To all whom it may concern:

Be it known that I, Thomas Tryhook, a citizen of Ukraine, residing at Hamtramck, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Combination Sash Balances and Locks, of which the following is a specification.

This invention relates to certain new and useful improvements in combination sash balances and locks.

The primary object of the invention is to provide efficient means associated with the pinion wheel of a spring sash balance for locking the sashes of a window against being raised or lowered and progressively connected to a push rod which is drawn into the window frame when the device is in locked position so that the same may only be released by an authorized person with a proper fit of key and whereby the push rod is projected outwardly of the casing for permitting ready movement of the locking mechanism to locking position without the use of the key.

Another object of the invention is to provide a cooperative relationship of spring sash balance elements including a spring actuated rack pinion, a stop engageable with the rack pinion, means to permit ready movement of the stop to locking position into engagement with the rack pinion and inaccessible for releasing the stop, key mechanism for releasing the stop only by the possession of a proper form of key, and incasing means for supporting the elements adapted to be embedded in the window frame so that a small portion of the periphery of the rack pinion may engage a rack upon the adjacent side edge of the window sash with the key receiving opening presented at the inner face of the inner guide strip of the window and the manually operable means for moving the stop to locking position exposed at the inner side of the window frame.

With the above general objects in view and others that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings forming a part of this application and in which like reference characters indicate corresponding parts throughout the several views,

Figure 1 is an elevational view of a window frame taken from the inside of a dwelling and equipped with a combined sash balance and lock construed in accordance with the present invention.

Fig. 2 is a substantially central vertical sectional view of the device shown in Fig. 1 with the sashes removed.

Fig. 3 is a top plan view of the combined sash balance and lock shown employed with the sashes in Fig. 1 drawn on a larger scale.

Fig. 4 is a side elevational view of the device shown in Fig. 3 with a part of the casing broken away, and parts in section.

Fig. 5 is a fragmentary perspective view of one of the sashes employed with the present invention showing the rack, and

Fig. 6 is a view similar to Fig. 5 of the upper portion of the same sash illustrating a form of anti-rattling device preferably employed with sash balances.

Referring more in detail to the several views, the present invention embodies a casing preferably formed from sheet metal or the like of the desired shape so as to accommodate a relatively large sheet metal coil spring 6 at one end and near one side thereof, a shaft 7 being journaled between the side plates of the frame at this end and having the inner end of said spring attached thereto. The other end of the shaft 7 opposite to which the inner end of the spring 6 is attached is journaled in a block 8 which is swiveled as at 9 in the adjacent side of the frame 3, and a longitudinally extending shaft 10 has its adjacent end journaled in said block 8 with the shafts 7 and 10 at right angles to each other and interconnected by means of bevel pinions 11. By journaling the ends of the shafts 7 and 10 in a swiveled block as at 8 binding of parts is prevented to a great extent and the gear 11 upon the shaft 7 is preferably slidably thereon and normally pressesyieldingly in mesh with the gear 11 upon the shaft 10 by means of a coil spring 12 surrounding said shaft 7, it being understood that the shaft 7 and its gear are provided with a driving connection such as a spline or flat-tined mating faces. The other end of the shaft 10 is journaled in another swiveled block 13 which is pivoted as at 14 in the same side of the casing 5 to which the block 8 is swiveled and this block 13 is maintained in alignment with the block 8 by means of a helical compression spring 15.
which surrounds a transverse post 16 arranged parallel with the shaft 7 and which has one end pivoted in the block 13 while the outer end of the spring 6 is attached to the other end thereof. A relatively large pinion 17 is fastened upon the shaft 10 and adjacent the block 13 and this pinion is of such diameter as to have a portion of the same project through the adjacent side of the frame 5 so that when said frame is fixed within the window frame A as shown in Figs. 1 and 2, the pinion 17 will project partially through a slot in the inner wall of said window frame as at a and thereby engage the usual rack b provided upon the adjacent edge of the adjacent side rail of the window sash B, it being understood that the frame A is provided with a pair of such sashes B, one of which is lowered for opening the same and the other of which is raised for opening the same so that by simply using the same sash balance for both sashes, one will be inverted for the upper sash and arranged at the opposite side of the frame from that employed with the lower sash as shown in Fig. 1. It will be seen that with the pinion 17 meshing with the rack b, upon lowering of said sash B, the shaft 7 will be rotated through the gearing described and cause the spring 6 to be wound thereon so that when the sash is released, the spring 6 will act to retain the sash in any adjusted open position to which the same might be manually moved. A pair of cylindrical posts 18 and 19 have their ends rigidly fixed in the opposite sides of the casing 5 parallel with the shaft 7 at opposite sides of the pinion 17 and tubular spacing sleeves 20 are mounted upon these posts, said sleeves being formed in sections with arms 21 and 22 pivoted between said sections upon said posts 18 and 19 respectively so that movement of the arms is prevented longitudinally of the posts 18 and 19 although said arms may rock freely in a direction transversely of the pinion 17. The arms 21 and 22 are connected by a pair of links 23 which extend transversely of and above the pinion 17 and which are provided with depending lugs 24 arranged to engage opposite sides of an adjacent tooth of said pinion 17 when the arms 21 and 22 are rocked toward the right of Fig. 4, thereby preventing rotation of said pinion and consequently preventing movement of the sash with which it is associated in view of the engagement of a number of the teeth of said pinion with the rack upon said sash. A housing 25 is suitably rigidly mounted within the frame 5 to one side of the arm 22 and has a sliding bolt 26 arranged therein, the rear end of the bolt 26 being slidable and pivotally attached as at 29 to a downwardly projecting arm 30 integral with the arm 22, and the bolt 28 being of such length as to project through a slot 31 provided in the adjacent end of the frame 5 when the lugs 24 are released from the pinion 17 but movable within said frame 5 when said lugs are engaged with said pinion. The bolt 28 is provided with a notch as at 32 for reception of the bit of a key which may be inserted through a key hole 33 provided in the housing 27, thus permitting manipulation of the bolt 28 only by an authorized person in possession of a proper form of key, for releasing the lugs 24 and permitting the sash to be raised. A suitable spring 34 may engage the bolt 28 to prevent accidental longitudinal displacement of the latter and prevent vibration of the same within the housing 27. As shown in Fig. 6, the sashes B may be provided with a spring pressed roller 35 adapted to engage the adjacent face of the window frame A for preventing rattling of said sashes, the roller 35 being preferably carried by a spring strip of sheet metal 36 which is fastened as at 37 to the side edge of the sash. In operation, the device shown in Figs. 3 and 4 is suitably embodied within the window frame A so that the pinion 17 projects through the slot a of said frame into engagement with the rack b of the adjacent sash with the spring 6 partially uncowed and said sash open. With the bolt 28 projected as shown in Fig. 4, the lugs 24 will be released from the pinion 17 and upon lowering of the sash said pinion will be rotated to wind the spring 6. When the sash is lowered to the desired extent, the bolt 28 may be pressed inwardly for swinging the arms 21, 22, and 30 about the posts 18 and 19 and causing movement of the lugs 24 into engagement with the pinion 17, thus locking the sash against being opened or closed farther if not entirely closed. As the bolt 28 is then within the window frame and the casing 5, the same cannot be grasped for releasing the lugs 24 and thus the window sash can only be raised by an authorized person in possession of a key which is adapted to be inserted through a suitable key hole c provided in the window frame in line with the key hole 33 of the housing 27, whereby turning of said key will slide the bolt 28 and thereby rock arms 21 and 22 toward the left of Fig. 4 so as to release the lugs 24 from the pinion 17, the sash may then be moved in either direction as desired.

From the foregoing description, it is believed that the construction and operation as well as the advantages of the present invention will be readily understood and appreciated by those skilled in the art. Minor changes may be made without departing from the spirit and scope of the invention as claimed.
What is claimed as new is:

1. A combined sash balance and lock comprising a rotatably mounted pinion adapted to engage a rack upon an edge of a sliding window sash, a spring, means operatively connecting said spring with said pinion whereby closing of the sash will cause winding of said spring and opening of the sash will cause unwinding thereof, a member mounted for movement transversely of said pinion and having a lug arranged to move into and out of engagement with the pinion, a casing supporting the pinion, spring and transversely movable member, an operating rod for said transversely movable member movable into the casing upon engagement of the lug with said pinion and movable outwardly of the casing upon release of said lug from the pinion whereby said rod may be manipulated for locking the pinion against rotation but not for releasing the lug said operating rod being provided with a cut out and the casing being adapted for reception of a key engageable with said cut out for projecting the operating rod outwardly of the casing to release said lug from said pinion, said transversely movable member comprising a link, a pair of arms connected by said link mounted for rocking movement transversely of the pinion, a third arm depending from and rigid with one of said arms and pivotally and slidably connected to said operating rod.

2. A combined sash balance and lock comprising a rotatably mounted pinion adapted to engage a rack upon an edge of a sliding window sash, a spring, means operatively connecting said spring with said pinion whereby closing of the sash will cause winding of said spring and opening of the sash will cause unwinding thereof, a member mounted for movement transversely of said pinion and having a lug arranged to move into and out of engagement with the pinion, a casing supporting the pinion, spring and transversely movable member, an operating rod for said transversely movable member movable into the casing upon engagement of the lug with said pinion and movable outwardly of the casing upon release of said lug from the pinion whereby said rod may be manipulated for locking the pinion against rotation but not for releasing the lug said operating rod being provided with a cut out and the casing being adapted for reception of a key engageable with said cut out for projecting the operating rod outwardly of the casing to release said lug from said pinion, said transversely movable member comprising a link, a pair of arms connected by said link mounted for rocking movement transversely of the pinion, a third arm depending from and rigid with one of said arms and pivotally and slidably connected to said operating rod.

3. A combined sash balance and lock including a casing having a transverse shaft journaled therein, a coil spring having one end fixed to the frame and its other end fixed to one end of said shaft, a second shaft journaled within the casing at right angles to the first named shaft and rotatably geared thereto, a pinion fixed upon the second named shaft and projecting partially through the casing to engage a window sash rack, manually operable means mounted in the frame for movement transversely of the pinion to engage the teeth of the latter so as to lock the same against rotation, said manually operable means comprising a member accessible for operation to lock said pinion against rotation and movable to an inaccessible position whereby the same may not be grasped for unlocking the pinion, and means permitting only key actuation of the locking means for releasing the same from said pinion.

4. A combined sash balance and lock including a casing having a transverse shaft journaled therein, a coil spring having one end fixed to the frame and its other end fixed to one end of said shaft, a second shaft journaled within the casing at right angles to the first named shaft and rotatably geared thereto, a pinion fixed upon the second named shaft and projecting partially through the casing to engage a window sash rack, and manually operable means mounted in the frame for movement transversely of the pinion to engage the teeth of the latter so as to lock the same against rotation, said manually operable means comprising a member accessible for operation to lock said pinion against rotation and movable to an inaccessible position whereby the same may not be grasped for unlocking the pinion, and means permitting only key actuation of the locking means for releasing the same from said pinion, said locking means involving a member movable transversely of the pinion into and out of engagement with the latter, and means to move said member.

In testimony whereof I affix my signature.

THOMAS TRYHOOK.