

No. 632,500.

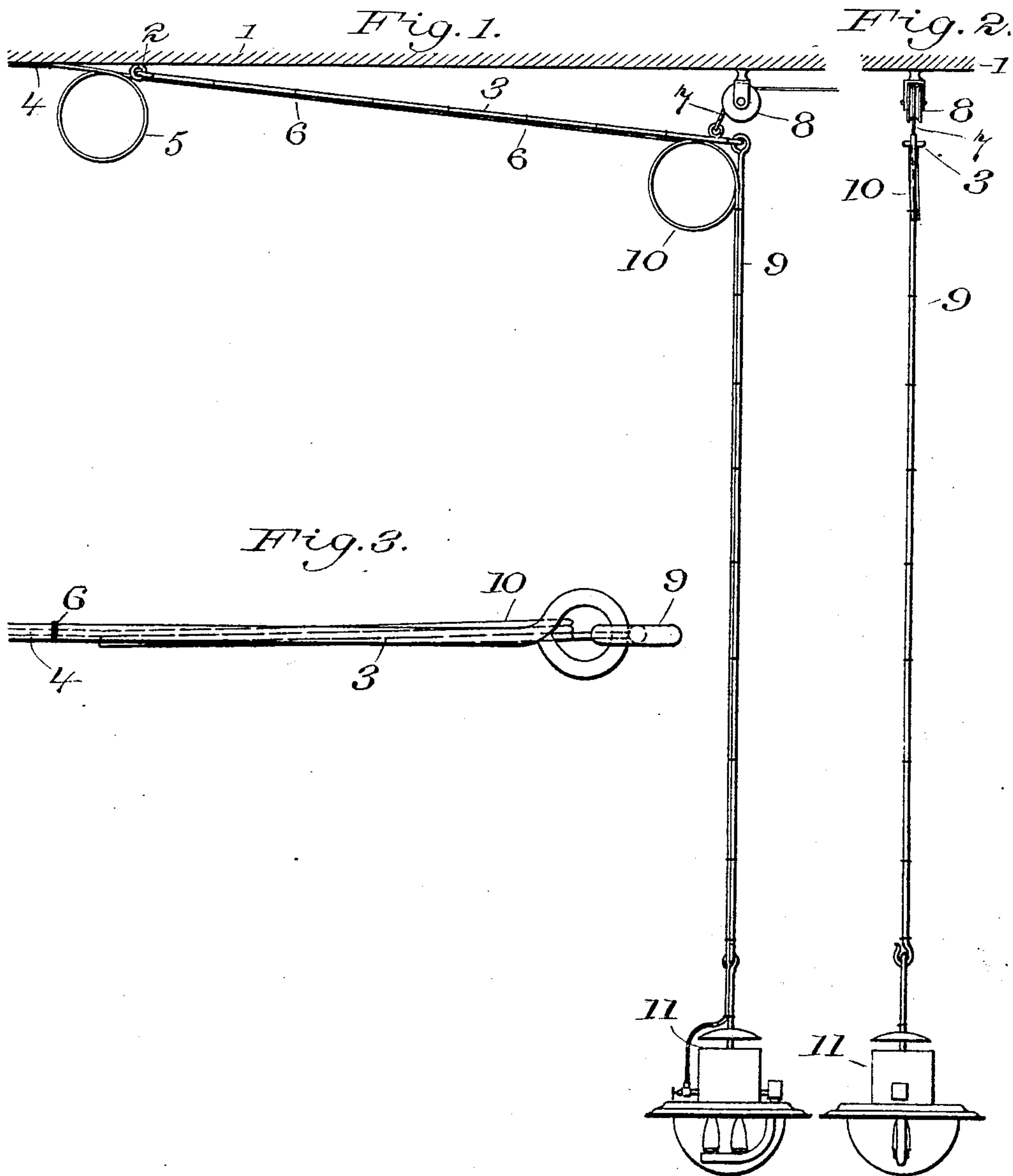
Patented Sept. 5, 1899.

A. KITSON.
SUSPENSION APPARATUS.

(Application filed Mar. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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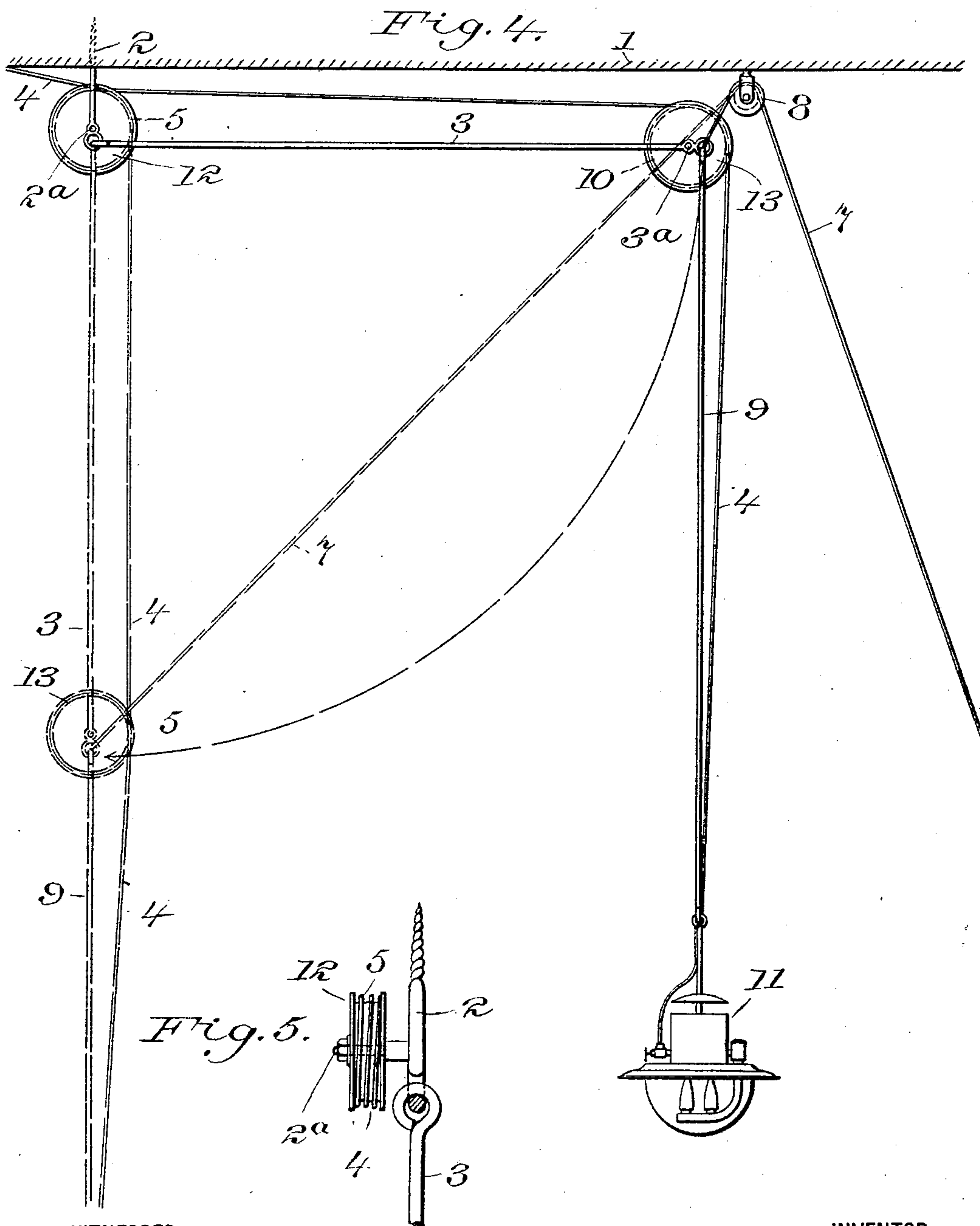
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UNITED STATES PATENT OFFICE.

ARTHUR KITSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
KITSON HYDROCARBON HEATING AND INCANDESCENT LIGHTING COM-
PANY, OF SAME PLACE AND CHARLESTON, WEST VIRGINIA.

SUSPENSION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 632,500, dated September 5, 1899.

Application filed March 20, 1899. Serial No. 709,811. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR KITSON, a sub-
ject of the Queen of Great Britain, and a resi-
dent of Philadelphia, county of Philadelphia,
5 State of Pennsylvania, have invented certain
new and useful Improvements in Suspension
Apparatus, (Case No. 32,) of which the follow-
ing is a specification.

My invention relates to suspension appa-
10 ratus provided with flexible connections ca-
pable of transmitting a supply of fluids under
pressure, and more specifically consists of an
improved form of jointed suspension appa-
15 ratus for oil-burning lamps, together with an
arrangement of flexible tubing attached there-
to for the purpose of supplying oil to the lamp
and so arranged that it shall not be broken
or bent, so as to close the passage-way through
20 the tubing when the jointed suspension appa-
ratus is shifted in its position to raise or lower
the lamp.

Where a series of oil-burning lamps—such,
for instance, as those burning the vapor of
oil under pressure in conjunction with an in-
25 candescent mantle—are used to light rooms
or sheds having high ceilings, it is necessary
to suspend said lamps at a height beyond the
reach of the lamp-trimmer. To avoid the ne-
cessity of said lamp-trimmer carrying around
30 a step-ladder, it becomes desirable to provide
means for raising and lowering said lamps so
that they may be dropped down within reach
of a man standing on the floor or drawn up
to their proper height. To accomplish this
35 without breaking or bending the fine flexible
metal tube through which oil is supplied
under a pressure of forty or fifty pounds, I
have designed an improved form of suspen-
sion apparatus for supporting both said lamp
40 and the tube.

The preferred form of construction embody-
ing my invention is illustrated in the accom-
panying two sheets of drawings, in which—

Figure 1 is a side elevation of the apparatus
45 with the lamp in its elevated position. Fig.
2 is an end elevation of same. Fig. 3 is an
enlarged detail plan view of one of the coils
of tubing. Fig. 4 illustrates a slightly-modi-
fied form of apparatus, the dotted lines rep-

resenting the position of the same when low- 50
ered. Fig. 5 is an enlarged detail showing a
side view of one of the spools employed in
this modified construction.

Throughout the drawings like reference
figures refer to like parts. 55

From a ceiling or roof 1 the entire appa-
tus is suspended by means of the eyebolt 2,
to which the first link 3 of the jointed suspen-
sion apparatus is pivoted. A line of metal
tubing 4 runs along the ceiling to said point 60
of suspension, at or near which point it is
coiled into a spiral 5 of one or more turns.
The tubing is then attached in any conven-
ient way to the various links of the jointed
supporting apparatus by means of bands 6 6, 65
&c., if desired. The free end of the link 3 is
normally supported by the cord or chain 7
running over the pulley 8, also mounted on
the roof or ceiling, the cord extending down
to a point within the reach of a person stand- 70
ing on the floor and there fastened in any
suitable way. (Not shown.) The second link
9 is pivoted to the free end of the first link 3
in any convenient manner, and the tubing 4
is coiled into a second spiral 10 at or near 75
the joint between the two links. The tubing
continues along the second link 9 to the lamp
or other consuming device 11.

In the modified construction shown in Fig.
4 the coil 5 is formed around a spool 12, 80
mounted on a projection 2^a from the eyebolt
2, and the coil 10 is similarly formed about
the spool 13, mounted on a projection 3^a from
the free end of the link 3. The centers of
these spools are approximately coincident 85
with the axes of the joints between the va-
rious sections of the suspension apparatus.

The mode of operating my invention is as
follows: The lamp is normally in the position
shown in Figs. 1, 2, and 4 in full lines. When 90
the lamp is to be trimmed, the operator
loosens the cord 7 and allows it to reeve over
the pulley 8, thus lowering the free end of
the link 3, the whole apparatus assuming the
position shown in dotted lines in Fig. 4. 95
This brings the lamp down within reach of
the operator. When the links are swung, as
shown by the arc in broken lines in Fig. 4,

the spiral 5 winds up a trifling amount and the spiral 10 unwinds a trifling amount. This permits the tubing to accommodate itself to the changed position without making any sharp bend, which would break it or partly close it. Thus, for instance, if a three-coil spiral is employed, as indicated in Fig. 3, the coil 5 would, roughly speaking, be reduced only one-twelfth of its radius and the coil 10 would be increased in radius one-twelfth. This would evidently produce but a slight change in the curvature, and that slight change would be equal throughout the entire spiral. The spools 12 and 13 help to center the spirals coincidently with the joints of the suspension apparatus, and thus protect them from unequal expansion and contraction, also from any excess of bending strain at any one point.

It is evident, of course, that various changes could be made in the details of construction shown without departing from the spirit and scope of my invention so long as the relative arrangement of parts shown in the drawings or the principle of operation described in the specification is preserved. Links of different lengths may be employed, and a greater or less number might be used than that shown. Other means for raising and lowering the lamp might be substituted for the cord and pulley shown, and the point of attachment of the flexible tubing to the fixed support might be varied; but such modifications I consider mere changes in form and not in substance and still within the scope of my invention.

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

1. The combination of the jointed suspension apparatus and the flexible tube extending along the same and coiled into a spiral at or near each joint in the suspension apparatus.

2. The combination of the fixed support, the jointed suspension apparatus consisting of a plurality of links flexibly joined together, one end of such jointed suspension apparatus being attached to the fixed support, the lamp suspended from the other end of the jointed

suspension apparatus, and a flexible tube extending along the apparatus from the fixed support to the lamp.

3. The combination of the jointed suspension apparatus consisting of a plurality of links, the lamp suspended from the last link, and the flexible tube extending along the apparatus to the lamp, said tube being attached to the suspension apparatus and coiled into spirals at or near the joints thereof.

4. The combination of the support, the link of the suspension apparatus pivoted to said support, the pulley attached to the support and the cord attached to the free end of the above-mentioned link and running over said pulley, the lamp swung from the free end of the link, and the flexible tube extending along said link to the lamp and coiled into a spiral at either end of said link.

5. The combination of the fixed support, the lamp, movable means for suspending said lamp from said support, and the flexible tube attached to the lamp and to a fixed point of support and coiled into spirals adapted to expand and contract to accommodate the movements of the lamp.

6. The combination of the fixed support, the jointed suspension apparatus consisting of a plurality of links flexibly joined together, one end of such jointed suspension apparatus being attached to the fixed support, the lamp suspended from the other end of the jointed suspension apparatus, a flexible tube extending along the apparatus from the fixed support to the lamp, together with means for raising and lowering the last link in the jointed suspension apparatus.

7. The combination of the jointed suspension apparatus, the spools mounted on the same near the joints thereof, and the flexible tube extending along the suspension apparatus and coiled around said spools.

Signed by me at New York, N. Y., this 11th day of March, 1899.

ARTHUR KITSON.

Witnesses:

LILIAN FOSTER,
J. E. PEARSON.