My invention relates to a window balance assembly and more particularly to an improved window balance assembly designed for overhead installation in a window frame to be used with single or double-hung windows. Window balance units for vertically slidable sash in conventional single and double-hung windows are known and in use. The majority of such assemblies are mounted in the side of window frames on a jamb surface upon which the sash slides for biasing the same. Such a positioning increases the overall width of the window construction in that the balance assembly occupies space adjacent the sash in this direction to increase the overall width of a window construction. Such installations require special window constructions and special mountings for the balance assembly. Overhead balance assemblies have been utilized in the past with spiral-type spring systems and tape-type sash cord. However, such application is limited because of the limitation of the bias rate of the spring. With the advent of removable-type sash, the prior overhead balance systems are inapplicable since they require permanent mounting on the sash. Further, the particular types of balance systems are limited in application to particular window sizes in order to provide the desired balance or biasing force.

The present invention is directed to an improved balance assembly of the overhead type which is applicable for single and double-hung windows with removable sash. This improved balance assembly incorporates separate balance units positioned in a side-by-side relationship in an overall mounting structure with conventional cord type connections between the springs and the sash which are readily removable. The improved overhead window balance permits the use of larger springs with greater width sash to provide proper biasing for the same. In addition, the improved balance assembly incorporates guide blocks in the ends of the same which mount the springs for the individual balance units and a part of the pulley system for the same with means for directing the sash cord from the bottom of the balance down the sides of the window frame and in appropriate grooves in jamb structures to connect to the sash. The overall arrangement of the improved window balance assembly provides a simplified structure which is readily attachable and removable from the sash for the purpose of removing the sash.
The frame member which aligns with apertures or recesses in the guide blocks will provide for the same function and apparatus at this point to cause the sash cord associated therewith to be directed in a similar manner. The individual guide blocks are preferably made of a plastic material to provide for each row of posts and recessed surfaces thereon and preferably include a metal cover, such as is indicated at 90, with suitable apertures therein to fit over the ends of the posts 62, 66, 78 and 79 to secure the same thereon. Suitable apertures are provided therein through which the rivets extend to secure the posts 60 and include the guide blocks. The actual cable system and the shape or detail of the pulley block 46 may vary in form within the scope of the present invention, but the improved window balance assembly permits the mounting of a plurality of individual balance units in a side-by-side relationship and in a single frame member for an overhead installation to be connected to the window sash for balancing the same. As the sash cords 30-32, are pulled out of the frame member, the associated springs are extended or tensioned to apply a bias force to the same. The individual sash cords include hook members 100 on the ends of the same by means of which they may be connected to the individual box of single or double-hung window in any desired manner. The location of the sash cords will normally be positioned in the frame member so as to be directed down or within a jamb surface guiding the respective sash for connection thereto. As indicated in FIGURES 2 and 3, the frame member 40 will normally extend beyond the guide block such as to completely fill a window opening and suitable mounting apertures 110 are positioned therein by means of which the channel member or window balance unit may be secured on the window frame for installation purposes. The width of the channel member will increase with size of the sash and thickness of the same as well as the length and the frame member will provide such a width dimension as to substantially fill the head of the window frame above the jamb surfaces and against the stops. Thus, for large-sized windows, both the width and length dimensions of the frame member will be increased permitting the use of larger-sized springs and pulley systems for greater effective sash cord length and larger bias forces to counterbalance the increased sash weight.

Therefore, in considering this invention, it should be remembered that the present disclosure is intended to be illustrative only and the scope of the invention may be determined by the appended claims.

What is claimed is:

1. A balance assembly adapted to be positioned in the head of a window frame and supported therein above side jambs for a window to connect to the window sash for balancing the same comprising, an elongated frame member, said frame member having apertures near the ends thereof to pass the sash cord from the balance assembly therethrough, a guide block mounted on each end of the frame member on one surface thereof adjacent the apertures therein, a plurality of spring-balance units having a spring which is secured at one extremity to a guide block at one end of the frame member and with a sash cord connected to the free end of the spring and over roller members included in the guide blocks at the free extremity of the frame member to which the associated spring is anchored, said guide blocks including transversely directing guide surfaces for guiding the sash cord through one of the apertures in the end of the frame member normal to the extent of the spring and the frame member, and clip means secured to the end of the sash cord and adapted to releasably connect to a sash to balance the same.

2. The balance assembly of claim 1 wherein the frame member is a flat channel-shaped construction of a metallic material adapted to be positioned in the head of the window frame and having length dimensions substantially equal to the length of the window opening therein and a
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width dimension substantially equal to the width of the side jamb supporting the sash therein.

3. The balance assembly of claim 2 in which the frame member is open at the upper extremity and at the ends thereof.

4. The balance assembly of claim 3 in which each guide block includes a plurality of journaled rollers and anchoring posts and including transversely extending guide posts to direct the sash cord through the bottom of the frame member.

5. The balance assembly of claim 4 in which the frame member houses four spring-balance units in a side-by-side relationship with alternate units extending in opposite directions to opposite ends of the frame member.

6. The balance assembly of claim 4 in which the frame member houses at least two spring-balance units positioned in a side-by-side relationship and anchored in guide blocks at opposite extremities of the frame member with sash cords being directed therefrom through the respective guide blocks at opposite ends of the frame member.

7. The balance assembly of claim 4 in which each spring-balance unit is comprised of an elongated coil-wound spring anchored at one extremity to the guide blocks and mounting at its other extremity a floating pulley block with the sash cord being secured to the pulley block and wound around rollers in the guide block at the other extremity of the channel member and through pulleys in the floating block with the extremity of the sash cord being directed over roller guides which change the direction of the sash cord and guide it out of the apertures in the frame member.

8. The balance assembly of claim 7 in which each guide block is made of a plastic material with a removable metallic plate attached thereon and in which the rollers are made of similar plastic material and journaled on posts in the guide block.

9. The balance assembly of claim 1 in which the frame member is an elongated plate of metallic material with turned-up sides open at the ends and top and in which the guide blocks are permanently secured near the extremities thereof to the inner surface of the frame member with apertures in the frame member disposed adjacent the guide blocks and in which the plurality of spring-balance units are positioned in location extending between the guide blocks substantially filling the inner surface of the frame member with the alternate balance assemblies being directed in opposite directions such that the sash cords will be guided over guide blocks at the opposite extremities of the frame member to direct the sash cords therefrom through opposite sides of the sash.

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