

Nov. 9, 1926.

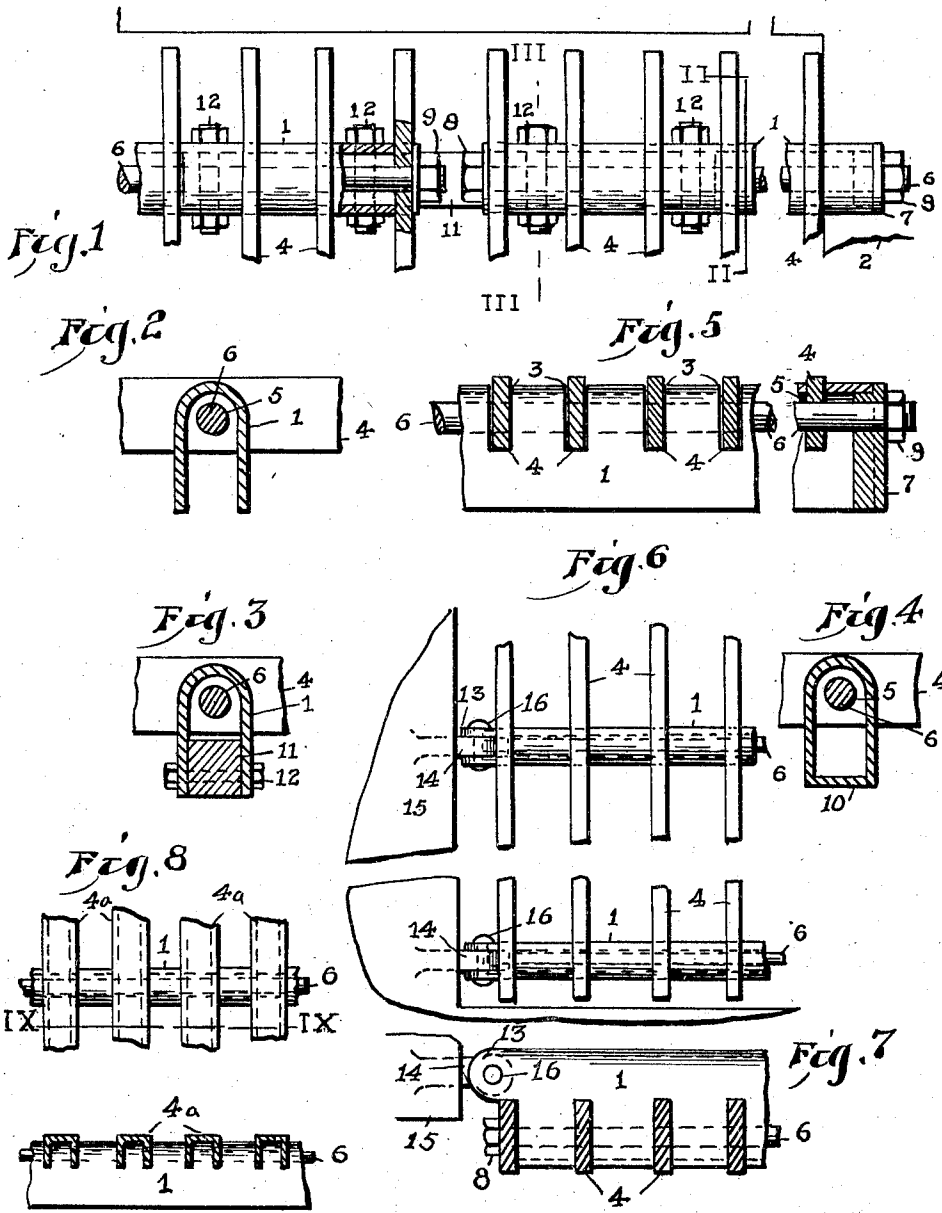
1,606,434

L. R. McAFOOS

GRID STRUCTURE

Filed Feb. 12, 1926

2 Sheets-Sheet 1



INVENTOR.
Lawrence R. McAfoos.
BY Edward A. Lawrence
his ATTORNEY.

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L. R. McAFOS

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2 Sheets-Sheet 2

Fig. 10

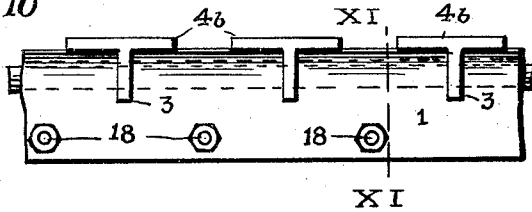
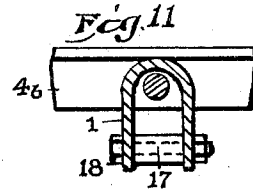


Fig. 12

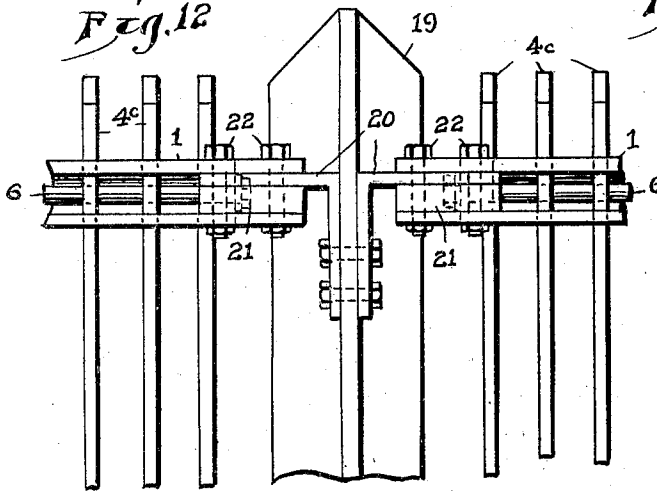


Fig. 16

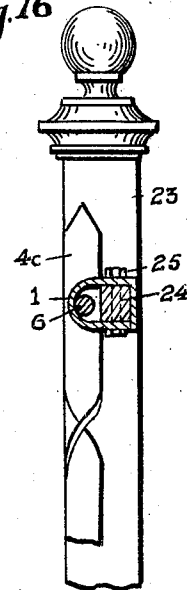


Fig. 13

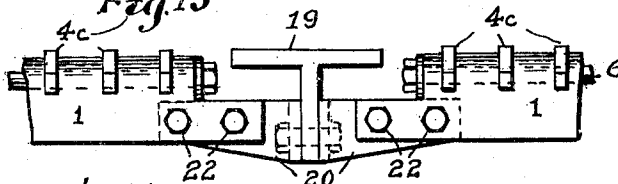


Fig. 14

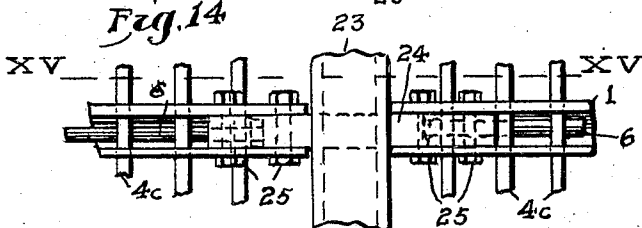
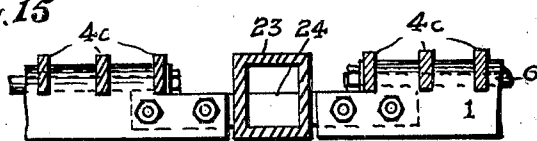


Fig. 15



INVENTOR.
Lawrence R. McFoss
BY Edward A. Lawrence
his ATTORNEY.

UNITED STATES PATENT OFFICE.

LAWRENCE R. McAFOS, OF BELLEVUE, PENNSYLVANIA, ASSIGNOR TO RELIANCE STEEL PRODUCTS COMPANY, A FIRM COMPOSED OF LAWRENCE R. McAFOS AND MAX PINKUS, OF PITTSBURGH, PENNSYLVANIA.

GRID STRUCTURE.

Application filed February 12, 1926. Serial No. 87,780.

The object which I have in view is the provision of a new and improved grating structure which is simple and relatively inexpensive in construction, which may be readily assembled in proper alinement without requiring special skill, and readily disassembled, and which is strong and durable and also of attractive appearance.

My grating structure may be used for any purpose for which a metallic grating is used, as, for instance, side-walks, gratings, window gratings, bank gratings, fences and the like.

In general my improved grating structure is of the following character.

I employ two or more parallel girder bars which are metal bars bent up or formed in a substantially U shape with slots cut in the enclosed or arcuate side, and in the slots are fitted the grating bars, the grating bars bearing on the ends of the slots and being held against displacement in said slots by means of through-bolts extending longitudinally within the girder bars and through aligned holes in the grating bars and with their ends bearing against washers which close the ends of the girder-bars.

I provide novel means for splicing the ends of the aligned girder bars whereby the length of the grating or other structure may be extended without sacrifice of strength or efficiency.

Other novel features of construction and arrangement of parts will appear from the following description.

In the accompanying drawings wherein I have illustrated the best embodiment of the principles of my invention now known to me, Fig. 1 is a broken plan view of a side-walk grating to which my invention is applied; Fig. 2 is a cross section thereof taken along the line II—II in Fig. 1; Fig. 3 is a similar view taken along the line III—III in Fig. 1; Fig. 4 is a view similar to Fig. 2 but showing a modification; Fig. 5 is a broken side elevation of one of the girder bars with its ends broken away in section to show the through-bolt and the end washer and the grating bars being shown in section; Fig. 6 is a broken elevation showing the invention developed as a gate; Fig. 7 is a broken plan view of the same; Fig. 8 is a broken elevation showing the invention developed as a window grating or bank barrier with channel grating bars; Fig. 9 is a sectional view taken along the

line IX—IX in Fig. 8; Fig. 10 is a plan view showing the invention developed as a fence with T shaped bars or pickets; Fig. 11 is a sectional view taken along the line XI—XI in Fig. 10; Fig. 12 is a front elevation of a fence embodying the principles of my invention; Fig. 13 is a plan view of the same; Fig. 14 is a broken front elevation of a modified form of the fence; Fig. 15 is a plan view of the structure shown in Fig. 14 with the post sectioned along the line XV—XV in Fig. 14; and Fig. 16 is a side view of the post with the girder bar and connecting bar shown in section.

Referring to Figs. 1, 2, 3 and 5 wherein my invention is shown developed as a side-walk grating, 1 represents one of a plurality of girder bars which are supported in parallel and spaced relation. Thus at the right of Fig. 1 the girder bar is shown supported by the area wall 2. Said bars are of metal bent or formed to a substantially U-shaped cross section, and in the case of a side-walk grating the closed or arcuate side is turned upwardly so that the U is inverted.

The closed or arcuate side of the girder bar is provided at regular intervals with transverse slots 3 in which are fitted the grating bars 4 which are disposed at right angles to the girder bars and are supported by the end walls of the slots 3. The grating bars 4 are provided with aligned holes 5 which are positioned within the interior of the girder bar 1, and 6 is a through-bolt which is inserted through said holes and extends longitudinally of and within the girder bar. At either end of the girder bar is a washer 7 which fits against the end of the girder bar and is shouldered as shown in Fig. 5 so as to enter the end of the girder bar and maintain its position. The washers are provided with holes which are aligned with the holes in the grating bars and the through-bolt 6 extends through the washers, the head 8 of the bolt bearing from without against one of the end washers while the nut 9 is screwed up on the bolt against the other washer.

It is evident that the grating bars 4 are supported by the girder bars resting on the ends of the slots 3 and not by the through-bolts, so that the through-bolts support no burden but merely retain and bind the grating bars in their assembly with the girder bars.

In Fig. 4 I show the lower side of the girder bar, or the side opposite that provided with the slots 3, with a closure formed by the turned over portion 10 of one of the side walls. This gives the girder bars a more finished appearance where they are exposed to view.

It is not necessary to provide girder bars of sufficient length to span the space between the area walls or other end supports which are relatively far apart but alined girder bars may be conveniently spliced without sacrifice of strength or rigidity.

Thus in Fig. 1 I have shown two alined girder bars 1 with their ends sufficiently spaced apart to provide clearance for the head 8 of one through-bolt and the threaded end and the nut 9 of the other through-bolt. In Fig. 3, 11 represents a splice bar of proper cross sectional shape to fit into the interior of the alined girder bars below the grating bars 4. The splice bar 11 is held in place by the transverse bolts 12 which extend through alined holes in the opposite walls of the girder bar and of the splice bar 11. I make the splice bar of sufficient length so it can be provided with two bolts at each end. It is thus evident that the grating can be made in sections of convenient dimensions to handle and place in position and the splice bars may then be installed and bolted in place. In Fig. 1 at girder connections the top section of girder is notched out to provide for a washer and nut on each through-bolt for tightening grating bars in each section of grating where splice bar 11 connects same.

Referring to Figs. 6 and 7 I show the development of my grating structure as a gate, the girder bars being horizontally disposed to form the rails of the fence while the grating bars are vertically disposed to form the pickets. I may hingedly support the gate in place as follows. 13 represents end extensions of the rear portions of the girder bars 1, forming upper and lower perforated ears between which the bars 14, extending horizontally from the post 15 are inserted, 16 being pivot bolts extending down through the perforation in the ears 13 and an alined hole in the bar 14.

In Figs. 8 and 9 I have illustrated the development of my invention as a window or bank grating, the grating bars 4^a being channel shaped with their closed side disposed outwardly to cause a broader bar effect.

In Figs. 10 and 11 I have shown T-shaped grating bars 4^b used, the arm of the T being outwardly while the stem of the T is inserted in and bears against the ends of the slots 3 in the girder bar 1. Where great strength is necessary, as where considerable weight is to be sustained, or a strong barrier is to be provided the girder bars 1 may be braced by means of sleeves 17 which are

interposed between the side walls of the girder bars with the ends of the sleeve registering with holes in said side walls and bolts 18 being inserted through the same and tightened.

In Figs. 12 and 13 I show a convenient form of metal fence in which my invention is used, the vertical pickets 4^c being clamped in assemblage with the girder bars 1 or by means of the through-bolts 6 in the manner above described.

19 represents the post which may be conveniently of T-shaped cross section with the stem of the T extending rearwardly and having bolted or otherwise attached thereto on either side the angular brackets 20, whose horizontal portions extend into the interiors of the girder bars 1 and support the same in place, filler blocks 21 filling the space within the girder bars below the brackets and bolts 22 passing through the assembled parts to clamp them in place. This forms a very strong fence structure.

In Figs. 14, 15 and 16 I show the use of a hollow or box post 23 through which extends the horizontal splice bars 24 whose ends occupy the ends of the girder bars 1 and are clamped therein by the bolts 25.

My grating structure, as is apparent, is very simple in construction and can be easily assembled by one unskilled in the use of tools. It can be as easily disassembled. It is of great strength and lends itself to a great many character of purposes for which metallic grating structures are used.

What I desire to claim is:—

1. In a grating structure for the purposes described, the combination of a plurality of parallel grating bars, a girder bar positioned angularly thereto and provided with a plurality of transverse slots in which the grating bars are inserted, said grating bars being provided with holes which are alined when the grating bars are in place, and a through-bolt parallel with the girder bar and extending through the holes in the grating bars.

2. In a grating structure for the purposes described, the combination of a plurality of parallel grating bars, a girder bar positioned angularly thereto and provided with a plurality of transverse slots in which the grating bars are inserted, said grating bars being provided with holes which are alined when the grating bars are in place, a through-bolt parallel with the girder bar and extending through the holes in the grating bars, and means for holding said bolts in position.

3. In a grating structure for the purposes described, the combination of a plurality of parallel grating bars, a girder bar positioned angularly thereto and provided with a plurality of transverse slots in which the grating bars are inserted, said grating bars

being provided with holes which are alined when the grating bars are in place, a through-bolt parallel with the girder bar and extending through the holes in the grating bars, and washers engaging said girder bar and against which the through-bolt is tightened to hold it rigidly in position.

4. In a grating structure for the purposes described, the combination of a plurality of girder bars of substantially U-shape disposed in parallel and spaced relation and provided with transverse slots, grating bars supported in said slots and having holes positioned within the girder bars, and through-bolts extending longitudinally within the girder bars and extending through the holes in the grating bars.

5. In a grating structure for the purposes described, the combination of a plurality of girder bars of substantially U-shape disposed in parallel and spaced relation and provided with transverse slots, grating bars supported in said slots and having holes positioned within the girder bars, through-bolts extending longitudinally within the girder bars and extending through the holes in the grating bars, and means for fixing said through-bolts in position relative to the girder bars.

6. In a grating structure for the purposes described, the combination of a plurality of girder bars of substantially U-shape disposed in parallel and spaced relation and provided with transverse slots, grating bars supported in said slots and having holes positioned within the girder bars, through-bolts extending longitudinally within the girder bars and extending through the holes in the grating bars, and washers positioned at the ends of the girder bars, through which the through-bolts pass and against which said bolts are tightened.

7. A spliced grating structure for the purposes described comprised of substantially U-shaped girder bars in alinement and each provided with transverse slots, grating bars clamped in said slots, and a splice bar overlapping the alined girder bars having its ends secured within the hollow ends of the alined girder bars.

8. A spliced grating structure for the purposes described comprised of substantially U-shaped girder bars in alinement and each

provided with transverse slots, grating bars clamped in said slots, and a splice bar overlapping the alined girder bars having its ends within the hollow ends of the alined girder bars and bolts extending through holes in the walls of said girder bars and the splice bars to clamp the elements together.

9. In a grating structure, the combination of a pair of parallel and spaced apart girder bars of substantially U-shape and provided with transverse slots, grating bars disposed angularly to said girder bars and occupying said slots, said grating bars being provided with bolt holes which are alined with said girder bars and through-bolts extending within said girder bars and inserted through said holes to hold the grating bars in position.

10. In a grating structure, the combination of a pair of parallel and spaced apart girder bars of substantially U-shape and provided with transverse slots, grating bars disposed angularly to said girder bars and occupying said slots, said grating bars being provided with bolt holes which are alined with said girder bars, through-bolts extending within said girder bars and inserted through said holes to hold the grating bars in position, a fixed element, connecting bars extending from said fixed element into the interior of said girder bars, and means for securing said connecting bars to said girder bars.

11. In a grating structure, the combination of a pair of parallel and spaced apart girder bars of substantially U-shape and provided with transverse slots, grating bars disposed angularly to said girder bars and occupying said slots, said grating bars being provided with bolt holes which are alined with said girder bars, through-bolts extending within said girder bars and inserted through said holes to hold the grating bars in position, a fixed element, connecting bars extending from said fixed element into the interiors of said girder bars, and pivotal connections between said connecting bars and said girder bars whereby the grating structure is hinged to said fixed support.

Signed at Pittsburgh, Pa., this 1st day of February, 1926.

LAWRENCE R. McAFOS.