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E. B. LAKE.

Venetian-Blind.

No. 210,129. Patented Nov. 19, 1878.

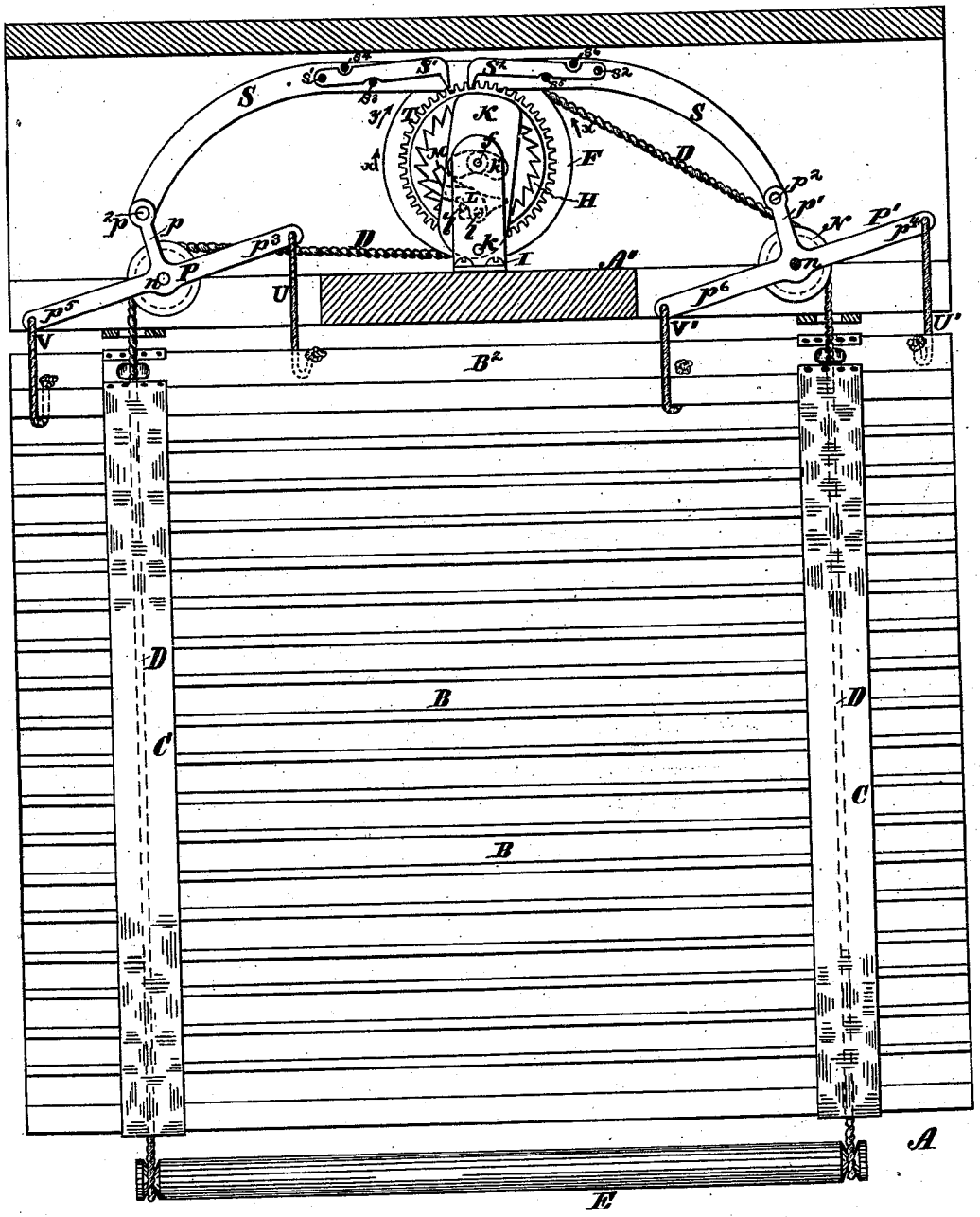


Fig. 1.

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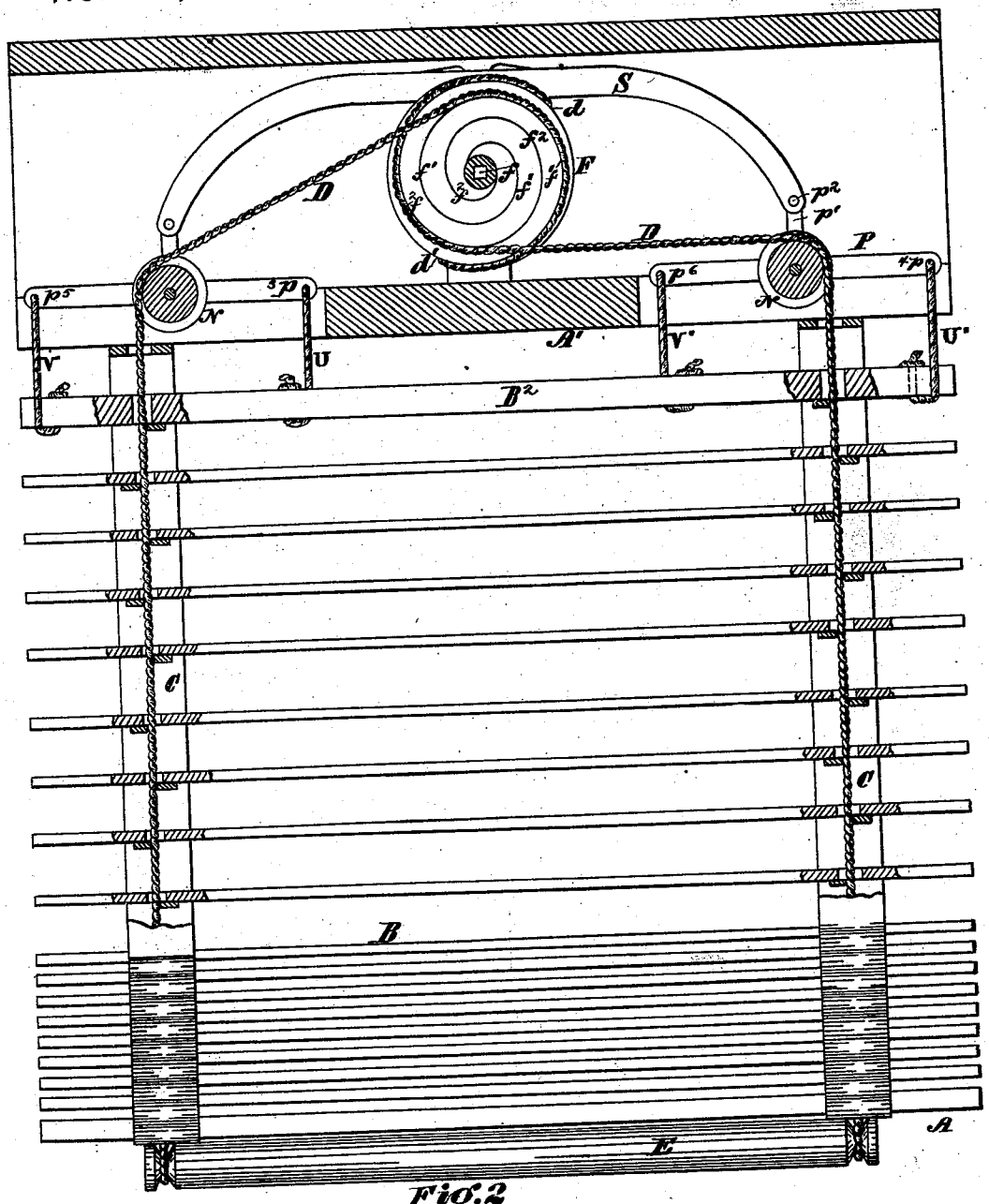


Fig. 2

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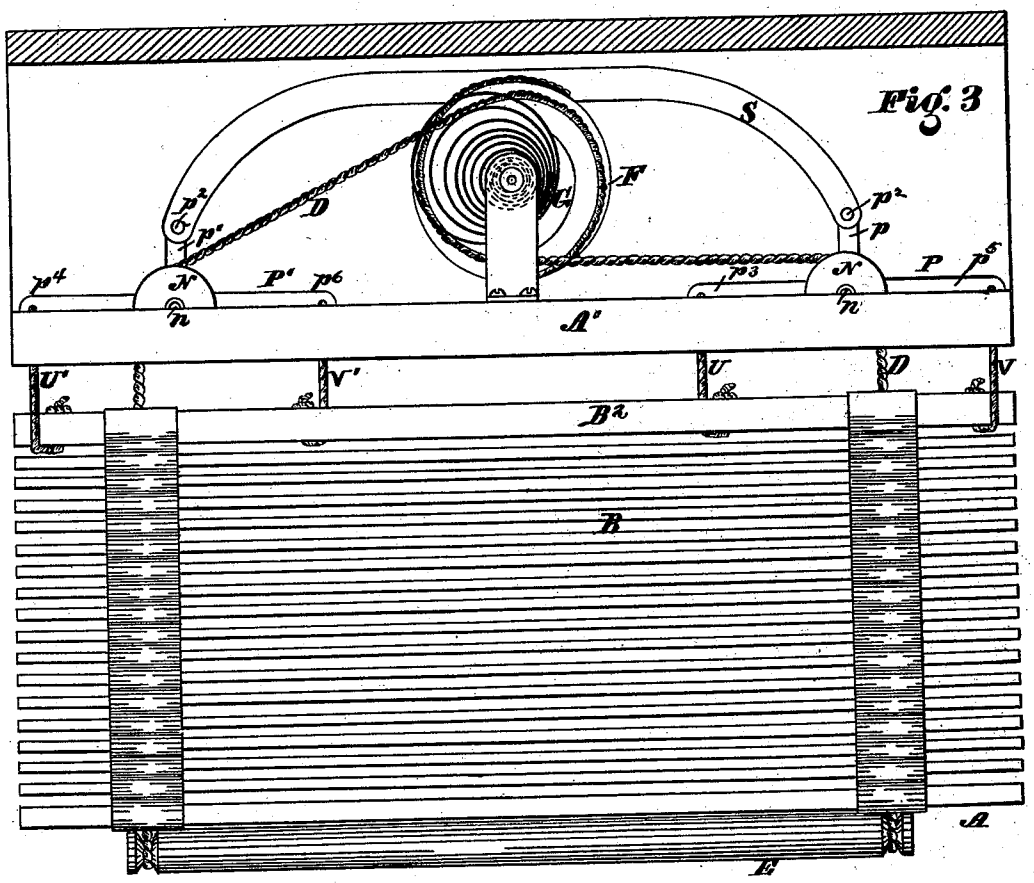
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E. B. LAKE.

Venetian-Blind.

No. 210,129. Patented Nov. 19, 1878.

Fig. 3



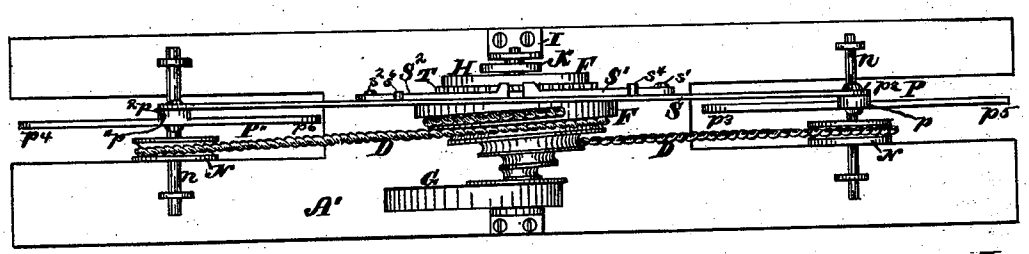


Fig. 4

Fig. 5

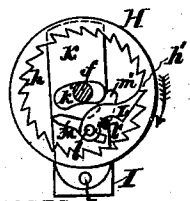
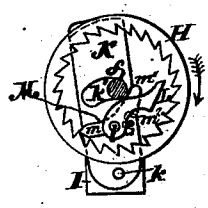


Fig. 6



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UNITED STATES PATENT OFFICE.

EZRA B. LAKE, OF DELANCO, NEW JERSEY.

IMPROVEMENT IN VENETIAN BLINDS.

Specification forming part of Letters Patent No. **210,129**, dated November 19, 1878; application filed March 27, 1878.

To all whom it may concern:

Be it known that I, EZRA B. LAKE, of Delanco, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Venetian Blinds; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a front elevation of a blind, partly in section, showing my improvements applied, the spring being locked and the slats inclining inwardly. Fig. 2 is a rear elevation, partly in section, showing blind partly elevated and slats horizontal. Fig. 3 is a rear elevation, showing blind entirely drawn up. Fig. 4 is a plan. Fig. 5 is a rear elevation of locking mechanism, showing lock effected; Fig. 6, a similar view, showing position of parts when lock is not effected.

The object of my invention is to provide improved means whereby Venetian blinds may be elevated by means of springs and without the employment of the cords heretofore generally used for that purpose.

A further object of my invention is to provide means whereby blinds elevated by springs may be arrested at any point of their ascent, and held fixedly at any desired altitude.

A still further object of my invention is to provide means whereby Venetian blinds elevated by springs may have their slats adjusted at any desired inclination, either inwardly or outwardly, or held in a horizontal position.

My invention accordingly consists in the combination, with a Venetian blind having a spring for raising it, of a device for arresting the ascent of said blind, and holding the latter by locking the spring at any desired altitude.

My invention still further consists in the provision of means whereby the ascent of the blind causes its slats to be inclined in one direction, the descent of the blind causing the slats to incline in a contrary direction, said means also comprising the medium whereby said slats are held, when so desired, in a horizontal position.

My invention still further consists in certain details of construction, hereinafter fully set forth.

Referring to the accompanying drawing, A designates a Venetian blind with my improvements applied. B B are the slats; C C, the tapes holding said slats the proper relative distances apart, and D D the cords whereby the slats are drawn together to elevate the blind. Said cords, at their lower extremity, and below the last or terminal slat, are united to a rod, E; or they may have tassels affixed to these ends. The upper extremities of said cords are secured to a fusee, F, the shaft of which is secured to a coiled spring, G. Said spring may be either within or without the fusee, in either case serving the purpose of causing said fusee to revolve on its axis *f*.

As the blind is drawn down, (which is effected by a downward pull on the rod E,) the spring G becomes coiled, the cords D D unwinding from the fusee F. When the blind is allowed to ascend under the influence of the spring, the cords D D wind upon the fusee and the spring uncoils. Hence, when the blind is down the spring is coiled, or at its maximum tension, while, when the blind is elevated, the spring is partially uncoiled and its tension or power decreased. When the blind is lowered the weight of the slats falls upon the tapes C C, and through these, by means presently to be explained, upon the head-piece A′, no part of such weight being then imposed upon or used to balance the spring, which, as already remarked, is coiled and at its greatest power when the blind is drawn down; but when the blind is elevated the weight of the slats is transferred from the tapes C C to the cords D D, and thence, through the fusee F, operate to balance the spring G. Hence it follows that when the spring is strongest it is relieved of the weight of the slats, while when its tension is weakest the entire weight of the slats is imposed upon it. The spring must, therefore, be of such power that when the blind is elevated, whereby said spring is partially uncoiled, it will still sustain the said blind and

prevent it from running down. And, on the other hand, to prevent the spring, as its tension or power increases, from drawing up the blind, means must be provided for overcoming or resisting such power. This I accomplish by means of the fusee, which I make of such diameter and thread of such pitch that it will accomplish the purpose in view. In other words, the fusee as it unwinds must give a power greater than that of the spring, and the power of such fusee must increase faster in unwinding than the spring does in coiling. Hence, when the blind has been lowered its entire extent the spring is fully coiled, and the cords D D unwound to the last thread or groove of the fusee. The weight of the slats is then wholly on the tapes C C, but the weight of the rod E alone acting upon the largest diameter of the fusee counterbalances the spring and prevents it from drawing up the blind. As the blind is lifted up on two sides at one time by the cords D D, and as it is requisite that these two sides should be always in the same plane, I construct the fusee F so that said cords shall wind and unwind evenly upon it. To this end I attach said cords at diametrically-opposite points *d d'* to said fusee, and form the latter with double threads or grooves f^1 f^2, of the same length and pitch, in which said cords travel.

To provide means for locking the spring or fusee, and thereby arresting the movement of the blind at any point in ascending or descending, I form the larger end of the fusee with, or attach to such larger end so as to move therewith, an annular ratchet, H, and pivot to the stand or bracket I, in which the shaft of said fusee is supported, a lever, K. The pivot of said lever is shown at *k*, and *k'* is a segmental slot in the latter, through which passes the fusee-shaft *f*.

L is a pawl, pivoted at *l* to the lever K, and having its downward motion limited by a pin or stud, *l'*, on said lever. M is another pawl, whose pivot is also at *l*. Said pawl M has a tail-piece, m^1, which is of greater gravity than its nose or point *m*, and said tail-piece is notched, as shown at m^2, to embrace the pin or stud *l'*.

In Fig. 5 the parts just described are shown in the positions they occupy when a lock is effected, the pawl L being in engagement with the ratchet H. By taking hold of the draw-rod E and pulling downwardly, the ratchet H is caused to revolve in the direction of arrow *x*, the inclined side of the ratchet-tooth *h* moving upwardly. The lever K now swings on its pivot, so as to move said pawl L out of line with the circle described by the points of the ratchet-teeth *h*. The blind may now be drawn down at any rate of speed and elevated slowly or at a moderate speed without effecting a lock; but if the blind (or the draw-rod E) be released, or the grasp thereon be relaxed so as to permit the blind to begin ascending rapidly, a lock will be effected, the shoulder *h'* of the ratchet-teeth *h* striking the point of the pawl M with violence, thereby elevating said point and depressing the opposite or tail end of said pawl, and causing the lever K to so rock on its pivot that the point of the pawl L will come into engagement with the ratchet H and prevent the latter from revolving.

The cords D D pass over pulleys N N, sustained on shafts *n n*, which have their bearings in the head-piece A'. Fulcrumed on said shafts are ⊥-levers P P', whose middle arms, *p* p^1, are connected by an arched girt, S, pivoted to said arms at p^2 p^2. S^1 S^2 are pawls, pivoted, respectively, at s^1 s^2, to the girt S, and having their pivotal motions limited by pins or studs s^3 s^4 s^5 s^6. The points of said pawls engage with the teeth of a cog-wheel or annular rack, T, secured to the fusee F in any suitable manner to turn therewith. The inner arm, p^3, of the lever P, and the outer arm, p^4, of the lever P', are connected, respectively, by cords U and U' to the inner side or edge of the initial or top slat, B^2, while the outer arm, p^5, of the lever P and the inner arm, p^6, of the lever P' are connected, respectively, by cords V V', with the outer edge or side of said slat B^2. Hence, whenever the levers P P' are so rocked that the arms p^3 and p^4 are elevated the inner edge or side of the slat B^2 will be raised, so as to cause the surface of said slat to incline inwardly or away from the window to which the blind is attached; and, on the other hand, when the arms p^5 p^6 are elevated, the opposite edge of said slat will be raised, so that its surface will be inclined toward said window.

By reason of the connection of the lower slats with the top slat, B^2, (which may be a roller, if desired,) through the medium of the tapes C C, all the slats will have the same inclination as said top slat, and will follow the adjustment of the latter. Now, as on the downward motion of the blind, the wheel T moves in the direction of the arrow *y*, its teeth will engage with the pawl S^2, thereby pushing back the girt S longitudinally, and causing the levers P P' to be so rocked as to elevate the arms p^5 p^6. Hence, whenever the blind is drawn down the slats will be caused to incline from their upper edges downward and outward. When the blind is raised the wheel T moves in the direction of the arrow *z*, causing its teeth to engage with the pawl S^1 and push the girt S longitudinally, so as to rock the levers P P' in such manner as to elevate the arms p^3 and p^4. Hence, whenever the blind is raised the slats will be caused to incline inwardly.

In changing from an upward to a downward motion of the blind, and vice versa, the slats turn on their longitudinal axes, and hence during such motion are in a horizontal plane, or open. By effecting the lock, as already described, at this moment the open position of the slats may be retained.

What I claim as my invention is—

1. In combination with a roller or fusee, F,

the annular ratchet H, pivoted lever K, and pawls M and N, arranged and operating substantially as shown and described.

2. In combination with the roller or fusee F and slat B^2, the levers P P′, arched girt S, pawls S^1 S^2, and cords U V, arranged and operating substantially as shown and described.

3. In combination with a Venetian blind having a spring for elevating the same and a roller or fusee for receiving the cords on which the slats are hung, a locking device operating to arrest the ascent of said blind by the mere manipulation of the latter, substantially as set forth.

4. In combination with a Venetian blind having a spring for elevating the same and a roller or fusee for receiving the cords on which the slats are strung, means for causing the inclination of the slats to be varied or controlled by the raising and lowering of said blind, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of March, 1878.

EZRA B. LAKE.

Witnesses:

M. D. CONNOLLY,

CHAS. F. VAN HORN.