

[54] SAFETY BARRICADE FOR A ROOF

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 291,990, Sept. 25, 1972, abandoned.

[52] U.S. Cl. 256/59; 182/113; 248/237; 256/65

[51] Int. Cl.²..... E04H 17/14; E04G 1/16

[58] Field of Search 256/59, 65, 1, 24; 248/237, 291; 182/113; 52/707

[56] References Cited

UNITED STATES PATENTS

| | | | |
|-----------|---------|------------------------|-----------|
| 629,021 | 7/1899 | Truc | 248/291 X |
| 1,456,940 | 5/1923 | Showalter | 248/237 |
| 1,727,791 | 9/1929 | Sproul et al. | 52/707 |
| 1,917,809 | 7/1933 | Reimann | 248/237 |
| 1,926,207 | 9/1933 | MacAlpine | 182/113 X |
| 1,995,656 | 3/1935 | Stout..... | 248/291 |
| 2,074,483 | 3/1937 | Mason et al. | 52/707 X |
| 2,329,415 | 9/1943 | Osborne..... | 248/237 |
| 2,429,949 | 10/1947 | Thayer..... | 52/707 X |
| 2,745,688 | 5/1956 | Farrington et al. | 248/291 X |
| 2,921,773 | 1/1960 | Hoelzer..... | 287/99 X |
| 3,333,802 | 8/1967 | Goodman | 248/237 X |
| 3,450,378 | 1/1969 | Cucka..... | 248/237 X |
| 3,480,257 | 11/1969 | Bourn et al. | 256/65 X |
| 3,715,850 | 2/1973 | Chambers..... | 52/707 X |

FOREIGN PATENTS OR APPLICATIONS

| | | | |
|---------|---------|---------------------|---------|
| 767,212 | 1/1957 | United Kingdom..... | 182/113 |
| 658,134 | 10/1951 | United Kingdom..... | 248/237 |

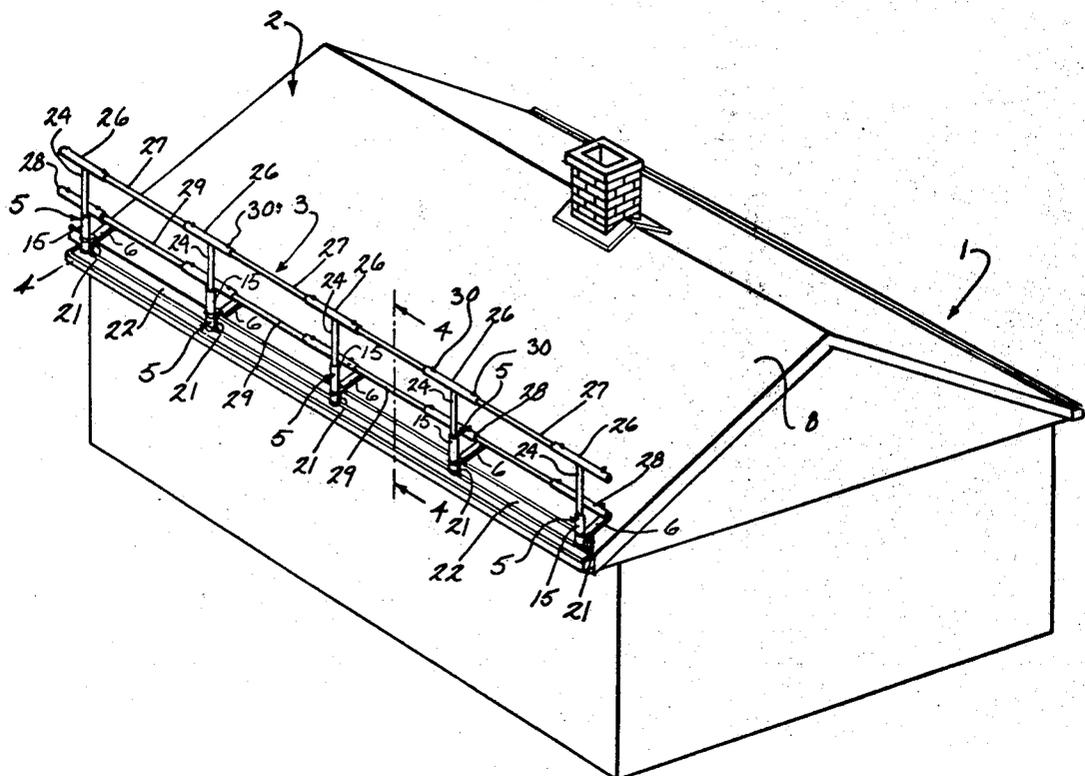
Primary Examiner—Dennis L. Taylor

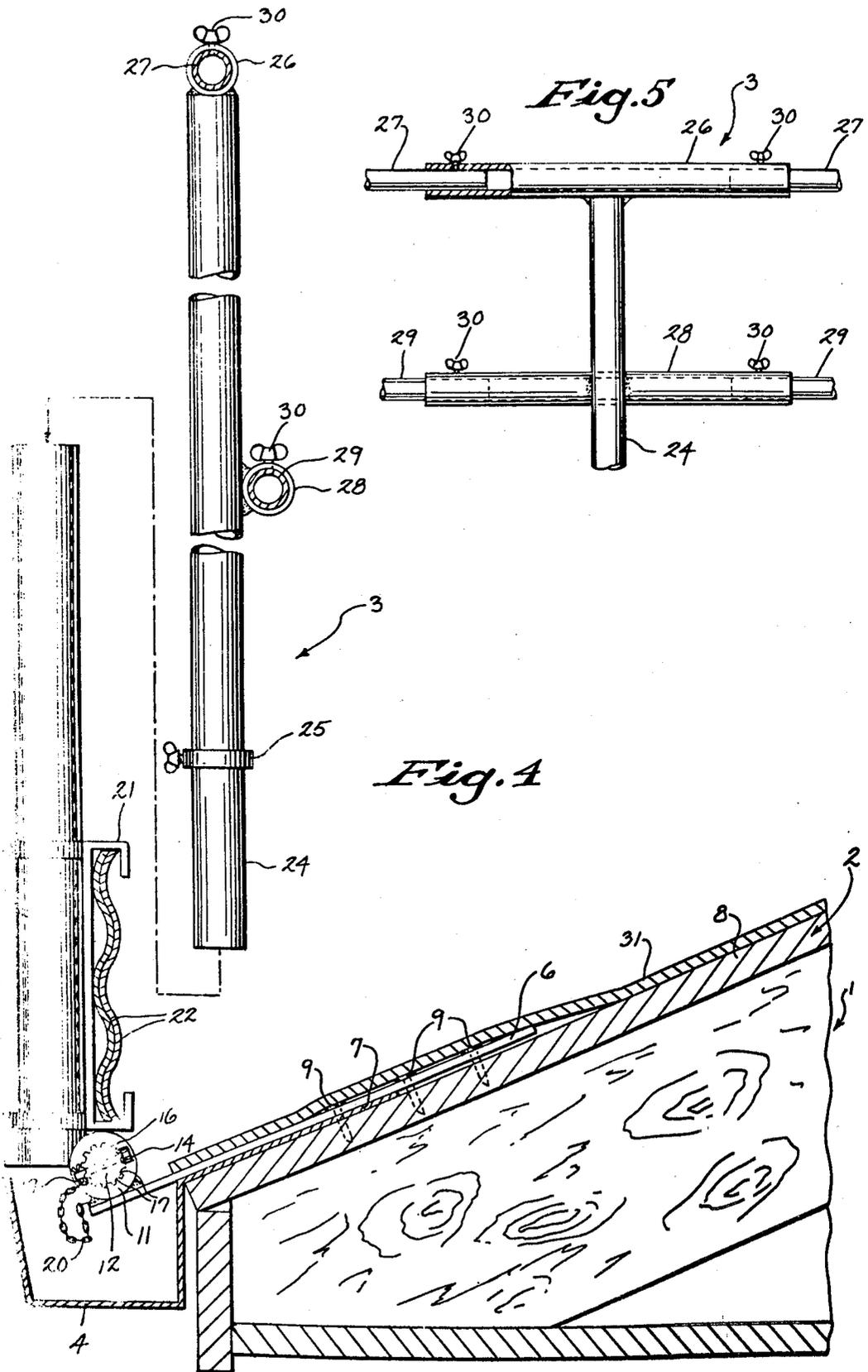
Attorney, Agent, or Firm—Andrus, Scales, Starke & Sawall

[57] ABSTRACT

A barricade for a roof, which can be used as a safety railing or a parapet. The barricade includes a series of supports which are spaced at intervals along the edge of the roof. Each support comprises a plate provided with a series of inclined parallel slots and nails are driven through the slots to secure the plate to the roof deck. A tubular support is pivotably connected to each plate and can be locked with respect to the plate to enable the support to be adjusted to a vertical position regardless of the roof pitch. A pipe is inserted within each tubular support, and horizontal rails are connected to the pipes to provide a barricade or railing at the edge of the roof. The plates can also be attached to a vertical concrete block wall rather than being secured to the roof deck. To mount each plate on the wall, an L-shaped bracket is positioned between the concrete blocks with the upper flange of the bracket resting on the upper edges of the blocks. Threaded bosses are formed on the vertical leg of the L-shaped bracket and extend within the vertical joint between adjacent blocks. Studs connect the plate to the bosses on the bracket.

11 Claims, 9 Drawing Figures





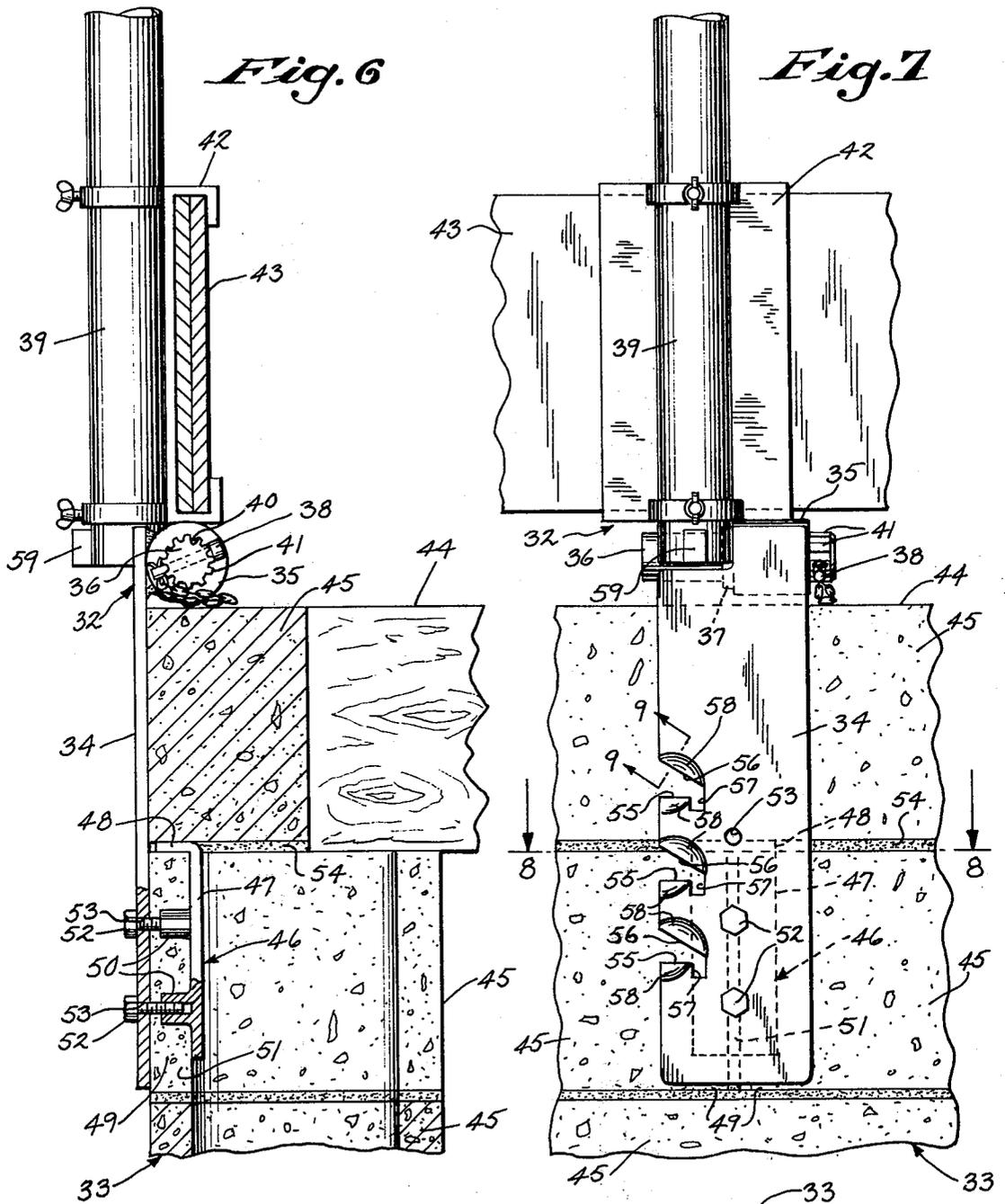
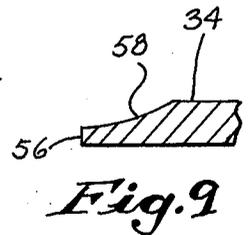
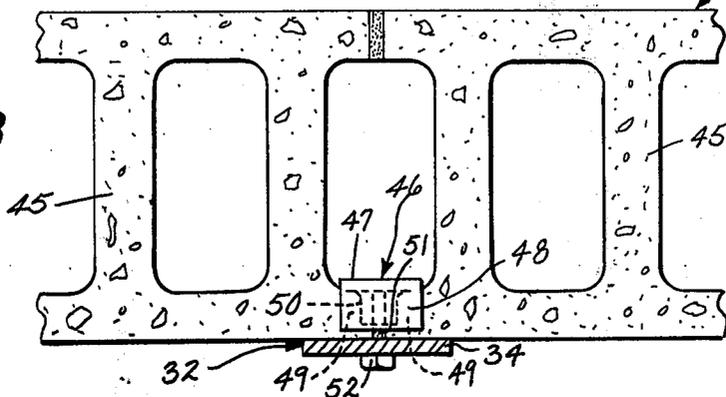


Fig. 8



SAFETY BARRICADE FOR A ROOF

BACKGROUND OF THE INVENTION

This application is a continuation-in-part of application Ser. No. 291,990, filed Sept. 25, 1972, now abandoned.

When applying or removing roofing from a roof, it is often desirable, particularly on steep pitched roofs, to have a railing or barricade at the roog edge to prevent the workmen or equipment from falling from the roof. Recently Federal safety legislation has required that safety barricades or railings be installed along the edge of a roof in all situations where roofing is either installed or removed.

A safety railing must have certain characteristics. The railing must be strong enough to prevent a workman or equipment from falling from the roof, and it must be easily installed on the roof and removed after the roofing job is completed. In addition, the safety railing must be installed in a manner such that it will not interfere with the roofing operation and it must be capable of being installed on both flat and pitched roofs, as well as on roofs of wood, concrete, and other materials.

SUMMARY OF THE INVENTION

The present invention is directed to a safety barricade for a roof which can be used as a safety railing or a low level parapet. The barricade includes a series of support members which are spaced at intervals along the edge of the roof. Each of the support members includes a generally flat plate having a series of parallel inclined slots along one edge. Nails are driven through the slots into the roof deck to secure the support member to the roof.

A tubular member or pipe is pivotally connected to the outer end of each of the plates and can be pivoted and locked with respect to the plate to position the tubular member at a vertical attitude regardless of the roof pitch. Each of the tubular members carries a channel bracket and a plate is mounted in the channel brackets and extends between adjacent support members to provide a continuous low level parapet or toe plate along the edge of the roof.

To serve as a safety railing, a pipe is inserted within the upper end of each of the tubular members and the pipes carry brackets which support horizontal rails that extends between the support members to provide a continuous railing along the entire roof edge. The rails are mounted with respect to the support members so that they can be shifted horizontally to provide an access opening and enable materials or equipment to be introduced or withdrawn from the roof.

In a modified form of the invention the plates are attached to a vertical concrete block wall rather than being secured to the roof deck. To mount each plate on the wall, an L-shaped bracket is positioned between the concrete blocks with the upper flange of the bracket resting on the upper edges of the blocks. Threaded bosses are formed on the vertical leg of the L-shaped bracket and extend within the vertical joint between adjacent blocks. Studs connect the plate to the bosses on the bracket to firmly secure the plate to the wall.

In this form of the invention either a low level parapet or kickboard can be connected between the supports along the edge of the roof, or higher level horizontal rails can be utilized.

The barricade construction of the invention is firmly fixed to the building and provides a strong rigid barrier which will prevent workmen, equipment, or materials from falling from the roof.

When the barricade structure is installed on the roof deck, the roofing material is adapted to be applied over the plates that are nailed to the roof deck. The construction of the invention will not interfere with the application of the roofing material, for the support members are located outwardly of the edge of the roof. After completion of the roofing operation, and removal of the rails, each support member can be easily removed from the roof deck by merely pounding inwardly on the support member which will automatically release the nails from the inclined slots so that the plate can be slipped outwardly from beneath the roofing.

The safety railing has an added advantage in that it can be readily adapted to a flat, or pitched roofs, up to approximately a 10/12 pitch, by merely pivoting and locking the tubular support member with respect to the base plate.

While the safety railing is normally utilized as a temporary barricade for a roof during the application or removal of roofing, it is contemplated that in the case of some commercial or apartment buildings, where the local ordinances require a fire guard rail along the edge of a flat roof, the railing can be a permanent installation.

It is also contemplated that the railing construction can be utilized to support plywood or panel board sheets which would serve as a solid and continuous barricade during the removal of roofing, so that the removed roofing would be collected against the sheets and would not fall down onto the ground.

Other objects and advantages will appear in the course of the following description.

DESCRIPTION OF THE DRAWINGS

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIG. 1 is a perspective view of a building with the safety railing of the invention installed along one edge of the roof;

FIG. 2 is a top plan view of a supporting member of the railing as installed on the roof;

FIG. 3 is a section taken along line 3—3 of FIG. 2;

FIG. 4 is a vertical section taken along line 4—4 of FIG. 1;

FIG. 5 is a side elevation of a support member showing the attachment of the rails;

FIG. 6 is a vertical section of a modified form of the invention in which the plates are attached to a vertical wall;

FIG. 7 is a front view of the structure of FIG. 6;

FIG. 8 is a section taken along line 8—8 of FIG. 7; and

FIG. 9 is a section taken along line 9—9 of FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates a building 1 having a gabled roof 2 and the barricade construction 3 of the invention is installed as a safety railing along the lower edge of the roof 2 adjacent the gutter 4.

As best illustrated in FIGS. 2 and 3, the safety railing structure includes a series of supports 5 which are secured to the roof deck and spaced at intervals along the length of the roof. Each of the supports 5 includes a flat base plate 6 which is positioned over the flashing 7 of the gutter 4 and is secured to the roof deck 8 by a series of nails 9 that extend through the slots 10 in the base plate. As best shown in FIG. 3, the slots are located at an angle or diagonally to the edge of the base plate 6 and are disposed in generally parallel relation. A bushing or sleeve 11 is welded to the outer end of the base plate, and one end of a shaft 12 is mounted within the bushing 11. The shaft 12 is prevented from moving axially with respect to the bushing by means of a collar 13, which is secured to the shaft and bears against one end of the bushing, and a lock pin 14 which extends through an opening in the outer end of the shaft and bears against the opposite end of the bushing. A pipe or tubular member 15 is secured to the projecting end of the shaft 12, and normally extends upwardly in a generally vertical direction from base plate 6.

The shaft 12 is secured against rotation with respect to the bushing 11 through a spline connection consisting of a series of mating teeth 16 and 17 on shaft 12 and bushing 11, respectively. By removing locking pin 14, shaft 12 can be withdrawn axially from the bushing 11. Tubular member 15, which is attached to the shaft 12, can then be adjusted to the desired angularity with respect to plate 6, and the shaft 12 can then be reinserted and locked within the bushing. To retain locking pin 14 within the hole 18 in the shaft 12, a cotter pin 19 is inserted within an opening in the end of the pin 14, and a chain 20 connects the cotter pin to the bushing. This construction enables the shaft 12 and tubular member 15 to be locked at a variety of angular positions with respect to the base plate 6 and permits the tubular member to be disposed at a generally vertical position regardless of the pitch of the roof deck 8.

As shown in FIG. 4, each tubular member 15 carries a vertically adjustable channel-shaped bracket 21 and a series of corrugated metal plates or other structural members 22 are slidably received within the channel brackets and extend between the supports 5, thereby providing a continuous toe-plate or kickboard which is located slightly above the lower edge of the roof deck 8. The channel brackets 21 have sufficient depth to permit the ends of plates 22 to be lapped.

The lower end of each tubular member is provided with a pad 23 and the pad serves as a striking area for removal of the supports 5, as will be described hereinafter.

A pipe 24 is adapted to be inserted within the upper end of each of the tubular members 15, and the pipe is provided with a vertically adjustable collar 25 which engages the upper end of the tubular member 15 and limits the insertion of the pipe within the tubular member. A horizontal pipe 26 is welded to the upper end of each pipe 24 and each end of the horizontal pipe 26 is adapted to receive a rail 27. Similarly, a horizontal pipe 28 is welded to the central portion of pipe 24, beneath the upper pipe 26, and each end of pipe 28 receives the end of a rail 29. Set screws 30 serve to retain the rails 27 and 29 in the respective pipes 26 and 28. As shown in FIG. 5, the pipes 26 and 28 have a substantial length, and the rails 27 and 29 only extend a short distance within the pipes. This permits the rails 27 and 29 to slide or telescope horizontally with respect to the

pipes 26 and 28, to open a space between the support members 5 and enable equipment or materials to be brought up or removed from the roof. For example, in practice, the pipes 26 and 28 may have a length of 36 inches and the rails 27 and 29 may extend only 6 inches within the pipes when the railing is in a closed condition. By loosening the set screws 30, the rails 27 and 29 can be telescoped approximately 24 inches with respect to the pipes 26 and 28 to open a space of 24 inches in the railing.

The particular rail construction, such as shown by rails 27 and 29, is not critical to the invention, and any type of supporting rails or connecting members can be utilized for connecting the supports 5. However, it is desirable to have a provision for opening or separating the rails so that materials and equipment can be brought to and removed from the roof.

To install the safety railing structure of the invention, the base plates 6 are secured to the roof deck at intervals along the roof by pounding the nails 9 through the slots 10 into the roof deck. The nails 9 are pounded down so that the heads are in tight engagement with the upper surface of the plate 6. The locking pins 14 are then removed, the shafts 12 withdrawn from bushings 11 and the tubular members 15 are adjusted in position so that they are substantially vertical. The shafts 12 are then reinserted within the bushings, and the lockings pins 14 reinstalled to lock the tubular members 15 in the vertical position.

With the tubular members 15 correctly installed, the plates 22 are slid into the channel brackets 21 and the pipes 24 are inserted within the upper ends of the tubular members 15. Rails 27 and 29 are then installed within the respective pipes 26 and 28 and locked into place by means of the set screws 30. When it is desired to bring materials or equipment to the roof or remove equipment or materials, the set screws 30 associated with certain rails 27 and 29 can be loosened and the rails slid horizontally within the pipes to provide an opening through which the material can be passed.

With the safety railing installed, the shingles or other roofing material 31 is applied to the roof deck 8. As the plates 6 are secured to the roof deck, the roofing material is applied over the plates 6.

To remove the safety barrier after the roofing operation is completed, the rails 27 and 29 are removed, and the pipes 24 are withdrawn from the tubular members 15. To remove the supports 5, the workman strikes the pad 23 with a hammer, moving the plate 6 inwardly beneath the roofing 31 and causing the plate to move diagonally with respect to the nails 9 until the nails are released through the edge of the slots 10. The plate 6 can then be drawn outwardly from beneath the roofing 31 to complete the removal of the safety railing.

The safety railing construction of the invention provides a strong barricade which will prevent workmen, equipment, or materials from falling from the roof. It provides a continuous low level barricade by means of the plates 22 which are located slightly above the edge of the roof, as well as a higher level barricade by virtue of rails 27 and 29 which are located a substantial distance above the roof.

The barricade structure can be easily installed on the roof deck and when installed will not interfere with the roofing operation. In some situations where local ordinances require a fire guard rail around a flat roof deck,

it is possible to use the railing structure as permanent railing after the roofing is completed.

The barricade construction can be adjusted in angularity so that it can be utilized with flat roof decks and roof decks having a pitch up to about 10/12. Similarly, the unit can be installed with roof decks of any material such as wood, concrete or the like.

By securing plywood or other sheeting material to the rails 27 and 29, a solid continuous barricade can be obtained which can be utilized in situations where roofing is being removed. The solid barricade will prevent the removed roofing from falling from the roof.

As the collars 25 are adjustable vertically on the pipes 24, the height of the rails 27 and 29 above the roof deck can be varied. Similarly, the position of the toe plate 22 can be varied by changing the position of the channels 21 with respect to the tubular members 15.

FIGS. 6-9 illustrate a modified form of the invention in which the barricade is used as a temporary adjustable roof parapet attached to a vertical wall.

The parapet includes a series of supports 32, similar to supports 5 of the first embodiment, which are secured to the wall 33 of the building and spaced at intervals along the length of the building. Each of the supports 32 includes a flat base plate 34 which extends vertically along the wall 33. A bushing or sleeve 35 is welded to the outer end of the base plate 34 and one end of a shaft 36 is mounted within the bushing 35. The shaft 36 is prevented from moving axially with respect to the bushing 35 by means of a collar 37, similar to collar 13, which is secured to the shaft and bears against one end of the bushing, while a retaining pin 38 extends through an opening in the outer end of the shaft 36 and bears against the opposite end of the bushing. A pipe or tubular member 39, similar to pipe 15 of the first embodiment, is secured to the projecting end of the shaft 36 and normally extends upwardly in a generally vertical direction.

Shaft 36 is secured against rotation with respect to the bushing 35 through a spline connection consisting of mating teeth 40 and 41 on the bushing 35 and shaft 36, respectively.

As described with respect to the embodiment shown in FIGS. 1-5, the spline connection enables the shaft 36 and pipe 39 to be locked in a variety of angular positions with respect to the plate 34. As shown in FIG. 6, both the pipe 39 and the plate 34 extend generally vertically. In the event the supports 32 are to be attached to a roof deck, the shaft 36 can be withdrawn axially from the bushing 35 and the bushing 35 and plate 34 can be adjusted to the desired angularity with respect to shaft 6, so that the plate 34 can then be attached to the roof deck and the pipe 39 will be substantially vertical.

Each pipe 39 carries a vertically adjustable channel-shaped bracket 42 and a toe board or piece of plywood 43 is received within the channel brackets and extends between the supports 32, thereby providing a continuous low level parapet or kickboard which is located slightly above the upper edge of the roof deck 44.

The wall 33 is formed of a series of vertical courses of concrete blocks 45 and in accordance with the invention, a generally L-shaped bracket 46 is utilized to attach each of the plates 34 to the block wall 33. As best shown in FIG. 6, the bracket 46 is composed of a vertical section 47 and an outwardly extending hori-

zontal flange 48. Vertical section 47 is positioned inwardly of the end flanges 49 on the blocks 45, while the horizontal flange 48 rests on the upper edges of the adjacent blocks in a course.

As best illustrated in FIG. 6, a pair of bosses 50 extend outwardly in vertically spaced relation from the vertical section 47 and the bosses are located in the vertical space or mortar joint 51, between the adjacent flanges 49 of the blocks. Stud 52 extends through holes 53 in the plate 34 and are threaded within the bosses 50. With this construction, each plate 34 is firmly secured to the block wall 33 and the horizontal flange 48 of each bracket 46 extends between the horizontal mortar joint 54 between blocks of adjacent courses, while the bosses 50 extend within the vertical mortar joint 51 between adjacent flanges 49 of the blocks in a single course. After the parapet is removed from the wall by unthreading studs 52, the holes in the vertical mortar joint 51, through which the studs extended, can be mortared in to provide a uniform appearance for the wall.

The supports 32 enable the plates 34 to be readily attached to a concrete block wall without the necessity of drilling any holes into the wall. The brackets 46 are placed in the wall during laying of the concrete block and after parapet is removed any exposed areas in the mortar joints can be readily mortared in to provide a wall of uniform appearance.

As previously noted, the supports 32 can also be applied to either a flat or pitched roof, instead of the vertical wall 33, with the plates 34 being nailed to the roof deck. In this regard, each plate 34 is provided with a series of slots 55 similar in function to slots 10 of the first embodiment. Each slot 55 is provided with an inclined edge 56 and terminates in a longitudinally extending recess 57 which receives the nail 9. In addition, bevelled areas 58 are provided adjacent the slot 54. A striking pad 59 is secured to the pipe 39 and by striking the pad 59 with a hammer, the plate 34, when attached to a roof, will be moved inwardly causing the nails to ride outwardly in the slots 55. When the heads of the nails approach the bevelled areas 58, the heads will be out of contact with the surface of the plate 34, thereby reducing the frictional contact and enabling the plates to be more readily removed from the roof. Thus, the slot construction of the plates 34, as shown in FIG. 7, enables the plates, when nailed to a pitched or flat roof to be more readily removed from the roof.

While the structure shown in FIGS. 6-9 has been described as being an adjustable parapet, it is contemplated that the structure can also be used for a safety railing in which pipe and railing sections similar to pipes 24 and railing members 27 and 28 of the first embodiment can be utilized with the vertical pipes 39.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A safety construction for a roof, comprising a series of base members secured to the roof adjacent the roof edge, a support member extending upwardly from the outer end of each base member, pivotal means for connecting each support member to the respective base member whereby the support member can be pivoted with respect to the base member, locking means connected to said pivotal means for locking the support

member with respect to the base member, said base member having an edge disposed generally normal to the axis of pivotal connection of the base member and the support member, said base member having at least one slot communicating with said edge and disposed diagonally with respect to said edge, said slot adapted to receive a fastener to secure the base member of the roof, said fastener being automatically removable from the base member by driving the base member inwardly in the direction of said edge, and connecting means interconnecting the lower portions of said adjacent support members, said connecting means having a substantially vertical surface to provide a substantially continuous low level parapet.

2. The structure of claim 1, and including a series of rails extending between adjacent support members and located above said connecting means, and mounting means for mounting the rails for movement in a generally horizontal direction to thereby permit the rails to be moved relative to the support members and provide an access opening for said safety railing.

3. The structure of claim 1, and including a bracket connected to the lower end of each support member, said connecting means comprising a plate supported by the brackets and extending between adjacent support members.

4. The construction of claim 3, wherein said slot includes a recess located at the inward extremity of said diagonal edge, said recess being generally parallel to said side edge.

5. The construction of claim 4, wherein said bevelled section is located on both sides of the slot and terminates adjacent said recess.

6. A safety barricade for a roof of a building, comprising a base member to be secured to the building adjacent the edge of the roof and having an inner surface disposed contiguous to the building and having an outer surface facing away from the building, a support member extending upwardly from the outer end of the base member, pivotal means for pivotally connecting the support member to the base member whereby the support member can be pivoted with respect to the base member, and locking means for locking the support member with respect to the base member, said base member having a longitudinal side edge disposed generally normal to the axis of pivotal connection of the base member and the support member, said base member having at least one slot communicating with side edge and a diagonal edge bordering the slot and disposed diagonally with respect to said side edge, said slot adapted to receive a nail to secure the base member to the roof, said nail being automatically removable

from the base member by driving the base member inwardly in the direction of said side edge, the outer surface of said base member having a bevelled section bordering said diagonal edge, whereby the head of the nail will move into the bevelled section on initial inward driving of the base member to thereby reduce the frictional contact between the head of the nail and the base member.

7. A safety barricade construction to be used for a roof of a building having a vertical wall formed of courses of concrete blocks each block having a vertically extending recess in its end surface, comprising a series of base members secured to the vertical wall adjacent the edge of the roof, a support member secured to each base member and extending upwardly above the level of the roof, a horizontal barricade member extending between said adjacent support members to provide a substantially continuous safety barricade along the edge of the roof, bracket means to secure each base member to the concrete block wall, said bracket means having a generally vertical section and a generally horizontal section, said horizontal section disposed within a horizontal joint between adjacent courses of block and said vertical section disposed within mating recesses of adjacent horizontal blocks, said bracket means including a connecting element secured to the vertical section and extending outwardly within a vertical joint between adjacent horizontal blocks in a course, and connecting means for removably attaching said base member to said connecting element.

8. The construction of claim 7, wherein said connecting element constitutes a threaded boss, and said connecting means comprises a stud extending through openings in the base member and threaded within said boss.

9. The construction of claim 7, wherein said horizontal section is on the upper edge of said bracket means and rests on the upper edges of the blocks of a course.

10. The construction of claim 7, wherein said vertical section bridges said vertical joint between adjacent blocks in a course.

11. The construction of claim 7, wherein said base member has a side edge and has at least one slot communicating with said side edge and a diagonal edge bordering the slot and disposed diagonally with respect to said side edge, said slot adapted to receive a nail to secure the base member to the roof, said nail being automatically removable from the base member by driving the base member inwardly in the direction of said side edge.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,901,481
DATED : August 26, 1975
INVENTOR(S) : JOHN F. PROBST

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 6, line 26, After "after" insert ---the---

Column 7, line 7 Cancel "of" and substitute therefor
---to---

Signed and Sealed this

twenty-seventh Day of *January* 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks