

(No Model.)

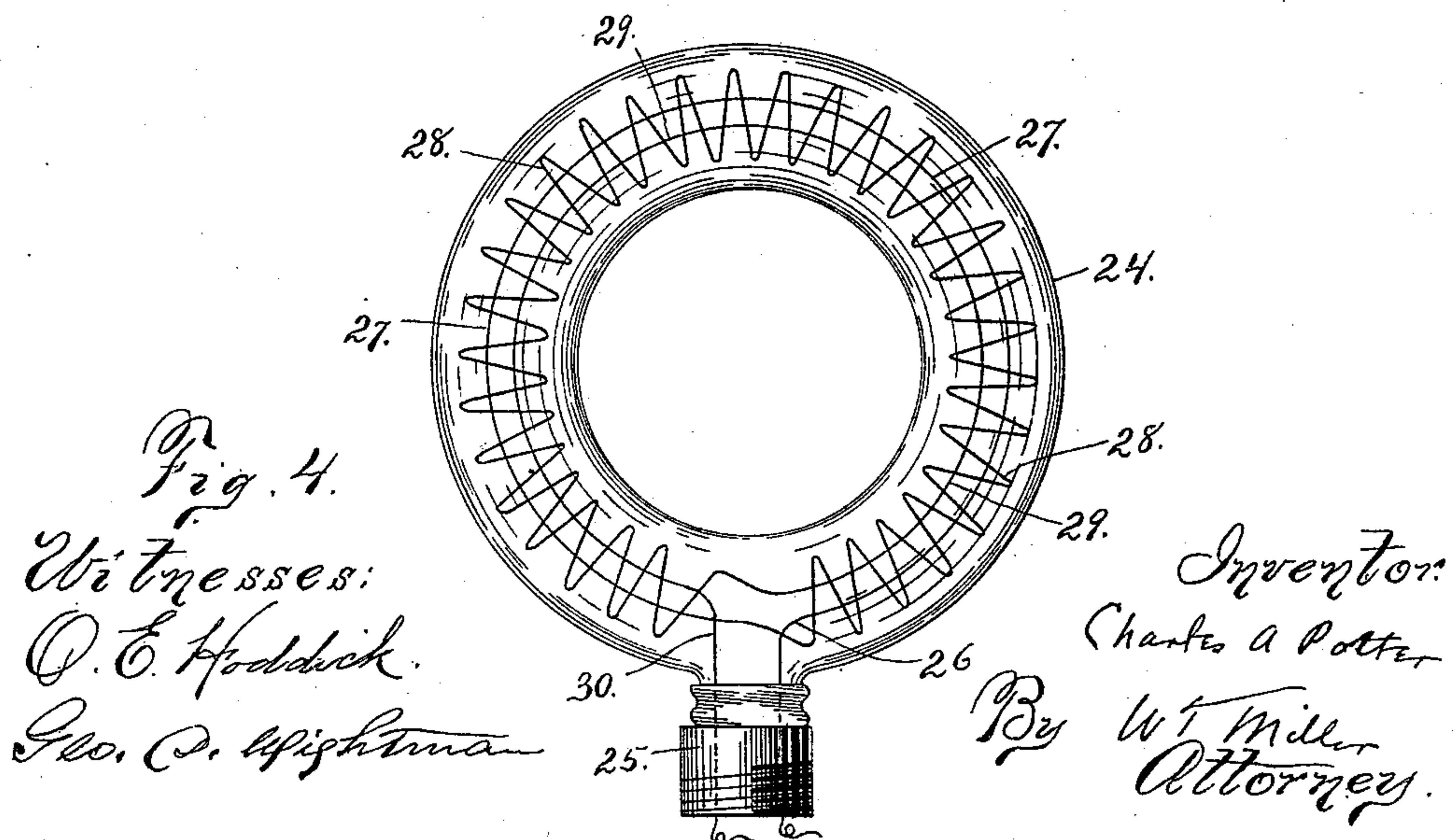
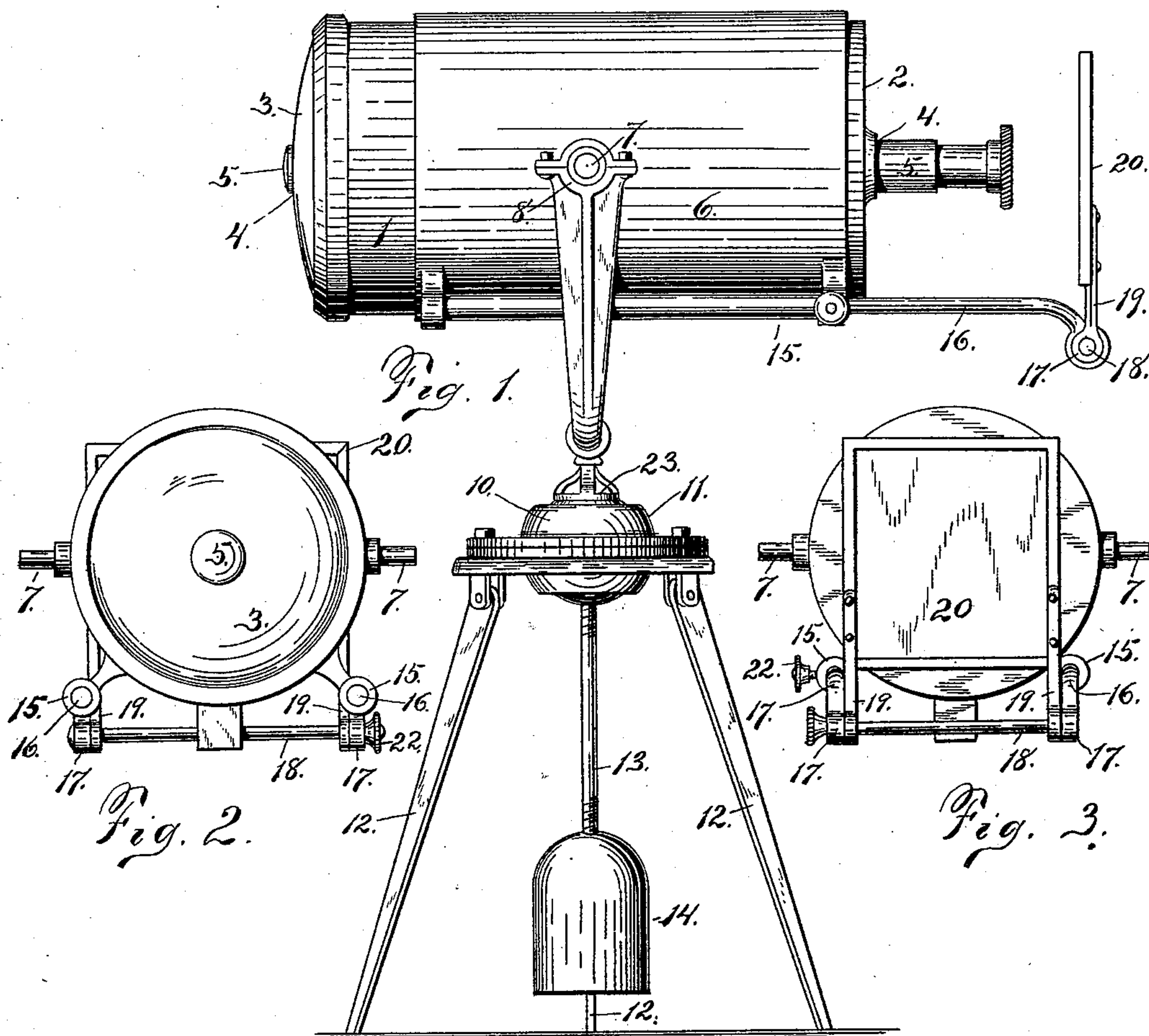
2 Sheets—Sheet 1.

C. A. POTTER.

INSTRUMENT FOR PENETRATING DARKNESS, HAZE, OR FOG.

No. 536,759.

Patented Apr. 2, 1895.



(No Model.)

2 Sheets—Sheet 2.

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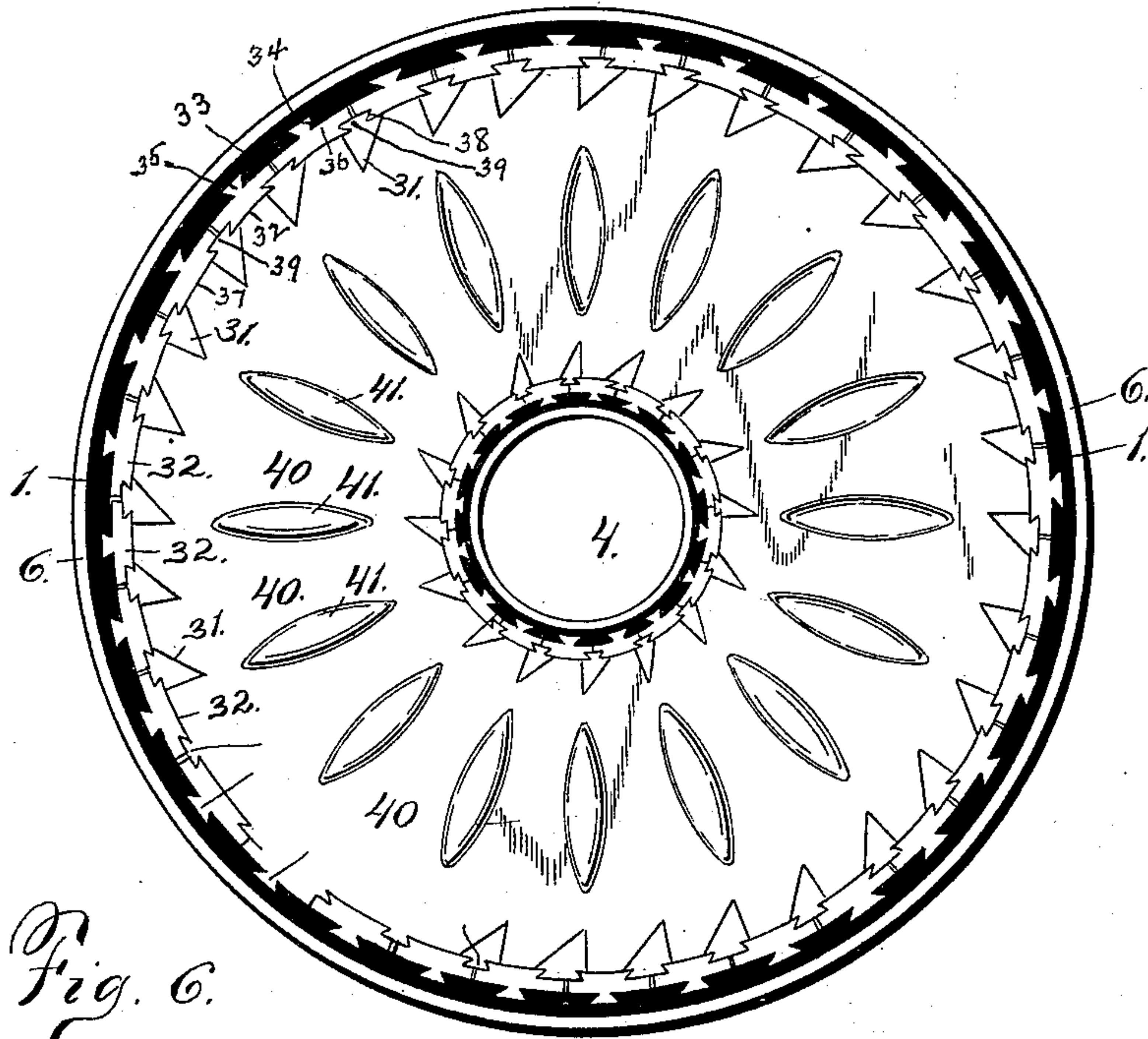


Fig. 6.

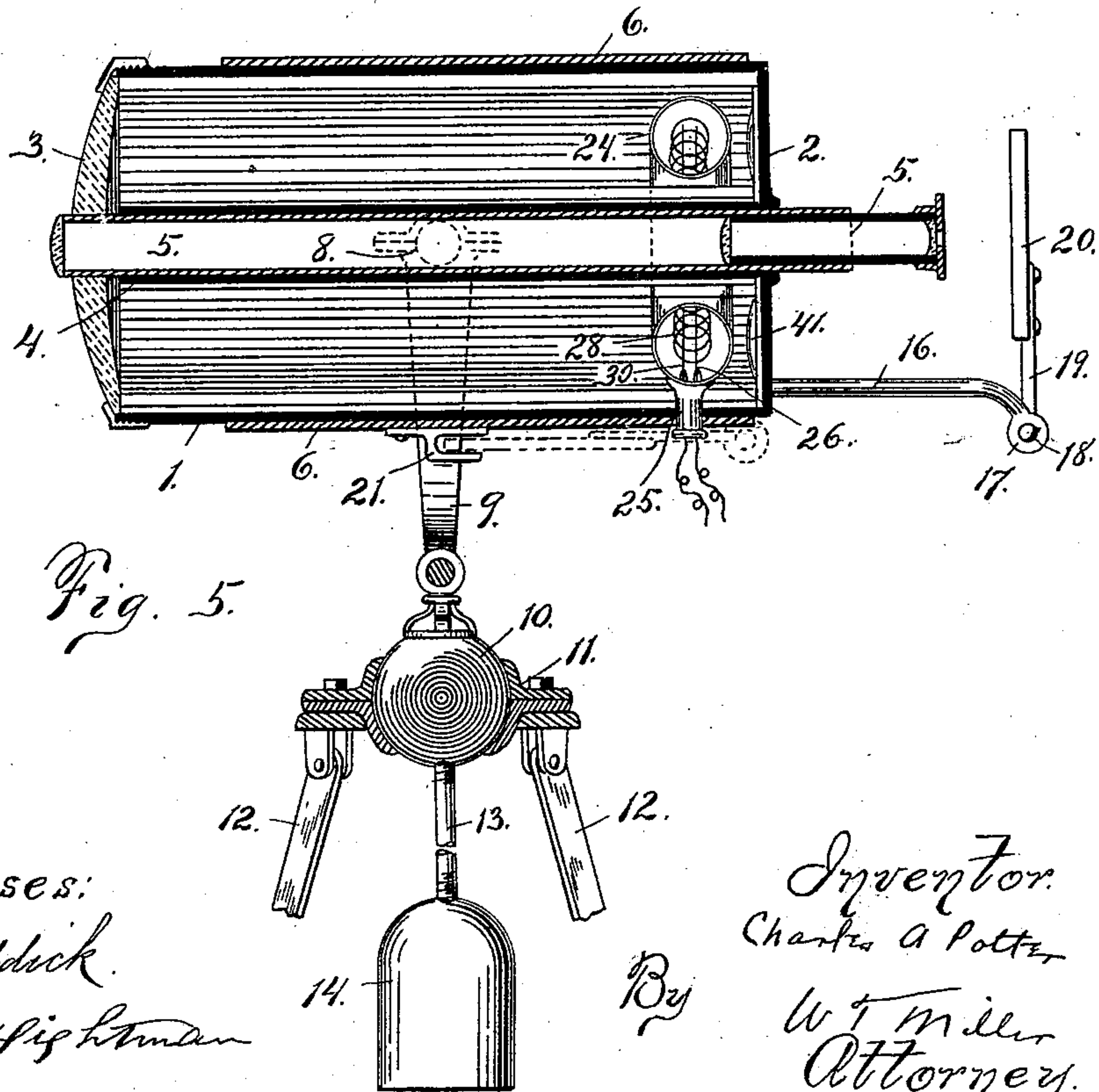


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES A. POTTER, OF BUFFALO, NEW YORK.

INSTRUMENT FOR PENETRATING DARKNESS, HAZE, OR FOG.

SPECIFICATION forming part of Letters Patent No. 536,759, dated April 2, 1895.

Application filed March 29, 1894. Serial No. 505,585. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. POTTER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Instruments for Penetrating Darkness, Haze, or Fog; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

The object of my invention is the production of an instrument which not only partakes of the nature of a search light, to bring within the vision a distant object, but which magnifies the object rendered visible thereby to enable the observer to examine such object more clearly both as to outline and detail, the instrument being specially adapted for use at night and when the atmosphere is in a hazy or foggy condition.

To that end my invention consists of a suitably mounted chamber closed to the light at one end and having a lens across its other end such chamber being provided with a central longitudinal passage open at both ends for the reception of a magnifying instrument the inner surface of the chamber and the outer surface of the central passage being provided with reflecting surfaces, and a light placed within the chamber at its closed end, the contained light within the chamber being intensified by the reflecting surfaces to penetrate the darkness, haze or fog, and the centrally arranged magnifying instrument to transmit the image for examination at the instrument.

My invention further consists of details of construction all of which will be fully hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of my improved instrument. Fig. 2 is a forward end elevation of the light chamber. Fig. 3 is a rear end elevation of the same. Fig. 4 is a detached detail view of the light. Fig. 5 is a central vertical longitudinal section of the form in Fig. 1, and Fig. 6 is an enlarged vertical transverse section of the light chamber.

Referring to the drawings, 1 is the metallic

light chamber preferably of hollow cylindrical configuration having the closed metallic end 2 and the lens 3 secured across its other end.

4 is a central longitudinal passage secured within the chamber 1 and open at both ends through the centers of the metallic head 2 and the lens 3 it being adapted for the reception of the telescope or magnifying instrument 5.

6 is an outer shell or casing placed around the chamber 1 and provided with trunnions 7, 7 on either side, which are seated in bearings 8, 8, at the upper ends of the arms 9, 9 constituting the supporting frame. Below the united bases of these arms and secured thereto is the ball 10 loosely secured in the spherical socket 11 supported by the tripod legs 12. To the under side of the ball 10 is secured the rod 13 the lower end of which carries the counter-weight 14. The socket 11 is open at top and bottom to permit of sufficient play of the ball and its upper and lower attachments. With this manner of adjustment the light chamber and its contained reflecting instrument can be placed at any vertical angle desired and their supporting frame will always retain an upright position during the rolling or pitching of a vessel upon which the instrument is used, the legs 12 of the tripod being, of course, secured.

Attached to the casing 6 on either side of its under surface are the tubular sockets 15, 15, adapted for the sliding reception of the rods 16, 16, their outer ends curving downwardly and provided with the bearings 17, 17, in which the cross rod 18 is journaled. To this cross-rod 18 are rigidly secured the arms 19, 19 between which is placed the mirror 20 with its reflecting surface opposite the protruding eye-piece of the telescope 5. When not in use this mirror is swung down under and parallel to the sliding rods 16, 16, which may be pushed into their sockets 15, 15, the outer end of the mirror engaging with and resting upon the shelf 21. (See Fig. 5.) A thumb nut 22 serves to tighten and hold the mirror in an upright position when in use.

If desired a compass may be swung in the top of ball 10 at the point 23 to note the bearing of the observations.

The incandescent light which I employ is located at the end of the chamber 1 adjacent

to the metallic head 2 and preferably consists of a globe 24 of annular form surrounding the passage 5 as shown, its shank 25 projecting down through the bottom walls of the casing 6 and chamber 1. The filament within the globe is arranged as follows, see Fig. 4: The right hand end 26 is passed completely around the globe 24 forming the loop 27. It is then bent in the form of a spiral 28 which passes completely around the globe 24 encircling the loop 27 and when it reaches a point adjacent to the shank 25 it is again continued around the globe, within the spiral, in the form of a loop 29, concentric with the loop 27 and just within the same, its end 30 passing into the shank 25. A simpler form of filament would consist of the spiral alone without the loops 27 and 29, but I prefer the form shown as giving a maximum amount of light.

The interior side walls of the chamber 1 are covered with the longitudinal glass prisms 31 located at regular intervals around the cylindrical wall with the intermediate longitudinal reflecting mirrors 32. These are arranged in position as follows, see Fig. 6: Within the inner wall 1 is a metallic lining 33 provided with a series of mortises 34 adapted for the sliding reception of the tenons 35 centrally arranged upon the glass strips 36 having upon each of their inner faces the reflecting surfaces 37 narrower than the strips 36 and having outwardly tapering edges 38. Two of these adjacent edges 38 form a mortise adapted, when placed in position as shown, for the reception of a tenon 39 formed upon the inner face of each prism 31. The prisms 31 and reflecting surfaces 32 are in this manner assembled around the inner cylindrical wall of the chamber 1 and also around the outer cylindrical wall of the central passage 4 as clearly shown.

The inner face of the metallic end 2 of the chamber 1 is covered with segmental reflecting mirrors 40 and the radial oval shaped projecting prisms 41 at the adjoining edges of the segmental pieces 40.

With my improved arrangement of mirrors and prisms within the chamber the light radiated from the incandescent lamp is intensified and sent out through the lens 3 penetrating the darkness haze or fog and illuminating any intercepted object within range of the transmitted light. This image is transmitted by the telescope in which it can be seen magnified, or it can be thrown upon the mirror 20 in the rear, by the magnifying in-

strument centrally located within the passage 4 and there examined as to outline and detail.

This instrument is not only extremely valuable on the sea, but is equally so on land especially in railroad travel as, placed in the cab of a locomotive, it will enable the engineer to discern objects in darkness, haze or fog for a safe distance ahead and thereby avoid collisions with approaching trains or stationary obstacles upon the track.

I claim—

1. An instrument for bringing objects into view through darkness haze or fog consisting essentially of a suitably mounted chamber closed to the light at one end and having a lens across its other end, such chamber being provided with a central longitudinal passage open at both ends for the reception of a magnifying instrument, the inner surface of the chamber and the outer surface of the central passage being provided with reflecting surfaces, and a light placed within the chamber at its closed end all combined and operating substantially as and for the purpose stated.

2. An instrument for bringing objects into view through darkness haze or fog consisting essentially of a suitably mounted chamber closed to the light at one end and having a lens across its other end, such chamber being provided with a central longitudinal passage open at both ends for the reception of a magnifying instrument, the inner surface of the chamber and the outer surface of the central passage being provided with reflecting surfaces, a light placed within the chamber at its closed end and an adjustable receiving mirror located back of the magnifying instrument all combined and operating substantially as and for the purpose stated.

3. In an instrument for bringing objects into view through darkness haze or fog a cylindrical light chamber having a central longitudinal passage therein, and provided on the inner cylindrical and end wall of the chamber and the outer cylindrical wall of the passage with alternating prisms and mirrors to intensify the light of the incandescent lamp placed within the chamber substantially as shown and described.

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

CHARLES A. POTTER.

Witnesses:

W. T. MILLER,
F. P. AUSTEN.