

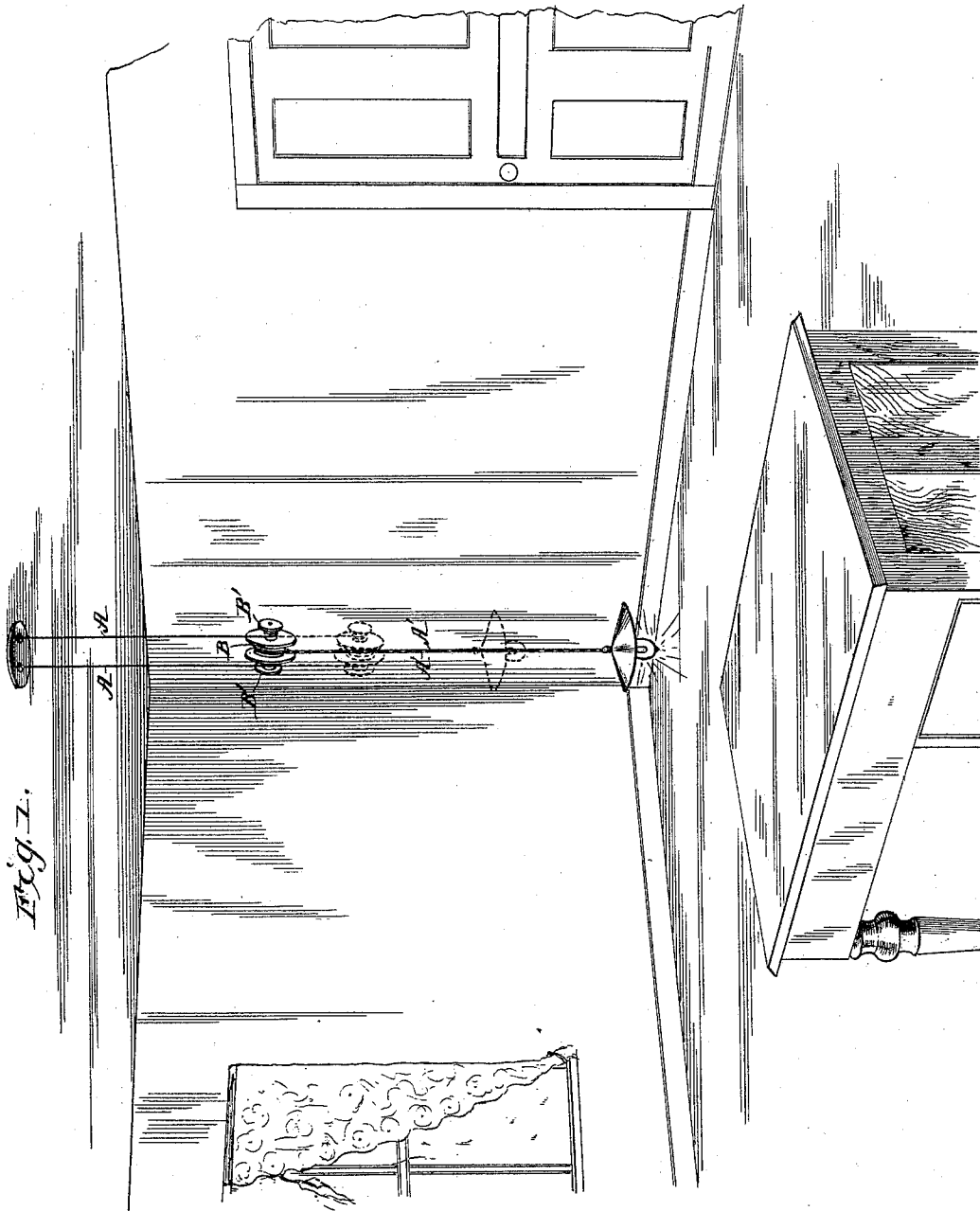
(No Model.)

3 Sheets—Sheet 1.

W. F. BRADNER.
ADJUSTABLE LAMP HANGER.

No. 415,897.

Patented Nov. 26, 1889.



WITNESSES:

Fred G. Dietrich
Edw. H. Byrne,

INVENTOR

Wm. F. Bradner
BY *Man. L.*

ATTORNEY

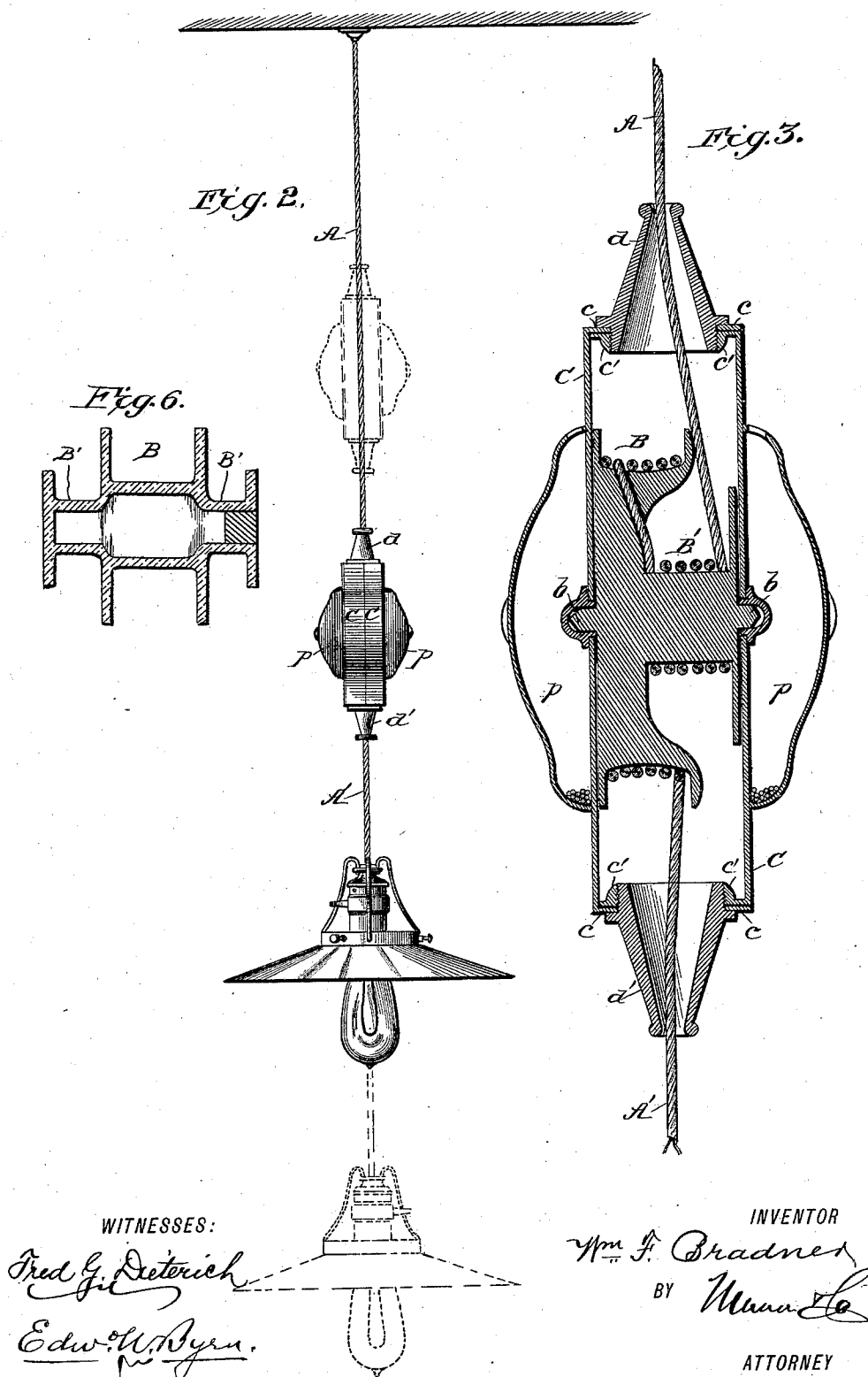
(No Model.)

3 Sheets—Sheet 2.

W. F. BRADNER.
ADJUSTABLE LAMP HANGER.

No. 415,897.

Patented Nov. 26, 1889.



WITNESSES:

Fred G. Dietrich

Edw. W. Ryan

INVENTOR

Wm. F. Bradner

BY

Munn & Co

ATTORNEY

(No Model.)

3 Sheets—Sheet 3

W. F. BRADNER.
ADJUSTABLE LAMP HANGER.

No. 415,897.

Patented Nov. 26, 1889.

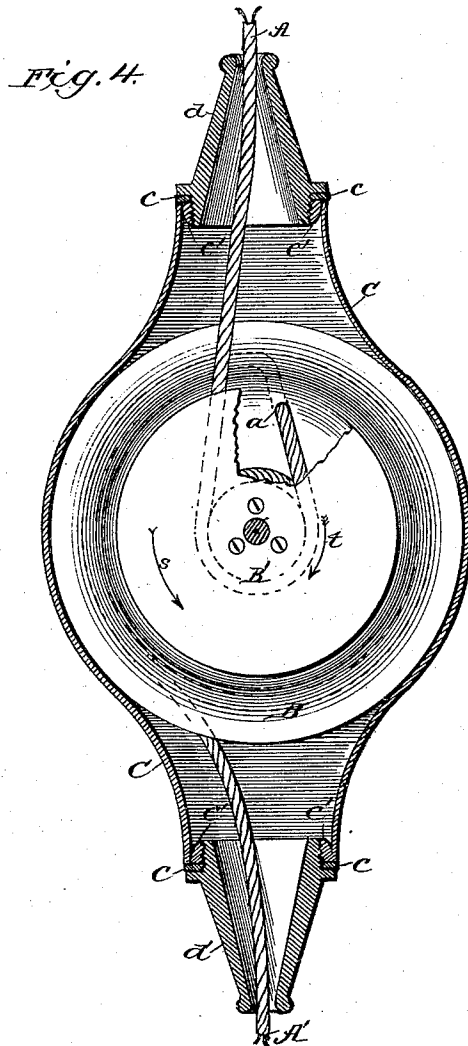
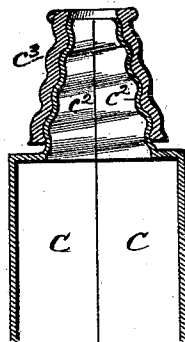


Fig. 5.



WITNESSES:

Fred G. Dieterich
Edw. W. Byrnes

INVENTOR

Wm. F. Bradner
BY *Marion L.*

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM F. BRADNER, OF DENVER, COLORADO.

ADJUSTABLE LAMP-HANGER.

SPECIFICATION forming part of Letters Patent No. 415,897, dated November 26, 1889.

Application filed December 27, 1888. Serial No. 294,767. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BRADNER, of Denver, in the county of Arapahoe and State of Colorado, have invented a new and useful Improvement in Adjustable Lamp-Hangers, of which the following is a specification.

My invention is in the nature of an improved adjustable hanger for lamps, bird-cages, and similar devices, and especially for electric lamps in which the suspending-cable serves the double purpose of supporting the lamp and conducting the electric current to the same.

It consists of a suspending cable or cord having interposed in its length a differential pulley, windlass, or drum having peripheries of two different diameters, from one of which the cable extends up to the ceiling or other point of support, and from the other of which the cable descends to the lamp, which differential pulley (with or without a case) forms a weight which, when the lamp is lifted, gravitates, and in unrolling the cord from the smaller pulley rolls up the slack of the cord below on the larger pulley, the balancing effect of the two pulley-surfaces serving to hold the lamp to any adjustment without special appliances.

Figure 1 is a perspective view of a simple form of the device. Fig. 2 is a side view of another form of the device. Figs. 3 and 4 are sectional views at right angles to each other, illustrating in detail the form of differential pulley and case shown in Fig. 2. Fig. 5 shows in detail a modification of the device for fastening together the two sections of the case, and Fig. 6 is a sectional view of the differential pulley shown in Fig. 1.

Referring to Fig. 1, B B' B' is a differential pulley, having one large pulley B and two smaller pulleys B' B', one small pulley upon each side of the large one.

A A represent two cords or cables extending from the smaller pulleys to the ceiling or other point of support, and A' A' represent the lower section of cord extending from the large pulley to the lamp below. When the lamp is an electric lamp, these lower cords are a continuation of the upper cords A A twisted together, and consist each of a central conductor with an insulating coating. In this

form of the device there is no frame or case forming axial bearings for the differential pulley or drum; but the latter forms its own axis in the wrap of the cord.

Referring now to Figs. 2, 3, and 4, A represents the cord, chain, or cable leading from the ceiling or other point of support to the differential pulley, and A' is the section of cord leading from the differential pulley to the lamp below. This cable may be made continuous or in two detached sections.

For suspending an ordinary kerosene-lamp a cord of non-combustible stuff or chain is used, while for electric lamps a continuous cord consisting of a metal core and an insulating web or coating is used, as shown, two of these cords being twisted together or woven into a tape, one being connected to one end of the line-wire and one side of the lamp and the other to the other end of the line-wire and other side of the lamp, so as to carry the electric current to and from the latter.

The differential pulley is formed as a single casting with two peripheries B and B', with flanges applied to the same. The pulley B is of much larger diameter than B', and the side of this larger pulley is hollowed out or recessed so as to receive the smaller pulley, and thus bring their peripheries approximately in the same plane. The object of this is to render the differential pulley more compact and to cause the cord which extends from the small pulley to come as nearly as possible in vertical alignment with the cord which extends from the large pulley. The cord A, which extends from the ceiling, is first wound around the smaller pulley B' a number of convolutions, and then, passing through a hole *a* to the periphery of the large pulley, is wound in the same direction around it an equal number of convolutions, and then descends to and is fastened to the lamp, which it supports. The differential pulley is provided at its axial line upon its opposite sides with trunnions *b b*, which find a bearing in a housing or casing C, which is designed to be constructed in a symmetrical ornamental shape, with an outlet at the top for the cord A, and another at the bottom for the cord A'. This case is conveniently constructed in two halves, with registering or coinciding perforated flanges *c c'* at the outlets, and these

halves are connected by screw nipples or thimbles $d d'$, which penetrate the perforated flanges and hold the two sections together. As a modification of this fastening, the case-
 5 sections may be formed with half-nipples $c^2 c^2$, with screw-threads formed thereon and connected by an encompassing thimble c^3 , constructed as a screw-nut, as in Fig. 5. If desired, small friction-rollers may be placed inside the case, to properly guide the cord to the peripheries of the pulleys. In constructing the differential pulley and its case, it is necessary that it should have a considerable weight, since it acts as a weight to effect by
 10 its own gravity one of the necessary adjustments of the lamp. For this reason I prefer to make the pulley (and its case, when used) either of metal or of glass. When made of metal, the case is brilliantly polished or plated and ornamented, and when made of glass it is to be ornamented with cut-glass pendants, after the manner of crystal chandeliers.

The operation of this adjusting device is as follows: It will be seen by reference to
 15 Figs. 1 and 4 that the cord is wound in the same direction around both the large and small peripheries of the differential pulley—*i. e.*, the cord extending from the ceiling is wound first around the smaller pulley, and
 20 then, passing to the large periphery, continues in the same direction around the large pulley, so that the section of the cord above the differential pulley and the section below it both emerge from the pulley on the same
 25 side of the vertical line of its axis. It will be seen, therefore, that the weight of the lamp has a tendency to turn the large pulley in the direction of the arrow s , while the weight of the differential pulley, its case, and
 30 all that is below it has a tendency to turn the small pulley in the direction of the arrow t , or opposite to pulley B. It will thus be seen that these two forces act in opposition to each other, and with the friction of the cord passing through the case they sufficiently balance
 35 each other to cause the lamp to be suspended in any position without turning the differential pulley in either direction. If it is desired to adjust the lamp higher, it is simply
 40 raised bodily, as in dotted lines, Fig. 1. This relieves the large pulley of the weight of the lamp, and the weight of the pulley and case being now relieved of antagonism and free to act it gravitates and unrolls the cord from
 45 the small pulley, and as it does so it winds up the slack cord below on the large pulley, and as the large pulley revolves the same number of times that the small one does the greater
 50 circumference of the large pulley takes up more of the lower cord than the small pulley pays out of the upper cord. The result is, that the lamp, when raised, is held to its raised position by the still taut cord. To lower the
 55 lamp it is simply grasped and pulled down, as in dotted lines in Fig. 2, and as the leverage of the lower cord on the large pulley is greater than that of the upper cord on the

small pulley the large pulley is unwound and the small pulley is wound up, and as the lower cord is paid out from the large pulley
 70 faster than the upper cord is wound on the small pulley the lamp reaches a lower adjustment. In this way the lamp is held at any adjustment, and is conveniently raised or lowered by simply pushing it up or pulling
 75 it down, preserving at the same time the unbroken electric continuity of the conducting-wire without any rubbing contact or other incident of uncertain electrical connection.

In making use of my invention I may not
 80 only use it for electric lamps and oil-lamps, but may also construct the cable in the form of a continuous hollow gum tube, which connects with the gas-pipes at the ceiling and with a drop-light below, thus securing in gas
 85 drop-lights the same advantages of vertical adjustment.

In making use of my adjusting device in electric chandeliers, the differential pulley may be allowed to play up and down in the
 90 central stem of the chandelier, a portion of which stem would in that case be constructed of a diameter sufficient to receive it.

In adapting my invention to the suspension and adjustment of lamps of different weight,
 95 the differential pulley shown in Fig. 1 may be made hollow to receive shot or other weighty substance, as shown in Fig. 6, while the form shown in Fig. 3 is provided with pockets p on its sides for the same purpose, thereby per-
 100 mitting an exact balance to be established.

I am aware that it is not new to wind up the flexible suspending-cord of a lamp by a spring-actuated pulley, and do not claim this arrangement.
 105

I am also aware of the toy shown in Farnum's patent, dated March 25, 1879, No. 214,839, in which a ball is made to rise and fall on a string by means of a differential pulley within and a cord leading from the two members of
 110 the pulley. My invention differs from this in that it is a suspending device, and its use has reference to suspending another article—such as a lamp and the like—and this use requires a certain amount of weight and adaptation in the differential pulley and its case to the article to be suspended in order to make it operative.

Having thus described my invention, what I claim as new is—
 120

1. A suspending device for lamps, &c., consisting of a cord or cable and a differential pulley, windlass, or drum of approximate weight to the object to be suspended interposed in the length of the cord, with the cord
 125 extending from the small periphery to the supporting-point above and from the large periphery to the lamp below, substantially as described.

2. A suspending device for lamps, &c., consisting of a flexible cable with electrical conductors therein, a differential pulley, and case of approximate weight to the object to be suspended, with the cable wound, as described,
 130

on both peripheries of the pulley and extending from the smaller periphery to the supporting-fixture above, and with the cable extending from the larger periphery to the lamp below, to balance the same in any adjustment, substantially as and for the purpose described.

3. The combination, in a lamp-hanger, of a flexible cable, a differential pulley arranged in the length of the cable and having two peripheries of different diameters, the smaller one being arranged partly within the plane of the larger one, and the cable being wrapped around the two peripheries and the ends extending in approximate alignment, substantially as shown and described.

4. The combination, in a lamp-hanger, of a flexible cable, a differential pulley arranged in the length of the latter and having the cable wound thereupon, as described, and an inclosing-case made in two halves, forming bearings for the pulley, and nipples or thimbles for connecting the two sections of case, substantially as and for the purpose described.

5. The combination, in a lamp-hanger, of a flexible cable, a differential pulley arranged in the length of the latter and having the cable wound thereon, as described, and an inclosing-case, made in two halves, joining to-

gether on the line of the cable and provided with thimbles forming both outlets for the cable and connections for the two sections of the case, substantially as described.

6. The combination, in a lamp-hanger, of a flexible cable, a differential pulley arranged in the length of the cable and having two peripheries of different diameters lying approximately in the same plane, with an opening *a* for passing the cable from one periphery to the other, and an inclosing-case, substantially as shown and described.

7. In a lamp-hanger, the combination of a suspending cord or cable and a differential pulley interposed in the length of the cord and provided with pockets or recesses for shot or other weighty material to balance the lamp, substantially as shown and described.

8. In a lamp-hanger, the combination of a suspending cord or cable, a differential pulley interposed in the length of the cord, an inclosing-case forming bearings for the pulley, and pockets for the reception of shot or weighty material to balance the lamp, substantially as shown and described.

WILLIAM F. BRADNER.

Witnesses:

SAMUEL LESEM,
B. W. WISEBART.