July 23, 1968 A. M. JACOBI 3,393,939

SWINGABLE KNEELERS

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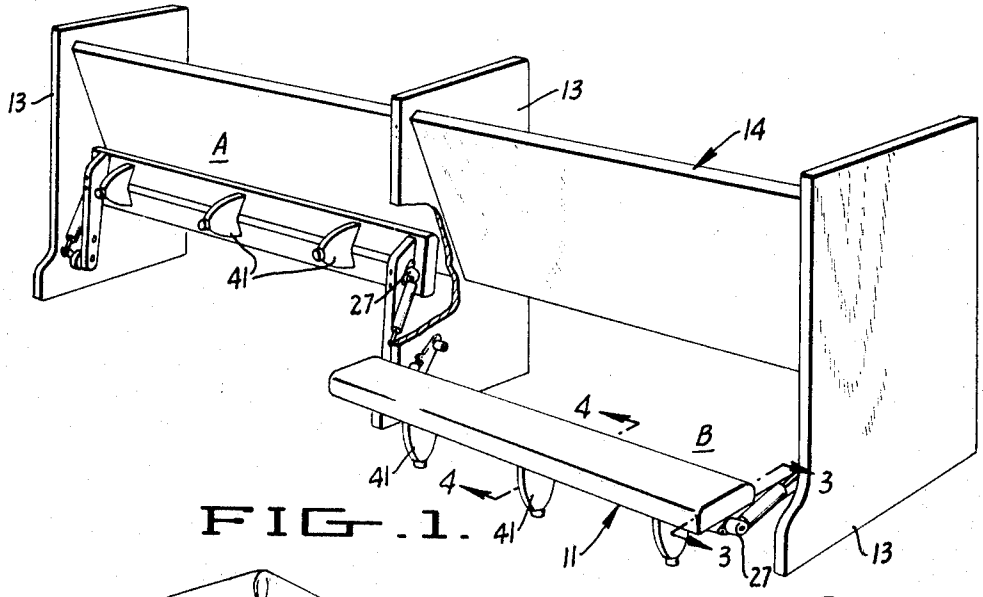


FIG. 1.

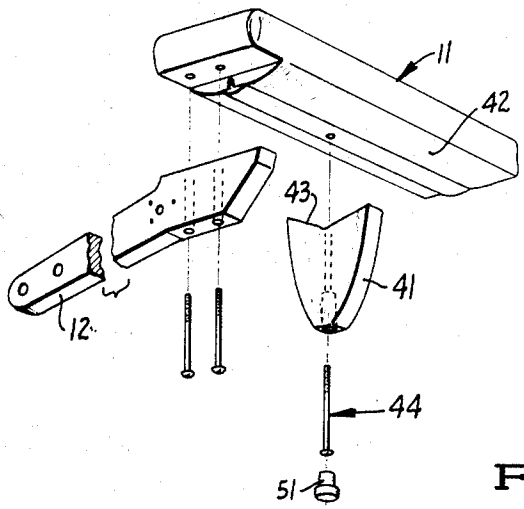


FIG. 2.

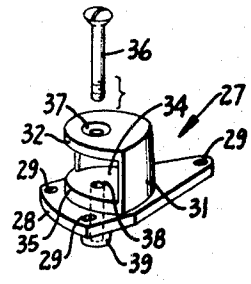


FIG. 6.

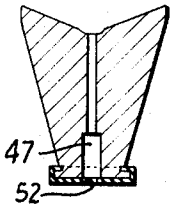


FIG. 5.

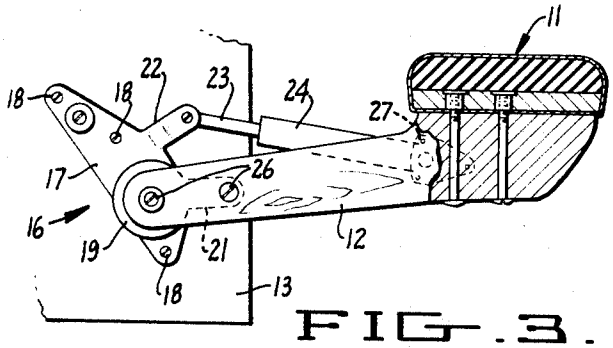


FIG. 3.

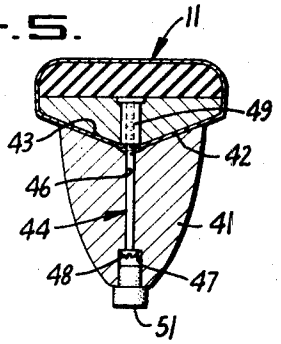


FIG. 4.

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SWINGABLE KNEELERS

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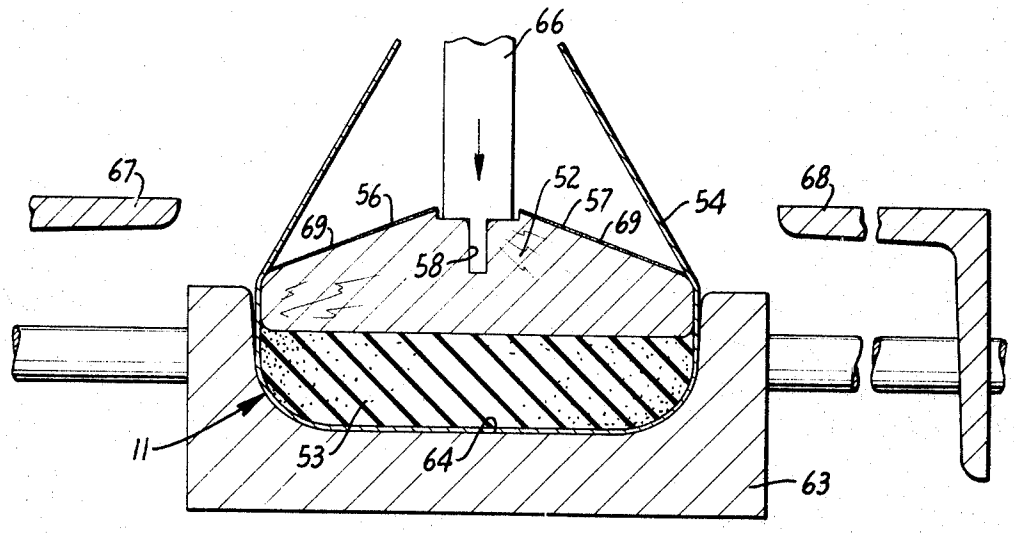


FIG. 7.

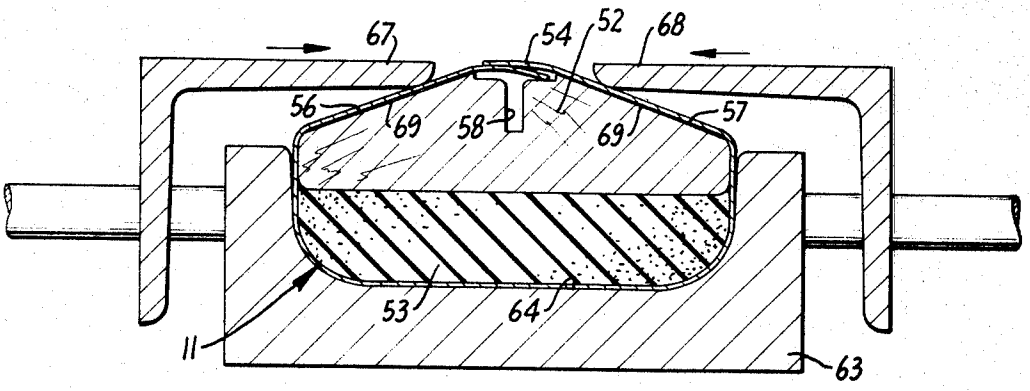


FIG. 8.

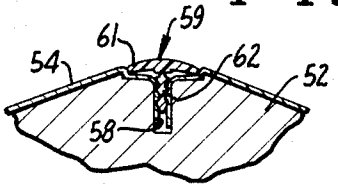


FIG. 9.

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SWINGABLE KNEELERS

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10 Claims. (Cl. 297—426)

ABSTRACT OF THE DISCLOSURE

A swingable kneeler for church pews utilizing a standard swing controlling mechanism and a kneeling bench construction, having replaceable legs and an improved covering, making it possible to vary the appearance of the kneeler to suit the individual needs and preferences of the designer.

This invention relates to improvements in swingable kneelers and more particularly to kneeling benches attached to church pews and adapted to be swung up out of the way when not in use.

Kneelers of this type are shown in my U.S. Patent 3,190,695 issued June 22, 1965. A suitable mechanism for effecting swinging movement of the bench between raised and lowered positions in a controlled manner is shown and described in that patent. However, the structure disclosed therein contemplates a metal construction of the pivoted arms and this restricts the design to the metal components available. Many architects and designers feel the need of a more adaptable kneeler which can be varied to suit specific design problems. For example, in certain churches the decor is such that the designer prefers to have the arms and supporting legs made of wood. This is because of the natural beauty of wood and its adaptability to finishes and styles which conform to the overall decorative concept. Wood is also preferred in certain instances because of ease in making repairs and replacements.

The present invention contemplates a kneeler which utilizes a standardized swing controlling mechanism and a bench construction which may be varied to suit the individual needs and preferences of the designer. Thus, the standardized raising and lowering mechanism can be used with a wide variety of benches of differing styles, colors and materials.

For this purpose, an improved leg construction is provided in which the legs are held firmly and securely in place but may be easily and quickly removed and replaced. Moreover, the mode of attaching the legs to the bench permits the use of a leg configuration which will not catch on or snag the clothing of the worshipers when the kneelers are not in use.

In addition, a construction is provided for the kneeling bench which makes it possible to cover and recover the bench as desired, while at the same time providing a neat and attractive appearance whether the bench is in its extended or retracted position. The covering material is held smoothly and securely in place over a resilient pad which is partially compressed to keep the material taut. This is accomplished without the necessity of forming seams in the covering material and the structure is finished off by a novel, matching finishing strip which also performs an important function in securing and concealing the confronting edges of the covering material.

The present invention also contemplates a novel method for constructing a kneeling bench which produces uniformly good results with a minimum of equipment and which does not require skilled labor to carry out.

It is therefore a principal object of the present invention to provide a kneeler construction which is highly adaptable for use on pews of varying characteristics.

Another object of the invention is to provide a kneeler of the character described which permits custom installations and relatively rapid and easy design modifications and repairs.

A further object of the invention is to provide a kneeler of the character described which incorporates universal swing controllers capable of being quickly and firmly secured to a wide variety of pews and kneeling benches.

A still further object of the invention is to provide a leg construction for a kneeler of the character described in which the legs may be quickly and easily removed and interchanged by operation of a single bolt.

Another object of the present invention is to provide a kneeler leg construction of the type described which will not catch or snag the clothing of persons passing behind the pew to which the kneeler is attached while the kneeler is in its upper or retracted position.

Yet another object of the present invention is to provide a kneeler bench construction in which a single sheet of covering material is held smoothly and tightly in place under tension created by compression of a resilient cushion pad during installation of the cover.

A further object of the present invention is to provide a kneeler bench construction of the character described in which the confronting edges of the cover material are secured in place and are at the same time covered and concealed from view by a novel finishing strip.

Another objet of the present invention is the provision of a method of constructing a kneeling bench of the character described which may be carried out with simple, readily available equipment and by personnel of limited skill and experience.

Other objects and features of advantage will become apparent from the following description and the accompanying drawings, in which:

FIGURE 1 is a perspective view of a typical chuch pew with a kneeler constructed in accordance with the present invention installed thereon;

FIGURE 2 is an exploded fragmentary perspective view on an enlarged scale of an arm, bench and leg assembly forming a portion of the kneeler of FIGURE 1;

FIGURE 3 is an enlarged cross-sectional view taken substantially in the plane of line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged cross-sectional view taken substantially on the plane of line 4—4 of FIGURE 1;

FIGURE 5 is a view similar to that of FIGURE 4, but illustrating a modified form of bench-supporting leg;

FIGURE 6 is a fragmentary perspective view on an enlarged scale of a portion of the apparatus of FIGURE 1;

FIGURE 7 is a schematic cross-sectional view of a kneeler bench top and associated apparatus used to perform the method of the present invention;

FIGURE 8 is a view similar to that of FIGURE 7 but showing the parts in another operative position;

FIGURE 9 is an enlarged fragmentary cross-sectional view of a slot and associated strip forming part of the present invention.

While only the preferred forms of the invention are shown in the drawings, it should be understood that various changes or modifications could be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawings in detail, it will be seen that the swingable kneeler of the present invention includes a padded knee support bench **11** having arms **12** adapted to be pivotally secured to upright portions **13** of a pew **14**, and means **16** connected to the arms **12** for controlling speed of swinging movement of the bench **11** between the upright or retracted position shown at A in FIGURE 1 and the lowered or extended position shown at B in FIGURE 1.

In accordance with the present invention, the styling and design characteristics of the kneeling bench **11** and arms **12** may be quickly and easily changed by removing same from the means **16** and replacing them with other units having the desired characteristics. For this purpose, the means **16** is here provided in the form of standardized right and left hand units which are substantially identical in structure except one is the mirror image of the other. Thus, it is only necessary to have the standardized units **16** in order to make and install swingable, motion-controlled kneelers, since the arms **12** and the bench **11** can be fabricated of wood either separately or on the job.

The silencer units are basically similar to those shown and described in my previously mentioned patent and include a base **17** adapted for attachment to the upright portions **13** of the pew by screws **18**. A spring-loaded hub portion **19** is carried for rotation on the base **17** and is provided with an extension arm **21**.

A bracket arm **22** extends from base **17** and, at its outer end, is pivotally connected to the piston rod **23** of a spring-loaded, orifice-controlled hydraulic cylinder **24**.

Means, here in the form of screws **26**, is provided for releasably securing the hub **19** and extension **21** at spaced points to the arm **12** so that the arm will swing upwardly and downwardly around the axis of the hub. Means **27** is also provided for releasably pivoting the distal end of cylinder **24** to the arm **12**.

As may best be seen in FIGURE 6 of the drawings, the means **27** here is in the form of a bracket having a flat base **28** adapted for securing to the arm **12**, as by screws **29**. Extending outwardly from the base **28** is a generally semi-circular wall **31** provided with spaced flanges **32** and **33** parallel to the base **28**. This structure provides an opening **34** adapted to receive the distal end of cylinder **24**, which is releasably held in place by a pivot pin **36** engaged in an opening **37** formed in flange **32** and threadably engaged with an aligned threaded opening **38**.

The means **27** is particularly adapted for use with wooden arms **12** and for this purpose includes a boss **39** extending from the flat base **28** and engageable in a corresponding bore in the arm **12**. Increased strength is achieved by the cooperation of the boss **39** with the fastening screws **29**, and by extending the threaded opening **38** through the boss.

As an important feature of the present invention, support legs **41** are secured to the padded kneeling benches **11** in a manner providing for rapid and easy removal and replacement. To this end, the bottom portion **42** of the benches **11** is formed with a uniform, non-flat configuration running substantially the length of the bench. The upper ends **43** of the legs **41** are formed with a complementary configuration, here a flattened V-shape, so as to prevent twisting of the legs **41** when the latter are held firmly against the bottom **42**.

Retainer means **44** is provided for holding the upper end **43** of the legs **41** firmly against the bottom **42** of the bench **11**. Preferably, and in accordance with the present invention, the retainer means **44** consists of an elongated bolt engageable in a central bore formed through the leg from top to bottom and having a counterbore **47** at the bottom. The head **48** of the bolt is accommodated in counterbore **47** and the threaded end of the bolt is screwed into a nut **49** embedded in the bottom **42** of bench **11**. With this construction, the leg **41** may be easily and rapidly removed and replaced merely by applying twisting force, as with a screwdriver, to the head **48** of bolt **44**.

The described construction of the retainer means **44** makes it possible to employ the semi-elliptical leg illustrated in FIGURES 1, 2 and 4 of the drawings, this shape being adapted to avoid snagging and tearing the clothes of persons passing behind the pew when the kneelers are in raised position A. The semi-elliptical shape of legs **41** also provides a pleasing, clean appearance, fitting in well with either modern or traditional decor.

The legs **41** may be provided in other desired shapes, such as the more conventional shape illustrated in FIGURE 5 of the drawings. Whatever the shape of the leg **41**, it is desirable to provide a resilient floor-engaging foot **51** made of rubber or the like at the bottom end of the leg. In the preferred form of the leg illustrated in FIGURE 4 of the drawings, the foot **51** is disc-shaped and is provided with a concentric, cylindrical boss engageable in a press fit in the bore **47**. When it is desired to remove the leg **41**, as for refinishing, repair or replacement, the foot **51** may be quickly and easily snapped out of place to provide access to the bolt head **48**.

In the more conventionally-shaped legs, such as that illustrated in FIGURE 5 of the drawings, the resilient foot **51** is provided in the form of an oblong pad permanently glued or otherwise secured to the bottom of the leg. With this form of foot, an opening **52** is provided through the pad in alignment with the counterbore **47** to provide access for the screwdriver or other tool used for rotating the bolt **44**.

As an important feature of the present invention, a novel construction is provided for the knee support bench **11** in which a single piece cover is held smoothly and securely in place in a manner providing a clean, attractive appearance, while at the same time permitting the cover to be rapidly and easily replaced in case it is damaged or a change of decor is desired.

As may best be seen from FIGURES 2, 4, 7 and 8, the bench **11**, in addition to the legs **41**, consists of an elongated bench member **52** having a coextensive cushioning pad **53** mounted thereon, and a flexible cover **54** of flexible sheet material. The member **52** is preferably formed of wood or some other rigid material, and the pad **53** is formed of a suitable resilient cushioning material such as foamed rubber or foamed plastic. The cover **54** may be of any suitable covering material, such as fabric-backed plastic or other upholstery materials.

As previously described, the bottom of the bench **11** is of flattened V-shape providing inclined surfaces **56** and **57**. In addition, a central slot **58** is formed lengthwise of the bottom of member **52** and the portions adjacent slot **58** are relieved or recessed in the manner shown in FIGURES 7 and 8 of the drawings.

The covering **54** is wrapped tightly around the member **52** and pad **53** so that the confronting edges of the covering material **54** are positioned in slot **58**. These edges are retained in slot **58** by a retaining and finishing strip **59**.

As may be seen in FIGURE 9 of the drawings, the strip **59** is of substantially T-shaped cross-section providing a cross bar **61** and a depending flange portion **62**. The slot **58** in member **52** is proportioned so that when depending flange **62** is forced into the slot, it will squeeze the confronting edges of the covering material **54** against the walls of the slot to hold them firmly in place. At the same time, the cross bar **61** of the strip **59** is counter-sunk into into the recessed portions of member **52** adjacent to slot **58**, thus effectively concealing the edges of the covering material and presenting a finished appearance.

Preferably, the strip **59** is formed of a fairly stiff yet somewhat resilient plastic which may be colored to match the covering material. Also, it has been found that the strip **59** and the confronting edges of the covering material **54** will be held more securely in slot **58** when the depending flange **62** is provided with longitudinal serrations such as those illustrated in the drawings.

In practicing the method of the present invention, the covering material **54** and the foam pad **53** are sandwiched between the member **52** and a conforming mold **63**. The latter may be of any suitable material, such as wood or metal, and is formed to provide an elongated mold cavity **64** which conforms closely to the finished shape of the top of the kneeler bench **11**.

Pressure is then applied against the bottom of bench

member **52**, as by a reciprocable plunger **66**, see FIGURE 7. This partially comprises pad **53**. The longitudinal edges of the covering material **54** are then folded toward each other over the inclined surfaces **56** and **57** of member **52**.

Lateral inward pressure is then applied to the material **54** to pull it taut and retain the material in taut condition. This is conveniently accomplished by a pair of members **67** and **68** which move toward each other in the manner indicated in FIGURE 8 of the drawings. Conveniently, and as here shown, the members **67** and **68** may comprise sections of angle iron supported adjacent the opposite sides of mold **63** for the described inward movement.

With the members **67** and **68** in their operative position, the plunger **66** is withdrawn and the confronting edges of the material **54** are forced down into slot **58** by the depending flange **62** of retaining strip **59**. If an excess of material is encountered, a knife (not shown) may be passed down slot **58** to trim the edges of the covering material **54** prior to insertion of the retaining strip **59**.

It has been found that a coating **69** of pressure-sensitive adhesive applied to surfaces **56** and **57**, or to the underside of material **54**, or both, prior to actuation of the members **67** and **68** will result in a smooth appearance and will cooperate with the strip **59** to hold the covering material **54** in place under extraordinary conditions of use. The material **69** is preferably of the pressure-sensitive type in order to avoid having to keep the members **67** and **68** in placing during the setting and bonding time required by other adhesive agents. Any suitable type of pressure-sensitive adhesive may be used which is compatible with the materials to which it is applied.

From the foregoing, it will be seen that the swingable kneeler construction of the present invention provides remarkable versatility and adaptability for use with pews of varying characteristics. Moreover, the disclosed structures and method make it possible to use a wide variety of materials and designs in the kneeler bench so as to make it conform to and complement the decor of the church in which it is used.

I claim:

1. A swingable kneeler, comprising a padded kneeling bench having arms adapted to be pivotally secured to upright portions of a pew, means connected to said arms for controlling speed of swinging movement of said kneeling bench, a plurality of supporting legs for said kneeling bench, and means for releasably securing said legs to said kneeling bench whereby said legs may be removed and replaced as desired.

2. A swingable kneeler as described in claim **1**, and wherein said legs are of substantially semi-elliptical configuration so as to avoid snagging clothing when said kneeling bench is raised.

3. A swingable kneeler as described in claim **1**, and wherein the bottom of said kneeling bench is formed with a uniform, non-flat configuration running substantially the length thereof, the upper ends of said legs are formed with a configuration complementary to that of the bottom of said bench so as to prevent twisting of said leg when held firmly against said bottom, and retainer means for holding the upper end of said leg firmly against the bottom of said kneeling bench.

4. A swingable kneeler as described in claim **3**, and wherein a threaded nut is embedded in the bottom of said kneeling bench, said leg is formed with a central bore from top to bottom and a counterbore at the bottom, and a bolt is positioned in said central bore with its head in said counterbore and its opposite end threadably engaged in said nut.

5. A swingable kneeler as described in claim **4**, and wherein a resilient floor-engaging foot is secured to the bottom of said leg and is provided with an opening aligned with said counterbore for accommodating a tool engageable with the head of said bolt for rotating the latter.

6. A swingable kneeler as described in claim **4**, and wherein a resilient floor-engaging foot is provided with a boss portion releasably engageable in said counterbore.

7. A swingable kneeler as described in claim **1**, and wherein said padded kneeling bench comprises an elongated bench member having a substantially flat upper side and a bottom side of flattened V-shape formed with a longitudinal slot in the apex thereof, a resilient foam pad on said upper side, a sheet of flexible covering material encasing said bench member and said pad, a pressure-sensitive adhesive securing said sheet to the V-shaped bottom of said bench member with said resilient foam pad in compression, and an elongated flexible strip having a T-shaped cross-section providing a cross-bar and a flange depending therefrom, said flange being wedged into said slot with said cross bar in covering relation thereto whereby said strip will retain and cover the confronting edges of said covering material in said slot.

8. A swingable kneeler as described in claim **7** and wherein the depending flange of said strip is formed with longitudinally extending serrations for engaging and holding the confronting edges of said covering material in said slot, and said bench member is relieved at said slot to receive the cross-bar of said strip.

9. A swingable kneeler as described in claim **3**, and wherein said padded kneeling bench comprises an elongated bench member having a substantially flat upper side and a bottom side of flattened V-shape formed with a longwise slot in the apex thereof, a resilient foam pad on said upper side, a sheet of flexible covering material encasing said bench member and said pad, a pressure-sensitive adhesive securing said sheet to the V-shaped bottom of said bench member with said resilient foam pad in compression, and an elongated flexible strip having a T-shaped cross-section providing a cross-bar and a flange depending therefrom, said flange being wedged into said slot with said cross bar in covering relation thereto whereby said strip will retain and cover the confronting edges of said covering material in said slot.

10. In a swingable kneeler adapted for installation on pews of varying characteristics, left and right-hand balancer units having a base mountable on vertical support portions of a pew, a spring-loaded hub rotatable on the base of each of said silencer units, means on each hub adapted for releasably securing an arm thereto, a hydraulic damping cylinder pivotally secured to each base in spaced relation to said hub, a bracket having a flat base adapted for securing to the arm and spaced flanges held parallel to said base by a generally semi-circular wall, said bracket having a boss extending from said base adapted for engagement in a corresponding opening in the arm, said bracket being formed with aligned openings through said flanges and said boss, and a pin threadably engageable in said aligned openings for pivotally securing said distal end of said cylinder to said bracket.

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