

No. 756,976.

PATENTED APR. 12, 1904.

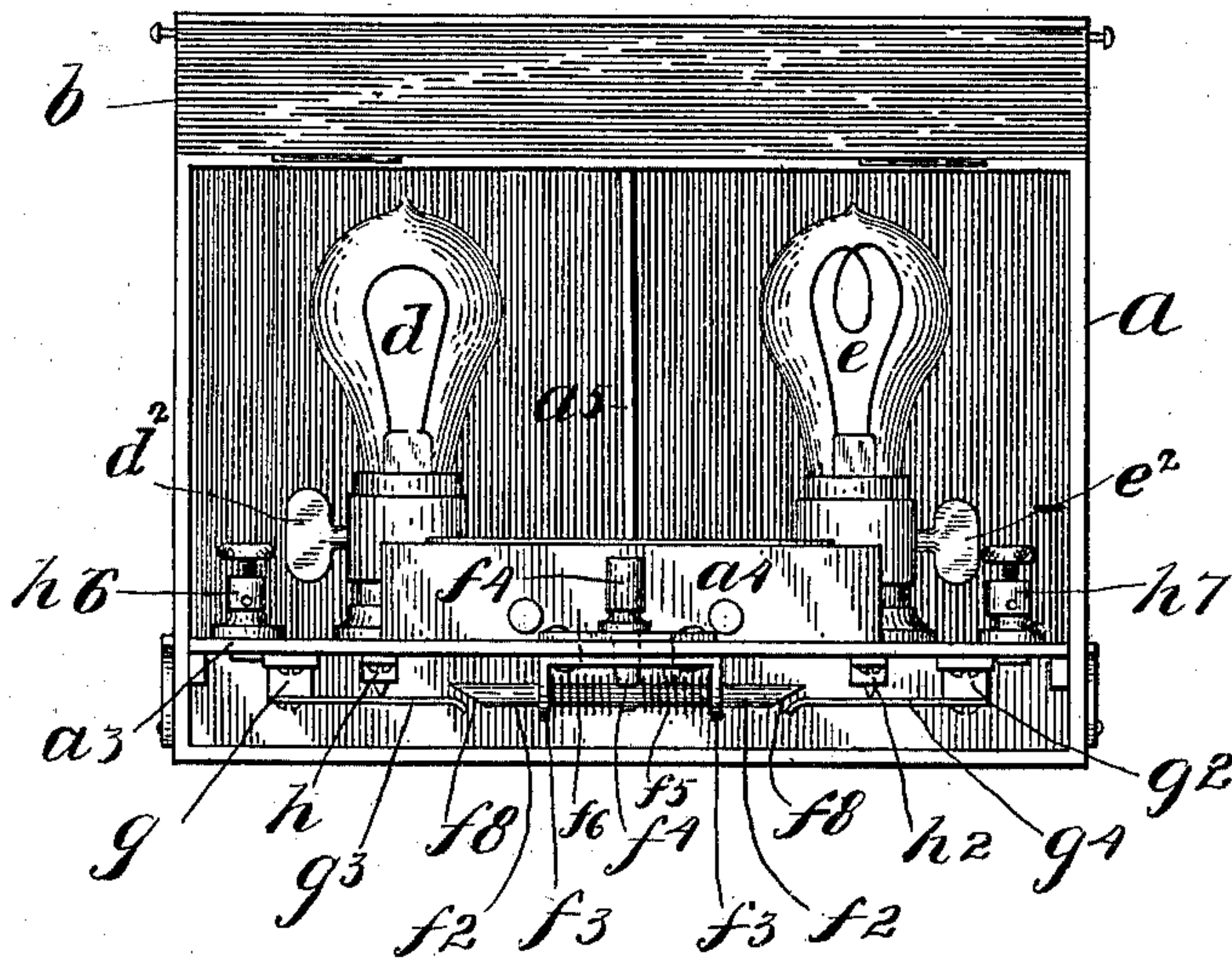
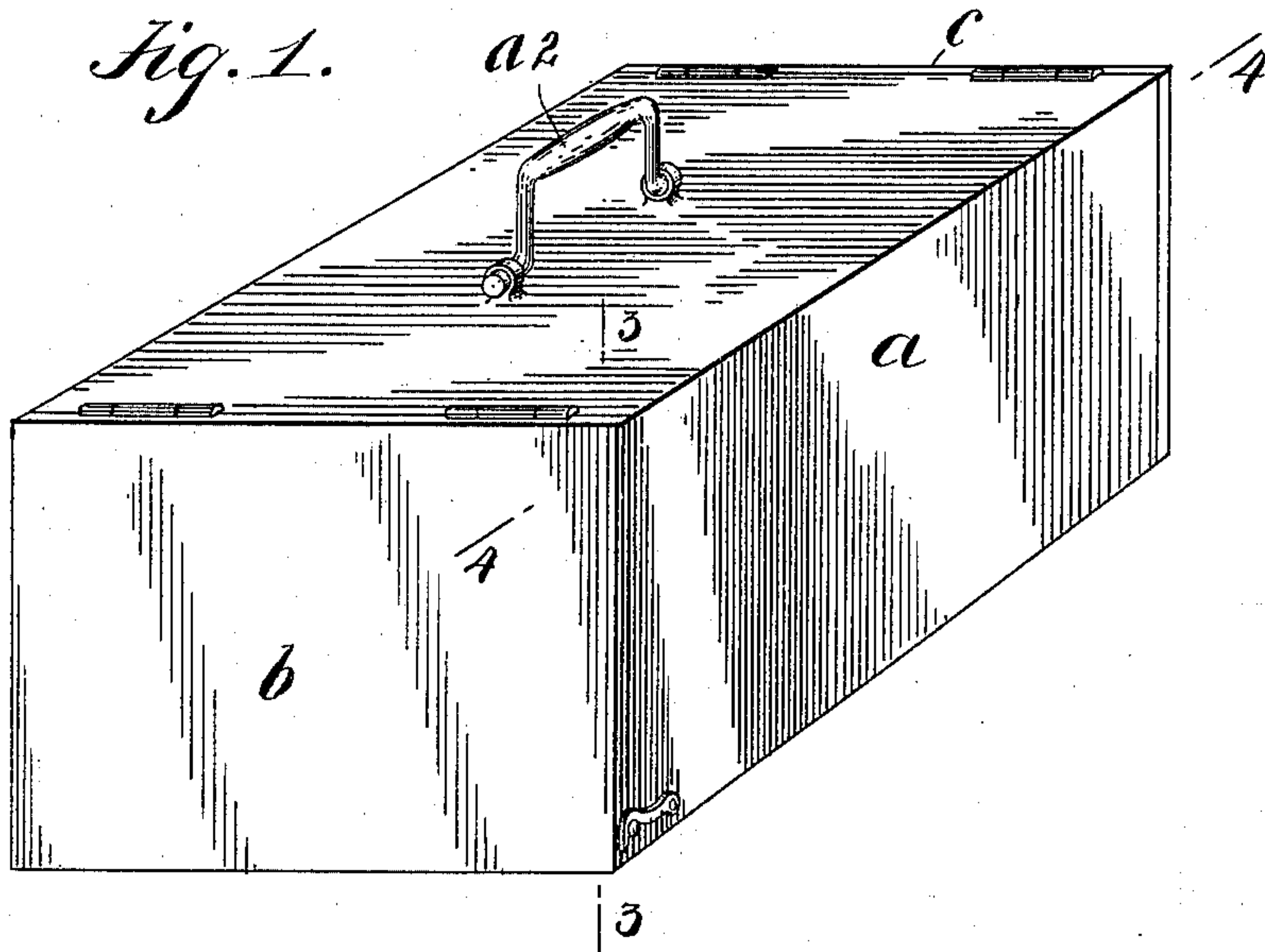
A. McCANDLISH.

PORTABLE TESTING AND COMPARING INSTRUMENT FOR ELECTRIC  
INCANDESCENT LAMPS.

APPLICATION FILED JUNE 26, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES  
*F. A. Stewart.*  
*C. E. Mulreamp*

*Fig. 2.*

INVENTOR  
BY *Albert McCandlish*  
*Edgar Tate*  
ATTORNEYS

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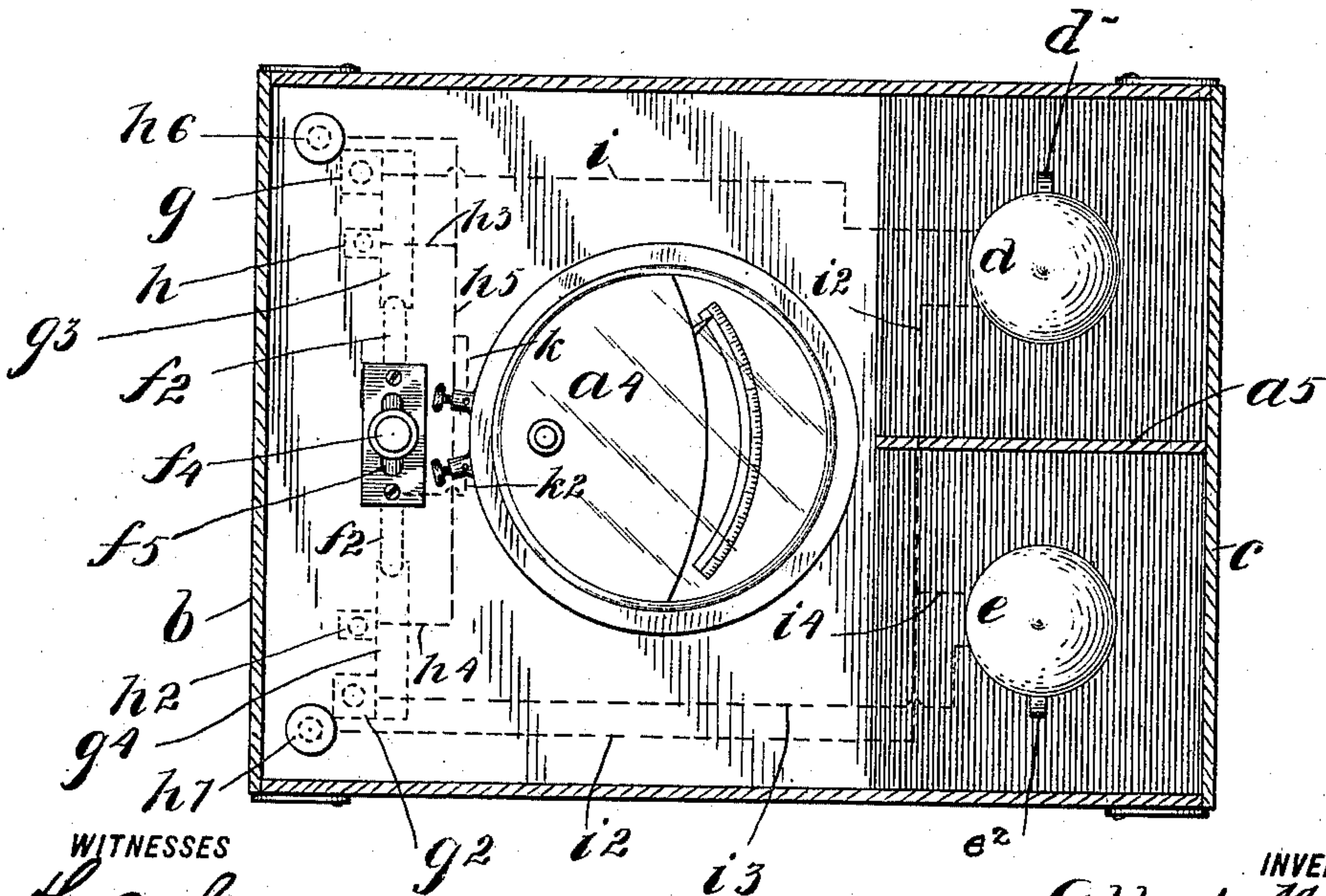
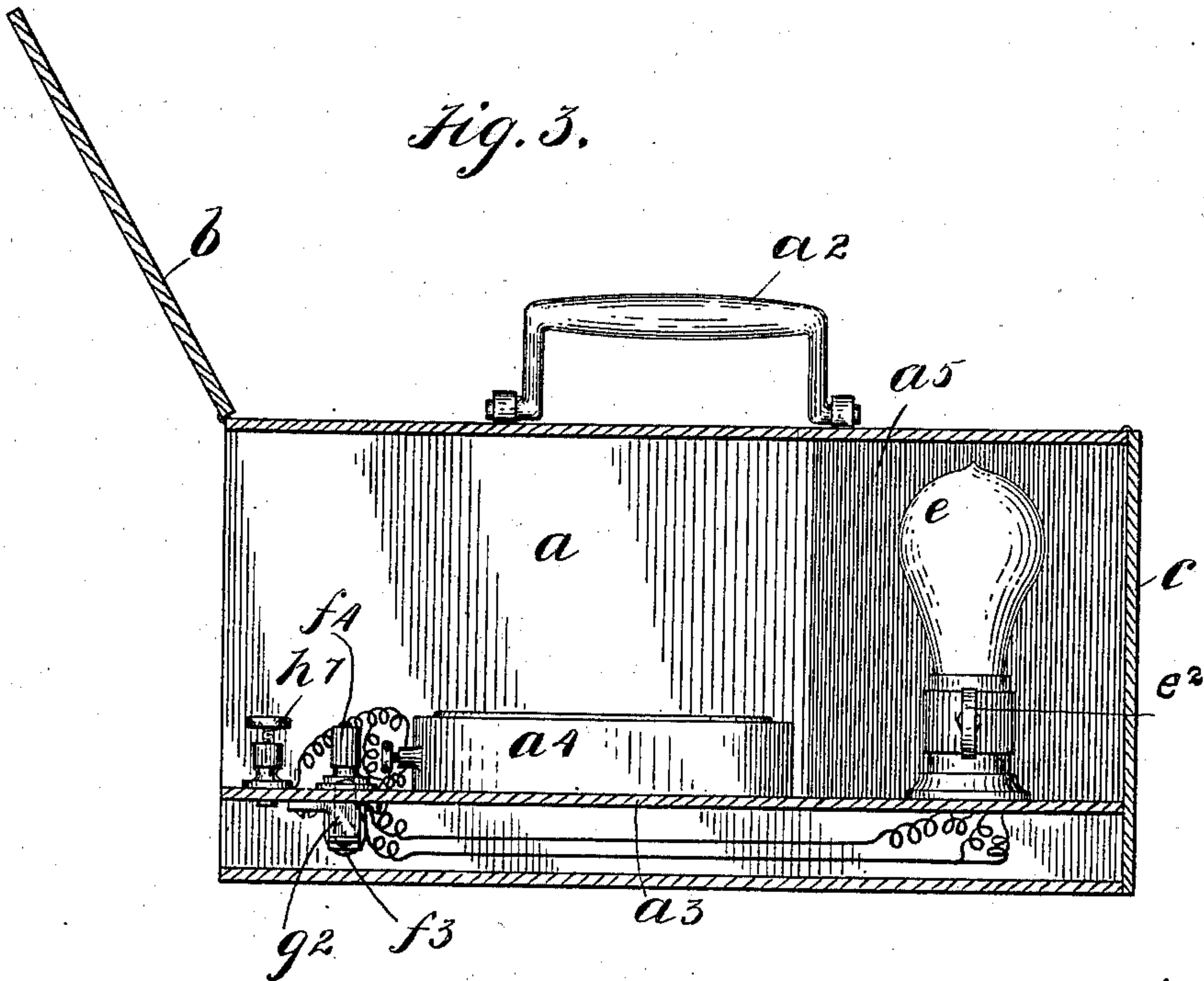
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2 SHEETS—SHEET 2.

Fig. 3.



WITNESSES

F. A. Stewart  
C. E. Mulheany

Fig. 4.

BY

Albert McCandlish  
Edgar Salter

INVENTOR

ATTORNEYS



# UNITED STATES PATENT OFFICE.

ALBERT McCANDLISH, OF GEORGE LANE, BREDBURY, ENGLAND.

PORTABLE TESTING AND COMPARING INSTRUMENT FOR ELECTRIC INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 756,976, dated April 12, 1904.

Application filed June 26, 1903. Serial No. 163,184. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT McCANDLISH, a subject of the King of Great Britain, residing at George Lane, Bredbury, England, have invented certain new and useful Improvements in Portable Testing and Comparing Instruments for Electric Incandescent Lamps, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide a portable testing and comparing instrument for electric incandescent lamps which is convenient to carry, may be attached to an electric circuit instantly, and whereby an incandescent lamp of any make may be readily and accurately compared with any known standard lamp, a further object being to provide an instrument of the class described wherein the lamps may be readily passed or removed and where the energy in watts required to efficiently light either lamp may be ascertained.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a perspective view of a portable casing provided with my apparatus, both ends of which are hinged; Fig. 2, an end view of Fig. 1 with the hinged end in a raised position; Fig. 3, a section on the line 3 3 of Fig. 1, and Fig. 4 a section on the line 4 4 of Fig. 1.

In the drawings forming part of this specification I have shown at *a* a casing composed of wood or other material provided with hinged covers *b* and *c* at either end thereof and said casing *a* being also provided with a handle *a*<sup>2</sup>.

Within the casing *a* and slightly above the bottom thereof I place a false bottom *a*<sup>3</sup>, upon which is mounted a direct-reading spring-controlled watt or ampere meter *a*<sup>4</sup>, which is preferably adjacent to the end member *b*, and adjacent to the end member *c* and laterally arranged is a vertical partition member *a*<sup>5</sup>, which is exactly in the middle of said casing and extends to a predetermined point near

the center thereof, and in practice I prefer to cover the inner side of the casing *a* and both sides of the member *a*<sup>5</sup> with black cloth or paint.

On either side of the member *a*<sup>5</sup> and exactly in the middle of the compartments formed thereby I mount lamp-sockets *d* and *e*, provided with a quick break-switch *d*<sup>2</sup> and *e*<sup>2</sup>, respectively, and these lamp-sockets *d* and *e* are adapted to hold any of the well-known incandescent lamps and may be of any suitable construction.

Beneath the false bottom *a*<sup>3</sup>, adjacent to the member *b* of the casing *a* and in the middle of said casing I, arrange a "hold-off" switch *f*, which consists of a transversely-arranged rod *f*<sup>2</sup>, of conductive material, carried by a suitable support *f*<sup>3</sup>, and passing through the center of the rod *f*<sup>2</sup> is an upwardly-directed handle member *f*<sup>4</sup>, which passes through a transversely-arranged slot *f*<sup>5</sup> in the false bottom *a*<sup>3</sup>, and on either side of the handle member *f*<sup>4</sup> and on the member *f*<sup>2</sup> are wound coil-springs *f*<sup>6</sup> and *f*<sup>7</sup>, and the ends of the rod *f*<sup>2</sup> are preferably beveled, as shown at *f*<sup>8</sup>.

From this construction it will be seen that the rod *f*<sup>2</sup> may be moved transversely of the casing *a* by means of the handle member *f*<sup>4</sup>, and when said handle member *f*<sup>4</sup> is released the springs *f*<sup>6</sup> and *f*<sup>7</sup> operate to force the said bar *f*<sup>2</sup> into its normal position.

In a transverse line with the bar *f*<sup>2</sup> and adjacent to either side of the casing *a* are arranged holders *g* and *g*<sup>2</sup>, upon which are mounted spring-plates *g*<sup>3</sup> and *g*<sup>4</sup>, respectively, and the plates *g*<sup>3</sup> and *g*<sup>4</sup> extend inwardly to a position adjacent to the corresponding ends of the bar *f*<sup>2</sup>, and it will be seen if the bar *f*<sup>2</sup> be moved in either direction the beveled surface *f*<sup>8</sup> thereof will engage the corresponding spring-plates *g*<sup>3</sup> and *g*<sup>4</sup> and make electrical contact therewith and at the same time depress said spring-plate from its normal position.

Near the center of the spring-plates *g*<sup>3</sup> and *g*<sup>4</sup> are arranged contacts *h* and *h*<sup>2</sup>, respectively, which normally bear against the spring-plates *g*<sup>3</sup> and *g*<sup>4</sup>, and connected with the contacts *h* and *h*<sup>2</sup> are electrical conductors *h*<sup>3</sup> and *h*<sup>4</sup>, respectively, which are connected with a wire



$h^5$ , which in turn is connected to a binding-post  $h^6$  of the ordinary construction, and on the opposite side of the casing  $a$  is similarly arranged a binding-post  $h^7$ .

5 Connected with the holder  $g$  is a wire  $i$ , which passes into the socket or lamp-holder  $d$  to one pole, and connected with the other pole of the lamp-holder  $d$  is a wire  $i^2$ , which passes transversely across the casing  $a$  and  
10 longitudinally thereof and is connected with the binding-post  $h^7$ , and the binding-posts  $h^6$  and  $h^7$  serve as connections for the wires of an ordinary electric-light circuit.

Connected with the holder  $g^2$  is a wire  $i^3$ ,  
15 which passes to one pole of the lamp-holder  $e$ , and connected with the other pole thereof is a wire  $i^4$ , which is connected to the wire  $i^2$ .

In electrical connection with the wire  $h^5$  is a wire  $k$ , which passes to one of the poles of  
20 the watt or ampere meter  $a^4$ , and to the other pole thereof is secured a wire  $k^2$ , which is connected at its other end to the slidably-movable rod  $f^2$ , and in the lamp holders or sockets  $d$  and  $e$  are placed lamps  $k^3$  and  $k^4$ , respectively, and in the operation of my apparatus  
25 I preferably place a well-known "Standard" lamp in the socket or holder  $d$ , and the lamp to be tested is placed in the socket or holder  $e$ .

When my apparatus is connected with an  
30 electric-light circuit by means of the binding-posts  $h^6$  and  $h^7$ , the current passes through the wires  $h^5$  and  $h^3$  to the contact  $h$ , through the spring-plate  $g^3$  to the holder  $g$ , through wire  $i$ , lamp-socket  $d$ , and if the switch there-  
35 of be on through the lamp  $k^3$ , wire  $i^2$  to the binding-post  $h^7$ , and out, and the lamp  $k^3$  is thereby actuated. The current passing through the wire  $h^5$  also passes into the wire  $h^4$  and contact  $h^2$  through the spring-plate  $g^4$   
40 and holder  $g^2$ , wire  $i^3$  into the socket or holder  $e$ , and if the switch is on through the lamp  $k^4$ , wire  $i^4$ , wire  $i^2$  to the binding-post  $h^7$ , and it will be seen that the lamp  $k^4$  is also actuated.

When the handle member  $f^4$  is forced to  
45 the left, the rod  $f^2$  makes electrical contact with the spring-plate  $g^3$  and depresses the same, thereby breaking connection with the contact  $h$ , and the current then passes through the wire  $h^5$ , wire  $k$ , watt or ampere meter  $a^4$ ,  
50 wire  $k^2$ , rod  $f^2$ , spring-plate  $g^3$ , holder  $g$ , wire  $i$ , lamp  $k^3$ , wire  $i^2$  to the binding-post  $h^7$  and out, and the amount of energy necessary to efficiently light the lamp  $k^3$  can thereby be read on the meter  $a^4$ .

55 When the handle member  $f^4$  is forced to the right, the bar  $f^2$  makes contact with the spring-plate  $g^4$ , forcing the same away from the contact  $h^2$ , and the current then passes through the wires  $h^5$  and  $k$ , meter  $a^4$ , wire  $k^2$ ,  
60 rod  $f^2$ , spring-plate  $g^4$ , holder  $g^2$ , wire  $i^3$ , lamp  $k^4$ , wire  $i^4$ , wire  $i^2$  to the binding-post  $h^7$  and out, and the amount of energy to efficiently light the lamp  $k^4$  can thereby be read on the meter  $a^4$ .

65 It will therefore be seen that the reading

of the ampere or watt meter with reference to either the lamp  $k^3$  or  $k^4$  is determined by the direction in which the handle member  $f^4$  is forced, for the reason that when the handle member  $f^4$  and bar  $f^2$  thereof are forced in  
70 either direction the corresponding spring-plate breaks connection with its corresponding contact and the current passes through the circuits heretofore described.

By means of this construction it will be  
75 seen that the relative brilliancy of the lamp being tested and the "Standard" lamp can be determined by the eye, while the energy necessary to light either one or the other may be read on the meter  $a^4$ .  
80

When the lamp  $k^4$  has been tested, it may be readily removed and another one inserted, and this operation may be repeated as often as desired, and in the construction of my apparatus I may make the casing  $a$  with a col-  
85 lapsible top, thereby being more portable, and various other changes in and modifications of the construction herein shown and described may be made without departing from the spirit of my invention or sacrificing  
90 its advantages.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A portable testing and comparing instru-  
95 ment for an electric incandescent lamp, comprising a casing, a plurality of lamp-sockets mounted therein adjacent to one end thereof, a watt or ampere meter in said casing adja-  
100 cent to the other end thereof, electrical conductors in communication with said lamp-sockets and said wattmeter and means for connecting said instrument with an ordinary electric-light circuit, substantially as shown and described.  
105

2. In a device of the class described, a casing both ends of which are hinged thereto, a coating of black material on the inner side of said casing, a laterally-arranged partition at one end of said casing, a plurality of electric-lamp  
110 sockets adjacent thereto and on either side thereof, a watt or ampere meter in the other end of said casing, an electric lamp in each of said sockets, and means for energizing said lamps and said watt or ampere meter, sub-  
115 stantially as shown and described.

3. In a device of the class described, a casing both ends of which are hinged thereto, a partition-plate laterally arranged in one end of said casing, an electric-lamp socket adjacent  
120 thereto and on either side thereof, a watt or ampere meter in the other end of said casing, a positive and negative binding-post adjacent to said watt or ampere meter, a spring-operated slidably-movable transversely-arranged  
125 bar in the end of said casing adjacent to said binding-posts, a spring-plate mounted in said casing one, either side of said movable bar and adapted to make electric contact therewith, a contact-point normally in connection with each  
130



of said spring-plates, electrical conductors connecting said electrical lamps, watt or ampere meter, binding-posts, contact-points, spring-plates and movable bar, substantially as shown and described.

4. A device of the class described, comprising a casing each end of which is hinged thereto, a plurality of lamp-sockets mounted therein, an electric lamp in each of said sockets, a watt or ampere meter at the opposite end of said casing, a slidably-movable bar adjacent to said watt or ampere meter, spring-plates adjacent to said slidably-movable bar and adapted to make electrical contact therewith, a positive and negative binding-post adjacent to said meter, contact-points normally in electrical communication with said spring-plates and electrical conductors connecting said lamps, meter, binding-post, slidably-movable bar, spring-plates and contacts consisting of a wire connecting the positive binding-post on one

side of said casing with the contact-points adjacent thereto, said wire also being connected with one pole of said meter, a wire connecting another pole of said meter with said slidably-movable bar, a wire connecting one of said spring-plates with one of said lamp-sockets, a lamp placed therein, a wire connecting the other of said spring-plates with the other of said lamp-sockets a lamp therein and a wire connecting said lamp-sockets and lamps with the negative binding-posts in said casing, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 4th day of May, 1903.

ALBERT McCANDLISH.

Witnesses:

C. MARSHALL,  
EEDON A. KING.