(No Model.) 3 Sheets—Sheet 1.

S. S. APPLEGATE.

Electric Burglar Alarm.

No. 240,939. Patented May 3, 1881.

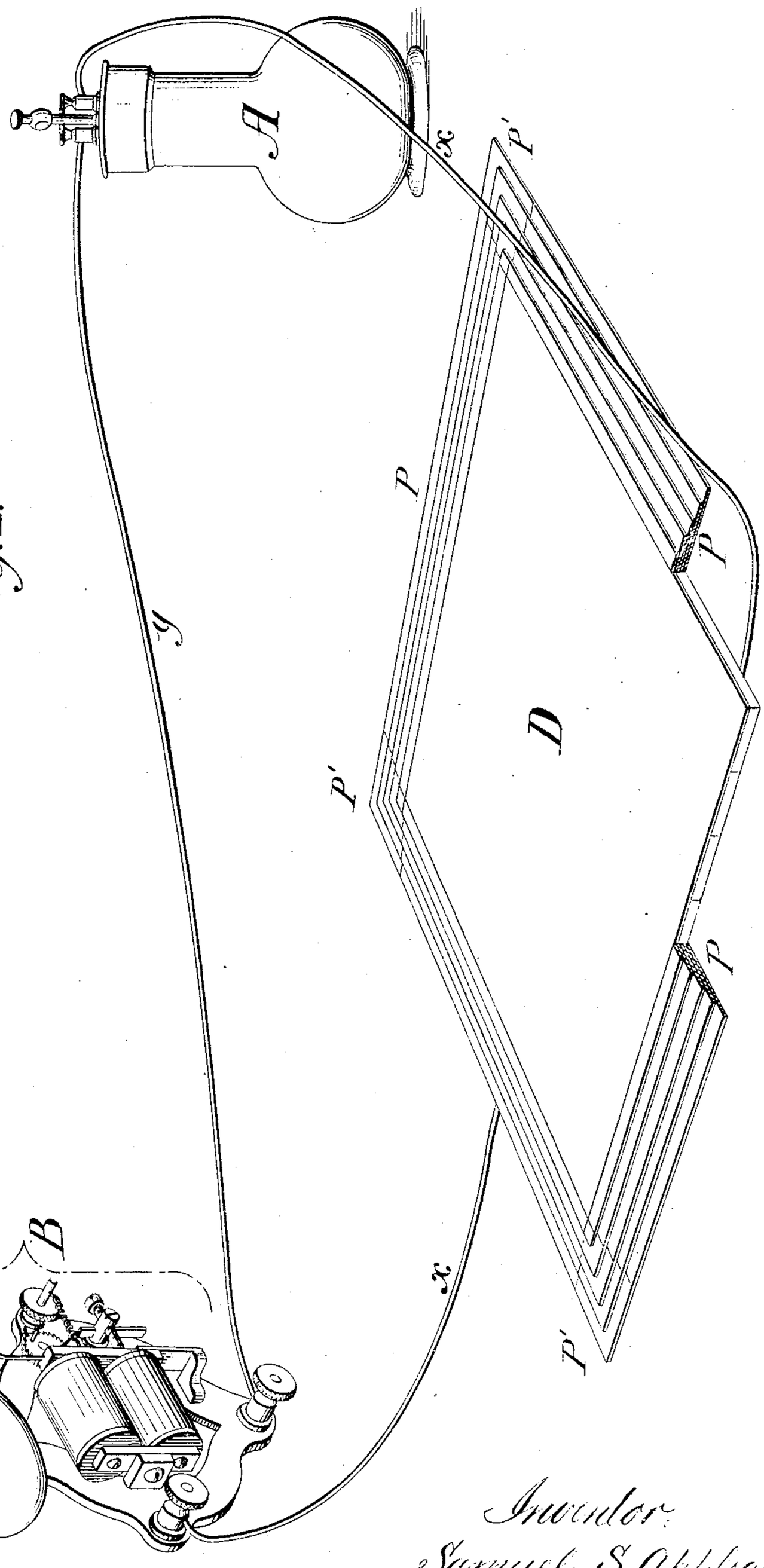


Fig. 1.

Witnesses:
James F. Tobin
David, Williams.

Inventor:
Samuel S. Applegate
by his Attorneys
Howson and Sons.

(No Model.) 3 Sheets—Sheet 2.

S. S. APPLEGATE.
Electric Burglar Alarm.

No. 240,939. **Patented May 3, 1881.**

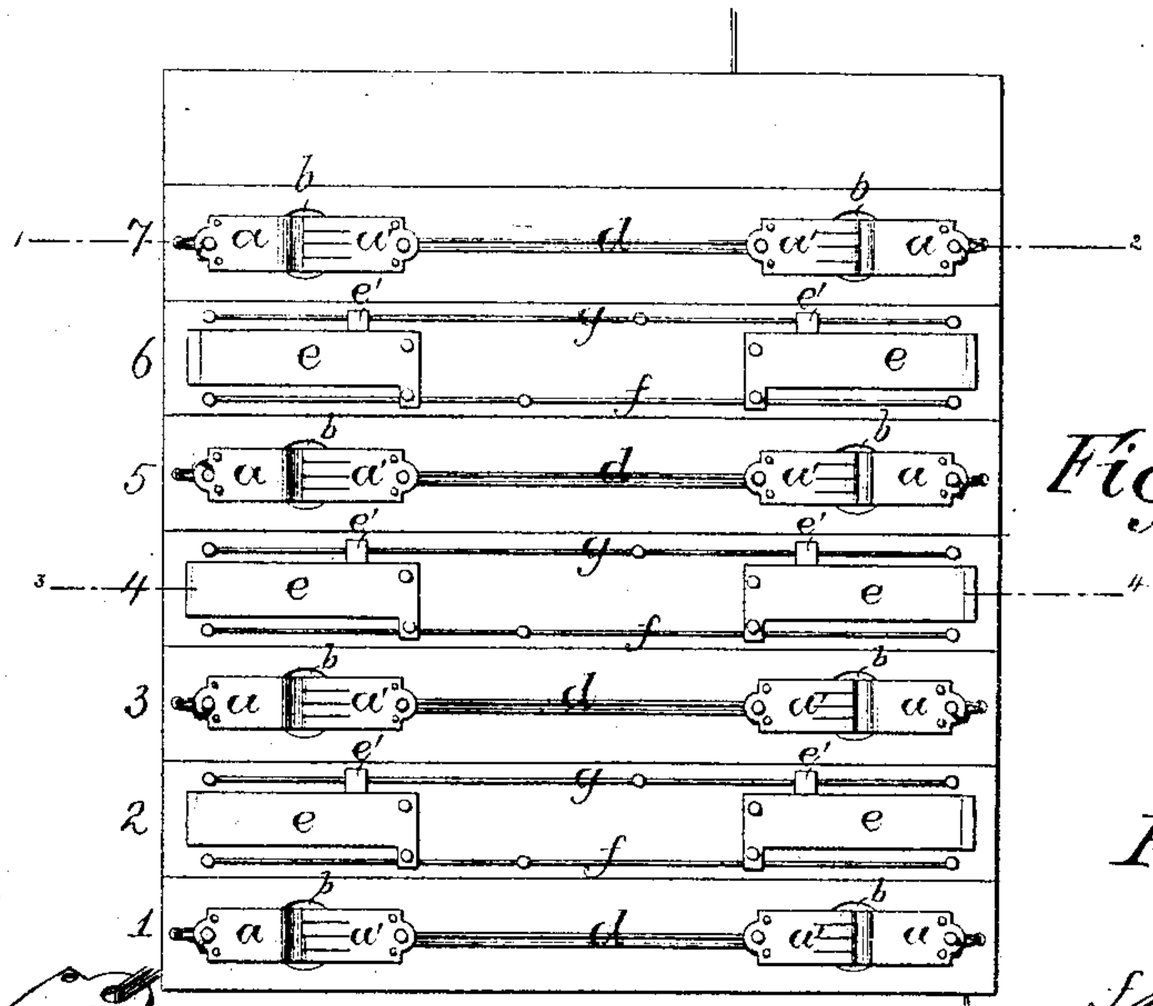


Fig. 2.

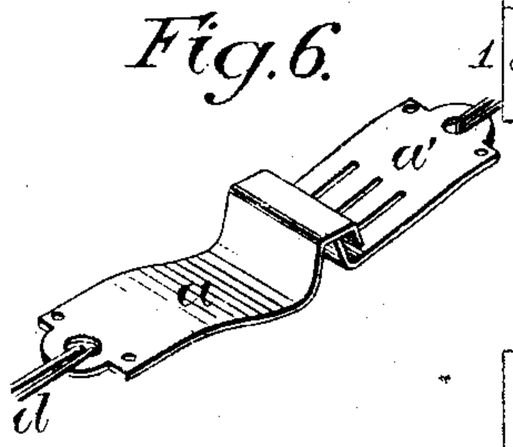


Fig. 6.

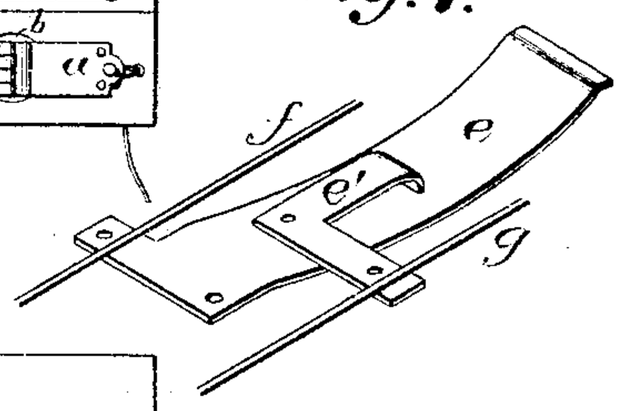


Fig. 7.

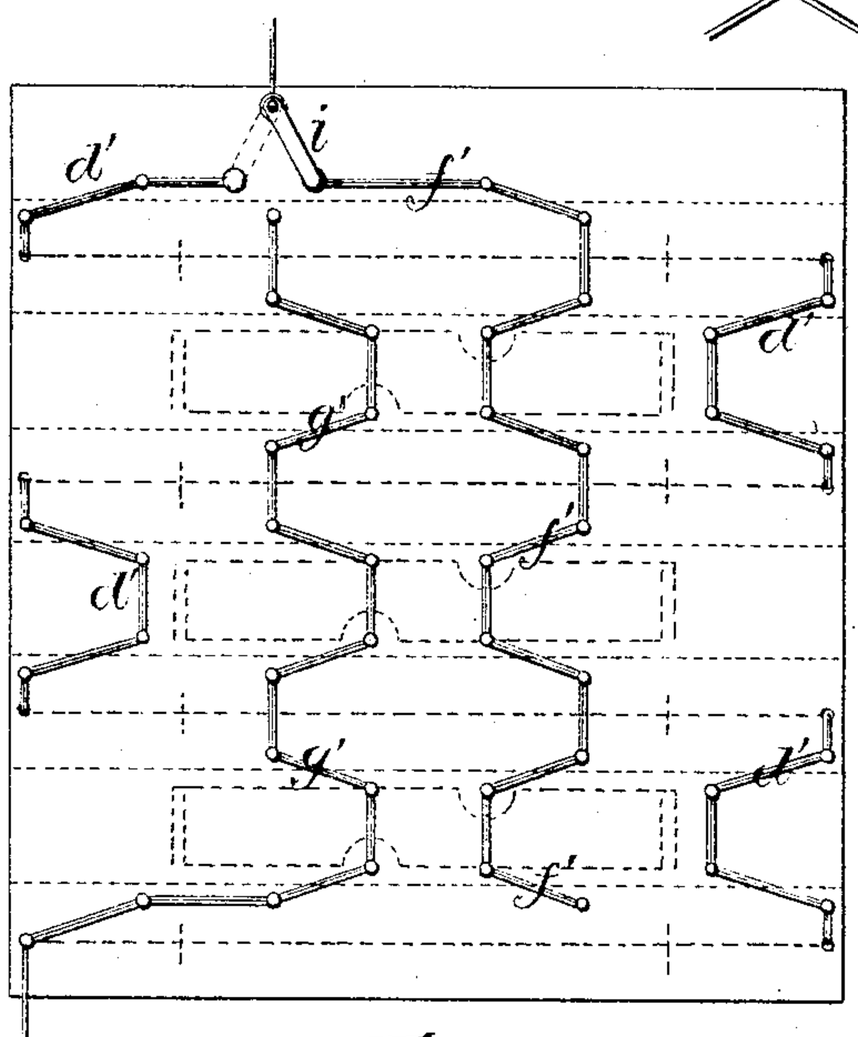


Fig. 3.

Fig. 7½.

Fig. 4.

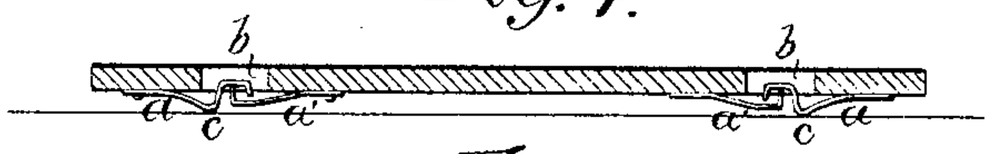
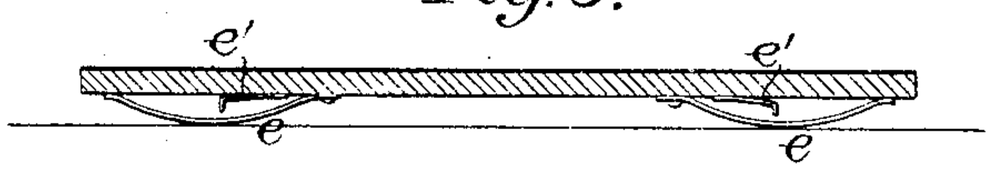


Fig. 5.



Witnesses:
James F. Tobin
David Williams.

Inventor:
Samuel S. Applegate
by his attorneys
Howson and Sons

(No Model.) 3 Sheets—Sheet 3.

S. S. APPLEGATE.

Electric Burglar Alarm.

No. 240,939. Patented May 3, 1881.

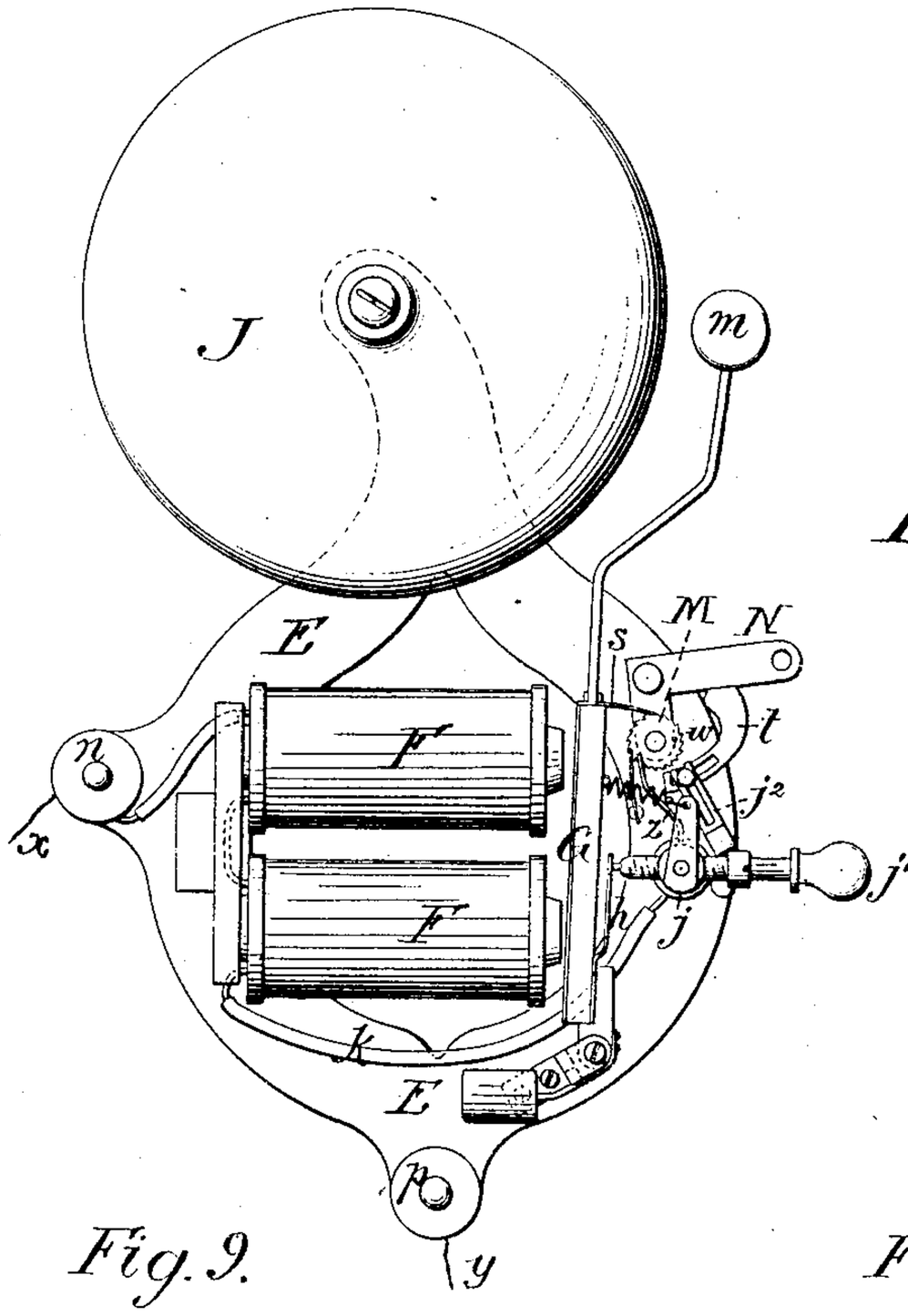


Fig. 8.

Fig. 9.

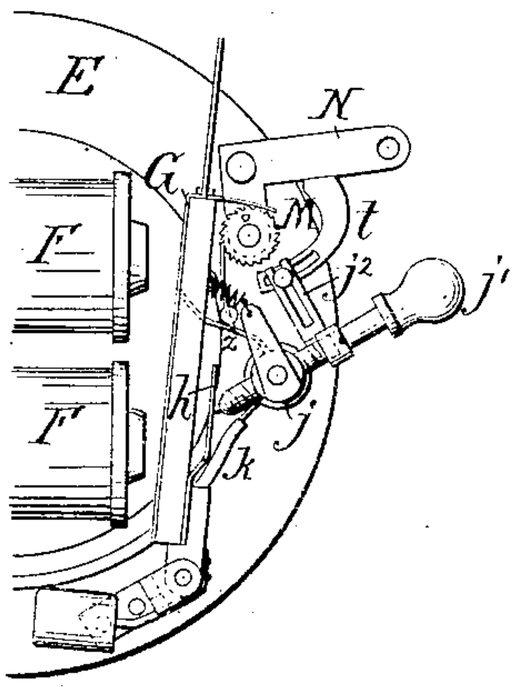
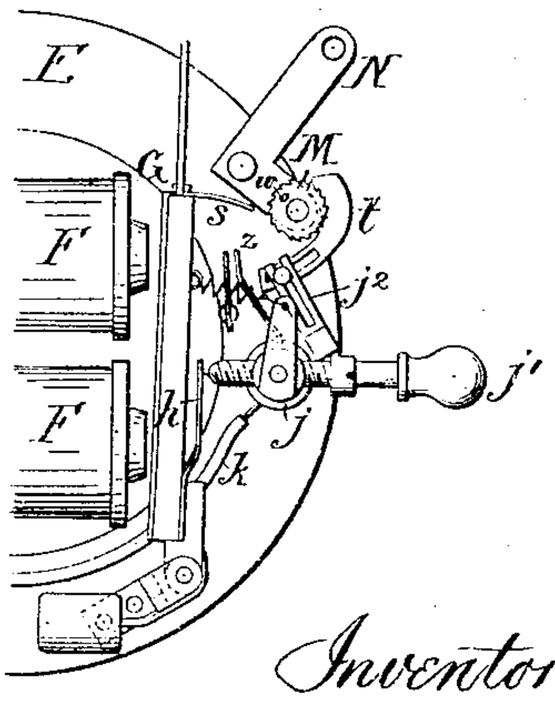


Fig. 10.



Witnesses.
James F. Tobin,
David, Williams.

Inventor.
Samuel S. Applegate
by his attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

SAMUEL S. APPLEGATE, OF CAMDEN, NEW JERSEY.

ELECTRIC BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 240,939, dated May 3, 1881.

Application filed January 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. APPLEGATE, a citizen of the United States, residing in Camden, New Jersey, have invented certain Improvements in Electric-Alarm Apparatus, of which the following is a specification.

My invention relates to certain improvements in the electrical-alarm apparatus for which Letters Patent No. 195,074 were granted to me on the 11th day of September, A. D. 1877, the objects of my present improvements being too fully described hereinafter to need preliminary explanation.

In the accompanying drawings, Figure 1, Sheet 1, is a perspective diagram illustrating the operation of the apparatus; Fig. 2, Sheet 2, a bottom view of the improved mat; Fig. 3, a top view of the same; Fig. 4, a transverse section on the line 1 2, Fig. 3; Fig. 5, a transverse section on the line 3 4, Fig. 3; Figs. 6 and 7, detached perspective views of parts of Figs. 4 and 5; Fig. 7½, a sectional view of part of Fig. 2; Fig. 8, Sheet 3, a front view of the alarm-bell and magnet; and Figs. 9 and 10, views showing different adjustments of parts of Fig. 8.

In order that a better understanding of my invention may be gained, I will in the outset briefly describe the device forming the subject of my aforesaid Letters Patent, reference being had to Fig. 1 of the drawings.

In this figure, A represents an ordinary battery, of which *x* is the positive and *y* the negative wire, the latter extending directly from the battery to one post of a magneto-electric alarm, B. The positive wire *x*, however, is discontinued for an interval between the battery and the alarm for the introduction into the circuit of a mat, D. This mat is constructed of narrow strips of wood or other suitable material backed with canvas or like flexible fabric, and on the under side of the mat are certain spring-plates, which complete the circuit and cause the sounding of the alarm when pressure is exerted upon any portion of the mat—such, for instance, as would be caused by a person stepping upon it—the circuit being broken and the sounding of the alarm stopped when the pressure is removed. This mat was therefore adapted for use only on an open circuit.

The improved mat is adapted for use either on an open or closed circuit by being constructed in the manner shown in Figs. 2 to 7, Sheet 2. In this case each of the strips of which the mat is composed has two pairs of spring-plates, those of the strips 1, 3, 5, and 7, however, differing in character from those of the strips 2, 4, and 6. The plates *a* and *a'* of each pair on the strips 1, 3, 5, and 7 are constructed as shown in Figs. 2, 4, and 6, the plate *a* being secured to the strip at one end, and being bent first downward, then abruptly upward into an opening, *b*, in the strip, and then forward and slightly downward within said opening. The spring-plate *a'* is also secured to the strip at one end, and is bent downward and then upward at the opposite end. The plates *a* are in contact with the floor at the points *c*, and thus serve to support, clear of the floor, the strip to which they are attached, the free ends of the plates *a a'* being in contact with each other when the mat is thus supported. When either of the strips is depressed, however, the spring-plate *a* yields and the contact between the plates is broken.

In order that the end of the plate *a'* may accommodate itself perfectly to the plate *a*, and with the further object of preventing the breaking of the contact between the two plates by the lodging of small particles of foreign matter between them, the free end of the plate *a'* is slotted, so as to form a series of fingers which can yield independently of each other. One or more of the fingers may be forced away from the plate *a* without affecting the electrical contact between the two plates, and the passage of a current from one plate to the other can only be broken by the removal of all of the fingers of the plate *a'* from contact with the plate *a*.

The plates *e* and *e'* of each pair on the strips 2, 4, and 6 are shown in Figs. 2, 5, and 7, the plate *e* being made in the form of an elliptical spring secured at one end to the strip, but free at the opposite end, the plate *e'* being arranged transversely to the plate *e*, and being secured to the strip at the outer end and bent upward at the inner end, under the plate *e*. The strip to which the plates *e e'* are attached is supported free from the ground when no pressure is exerted upon the same, and the plates *e e'* are then free from contact with each other, as

shown in Fig. 5; but when pressure is exerted upon the strip the plate *e* is flattened and the two plates are brought into contact.

On the under face of the mat are three sets of wires, *d*, *f*, and *g*, the wires *d* being carried by the strips 1, 3, 5, and 7, and the wires *f* and *g* by the strips 2, 4, and 6. The continuity of the wires *d* is interrupted for the insertion of the plates *a* and *a'*, and each wire *f* connects the plates *e* of its strip, each wire *g* connecting the plates *e'* of the strip.

On the back of the mat are wires *d'*, *f'*, and *g'*, the wires *d'* connecting the various wires *d*, the wires *f'* connecting the wires *f*, and the wires *g'* connecting the wires *g*. The wires *d'*, *f'*, and *g'* follow a zigzag course, so as to cross the joints between the strips 1, 2, 3, &c., diagonally. By this means the folding or rolling up of the mat merely imparts a slight twist to the wire, thereby overcoming all risk of breaking the latter, which might occur if the wire were bent abruptly, as in crossing the joint at right angles. The battery end of the wire *x* communicates at one end of the mat with the wires *d* and *g'*, and the alarm end of said wire communicates at the opposite end of the mat with a switch, *i*, which can be turned so as to communicate either with the wire *f'* or the wire *d'*. (See Fig. 3.) When the switch is turned to the position shown by full lines the wires *g'* and *g* and the plates *e'* are connected to the positive pole of the battery, and the wires *f'* and *f* and the plates *e* are connected to the negative pole, so that the mat is in open circuit, the completion of the circuit and sounding of the alarm being effected by the depression of any portion of the mat, so as to bring one or more of the plates *e* into contact with one or more of the plates *e'*. When the switch is turned to the position shown by dotted lines, however, the mat is in a closed circuit, the current passing directly through the wires *d'* and *d* and the plates *a a'* from one end of the mat to the other. In this case the depression of any portion of the mat will effect the separation of one or more of the plates *a* from the corresponding plate or plates *a'*, and the circuit will be broken, the alarm in this case being so arranged that it is operated by the breaking instead of by the completion of the circuit.

The switch *i* need not necessarily be carried by the mat, but may be combined with the wires *d'* and *g'* in any position which may be found most convenient.

One of the principal advantages of using the mat on a closed circuit is, that it may be connected with the wires of the district-telegraph lines now in operation in most of the large cities of the United States, these lines being worked on closed circuit.

By providing the mat with both open and closed circuit connections I am enabled to use the mat on open circuit and independent of the district-telegraph line during the day, while at night the mat may be changed to the closed circuit and connected with said line, so that the depression of the mat will cause the sounding of an alarm in the district-telegraph station, in addition to or in place of that in the house.

It has been found in practice that the use of an ordinary magneto-electric alarm with vibrating armature, in connection with the mat, is objectionable in some cases, owing to the fact that the gong continues to sound as long as any one stands upon the mat, and with the view of overcoming this objection I have devised the alarm shown in Figs. 8, 9, and 10, Sheet 3 of the drawings. In these views, E represents the frame of the magnet; F F, the electro-magnets; G, the armature carrying the spring-hammer *m*, and J the gong. The positive wire *x* is connected to the post *n*, insulated from the frame, but connected to the magnets F, and the negative wire *y* is connected to the post *p* on the frame. The circuit is completed through the wire *k*, the post *j* insulated from the frame, and the spring-plate *h* connected to the armature, which is hinged to the frame. When the armature is attracted the plate *h* is removed from contact with the screw of the post *j*, the current through the magnets is broken, and the armature is released until the said plate again comes in contact with the screw and the current is completed, as before. This is the ordinary arrangement by which a continuous vibration is imparted to the armature. I provide the armature G with a pawl, *s*, which engages with the teeth of a ratchet-wheel, M, hung to a lever, N, and having one or more pins, *w*. The approach of the wheel M to the armature is limited by the contact of the lever N with a stop, *t*, screwed to the frame E.

The post *j* has a spring-finger, *z*, the end of which projects into the path of the pin on the wheel M, so that when the parts are in the position shown in Fig. 8 the armature will only be vibrated until the wheel M is turned to such an extent as to bring one of the pins *w* into contact with the finger *z*, the current then passing from the post *j* to the frame E through the said finger *z*, wheel M, lever N, and stop *t*, instead of being compelled to pass through the circuit making and breaking plate *h*. The armature will thus be attracted and held until the circuit through the wires *x* and *y* is broken, when the armature will be released, and will so move the wheel M as to free the pin *w* from contact with the finger *z*, thus compelling a further revolution of the wheel M, when the circuit through the wires *x* and *y* is again completed.

When a single stroke only is desired the post *j* is turned, by means of its arm *j'*, until the latter comes into contact with a stop, j^2, on the frame E. (See Fig. 9.) The current then passes to the frame from the post through the arm *j'* and stop j^2, and the armature is attracted and held. This movement of the post *j* also slackens the drawback-spring of the armature, which

is attached to an arm on the post, so that the hammer *m* strikes the gong J more forcibly on the single stroke than on the continuous stroke.

When it is not desired to limit the striking of the bell, as in Fig. 8, the lever N may be turned to the position shown in Fig. 10, so as to carry the wheel M away from the pawl *s* and finger *t*, the device being then similar in action to an ordinary continuous alarm-bell. By a simple adjustment of the lever N or bar *j'*, therefore, I provide for either a continuous ring, a short ring, or a single stroke of the bell, the length of the short ring being determined by the number and position of the pins on the wheel M.

In order to protect the wires on the under surface of the mat from abrasion I form grooves in the strips of the mat and sink the wires therein, as shown in Fig. 7½, Sheet 2, the slight burr formed on the under sides of the plates *a a'* and *e e'*, in punching the holes for the securing-pins, being sufficient to insure the proper electrical contact of said plates with the sunken wires.

When the mat is intended to be placed beneath the carpet in a room, hallway, or other apartment, I place around the edges of the mat tapering pads P, the inner edges of which are equal in thickness to, or slightly in excess of, the thickness of the mat, the pads decreasing gradually in thickness to the outer edge. These pads are preferably made by cementing together a number of layers of paper of different widths, as shown. Square corner pads, P', made in the same manner, are combined with the side pads, P, to complete the inclosure of the mat D.

I claim as my invention—

1. The combination of a mat with wires and plates carried by the mat, and adapted to form part of a closed-circuit line, all substantially as set forth.

2. The combination of a mat with two sets of wires and plates carried by the mat, one set being adapted to form part of a closed-circuit line, and the other set being adapted to form part of an open-circuit line, as specified.

3. The combination of a mat carrying two independent sets of wires and plates, one adapted to form part of an open circuit and the other adapted to form part of a closed circuit, with a switch, whereby one set may be thrown into action and the other set out of action, as set forth.

4. The combination of a mat composed of jointed strips with circuit making or breaking devices carried by said strips, and with connecting-wires crossing the joints between the strips diagonally, as set forth.

5. The combination of the mat having openings *b*, wires carried by the mat and adapted to form part of a closed-circuit line, and plates *a a'*, connected to the wires and having bent ends overlapping each other, and adapted to the openings *b*, as set forth.

6. The combination of the mat, the wires carried thereby, and the plates *a a'*, the latter having a slotted end forming a series of contact-fingers, as specified.

7. The combination of a mat, two or more sets of circuit making or breaking plates carried thereby, and wires connecting said sets of plates and sunk in grooves in the mat, as set forth.

8. The combination of the mat and the circuit making or breaking devices carried thereby with the tapered pads P, as set forth.

9. The combination of the mat and the circuit making or breaking devices, the tapered pads P, and the corner pads, P', as specified.

10. The combination of the bell, magnet, armature, and frame, the circuit-breaker *h*, the post *j*, having a finger, *z*, and the wheel M, operated by the armature and having pins or projections *w*, as set forth.

11. The combination of the bell, magnet, armature, and frame, the circuit-breaker *h*, the post *j*, having a finger, *z*, the wheel M, operated by the armature and having pins or projections *w*, the lever N, carrying said wheel, and the stop *t*, as described.

12. The combination of the bell, magnet, armature, and frame, the circuit-breaker *h*, the post *j*, having an arm, *j'*, and the stop j^2, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL S. APPLEGATE.

Witnesses:

JAMES F. TOBIN,

HARRY SMITH.