July 14, 1964 E. C. SWITZGABLE 3,140,508

OVERHEAD DOOR HARDWARE

Filed Feb. 15, 1962 2 Sheets-Sheet 1

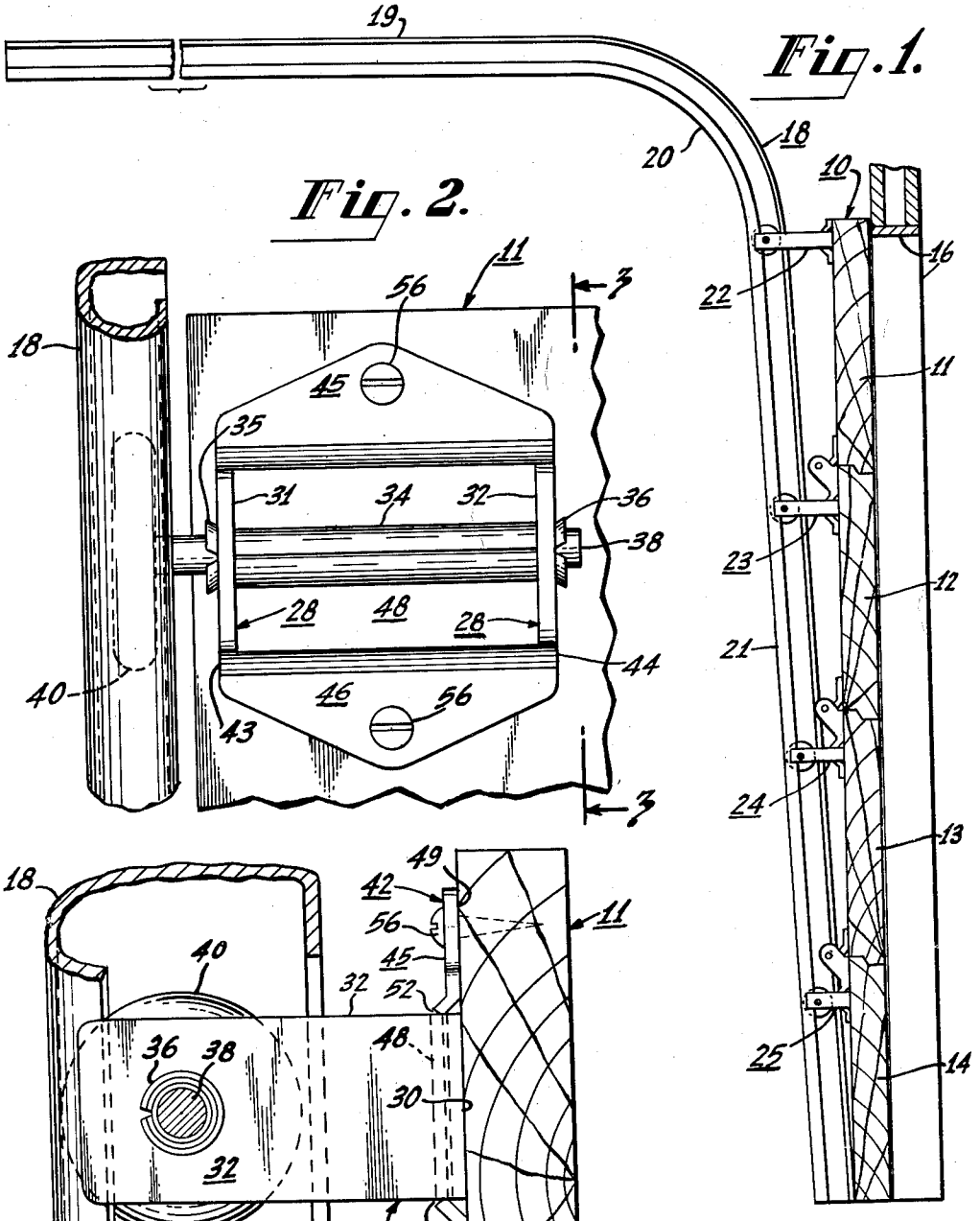


Fig. 1.

Fig. 2.

Fig. 3.

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Fig. 4.

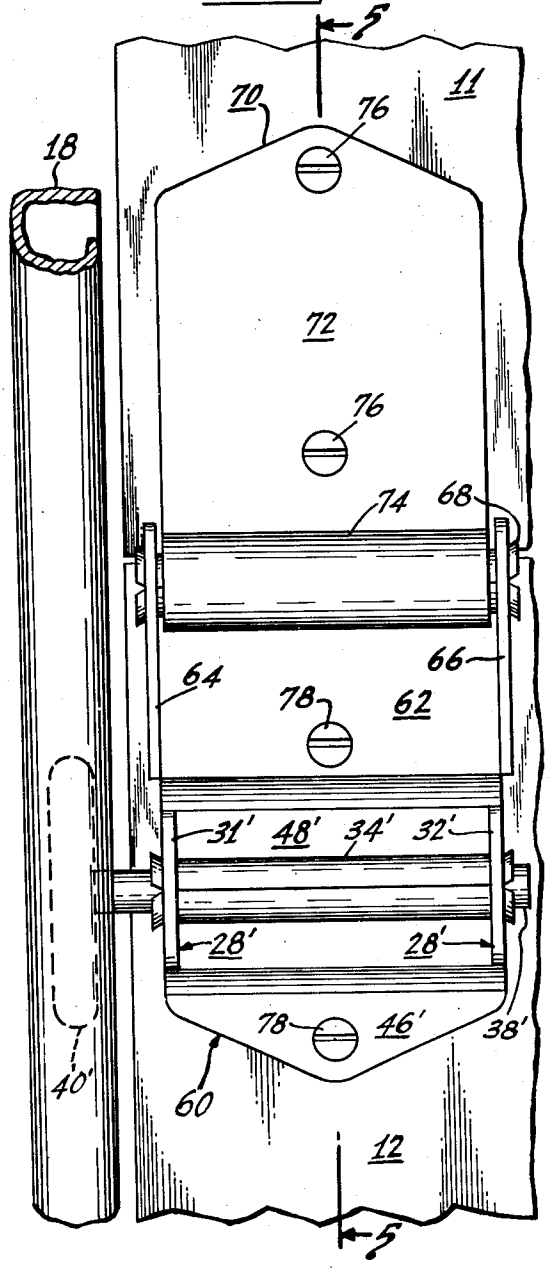
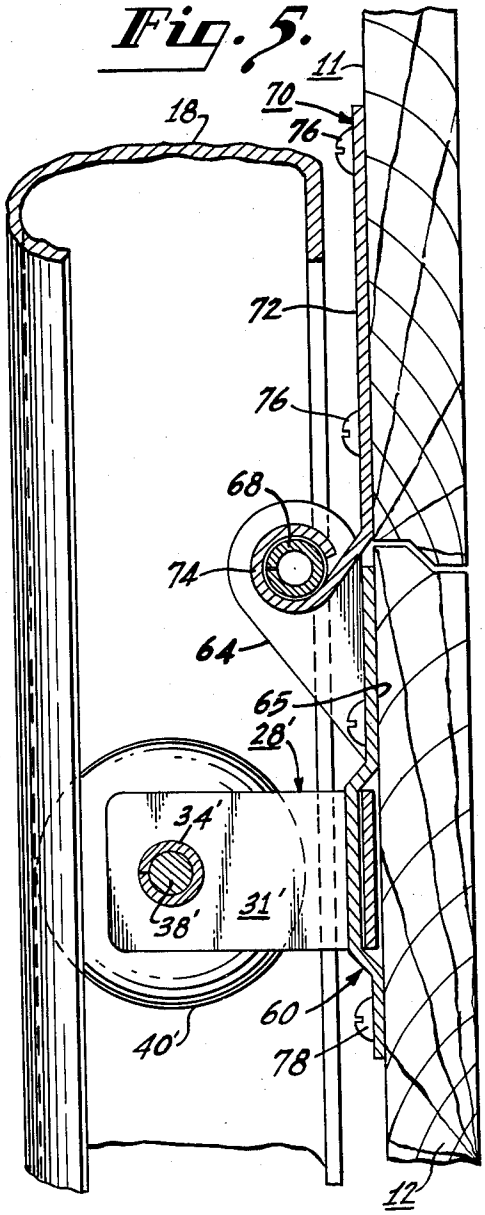


Fig. 5.



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OVERHEAD DOOR HARDWARE

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This invention relates to overhead door hardware, and particularly to the brackets and hinges affixed to a sectional overhead door for supporting rollers adapted to ride in guide tracks.

Overhead garage doors are commonly constructed of panels or sections hinged together and provided with rollers which ride in guide tracks. Each track has a horizontal portion suspended from the ceiling of the garage, a curved intermediate portion and a substantially vertical portion mounted along the side of the door opening. However, the substantially vertical portion of each track is in tapered relationship with the door frame so that it is spaced from the door frame a greater amount at the top than at the bottom. The tapered tracks cause the door to move both down, and horizontally toward the door frame. The door comes against the door frame only when the door is substantially all the way down to its fully closed position.

When the door is down in its closed position, the door is vertical and flush against the door frame. The guide track is slanted from the vertical. Therefore, the brackets on the door which support the rollers must extend varying distances from the door toward the guide tracks. Each side of the usual four-panel door will have three hinge brackets and one top bracket, all having different dimensions. It has been necessary to have four sets of dies for producing the four brackets.

It is, therefore, an object of this invention to provide an improved bracket and hinge construction which is economical in that all the different sized brackets and hinges can be made using the fewest possible number of dies, and in that fewer different parts need to be produced, stocked and distributed.

Overhead door brackets include a base portion having a mounting plane and two arm portions formed at right angles to support the axle of the roller. The base portion and the arm portions of brackets constructed according to the prior art have been formed from one piece blanked out of a strip of sheet steel. The necessary shape of the blank is such that a very large amount of sheet steel scrap results from the blanking process.

It is, therefore, another object of this invention to provide an improved bracket and hinge construction which is economical in that its production results in a minimum amount of sheet steel scrap.

It is a further object to provide an improved bracket and hinge construction which is light, rugged and sturdy.

According to an example of the invention, an overhead garage door roller bracket is constructed of a U-shaped sheet metal member having a base portion and two arm portions, a cylindrical steel sleeve extending through apertures in the arm portions to provide a bearing for a roller axle, and a sheet metal base plate having sides and having two end portions and an intermediate portion. The end portions of the base plate each have a mounting surface in amounting plane and have an intermediate portion which is formed offset from the mounting plane to provide a clearance accommodating the base portion of the U-shaped member. The intermediate portion of the base plate is notched on both sides to snugly receive the arm portions of the U-shaped member.

According to another example of the invention, one of the end portions of the base plate is provided with apertured side ears to form one portion of a hinge. An additional hinge plate is provided with a flat mounting portion and a rolled end portion dimensioned to cooperate with a hinge pintle and the apertured side ears of the base plate. The assembly is a combination roller bracket and hinge.

These and other objects and aspects of the invention will be more apparent to those skilled in the art from the following more detailed description taken in conjunction with the appended drawing, wherein:

FIGURE 1 is a sectional side view of an installed overhead door, the view showing the door panels in section and the overhead door hardware at one side of the door;

FIGURE 2 is a fragmentary elevation showing the door-mounted top bracket of FIGURE 1 in greater detail;

FIGURE 3 is a fragmentary sectional view taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary elevation showing one of the door-mounted combination roller bracket and hinge assemblies of FIGURE 1; and

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 4.

Referring now to FIGURE 1 of the drawing, an overhead door 10, consisting of four panels or sections 11, 12, 13 and 14, is shown in the closed position in a door frame 16. A roller track or guide 18 is mounted in the building by means not shown. The track 18 has a horizontal, ceiling-mounted portion 19, a curved portion 20 and a nearly vertical portion 21 which is tapered with relation to the vertical door frame 16. The portion 21 of the track is spaced a greater distance from the door frame at the top than at the bottom.

The movement of the door 10 between its closed position shown in the drawing and its overhead position is guided by bracket mounted rollers which ride in the track 18. The roller brackets include a top bracket 22 and combination hinge and roller brackets 23, 24 and 25.

Because of the tapered relationship between the portion 21 of the track 18 and the door frame 16, each of the brackets 22, 23, 24 and 25 must support the corresponding part of the door a different distance from the track 18. The general arrangement of the door and the hardware is such that, when the door is moved to its closed position, it moves both downwardly, and horizontally toward the door frame. The door snugly engages the door frame when the lowest or closed position is reached. The door does not rub on the door frame when being lowered or raised.

FIGURES 2 and 3 will now be referred to in describing the construction of the top bracket 22 in FIGURE 1. The bracket includes a U-shaped sheet metal member, generally designated 28, having a base portion 30 and two arm portions 31 and 32 which are formed in a parallel extending manner perpendicular to the base portion 30. The two arm portions 31 and 32 are provided with aligned apertures to receive a split cylindrical steel sleeve 34 which is held in place by means of flanged ends 35 and 36. The sleeve 34 serves as the bearing for an axle 38 which has a roller 40 mounted on one end thereof. The roller 40 rides in the guide track 18.

The bracket also includes a sheet metal base plate, generally designated 42, having sides 43 and 44, having two end portions 45 and 46, and having an intermediate portion 48. The end portions 45 and 46 of the base plate 42 have respective mounting surfaces 49 and 50 in a common mounting plane. The intermediate portion 48 of the base plate 42 is formed offset from the plane of the mounting surfaces 49 and 50 to provide a clearance relative to the mounting plane which is just sufficient to accommodate the base portion 30 of the U-shaped member 28.

The sides 43 and 44 of the base plate 42 are also notched to snugly receive the arm portions 31 and 32 of

the U-shaped member. The notches are preferably cut in the base plate 42 before the offset intermediate portion 48 is formed. This results in a configuration of the metal with corners at 52 and 53 which permits a force fitting of the U-shaped member 28 and the base plate 42 into the assembled positions shown. During the press or force fitting, the corners at 52 and 53 of the base plate dig into the mating arm portions 31 and 32 and cause a locking together of the parts. The rigidity with which the parts are locked together may be improved, if desired, by spot welding the intermediate portion 48 of the base plate to the base portion 30 of the U-shaped member. The assembled bracket is mounted on the surface of the door panel 11 by means such as screws 56.

Reference will now be made to FIGURES 4 and 5 for a description of the construction of the combination bracket and hinge 23 in FIGURE 1. The U-shaped bracket 28', the cylindrical sleeve 34' and the axle 38' are the same as the corresponding elements 28, 34 and 38 in the bracket of FIGURES 2 and 3, except that the two arm portions 31' and 32' have a shorter length than the arms 31 and 32 in the bracket of FIGURES 2 and 3. The base plate 60 in FIGURES 4 and 5 is like the base plate 42 in FIGURES 2 and 3 in that it has an end portion 46' and an intermediate portion 48' which are the same as the corresponding portions 46 and 48 in FIGURES 2 and 3. However, the other end portion 62 of the base plate 60 is different in that it is larger in size, and in that it is provided with formed apertured side ears 64 and 66. The side ears are formed perpendicular to the mounting plane surface 65 of the base plate 62. The side ears 64 and 66 are provided with aligned apertures to receive a split cylindrical steel sleeve hinge pintle 68 which is maintained in position by flared ends.

A hinge plate 70 is provided having a flat mounting portion 72 and having a rolled end portion 74 dimensioned to fit confinedly between the apertured ears 64 and 66, and dimensioned to surround the hinge pintle sleeve 68.

The hinge plate 70 is fastened to door panel 11 by any suitable means such as screws 76. The base plate 60 is fastened, as by screws 78, to the adjoining door panel 12. The base plates are fastened to the door panels with the cylindrical pintle 68 opposite the joint between the two panels so that the panels are hingedly connected together. The combination roller bracket and hinge assembly is seen to include the bracket base plate 60, the U-shaped member 28' and the hinge plate 70, all of which are made of formed sheet steel. The shapes of the members are such that they can be blanked out of sheet steel with a minimum of resulting scrap.

All of the combination roller bracket and hinge assemblies 23, 24 and 25 in FIGURE 1 are constructed the same as is shown in FIGURES 4 and 5, except that the U-shaped members 28' in the respective locations have arm portions 31' and 32' of differing lengths. The U-shaped member 28 of the top bracket 22 is the same as the U-shaped member 28' of the combination bracket and hinge assemblies, except that the arm portions 31 and 32 are longer. All of the U-shaped members 28 and 28' are conveniently made from sheet steel strip stock, the pieces being cut to the appropriate lengths on a standard cut-off shear. All of the strips of different lengths can be formed to the desired U-shape on the same forming die by merely adjusting end stops on the die. All of the U-shaped members can be conveniently constructed in the different desired sizes with a minimum outlay for tools.

It is thus seen that, according to this invention, the hardware for linking the door panels to each other and for moving the door in tapered relation to the guide tracks is economically made from relatively few different pieces, and that the pieces are such that they can be blanked out from strip sheet steel with a minimum of scrap.

What is claimed is:

1. An overhead garage door roller bracket, comprising a U-shaped sheet metal member and having a base portion and two arm portions, said arm portions having aligned apertures, a cylindrical sleeve extending between said arm portions, and through said apertures, an axle positioned in said sleeve with an end extending therefrom, a track roller wheel mounted on said end of said axle, and a base plate formed of sheet steel and having sides and having two end portions and an intermediate portion, said end portions each having a mounting surface in a mounting plane, said intermediate portion being formed offset from said mounting plane to provide a clearance relative to said mounting plane accommodating the base portion of said U-shaped member, said intermediate portion being notched at both sides to snugly receive the arm portions of said U-shaped member.

2. An overhead garage door roller bracket, comprising a U-shaped sheet metal member having a base portion and two arm portions, said arm portions having aligned apertures, a cylindrical metal sleeve extending between said arm portions and through said apertures and having flanged ends on the outsides of said arm portions to permanently maintain the sleeve in position, an axle positioned in said sleeve with an end extending therefrom, a track roller wheel rotatably mounted on said end of said axle, and a base plate formed of sheet metal and having sides and having two end portions and an intermediate portion, said end portions each having a mounting surface in a mounting plane, said intermediate portion being formed offset from said mounting plane to provide a clearance relative to said mounting plane accommodating the base portion of said U-shaped member, said intermediate portion being notched at both sides to snugly receive the arm portions of said U-shaped member.

3. A combination bracket and hinge, comprising a U-shaped member formed of sheet metal and having a base portion and two arm portions, a base plate formed of sheet metal and having sides and having two end portions and an intermediate portion, said end portions each having a mounting surface in a mounting plane, said intermediate portion being formed offset from said mounting plane to provide a clearance relative to said mounting plane accommodating the base portion of said U-shaped member, said intermediate portion being notched at both sides to snugly receive the arm portions of said U-shaped member, one of the end portions of said base plate having apertured side ears formed perpendicular to said mounting plane, a hinge plate having a flat mounting portion and having a rolled end portion dimensioned to fit confinedly between said apertured ears, and a hinge pintle extending through the apertures in said ears and the confined rolled end portion of said hinge plate.

4. An overhead garage door combination roller bracket and hinge, comprising a U-shaped member formed of sheet metal and havinga base portion and two arm portions, said arm portions having aligned apertures, a cylindrical metal sleeve extending between said arm portions and through said apertures, a base plate formed of sheet steel and having sides and having two end portions and an intermediate portion, said end portions each having a mounting surface in a mounting plane, said intermediate portion being formed offset from said mounting plane to provide a clearance relative to said mounting plane accommodating the base portion of said U-shaped member, said intermediate portion being notched at both sides to snugly receive the arm portions of said U-shaped member, one of the end portions of said base plate having apertured side ears formed perpendicular to said mounting plane, a hinge plate having a flat mounting portion and having a rolled end portion dimensioned to fit confinedly between said apertured ears, and a hinge pintle extending through the apertures in said ears and the confined rolled end portion of said hinge plate.

5. An overhead garage door combination roller bracket

and hinge, comprising a U-shaped member formed of sheet steel and having a base portion and two arm portions, said arm portions having aligned apertures, a cylindrical steel sleeve extending between said arm portions and through said apertures and having flanged ends on the outsides of said arm portions to permanently maintain the sleeve in position, a base plate formed of sheet steel and having sides and having two end portions and an intermediate portion, said end portions each having a mounting surface in a mounting plane, said intermediate portion being formed offset from said mounting plane to provide a clearance relative to said mounting plane accommodating the base portion of said U-shaped member, said intermediate portion being notched at both sides to snugly receive the arm portions of said U-shaped member, one of the end portions of said base plate having apertured side ears formed perpendicular to said mounting plane, a hinge plate having a flat mounting portion and having a rolled end portion dimensioned to fit confinedly between said apertured ears, and a cylindrical steel sleeve hinge pintle extending through the apertures in said ears and the confined rolled end portion of said hinge plate, said cylindrical sleeve pintle being flanged at the ends extending outside said ears to permanently maintain the sleeve in position.

6. An overhead garage door combination roller bracket and hinge, comprising a U-shaped member formed of sheet steel and having a base portion and two arm portions, said arm portions having aligned apertures, a split cylindrical steel sleeve extending between said arm portions and through said apertures and having flanged ends

on the outsides of said arm portions to permanently maintain the sleeve in position, an axle positioned in said sleeve with an end extending therefrom, a track roller wheel rotatably mounted on said end of said axle, a base plate formed of sheet steel and having sides and having two ends portions and an intermediate portion, said end portions each having a mounting surface in a mounting plane, said intermediate portion being formed offset from said mounting plane to provide a clearance relative to said mounting plane accommodating the base portion of said U-shaped member, said intermediate portion being notched at both sides to snugly receive the arm portions of said U-shaped member, one of the end portions of said base plate having apertured side ears formed perpendicular to said mounting plane, a hinge plate havir g a flat mounting portion and having a rolled end portion dimensioned to fit confinedly between said apertured ears, and a split cylindrical steel sleeve hinge pintle extending through the apertures in said ears and the confined rolled end portion of said hinge plate, said cylindrical sleeve pintle being flanged at the ends extending outside said ears to permanently maintain the sleeve in position.

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