J. G. MEREDITH.

ELECTRICAL SWITCHING DEVICE.

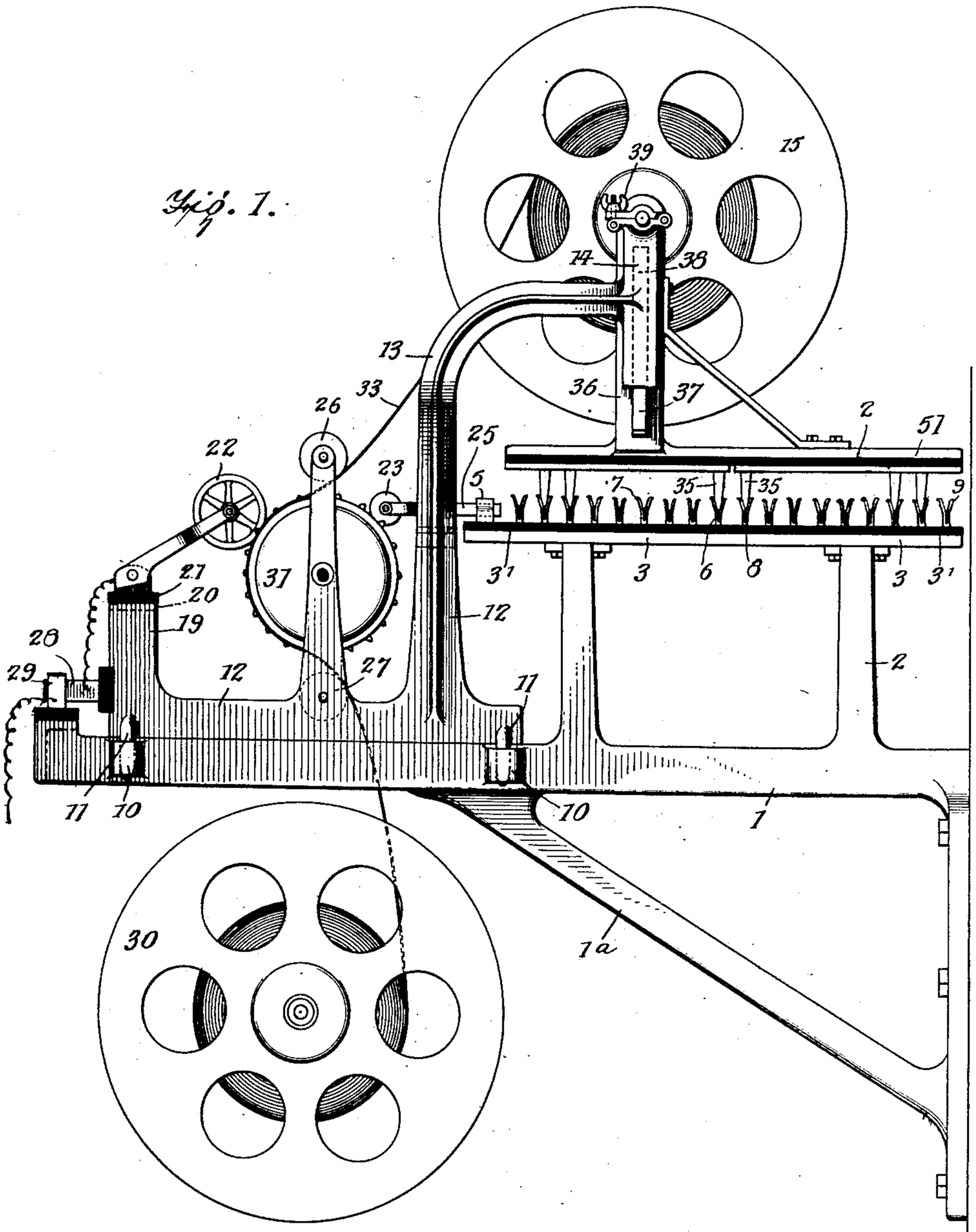
APPLICATION FILED JUNE 7, 1910.

969,646.

Patented Sept. 6, 1910.

5 SHEETS—SHEET 1.

Fig. 1.



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5 SHEETS—SHEET 2.

Fig. 2.

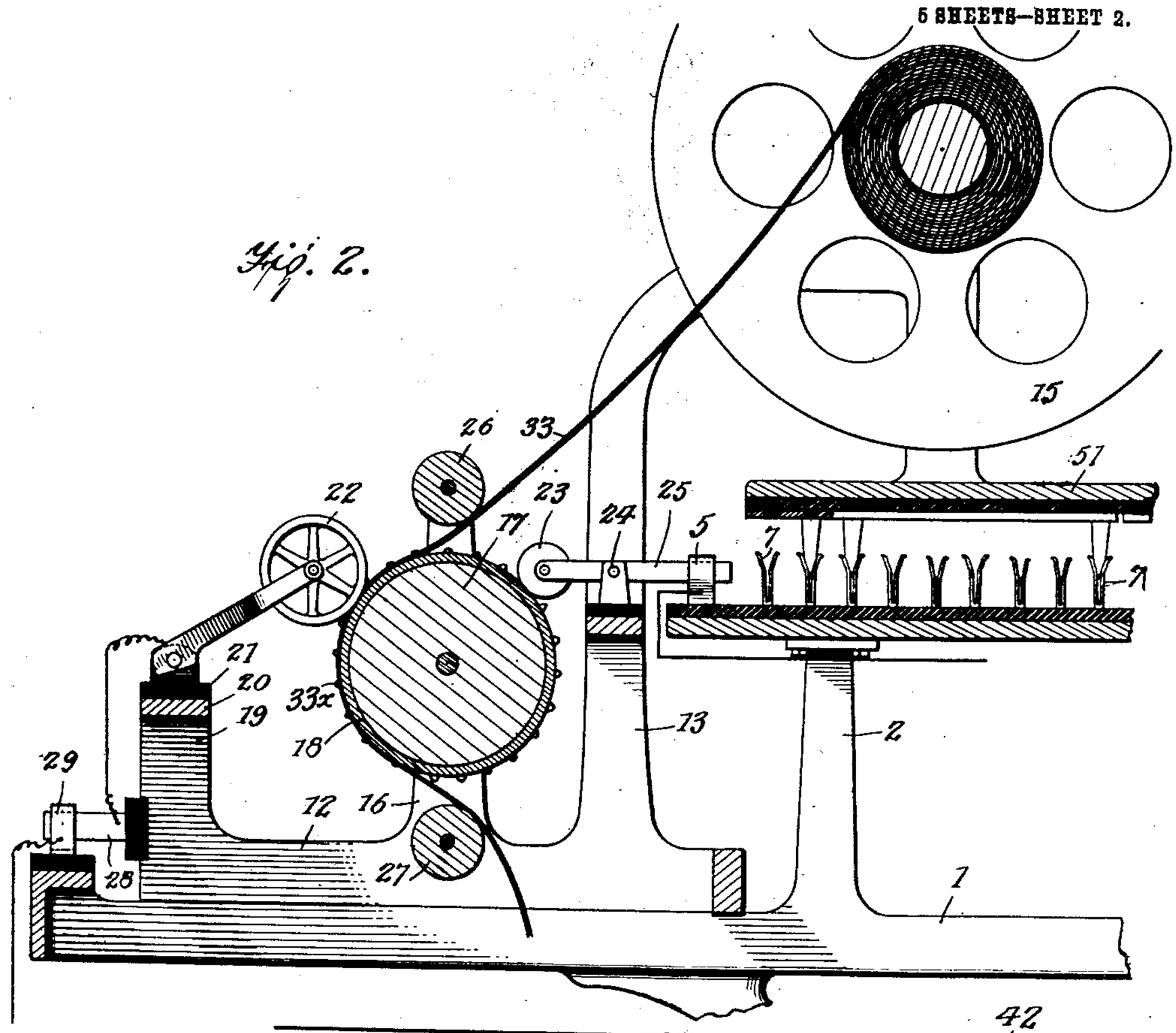
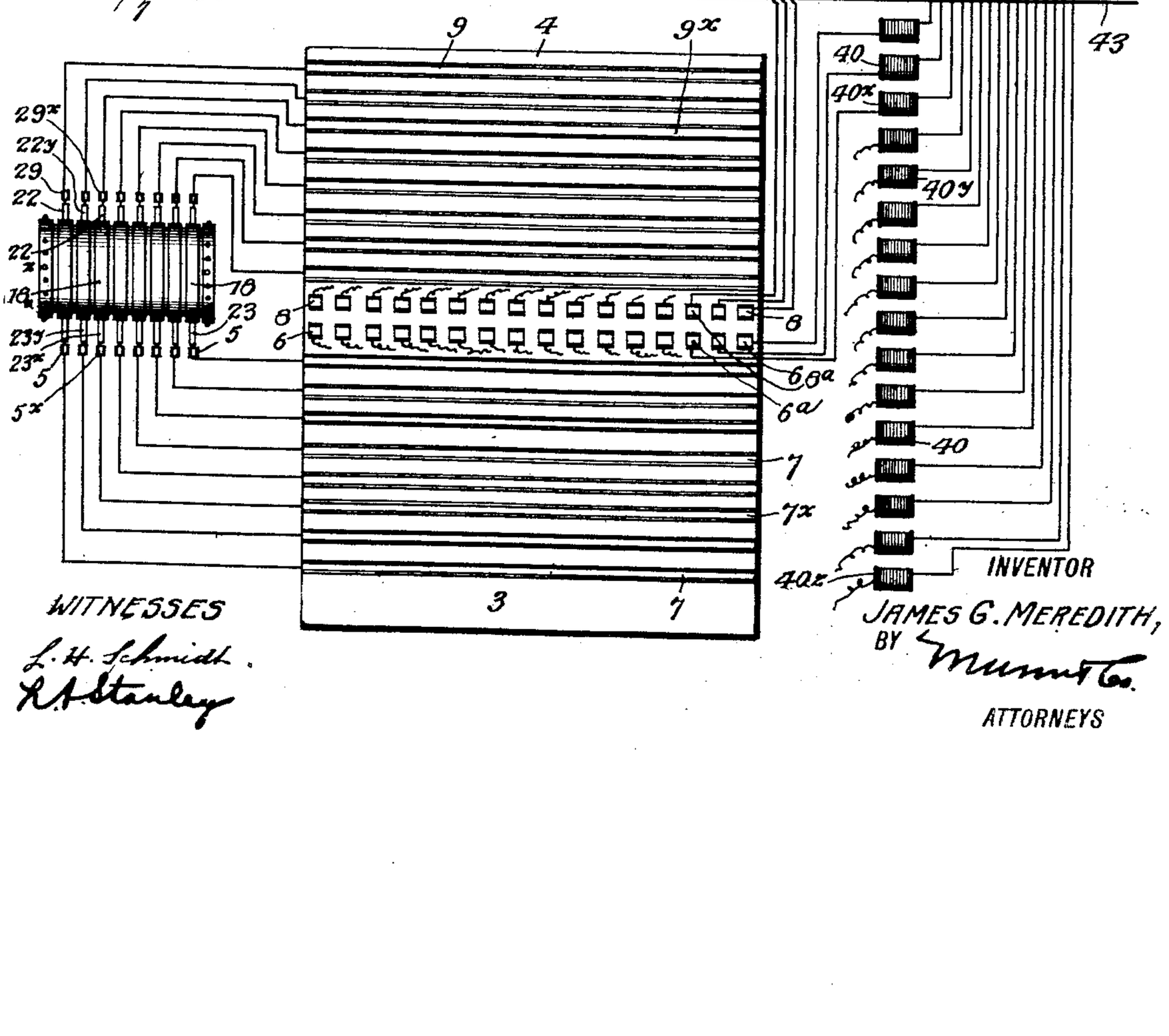


Fig. 3.



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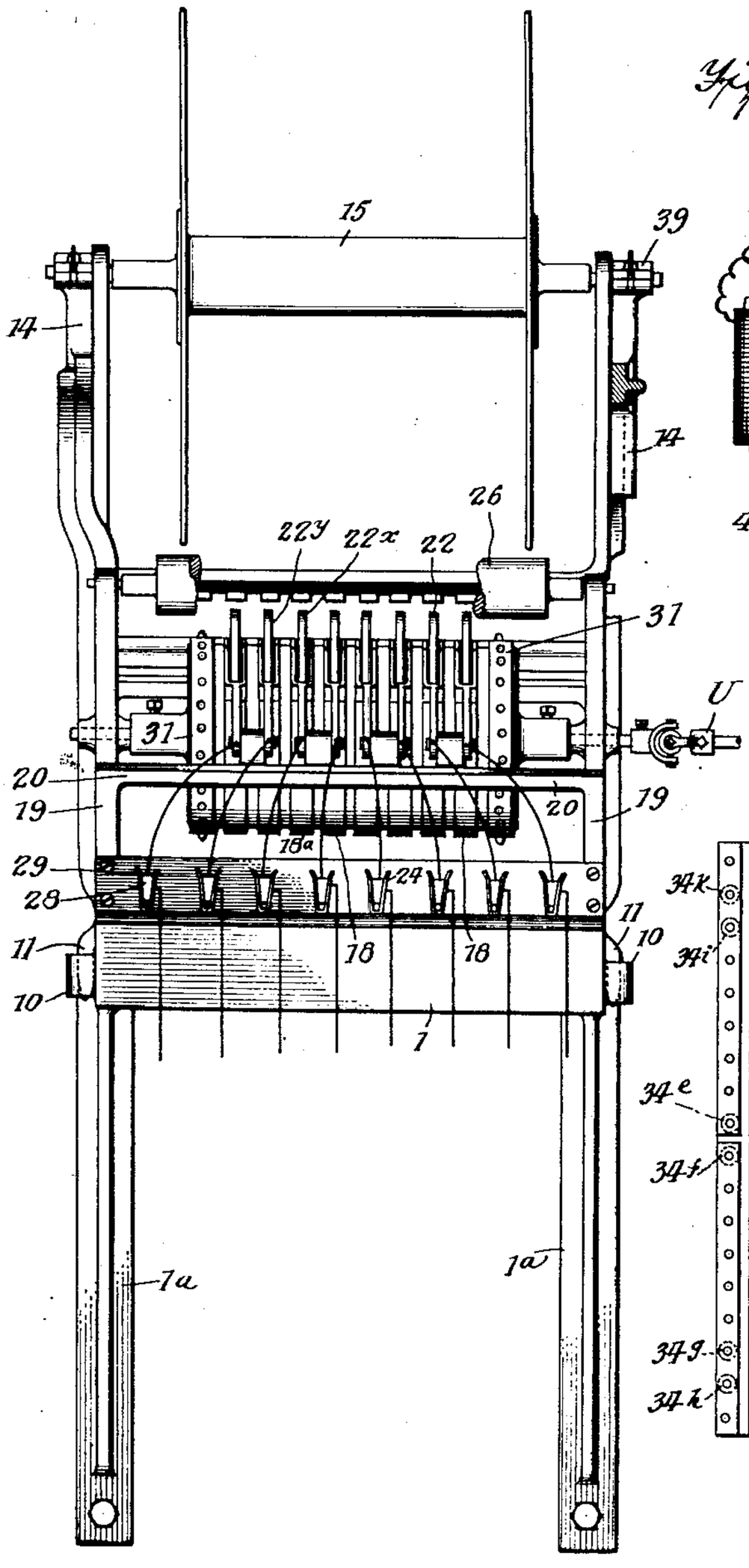
5 SHEETS—SHEET 3.

Fig. 4.



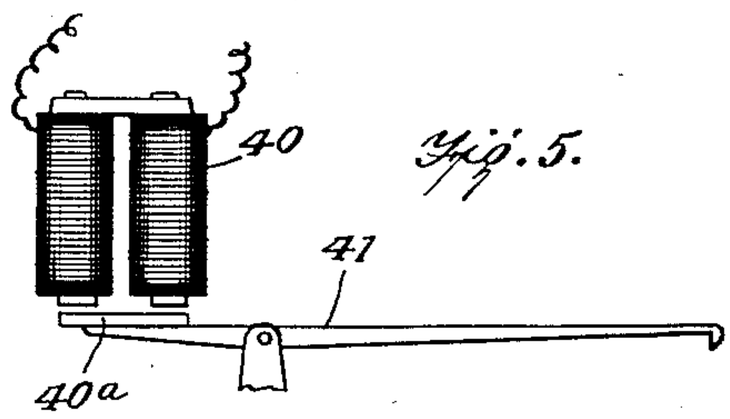
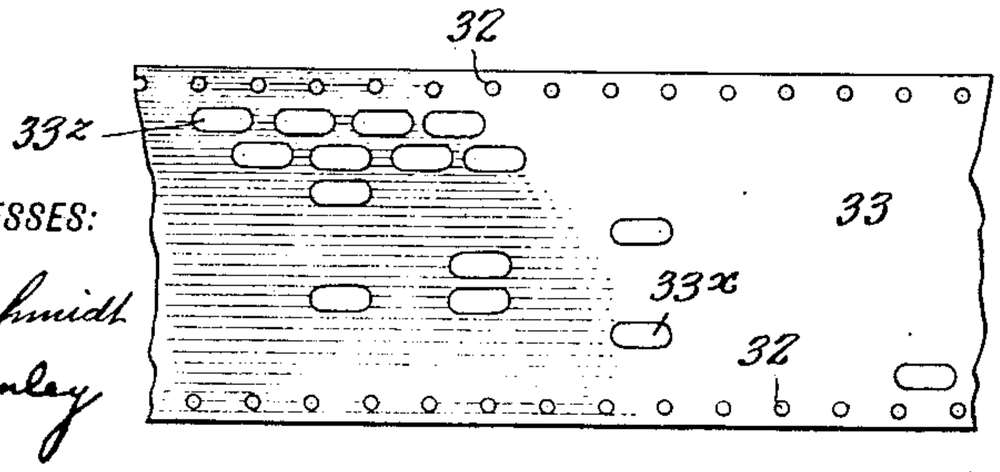


Fig. 5.

Fig. 7.

Fig. 6.



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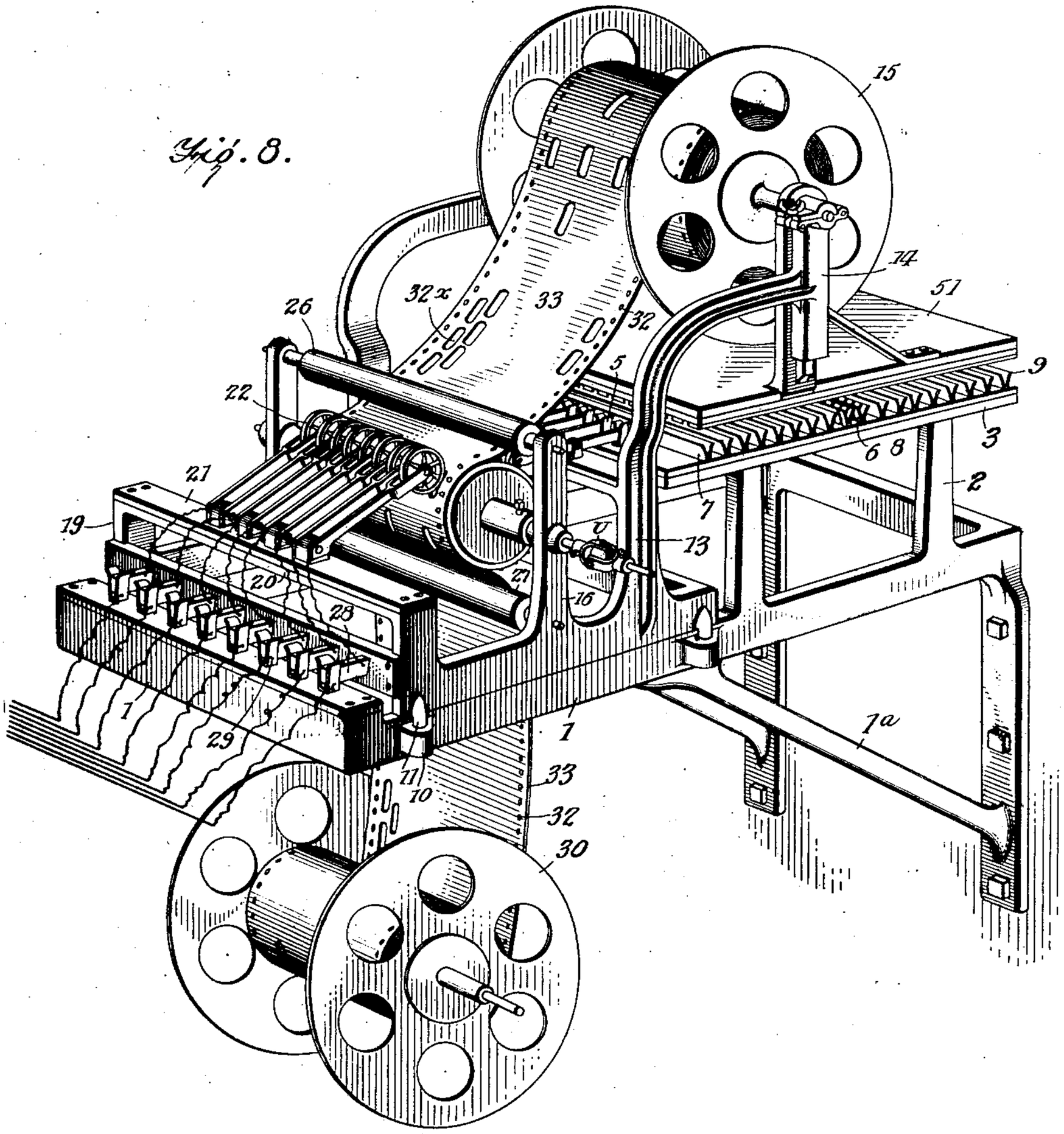
5 SHEETS—SHEET 4.

Fig. 8.



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5 SHEETS—SHEET 5.

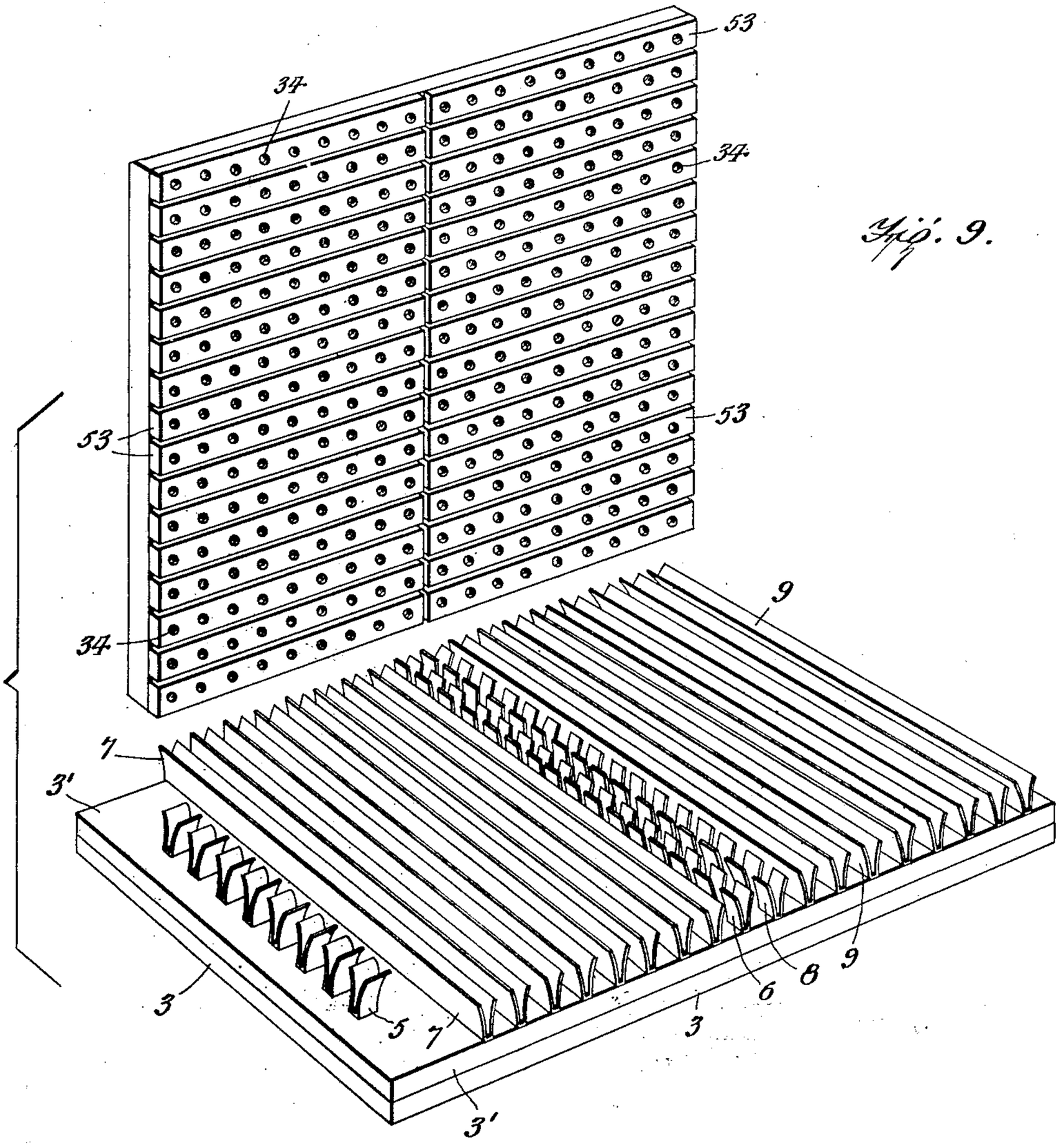

Fig. 9.

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UNITED STATES PATENT OFFICE.

JAMES G. MEREDITH, OF LYNCHBURG, VIRGINIA.

ELECTRICAL SWITCHING DEVICE.

969,646. Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed June 7, 1910. Serial No. 565,470.

To all whom it may concern:

Be it known that I, JAMES G. MEREDITH, a citizen of the United States, and resident of Lynchburg, in the county of Campbell and State of Virginia, have made certain new and useful Improvements in Electrical Switching Devices, of which the following is a specification.

My invention relates to improvements in electrical switching devices to be used in connection with moving picture apparatus, for actuating different magnets which operate their respective instruments or sounding devices that accompany the presentation of the pictures.

An object of my invention is to provide a device in which different sounds, such as the tapping of a bell, the sounding of a whistle, the roll of a drum, the report of a pistol, etc., may be produced simultaneously with the movement in the picture which would ordinarily cause such a sound.

A further object of my invention is to provide a device in which the simultaneous operation of the actuating magnet with its respective movement in the picture is rendered absolutely certain.

A further object of my invention is to provide an auxiliary film or tape to accompany the main film of the moving picture device, this film or tape being perforated so as to effect electrical connections for the operation of the magnets.

A further object of my invention is to provide a device upon which this auxiliary film tape may be detachably mounted so that for each new film for the moving picture a corresponding auxiliary tape may be used for the sound producing mechanism.

A further object of my invention is to provide an electrical switch in which a large number of combinations of sounds may be produced by means of a tape of relatively narrow width.

My invention is illustrated in the accompanying drawings forming part of this application, in which—

Figure 1 is a side view of the device, Fig. 2 is a vertical section through a portion of the device, Fig. 3 is a diagrammatical view showing the circuit connections, Fig. 4 is a front view, certain portions being broken away for the sake of clearness, Fig. 5 is a view showing a magnet and operating lever, Fig. 6 is a plan view of a portion of the tape or film, Fig. 7 is a bottom view showing the upper contact plate with the contact pins removed, Fig. 8 is a perspective view, showing all the parts assembled, and Fig. 9 is a perspective view, showing the upper and the lower contact plates.

In carrying out my invention I provide a main frame 1 which is adapted to be secured to a wall or other support, and is provided with braces 1^a. The frame is provided with uprights 2, bearing at their top a plate 3. This plate has suitable insulation 3^1. In Fig. 9 I have shown a perspective view of this plate. In this figure it will be seen that there is a series of contacts 5 carried on one side of the plate. In Fig. 3 which is a diagrammatic view these contacts are shown near the contact rollers, instead of on the plate 3, merely for the purpose of illustrating the electrical circuits. In Figs. 1, 2 and 9, however, the contacts 5 are shown in their true position. In addition to the contacts 5 one portion of the plate 3 bears a series of contacts 6, which are in one row, and a series of extended longitudinal contacts 7. The other portion or half of the plate has a series of individual contacts 8 similar to the contacts 6, and a series of extended longitudinal contacts 9 similar to the contacts 7. As will be seen from the drawings, the contacts 6, 7, 8 and 9 each consists of V-shaped conducting strips which are adapted to receive a conducting member and to hold the same by means of the spring sides.

Upon the frame 1 are the lugs 10, which are provided with openings to receive the tongues 11 of an auxiliary frame 12. This frame bears the uprights 13 which have lateral bends to provide supports 14 for the supply reel 15. Integral with the frame 12 are the uprights 16 upon which is mounted a cylinder 17 bearing a series of conducting rings 18, these rings being preferably copper, and being insulated from each other. Upon the uprights 19 is mounted a cross strip 20. The latter bears the insulation 21, upon which is pivotally mounted a series of trolley wheels 22, the peripheries of the trolley wheels being normally in engagement with the respective conductors 18. On the opposite side of the cylinder 17 is a series of trolleys 23 which are mounted on bars 25 pivoted at 24 and whose ends are adapted to engage the respective contacts 5. An idler 26 is mounted above the cylinder 17, while an idler 27 is

mounted below it. The frame 12 has projecting from its forward part a series of conductors 28 which are adapted to engage the contacts 29 on the frame 1. Below the frame 1 is mounted a take-up reel 30. At each end of the cylinder 17 is a sprocket wheel 31, which is adapted to engage the perforations 32 in the edge of the tape 33 to move the same.

In Fig. 7, I have shown the arrangement of the upper contact plate 51. This contact plate is provided with the insulation 52 upon which is secured a series of bars 53, spaced from each other, and provided with holes 34 adapted to receive pins 35. The plate 51 is secured to an upright 36 having a tongue 37 which is adapted to enter a groove 38 in the support 14. The shaft of the reel extends through the upright 36 and bears on the upper part of the support 14. This is provided with a split bearing, the upper part of which is secured by means of a thumb nut 39. In describing the support for the reel, I have made mention of only one side, but it will be understood that the opposite side is similarly supported.

The magnets which this machine is designed to control are preferably that of the type shown in Fig. 4 at 40. The armature 40^a of the magnets is mounted on the end of a lever 41 which actuates the sounding device.

Fig. 3 shows the circuit connection. In this figure 42 and 43 are the respective lead wires from the source of current. The magnets 40 are shown as single magnets for the sake of simplicity. One terminal of each magnet is connected to one of the lead wires, the other terminal being connected to its respective contact in the row of contacts designated by 6. The contacts 7 are connected to the contacts 5, which are in electrical connection with the trolley wheels 23, the latter bearing on the rings 18. On the other side of the conducting rings 18 are the trolley wheels 22 which are in electrical connection with the contacts 29. The latter are connected with their respective contacts 9. The contacts 8 have individual connections with the lead wire 42.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

The manufacturer of a moving picture film makes also the film or tape 33 which is wound upon the delivery reel 15. The reel, with the tape 33 thereon, and the plate 51, with the standards 36 connecting the two, are all sent out from the factory with the moving picture film. Moreover, the pins 35 are placed in the openings 34 so as to effect the proper connections for sounding the particular devices that correspond with the motion pictures. It will be observed that the number of sounds to be effected will be limited to eight for any one film, but the particular eight can be chosen from a large number of sounding devices on account of the arrangement of my switching device.

Suppose, for example, that it is desired to operate the magnet marked 40^x in Fig. 3, and also the one marked 40^y, these magnets being the third and the fifth magnets respectively from the top of the figure. The manufacturer of the film would have placed pins in the holes 34^a and 34^b of the bars 53 shown in Fig. 7. Then if he wanted the ring 18^a in Fig. 3 to operate the magnet he would place pins at 34^c and 34^d. Now as the film 33 is moved and a perforation such as that shown at 33^x passes the ring 18^a, the trolley wheel 22^x will close the circuit as follows: from the wire 43 through the magnet 40^x, contact 6^a, thence to the bar 33^y (see Fig. 7) by means of the pin in the hole 34^a, thence along the bar 33^y to the pin in the hole 34^d, thence to the contact 7^x, 5^x, trolley wheel 23^x, ring 18^a, trolley wheel 22^x, contact 29^x, contact 9^x to pin in hole 34^c and along 33^x to pin in hole 34^b, thence by contact 8^a to wire 42. The magnet 40^x will be energized every time that a perforation comes under the wheel 18^a. The magnet 40^y will be energized through pins placed so as to connect with the fifth pair of contacts in the rows 6 and 8. The particular trolley wheel for effecting the energization of this magnet may be selected by placing pins in the openings 34 of the fifth pair of bars from the right in Fig. 7, the distance of the pins from the central contacts in the rows 6 and 8 being the same.

If it is desired to hold down one magnet it may be done by making a continuous perforation in the film 33. A better way, however, is to perforate the film in the manner shown in Fig. 6 at 33^z in which adjacent rows are provided with stepped perforations. Now by placing pins so as to give one bar 53 electrical connection with two conductors of the set 7 and 9, one magnet will be controlled by two trolley wheels 22. Thus in Fig. 7 if I place pins 34^e, 34^f, 34^g, 34^h, 34^i and 34^k the magnet 40^z in Fig. 3 will be controlled by both trolley wheels 22^x and 22^y in Fig. 3. Now if the perforations are stepped as shown in 33^z, the magnet 40^z will hold up continuously.

As stated before, the film roll and the plate 31 bearing the pins 35 accompany the motion picture film, and can be placed in the apparatus as set up. In order to facilitate the handling of the parts I make the frame 12 so that it can be set on to the frame 1, the tongues 11 entering the sockets 10. The rods upon which the wheels 23 are mounted engage in the V-shaped contacts 5, while the bars 28 engage in their respective contacts 29.

The device as described is designed to be

attached to the shaft of a moving picture device by means of a connection such as the universal joint shown at U in Fig. 4. The film 33 is designed to run slower than the moving picture film, but the sounding of the various devices will be made to conform with the moving pictures by means of the perforations 33^x.

I claim:

1. In an electrical switch, a plurality of magnets, a source of current, a series of movable contacts less in number than the number of magnets, and means for effecting the operation of any one of the magnets through any of the movable contacts desired.

2. In an electrical switch, a plurality of magnets, a source of current, a series of contact rings less in number than the number of magnets, a movable contact adapted to engage its respective ring and means for selectively energizing any of the magnets through the action of any of the movable contacts.

3. In an electrical switch, a plurality of magnets, a source of current, a cylinder provided with a series of conducting rings, a trolley wheel for each ring adapted to contact therewith, a movable perforated tape, means for moving said tape between the trolley wheels and their respective rings, and means for selectively energizing any of said magnets through circuit connections effected by any of said trolley wheels.

4. In an electrical switch, a plurality of magnets, a cylinder provided with a series of conducting rings, a series of trolley wheels on each side of said cylinder, a lower plate provided with a series of V-shaped contacts, an upper plate provided with a series of pins arranged to engage the V-shaped contacts of the lower plate, a source of current, a perforated film adapted to be passed between the trolley wheels on one side of said cylinder and the conducting rings, and electrical connections between said conducting rings, the plate provided with the V-shaped contacts and the magnets, said magnets being operated through said electrical connection.

5. In an electrical switch, a main frame provided with uprights, a plate carried thereby, said plate being provided with a series of pairs of individual contacts, a series of longitudinal contacts on each side of said individual contacts, a second plate normally disposed above said first named plate and provided with bars having downwardly extending pins for effecting electrical connection between pre-determined contacts on the lower plate, a detachable auxiliary frame supported upon said main frame, said auxiliary frame bearing a cylinder provided with a series of contact rings, a series of trolley wheels carried by said frame on one side of said contact rings, a second series of trolley wheels carried by said frame on the other side of said contact rings, a series of spring contacts carried by said first named plate, and a series of similar spring contacts carried by said main frame, and conducting members having electrical connection with their respective series of trolley wheels for engaging the spring contacts.

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