

No. 632,285.

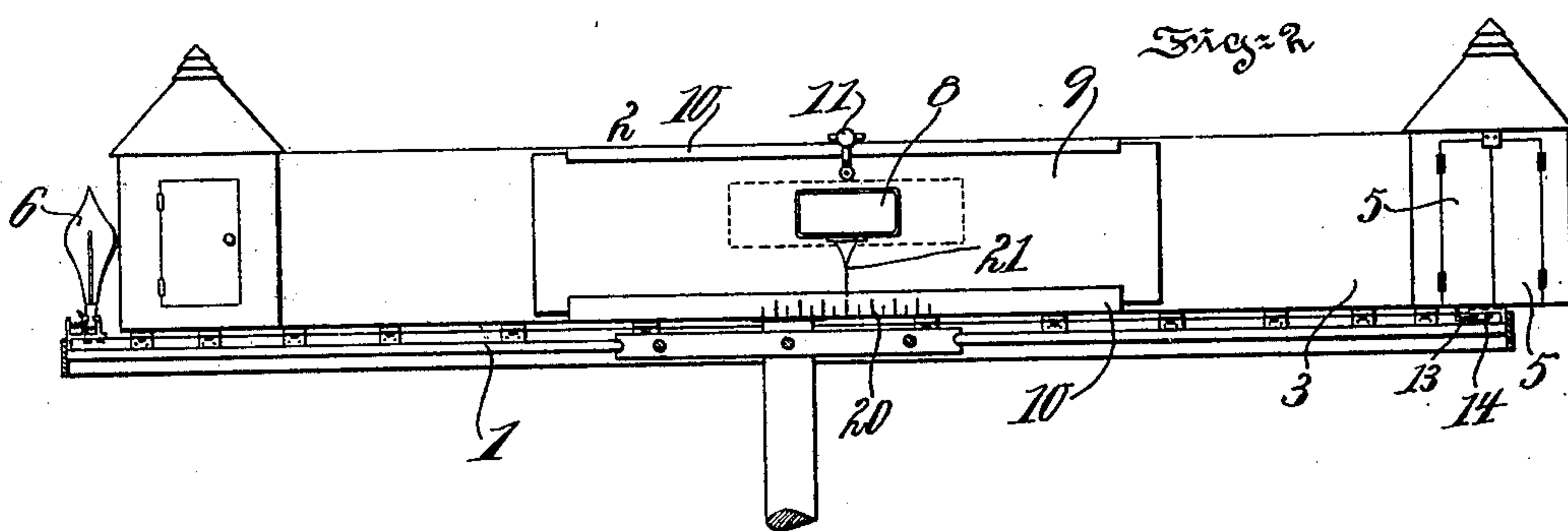
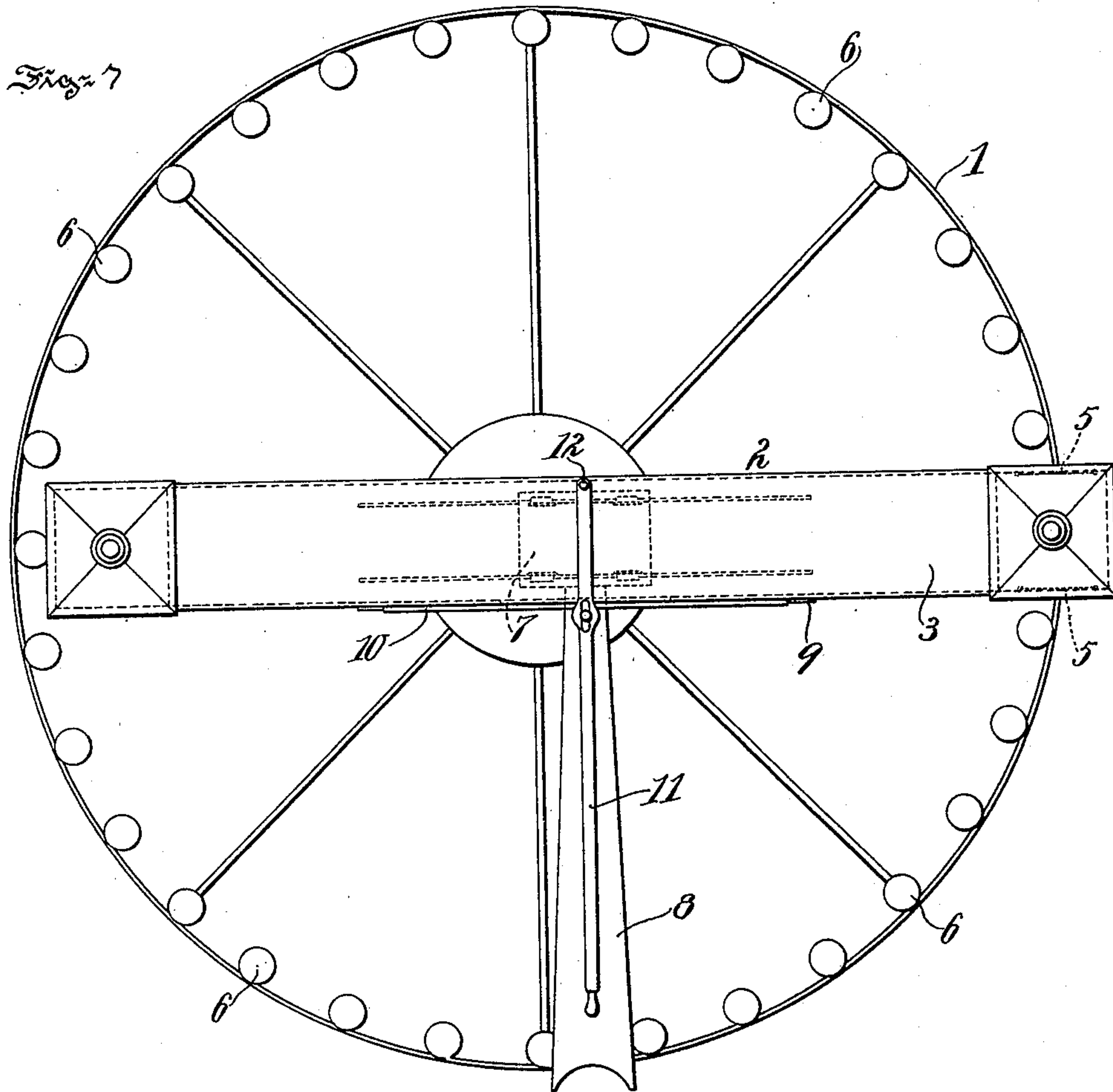
Patented Sept. 5, 1899.

W. F. SMITH.
PHOTOMETER.

(Application filed Oct. 15, 1898. Renewed July 25, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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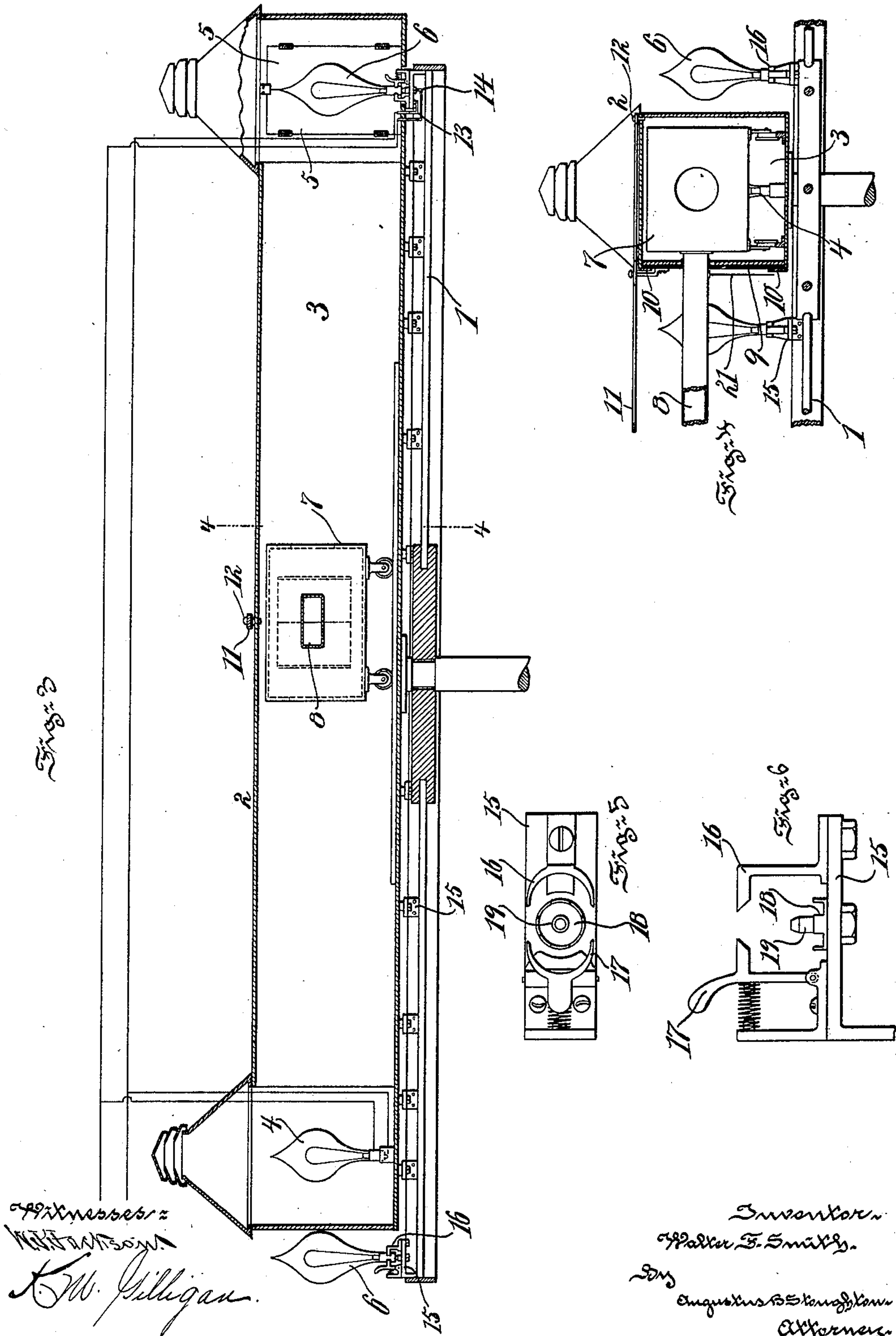
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

WALTER F. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE UNITED ELECTRIC IMPROVEMENT COMPANY, OF GLOUCESTER CITY, NEW JERSEY.

PHOTOMETER.

SPECIFICATION forming part of Letters Patent No. 632,285, dated September 5, 1899.

Application filed October 15, 1898. Renewed July 26, 1899. Serial No. 725,095. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. SMITH, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Photometers, of which the following is a specification.

The principal object of my present invention is to provide means for selecting electric lamps of approximately the same voltage and characteristics from lamps as they are completed in a factory, differing, as they do, considerably among themselves.

To this end my invention comprises a photometer provided with a movable carrier adapted to present in rapid succession the lamps to be tested, as is hereinafter more fully described and claimed.

The nature, characteristic features, and scope of the invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a top or plan view of apparatus embodying features of my invention. Fig. 2 is a sectional view illustrating in elevation the photometer portion of the apparatus. Fig. 3 is a sectional view of the photometer apparatus drawn to an enlarged scale. Fig. 4 is a transverse sectional view taken on the line 4 4 of Fig. 3, and Figs. 5 and 6 are respectively plan and elevational views of a socket adapted for the reception of the various types of lamps in common use.

In the drawings, 1 is a movable carrier illustrated as of circular form and adapted to carry a series of lamps which are to be tested.

2 is a photometer apparatus to which the carrier presents successively the lamps of the series which it carries. As shown, the carrier is arranged movable in respect to the photometer, although the photometer could be arranged movable in respect to the carrier, and in my judgment without the exercise of anything except mechanical skill, so that such an arrangement does not require illustration.

The photometer 2 comprises a housing 3, adapted to exclude light and provided at one end with a standard lamp or light 4. At the other end the housing 3 is provided with normally-closed doors 5, mounted, for example,

upon spring-hinges, as shown, so that they may be readily opened, and will when released immediately close. The relative positions of the photometer and carrier are such that when moved the lamps 6 to be tested are caused to open the spring-doors 5, and thus enter the housing 3 of the photometer. As each lamp enters the housing the doors close behind it, and it may be arrested in proper position by means of a detent (not shown) cooperating with suitable notches on the carrier.

Within the housing 3 there is mounted the sight-box 7 of an ordinary photometer. This sight-box is provided at its ends with openings facing the lamp to be tested and also the standard lamp. It is also provided internally with the usual inclined mirrors and with a disk having upon it a translucent spot. These are the usual accessories of the sight-box of a photometer, and they may be of any approved kind. The eye or sight piece 8 of the sight-box is adapted to work in a slot in the front wall of the housing 3, and this slot is covered by a plate 9, arranged to move in guides 10. The plate 9 may be pivotally connected with a hand-lever 11, fulcrumed as at 12. When the hand-lever 11 is shifted, the sight-box is caused to move toward or away from the standard lamp 4.

13 and 14 are electrodes adapted to automatically make contact with the terminals of the lamps to be tested as the latter are brought to position within the housing 3. These electrodes may consist of spring-strips adapted to press upon the terminals of the sockets on the carrier 1.

The standard lamp 4 may comprise an electric lamp of known characteristics, and by placing this lamp and the lamp to be tested in multiple-arc relation, as shown by the circuits in Fig. 3, variations in the circuit affect both lamps approximately equally, so that substantial accuracy is secured.

In Figs. 5 and 6 I have shown what may be termed a "universal" socket, because it is adapted to lamps of the three kinds best known on the market. Sockets of the kind illustrated are arranged around the periphery of the carrier, and they receive the lamps to be tested. Each socket comprises a base 15, provided with a fixed semicircular jaw 16 and with a pivotal spring-controlled semicir-

cular jaw 17. The jaw 16 is in electrical connection with one side of the circuit when its lamp has been positioned in the housing 3. In the center of the jaws and at the base
 5 there is a socket 18, connected with the other side of the circuit under the same circumstances. This socket is adapted for the reception of a removable pin 19. The described arrangement of the parts of the socket adapts
 10 it to the best-known types of lamps—for example, a Westinghouse base would be applied to the socket by the removal of the pin 19, in which case the projection on the base would enter and make circuit with the part 18 and
 15 the jaw 16 would complete the circuit through the lamp. Other known types of lamp-base can be applied to the described socket, as will be obvious to those skilled in the art. The jaw 17 is shown as provided with a projection
 20 that may be used as a handle in mounting and removing the lamps.

In use lamps to be tested are mounted upon the carrier 1, and the latter is turned so as to present each of these lamps within the housing 3 and include it in circuit, as described. The attendant in charge, looking through the sight-tube 8, adjusts the sight-box 7 by means of the lever 11 until the illumination upon the spot due to the standard lamp 4 and the
 30 illumination upon the spot due to the lamp to be tested are equal. In manipulating this handle 11 the attendant shifts the sight-box in respect to both lamps, as has been described. When these illuminations are equal,
 35 the attendant refers to the scale 20 and index 21. The index 21 of course shows the position of the sight-box, and the scale 20 is made to read so as to show the voltage, at least approximately, of the lamp being tested. When
 40 the position of the sight-box for equal illumination has been determined in respect to the standard lamp and the lamp to be tested, the candle-power may be determined in the usual way, based upon the relation between the
 45 known candle-power of a standard lamp, the candle-power of the lamp to be determined, and the squares of the distances of the lamps. The graduation of this scale for this purpose (indicating voltage) may be accomplished experimentally. For example, the standard
 50 lamp is known to be of sixteen-candle power at one hundred and ten volts. A second similar lamp is placed at the other end and the center is found by shifting the sight-box into
 55 position of equal illumination. This second lamp is then replaced by a third lamp known to give sixteen-candle power at one hundred and fifteen volts, and its circuit is kept at one hundred and ten volts, the voltage of the
 60 standard lamp. The sight-box is then shifted to position of equal illumination and its position marked on the scale. The described operation is repeated with other lamps of known voltage and candle-power until the
 65 completion of the scale has been accomplished. If preferred, the scale may by following known

methods be made to read in candle-power of the lamp to be tested. Obviously the attendant may test a great number of lamps in a very short time by means of the described
 70 apparatus. In fact, the lamps can be tested as rapidly as an assistant can mount them upon and remove them from the carrier.

It will be obvious to those skilled in the art to which my invention appertains that modifications may be made in details without departing from the spirit thereof. Hence I do not limit myself to the precise construction and arrangement of parts hereinabove set forth and illustrated in the accompanying
 80 drawings; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination a housing internally
 85 equipped with a standard light and the accessories of a photometer and provided with normally-closed doors and a carrier provided with means for supporting the lamps to be tested in position for entering the doors,
 90 movable in respect to each other, and electrical connections for the lamps, substantially as described.

2. In combination a housing provided at one end with a standard lamp and at the other
 95 end with normally-closed doors, a sight-box and its accessories mounted in said housing, a sight-tube and hand-lever connected with the sight-box and accessible from the exterior of the housing, a carrier constructed to introduce lamps to be tested through the normally-closed doors, and means for shifting the carrier and housing in respect to each other, substantially as described.

3. A photometer comprising a housing containing a standard light and sight-box and provided with normally-closed doors, and a rotatable carrier constructed to support the lamps to be tested and to feed the same past said doors, substantially as described.

4. In a photometer the combination of a carrier, a socket 18, included in circuit and countersunk for the reception of a pin, a removable pin, a spring-controlled pivotal semi-circular jaw provided with a handle; a fixed
 115 semi-circular jaw included in circuit, and circuit connections, substantially as described.

5. In a photometer the combination of a housing containing the photometer proper and provided with normally-closed doors, a
 120 movable carrier constructed to present lamps to be tested through said doors, and contacts for completing circuit through each lamp as it enters the housing, substantially as described.

In testimony whereof I have hereunto signed my name.

WALTER F. SMITH.

Witnesses:

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 W. J. JACKSON.