(No Model.)

A. S. FONTAINE.

SPRING SUSPENSION DEVICE.

No. 305,583. Patented Sept. 23, 1884.

Fig. 1.

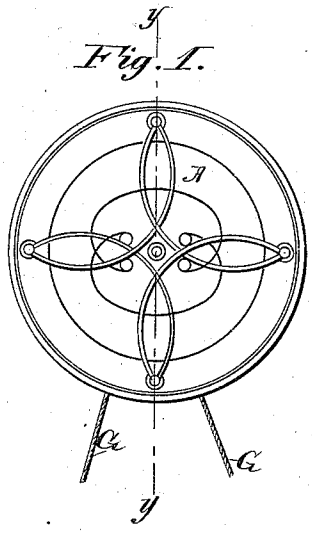


Fig. 3.

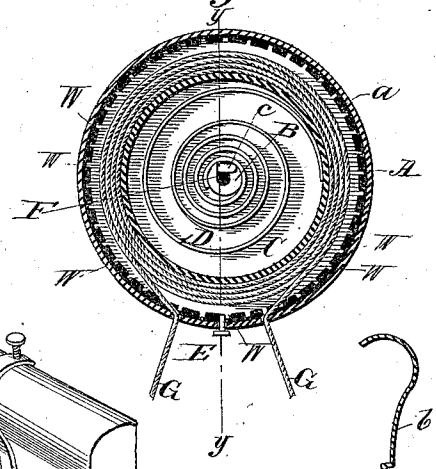


Fig. 5.

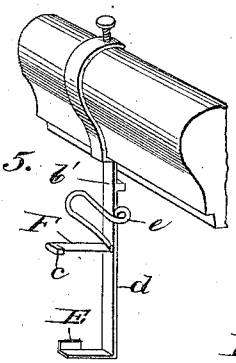


Fig. 7.

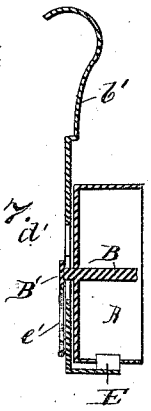


Fig. 2.

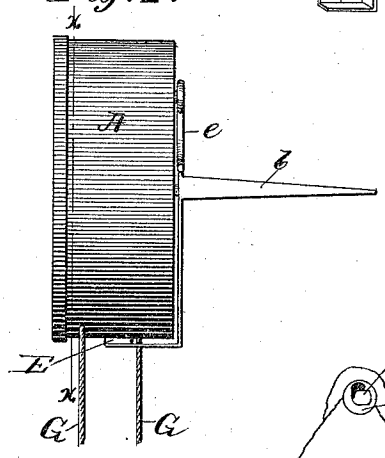
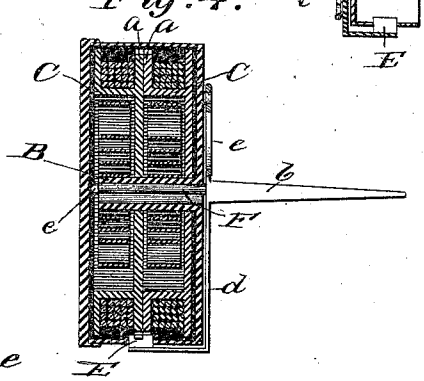


Fig. 4.



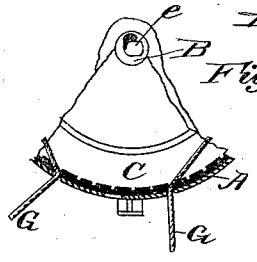


Fig. 6.

Witnesses.

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UNITED STATES PATENT OFFICE.

ALLEN S. FONTAINE, OF NEW YORK, N. Y.

SPRING SUSPENSION DEVICE.

SPECIFICATION forming part of Letters Patent No. 305,583, dated September 23, 1884.

Application filed March 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALLEN S. FONTAINE, of the city, county, and State of New York, have invented a new and useful Improvement in Spring Suspension Devices; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to an improved reel or device for winding one or more cords to be used in suspending pictures or other objects, or which are required to be kept taut for any purpose.

It has for its object to keep the cords taut and take in the slack thereof automatically in adjusting their length or the height at which an object suspended thereby shall hang, and to hold the same fast, when adjusted, without interfering with a ready change in said adjustment when required.

It consists in the combination of one or more spring-actuated pulleys to receive and wind up the cord or cords, with a suitable tubular spindle or axis formed with a radial longitudinal recess or enlargement upon its inner periphery and fitted upon a fixed supporting-pin or other equivalent device, as hereinafter described, so that the axis, normally concentric with the supporting-pin, may be moved radially into a position eccentric thereto, the rotation of the pulleys, where more than one are used, being in opposite directions.

It consists, secondly, in forming projecting teeth upon one flange of each pulley, to be engaged and held by a suitable pawl or detent made fast to and dependent from the fixed supporting-pin, and against which the teeth are brought by the radial movement of the pulley, permitted by reason of the play or movement of its spindle upon the pin, said movement being produced whenever a weight or tension is brought to bear upon the pulley sufficient to overcome a spring, by which it is otherwise held in a position concentric to the pin and clear of the pawl.

In the accompanying drawings, Figure 1 is a front view, in elevation, of my improved suspension-pulley adapted for two cords; Fig. 2, a side elevation thereof; Fig. 3, a section in line *x x* of Fig. 2; Fig. 4, a central transverse section in line *y y* of Fig. 1; Fig. 5, a detached view of the spindle or supporting-axis of my device, illustrating its attachment to a suspending-hook; Fig. 6, a detached view of a portion of one of the pulleys, illustrating its movement in connection with the pawl; and Fig. 7, a central vertical section through the case and supporting-hook of a modified form of my device.

The drawings illustrate my improved suspension-pulley as adapted to receive and operate two cords for hanging pictures.

Within a narrow cylindrical case, A, and upon an inwardly-projecting tubular spindle, B, projecting therein and secured thereto, are mounted two hollow cylindrical pulleys, C C, so disposed as to be made to rotate in opposite directions, each by the action of a spirally-coiled spring, D, contained therein, one end of the spring being attached to the central spindle, B, and the other to the inner periphery of the pulley K, as shown in Fig. 3. Each pulley is constructed with a peripheral flange on each side thereof, to produce a deep circumferential recess or groove about the same, and the adjacent flanges *a a* of the two pulleys are cogged or notched, as at W W, Fig. 3, to permit the use of a pawl, E, to retain them in any position when adjusted. The case A, containing the pulleys, may be closed by a suitable face-plate, A'. Its spindle B is mounted upon a pin, F, which enters the same, the spindle being provided upon its inner periphery with a radial longitudinal recess or groove large enough to receive the pin, and which will allow a movement of the spindle upon the pin in one direction radial to its axis far enough to operate the pawl E, as hereinafter described. The case A and inclosed pulleys are held concentric with the fixed supporting-pin F, when the load is removed from the pulleys, by means of a spring, *e*, attached to the case A and bearing upon or against the supporting-pin.

The outer end of the supporting-pin F may terminate in a nail, *b*, Fig. 4, or in a screw; or it may be secured to a hook or bracket, *b'*, as shown in Fig. 5; and it is made of such a length as to extend through and beyond the spindle B within the case A, and terminates

in a laterally-projecting head, *c*, so formed as that it may pass through the laterally-enlarged recess in the spindle B when brought into register therewith, but, projecting at the outer end of the spindle, will serve to retain it upon the pin.

The pawl E is attached rigidly to the fixed supporting-pin F of the device by a connecting-strip, *d*, which is of such length and is so bent at its lower end as that said end will clear the cogs or teeth upon the pulleys C C when said pulleys are concentric with the supporting-spindle, but will engage said teeth when the pulleys and their inclosing-case are moved radially out of center, which movement is allowed by the radial enlargement of the opening in the spindle B, as above described. Cords G G, wound upon the pulleys C C, are led out through openings in the case A, on either side of the pawl E, for attachment to the picture or other object to be suspended.

In operation, when tension is applied to the cords by a weight or otherwise, it will, by its outward pull, overcome the spring *e* and force the case and the pulleys therein outward until its supporting-pin F rests in the radial enlargement of the spindle, and the latter is brought into a position eccentric with said pin, so that the teeth W W W upon the flange of the pulleys will be engaged by the pawl E, and thereby prevent the pulleys from turning and thus fix the cords and prevent them from lengthening out. It is manifest that the heavier the weight or greater the tension the more securely will the pawl retain the pulleys. If, now, the weight be slightly raised or the tension released, the spring *e* at the back will center the case and its pulleys upon the supporting-pin F, and will free the pulleys from the pawl E. This movement of the case and pulley must be sufficient to clear the pawl, not only from the pulleys, but also from the case, so that by partially revolving the case, which may be done by moving the cords to one side of a line passing diametrically through its axis, the case will be brought into such a position relatively to the pawl (see Fig. 6) as that when the weight is again allowed to pull upon the cords the pawl will rest upon the outside of the case and allow the cord to be drawn out against the action of the springs; or, if the weight be raised, the springs will automatically take up any slack in the cord and wind it upon the pulleys. When the required adjustment is made in the length of the cords, the case may be returned to its proper position, with the pawl midway between the cords, (see Fig. 2,) and the pawl will then act upon the pulleys to retain them and support the weight.

As an equivalent substitute for the supporting-pin F entering the laterally-enlarged journal-opening in the spindle B, as described above, I contemplate forming the supporting device as shown in Fig. 7, wherein the central spindle, B, is made solid, and projects through the case and terminates in a head or button, B′, at the back of the case, adapted to be inserted in and retained by the sides of an elongated opening in the supporting-plate *d*, which forms the shank of the supporting hook or device *b*′. The spring *e*′ in this case is made fast to the supporting-hook, and its free end bears against the button B′, to lift the case, and to free the pulleys from the pawl E when they are relieved of weight or tension.

While this device is specially adapted for hanging pictures, I contemplate its use for the suspension of all manner of objects, and the tension of cords or ropes horizontally or otherwise as well as vertically. It is evident, also, that a single pulley and cord may be used instead of two.

I claim as my invention—

1. A spring suspension device consisting of two pulleys fitted to rotate automatically and independently in opposite directions upon a common axis, under the influence of spiral springs encircling said axis, and furnished with cords led over and wound upon said pulleys, substantially in the manner and for the purpose herein set forth.

2. In a spring suspension device, the combination, with one or more spring-actuated pulleys mounted within a case upon a spindle, and having a slight lateral radial motion upon a fixed supporting pin or plate, of a pawl rigidly attached to said fixed pin or plate, and adapted to engage teeth or notches upon the periphery of the pulley or pulleys when the latter are moved radially by a tension thereon, substantially in the manner and for the purpose herein set forth.

3. In a spring suspension device, the combination, with one or more spring-actuated pulleys, C, and cords wound thereon, rotating upon a spindle, B, having a laterally-enlarged or eccentric opening, K, therein, and a supporting-pin, F, fitted within said opening, of a pawl, E, rigidly attached to the pin F, and a spring, *e*, interposed between the pin F and a spindle, B, and operating to maintain the said spindle in a concentric position upon said pin, substantially in the manner and for the purpose herein set forth.

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

ALLEN S. FONTAINE.

Witnesses:

P. ELBERT NOSTRAND,

A. W. STEIGER.