drawing and specification.

Oftentimes in the exhibiting of a moving picture on a screen it is desired to produce in conjunction therewith various sounds, as for instance, the beat of a drum, the blowing of a whistle, the galloping of horses, etc. This generally has been produced by hand at the proper time interval in the judgment of the operator that it may appear to have been produced by occurrences displayed in the picture. This invention seeks to provide an automatic means for producing the effects in sequence and at the correct time interval and is shown in its preferred form in the accompanying drawings. The usual apparatus by means of which the picture is displayed is indicated at 1 which may be of any preferred form now commonly in use. Although not so shown it is to be understood that this picture projecting device is of the usual type in which a strip of film is moved intermittently to produce the desired motion effect. At 2 is diagrammatically shown a projecting apparatus for use with color screens. At 3 is shown a drum and apparatus diagrammatically shown for operation thereof while a whistle

is shown at 4, and at 5 is shown a notched wheel operated by a motor to produce crashes and the like. As will be readily understood by those familiar with this art, sounds and effects of various kinds corresponding with any of those within the limits of human experience may be produced with proper apparatus, as for instance, explosions, storm effects, sounds of birds and animals. Likewise musical instruments, mechanical fountains, stereopticon apparatus, talking machines, electric machines or another moving picture apparatus, etc., may be operated to produce effects in conjunction with a displayed scene.

As may be understood from Fig. 1 some or all of the effect-producing devices may be operated electrically. For instance magnets 6 are used for operating the drum stick of the drum. These magnets are connected by lines 7 and 7^a with two contacts, the circuit being closed by operation of the bellows 8 connected with the air control apparatus and it is to be understood that all the devices are controlled primarily by exhaustion of air from a bellows or other suitable device as is hereinafter more fully described.

The bellows controlling each apparatus is connected by a tube 9 with a tracker board 10, each tube 9 leading to a single channel 11 in the tracker board. This tracker board is quite similar to that usually used in automatic piano players but preferably, as will be understood, several of the openings of the channels, as for instance 12, are elongated as may be found desirable with some apparatus to prolong its operation. Also such elongation allows the use of several consecutive apertures in the perforated strip to cause prolonged operation of a device and thus avoids the making of a long slit in the strip and consequent weakening thereof. Over this tracker board runs the perforated strip 13 having several perforations 14 therein registering with the mouth of the channels 11 or 12 of the tracker board. This perforated strip has a series of regular perforations 15 adjacent each edge thereon engaged by the toothed wheels 16 operated by the shaft 17 running beneath the strip, as will be understood from Fig. 2. This shaft 17 is provided with a bevel gear 18 meshing with a similar gear 19 on a vertical shaft 20 shown in Fig. 1 on the opposite end of which is loosely mounted a bevel gear 21 meshing with a similar gear 22 carried by a shaft in geared relation with a part of the picture projecting apparatus so that the speed of movement of the film operating apparatus is transmitted directly to this shaft 17 in a manner to move the perforated strip at a speed corresponding with the speed of movement of the film. The speed of movement of the perforated strip, however, may be much slower than that of movement of the

film, the desired relation being that the perforations 14 uncover the corresponding channels 11 of the tracker board at the time interval required for operation of the effect-producing apparatus connected with the channel to produce the effect required to correspond with the action scene displayed.

The perforated strip 13 is carried on the rollers 24 and 25 mounted at opposite ends of the case 26 and each roll is yieldingly retarded in its revolution by the flat contact springs 26^a engaging the end of the roller as shown in Fig. 2. These springs are preferably mounted on a pulley 26^b in each instance, and these pulleys may be directly driven by an electric motor or by a belt from a pulley on the shaft 17 as shown in said Fig. 2. It is to be noted that the toothed wheels 16 do not drive the perforated strip but are utilized to control the speed of movement of the strip in order that the perforations 14 may be moved in exact synchronism with the movement of the picture film through the projecting apparatus.

In order that the perforations 15 at each edge of the strip may be held in proper relation with the toothed wheels 16, rollers 27 at opposite sides of the strip are each mounted on a pivoted lever 28 which is supported by a bracket 29 carried in the case 26. These rollers 27 hold the perforated strip in engagement with the toothed wheels 16.

As before stated, the tube 9 for each effect-producing apparatus is in communication with a single channel 11 or 12 of the tracker board. Each tube 9 is in communication by means of the tube 31, with an exhaust chamber 32 which is maintained at certain constant pressure by means of an exhaust pump 33. A valve 34 is placed in the wall of the chamber 32 and is adapted to open at certain pressure to allow air to flow into the chamber and thus the said chamber is never exhausted of air to an extent greater than is desired. Each of the valves 30 is provided with a tube 35 leading directly to the bellows or other device which operates the effect-producing apparatus as for instance the bellows 36 in Fig. 3 by means of which an electric contact is produced by an exhaustion of air in the bellows. The valve 30 is of the type usually used in an air controlled apparatus of this character, and it will be noted that when the upper end of the channel 11 of the tracker board is closed by the strip 13 the valve 30 will be lifted and close communication between the tube 35 and the exhaust chamber by means of the valve plate 37 and at the same time opens the tube 35 to atmosphere through the tube 38. When the channel 11 is opened by a perforation of the strip registering with the mouth thereof, the plate 39 being greater in diameter than the plate 37, the valve will be drawn downward by the exhaustion of

air in the valve chamber as air is allowed to flow through the channel 11 and the tube 9. This movement of the valve opens the channel 35 to the exhaust chamber, which tube, being in direct communication with the bellows produces operation thereof. As the aperture in the strip passes out of registration with the channel 11 of the tracker board, the said channel is closed stopping the flow of air therethrough and causing the valve plate 37 and other plates connected with the stem thereof to move upward closing the tube 9 and the tube 35 from the exhaust chamber and opening the tube 35 to the atmosphere, which allows the bellows connected with the tube to again assume normal position.

With all of the several devices necessary or usual to produce the various desired effects, as heretofore described, a strip may be cut or perforated to bring the various instrumentalities into operation at the time interval during the progress of display of the moving picture film. As will be readily understood, this perforated strip may be very accurately made of paper, cloth or other suitable material and when a film is sold or leased for exhibition, a companion perforated strip may accompany the film and a single operator may jointly operate the picture projecting apparatus and control apparatus for the several effect-producing instrumentalities.

In producing the various light effects on the display screen, a bank of color screens may be placed adjacent the picture apparatus, as indicated in Fig. 1, each screen being connected with a bellows in communication with the tracker board in the manner heretofore described. Likewise the device 2 may be provided with a similar bank of screens some being illustrative of forked lightning for instance, a rising moon or flame of camp fire, shadow effects, etc., each of which at the proper time interval may be brought in front of the lights of the device 2 and thrown onto the screen in conjunction with the scene displayed by the film of the apparatus 1. The perforated strip may also be used to operate the effects before or after the film is displayed.

As it is possible that the perforated strip may run slightly faster or slower than necessary, I have provided a means shown in Figs. 6 and 7 for advancing or retarding the perforated strip relative to the scenes displayed by the film. For this reason the toothed wheels 16 are mounted on a common hollow shaft 40 through which the shaft 17 extends and on the outer end of this shaft is mounted a controller 41 secured to the shaft 17 and having a gear 42 meshing with an internal gear 43 of the toothed wheel 16. The gear 42 is on a shaft 44 on which is a worm wheel 45 meshing with a worm 46 on

the shaft of a setting wheel 47. These several shafts and gears are carried by the member 41 which is inclosed within the case 48 slidably mounted at one end of the apparatus. To slide the said case, a bar 49 is secured to the base of the case 48 and attached to a lever 50 mounted on the frame of the projecting apparatus, but convenient for operation and control by the operator. As will be understood from Fig. 6 by moving the case in one direction the wheel 47 is brought into frictional contact with one side thereof or the other depending upon the direction in which the case is moved and the toothed wheels are made to rotate slower or faster than the shaft 17. When the case is in neutral position and the wheel 47 out of contact therewith the toothed wheels 16 and shaft 17 are rotated in unison.

If it is desired to operate any one or more of the effect-producing devices not provided for by the perforate strip in use at the time the channels 11 may be opened to atmosphere by means of the valve 51 and thus, even if the upper end of the channel is closed by the perforated strip, the valve in the corresponding conduit 9 may be actuated. Also the entire series of valves and instrumentalities connected therewith may be cut off from operation simultaneously by operation of the valve 52 common to each of the channels 11 or 12 of the tracker board and this valve may be utilized during the display of a picture, if a picture is to be displayed in which the control apparatus is not to be utilized. The said control apparatus may also be disconnected from the projecting machine by means of the clutch 53 on the shaft 20 by means of which the loose gear 21 may be connected with or disconnected from the shaft 20.

While I have here shown a simple arrangement of the air tubes leading directly to a single device in each instance, it will be readily understood that the valves 52 may be utilized to bring into operation an entire group of tubes in communication with a single tube 35. As will be understood from Fig. 3 the tube 35 in horizontal position is in communication with one bellows and likewise other tubes may extend from the tube 35 to other apparatus. In this manner several effects may be simultaneously operated by the opening of a single channel 11 of the tracker board and for this purpose each of the tubes 60 leading to the tube 35 should be provided with a valve as indicated at 61 so that any one of the several instrumentalities or groups may be cut off from communication with the exhaust chamber. Various departures may also be made in the arrangement of the air tubes without departing from the spirit of this invention, which fundamentally relates to the utilization of the perforated strip as described as a

medium through which several instrumentalities for producing effects in conjunction with the displaying of the picture may be brought into operation at the correct time interval.

It is further to be understood that both the film and the perforate strip should be marked in such manner that both may be placed in the respective machine to begin operation in step one with the other. Also that the perforate strip may be so set, when desirable, that effect-producing device may be operated prior or subsequent to the display of the picture on the screen.

Having thus briefly described my invention, its utility and general mode of operation, what I claim and desire to secure by Letters Patent of the United States is—

1. The combination of a plurality of stage-effect-producing devices, of a tube for each of the devices, a bellows for each tube controlling the operation of the device, exhaust producing means for exhausting the air from the tube and bellows connected therewith, a tracker board having conduits into which the tubes extend, a perforate strip movable across the tracker board to open the conduits at predetermined intervals to atmosphere, a valve member extending longitudinally of the tracker board having apertures therethrough for each of the conduits of the tracker board adapted to be

turned to close or open all of the said tubes, and a valve member for each tube of the tracker board by means of which it may be manually opened to atmosphere.

2. In combination with a series of stage-effect producing devices, a tracker board having a series of channels, a strip of material movable across the tracker board having perforations therein to open the said channels to atmosphere in predetermined time relationship, an air control device for operation of each effect producing device, an air tube connected with each air control device, several of the tubes connecting directly with the channels of the tracker board and several of the tubes connecting with a single tube in communication with the tracker board, an exhaust producing means communicating independently with each tube communicating with the tracker board, a valve in each tube communicating with the tracker board adapted upon closing the tracker board channel to atmosphere to close the exhaust means to the tube and prevent operation of the companion air controlled device, and a manually operable valve in the said tubes to independently shut off the tubes from the exhaust means.

In testimony whereof, I sign this specification.

FRANK R. SOMMERMEYER.