D. WHITEFORD.

Extension Device for Lamp.

No. 216,072. Patented June 3, 1879.

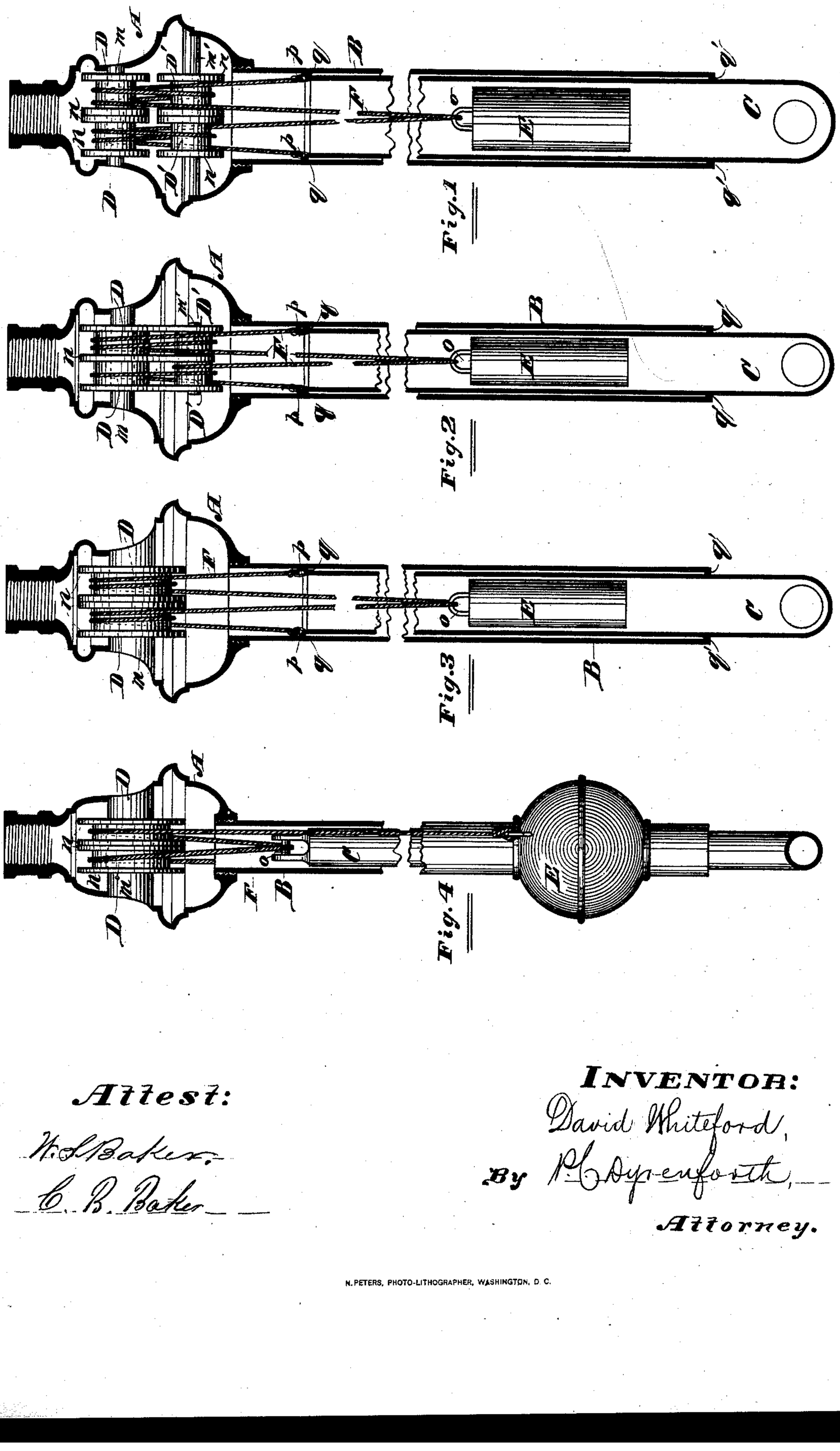

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Attest:

W. L. Baker.

C. B. Baker

INVENTOR:

David Whiteford,

By P. C. Dyrenforth,

Attorney.

UNITED STATES PATENT OFFICE.

DAVID WHITEFORD, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN EXTENSION DEVICES FOR LAMPS.

Specification forming part of Letters Patent No. **216,072**, dated June 3, 1879; application filed February 24, 1879.

To all whom it may concern:

Be it known that I, DAVID WHITEFORD, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Extension Devices for Lamps, Chandeliers, and the like; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, of which—

Figure 1 is a vertical section embracing, substantially, all the features of my invention; Fig. 2, a like view, showing a slightly different construction as to the pulleys, and suggestions in the matter of entwining the cords about them; Fig. 3, a like view, in which only a single pair of pulleys is employed; and Fig. 4, a view in which a part only of the features of my invention appear, and in which the application of such part in other ways than the ones hereinafter specifically described is shown.

My invention relates to the well-known class of extension devices in which cords, pulleys, and a counterpoising-weight are employed; and it is designed for raising and lowering hanging oil-lamps in particular, although with a simple addition, which will hereinafter be explained, the same may be used for gas-fixtures.

The object of my invention is twofold: first, to have all the operating mechanism, including the weight, if desired, concealed from view; and, secondly, to permit the use of a weight very much lighter than the lamp which it is required to balance.

My invention accordingly consists, first, in having the shaft carrying the lamp slide within a fixed tube or sleeve projecting downward from the upper portion of the device, and connected, by means of cords passing over pulleys situated above the said fixed tube, with a weight which is concealed from view by being inclosed within the said fixed tube; secondly, in having the shaft which carries the lamp, and which slides within the fixed tube, and which is connected by cords passing over pulleys with a balance-weight, itself hollow, and of sufficient diameter to receive the weight, whereby, as the lamp or chandelier is raised, the said inclosed weight passes into it; thirdly, in the arrangement of the pulleys over which the cords pass with respect to the shaft and weight and to each other; and, fourthly, in means for increasing the friction of the cord which connects the shaft and inclosed weight together, whereby a heavy chandelier may be balanced by a comparatively small weight, such means consisting in the employment of two pairs of pulleys, both pairs in fixed position in the upper part of the device above the weight and shaft, with one pair a short distance above the other, and entwining the cord or cords around both pairs, all as hereinafter more fully set forth.

Fig. 1 of the drawings represents the construction which I prefer, in general, to adopt where the chandelier to be raised and lowered is heavy, and this figure I shall proceed to describe first.

A is a metal shell, which is designed to be screwed to the ceiling; and B, the fixed sleeve, extending downward from this shell and terminating at the highest point to which it is desired the lamp shall rise. C is the hollow shaft, which carries the lamp or chandelier, and which slides within the sleeve B. D D and D′ D′ are the pulleys. The pair D are end to end on a fixed shaft, *m*, and the pair D′ similarly placed on a fixed shaft, *m′*, below the other, both shafts being in line with the diameter of the sleeve B. This central arrangement of the pulleys and placing of each pair upon a single shaft not only allows better than any other of their being invisible, but it also gives compactness to the device, reduces the compass, and improves the working in every way.

The pulleys are all provided with flanges *n* for the purpose of preventing the cord from slipping off, and it may often be found advisable to set each pair with their contiguous ends pressed close together to increase the friction.

The use of pulleys in extension devices for lamps, &c., to assist in raising and lowering the lamp or chandelier, I do not broadly claim; but I believe that their use in the manner shown in my device, and having them situated relative to each other and to the rest of the device in the manner shown, is new.

E is the weight, which I prefer to make cylindrical and sufficiently slender to slide within the hollow shaft C. The shaft C and weight E are connected together by means of the cord

F, this cord being passed to its center through a suitable ring or eye, *o*, at the top of the weight; then the strands carried up and entwined one about the two right-hand and the other about the two left-hand pulleys, then brought down and attached at their ends to opposite sides of the shaft C, as shown at *p*.

I do not limit myself to any particular mode or modes of entwining the cords about the pulleys; but it is proper to call attention to the fact that the degree of friction depends on the way adopted, and hence judgment must be exercised in the selection of one or another, according to circumstances. Thus where a considerable discrepancy subsists between the weight and the chandelier, such a way should be chosen as will afford a high degree of friction, and in addition to this it may be well to set the contiguous ends of the pulleys hard against each other, as before suggested. When a smaller discrepancy exists, a way giving less friction should be chosen.

Of the four methods shown in Figs. 1 and 2, it will readily be seen by following the cords that the one on the left-hand pulleys in Fig. 1 gives the greatest degree of friction, for there the two strands which pass over the upper pulley move in opposite directions, whereby that pulley remains stationary and the cords slip around it, while of the three strands which act on the lower pulley, two move in a like direction, thus turning it, while the third moves in a contrary direction, thus serving as a partial check.

The methods shown at the right both of Figs. 1 and 2 give an equal degree of friction, for the two strands which act on the upper pulley move in the same direction, the lower one being acted on in the same manner as the corresponding one before referred to. The method indicated at the left of Fig. 2 obviously gives the least friction of the four.

If the cord is sufficiently flexible, or if a chain is employed, (and everything which I have said or shall say in relation to the cords is intended to apply equally to chains,) there is no reason why it should not be passed more than once around the same pulley. However, I prefer to employ wire cord, as being the strongest and most desirable to be had, and this can only be passed twice around and still work well if the pulleys are exceptionally large, as they are in Fig. 3.

It is plain that by hanging the weight upon the center of the doubled cord, as shown, the opposite strands are rendered mutually compensating, and are caused to maintain exact equality, whereby the strain is always equally distributed.

Except for this matter of equalization, it is evident that two cords might be used instead of one, each passing over its separate pulley or pulleys, and firmly attached by opposite ends to the shaft and weight.

An outwardly-projecting shoulder, *q*, on the upper edge of the shaft C, and an inwardly-projecting shoulder, *q'*, on the lower edge of the sleeve B, serve to prevent the shaft from being drawn out of the sleeve.

Fig. 2 corresponds substantially with Fig. 1, except in the construction of the pulleys. These are here shown as set in a block, the latter performing the office of the flanges *n* in Fig. 1. The lower or supplementary pulleys, moreover, are here shown smaller than the upper ones, and this last is a very desirable construction.

Fig. 3 shows only a single pair of pulleys, and this is the form which I adopt when the lamp or chandelier is not very heavy. Considerable friction may be had by passing the cords twice around, as shown, and still more by bringing the ends hard together, as before stated.

Fig. 4 shows no novelty except in the matter of the arrangement of the pulleys, these being end to end upon a common shaft and centrally situated with respect to the other parts of the device, and shows also that this part of my invention may be used in connection with other modes of attaching and placing the weight, and with the weight in other positions relative to the shaft than the one to which my invention more particularly relates.

With the form of construction shown in Figs. 1 and 2 a three-pound weight may easily be made to balance a twelve-pound chandelier.

By having the shell A perfectly tight, and providing a suitable packing upon the outside of the shaft C, at or below the shoulder *q*, and, if desired, also upon the inside of the sleeve B, at or above the shoulder *q'*, my device may be used also for gas-fixtures, the gas passing down around the weight.

What I claim as new, and desire to secure by Letters Patent, is—

1. An extension device for lamps and chandeliers, comprising a fixed downwardly-projecting tube or sleeve, within which the shaft or stem of the chandelier slides, two or more pulleys above the same, and one or more cords passing over or around said pulleys and connecting said shaft of the chandelier with a balance-weight, in which shaft said balance-weight is concealed from view, the whole being inclosed within the said downwardly-projecting sleeve, substantially as described.

2. An extension device for lamps, &c., in which the shaft sustaining the lamp is hollow and slides within a fixed tube projecting downward, and in which one or more cords are attached to the said shaft and pass over or around pulleys situated above said fixed tube, and then pass downward and sustain a weight, said weight moving freely up and down the interior of the said fixed sleeve and hollow shaft which sustains the lamp, substantially as described.

3. An extension device for lamps and the like, in which the shaft or stem which carries the lamp is connected to the balance-weight by means of one or more cords passing over or around one or more pairs of pulleys situated centrally above said shaft, each such pair of

pulleys being placed end to end in frictional contact upon a separate shaft and revolving independently of each other, substantially as described.

4. An extension device for lamps and chandeliers, comprising the shaft carrying the lamp, a balance-weight, one or more cords connecting the two, and two pairs of pulleys, both in fixed position in the upper part of the device above said weight and shaft, with one pair a short distance above the other, said cord or cords being entwined around both pairs, substantially as described.

5. In an extension device for lamps, chandeliers, and the like, the pulleys D, end to end upon a common central shaft, as shown, in combination with the shaft or stem of the lamp, a balance-weight, and one or more cords connecting the two and passing over or around the said pulleys, substantially as described.

6. The combination of the pulleys D and D′, shaft C of the chandelier, weight E entering said shaft, and single cord F, said parts being constructed and arranged to operate substantially as described.

7. The extension device consisting of the shell A, pulleys D and D′, sleeve B, shaft C, weight E within said sleeve and shaft, and cord F, said parts being constructed and combined substantially as described.

DAVID WHITEFORD.

In presence of—
P. C. DYRENFORTH,
E. F. MERRILL.