

No. 850,044.

PATENTED APR. 9, 1907.

G. E. NYE.
INTERLOCKING METAL SHEET PILING.

APPLICATION FILED FEB. 11, 1907.

Fig. 1

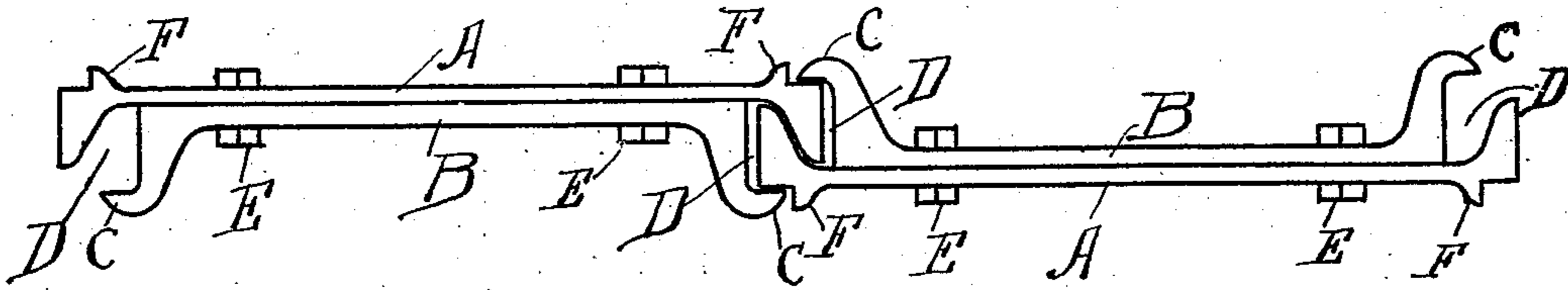


Fig. 2

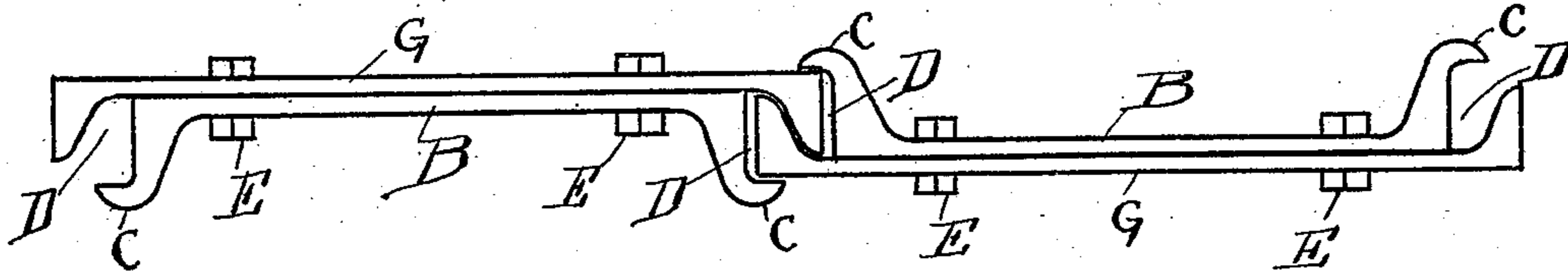
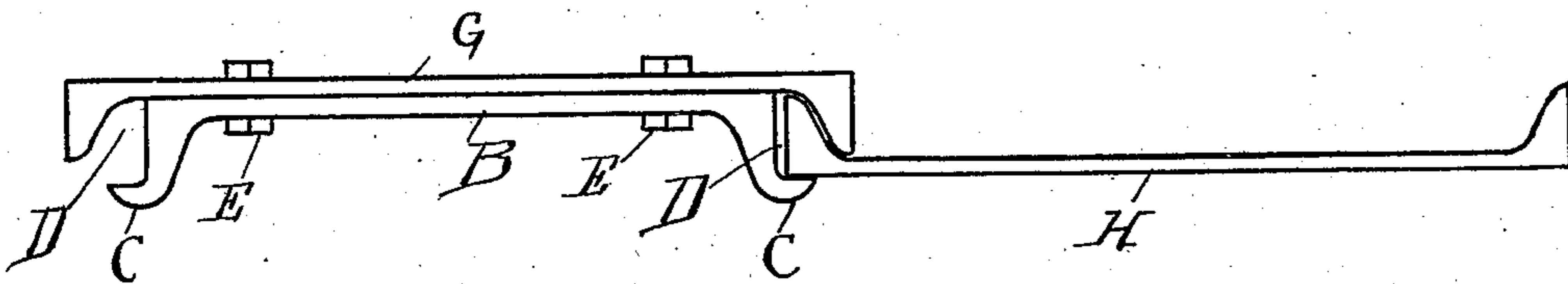


Fig. 3



Witnesses:

A. Frank-Philipson

Arthur C. Lutz

Inventor:

George E. Nye

By Rudolph J. Lutz
Atty.

UNITED STATES PATENT OFFICE.

GEORGE E. NYE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
GUSTAVUS A. KREIS, OF CHICAGO, ILLINOIS.

INTERLOCKING METAL SHEET-PILING.

No. 850,044.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed February 11, 1907. Serial No. 356,860.

To all whom it may concern:

Be it known that I, GEORGE E. NYE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Interlocking Metal Sheet-Piling; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in interlocking metal sheet-piling, the object being to provide piling of this character possessing requisite strength and the component parts of which are easily produced by rolls and assembled, and consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figures 1, 2, and 3 are views in end elevation of sheet-piling constructed in accordance with my invention.

In the construction of interlocking sheet-piling it is essential that simplicity of form of the component elements be adhered to and that such component elements be capable of being produced by the same process as structural iron of standard shapes and sizes. It is also essential that such elements shall be capable of being assembled with the greatest possible ease, so as to maintain the cost of labor and material (such as bolts and rivets) for assembling at a minimum.

It is further essential that the assembled elements composing the units reinforce each other to the greatest possible extent to prevent distortion thereof by the strains to which the same are ordinarily subjected and that such reinforcement be effected with the least increase in weight in proportion to the added strength imparted.

My present piling conforms to all of the above requirements and comprises units consisting of two channel-bars A and B each, the channel-bar A being of substantially standard shape and of greater width than the channel-bar B, the latter being disposed within said channel-bar A and having the outer face of its web disposed in contact with the inner face of the web of said bar A. The free ends of the flanges of said channel-bar B are bent over outwardly at their free ends to form

flanges C. The said channel-bars A and B are of such relative width that free spaces D are provided between the outer faces of the flanges of said channel-bar B and the inner faces of the flanges of said channel-bar A, said spaces conforming in shape with but being slightly larger than and adapted to receive the flanges of adjacent oppositely-disposed channel-bars A. The flanges C at the free ends of the flanges of the channel-bars B overhang said spaces D and are adapted to engage the outer faces of the webs of said adjacent oppositely-disposed channel-bars A, the distance of the lower overhanging faces of said flanges C from the bottoms of said spaces or recesses D being slightly greater than the distance from the free ends of the flanges of said channel-bars A to the outer faces of the webs thereof, thus allowing considerable play to said last-named flanges in the said spaces or recesses D.

I desire to direct particular attention to the fact that the said flanges C are relatively short and do not overhang the flanges of the channel-bar A, constituting the outer walls of said recesses D, as this constitutes an important feature of this invention. The said channel-bars A and B are secured together by suitable fastening devices, such as the bolts E, passing through the webs thereof, and when so secured to form a unit the latter has a web of double thickness and four flanges which renders it exceedingly stiff.

In my said drawings I have shown the flanges of the channel-bars A relatively thick at their bases and of relatively small depth in proportion to the width of the channels. It is not essential that said flanges should be of the usual depth, as the mutual reinforcement of said channels A and B renders the unit sufficiently stiff, even though said flanges are reduced in depth. I contemplate, therefore, to roll said channels A to retain all of the usual dimensions thereof except as to depth of flanges. This in turn will enable me to employ channel-bars B having flanges of standard depth and having their free ends bent over outwardly to form said short flanges C. Thus the total depth of the unit is not greater than the depth of a standard channel-bar and its weight maintained at a minimum. The sole object of the said flange C is to prevent lateral separation of the interlocked units. The said channel-bars A may

conform in shape with those shown in Letters Patent No. 832,407, granted to me October 2, 1906, the same being provided on the outer faces of their webs with ribs F, disposed
 5 parallel with and adjacent the side edges of said channel-bars. The said ribs serve to stiffen the unit to a large extent without materially increasing its weight. Such ribs are not essential and may, as shown in Figs. 2
 10 and 3, be omitted without materially affecting the merits of the structure, the channel-bars G of the units shown in said Figs. 2 and 3 being devoid of said ribs. Units thus constructed may be interlocked with each other,
 15 as shown in Figs. 1 and 2, or they may be alternated and interlocked with channel-bars H corresponding with the channel-bars G, as shown in Fig. 3.

I am aware that units having similarly-shaped recesses in their sides have been previously constructed and patented, as evidenced by Patents Nos. 734,314, 730,755, 500,780, 794,268, 744,847, 725,608, 744,361, 751,469, and 805,533; but in all except No.
 25 500,780 this has been accomplished by securing within one channel-bar or its substantial equivalent one or two Z-bars, each having one flange overhanging a flange of the channel-bar. In No. 500,780 the same result is obtained in a slightly-different manner, but
 30 which is the substantial equivalent of the Z-bar construction, except that it is more expensive and stronger.

My construction presents many advantages over the patented structures in the following particulars:

First. To secure two Z-bars to a channel-bar requires the use of a far larger number of bolts or rivets than the coupling of two
 40 channel-bars, as above described, thus increasing cost of construction.

Second. That while such Z-bars serve to stiffen the channel-bar to some extent they leave the same weak at its middle portion
 45 and increase the weight to substantially the same extent that I do in my present construction.

Third. That the overhanging flanges of the Z-bars contain a great deal of surplus metal
 50 which is of no use whatever either in stiffening the structure or improving the interlocking means and that such surplus metal is a source of weakness in that it affords a point far distant from the fastening means upon
 55 which the interlocked channel-bar exerts strain in the event of relative torsional movement of the channels or units. In my construction this surplus metal is, so to speak, "transferred" to a point where it is needed.

Fourth. That in driving sheet-piling the greatest pressure is exerted laterally against the next adjacent already-driven unit and that such pressure is frequently excessive,
 60 and so distorts the light Z-bars as to open the mouths of the L-shaped recesses and de-

stroys the effectiveness of the piling. As each Z-bar is independent of the other on the same channel, it must alone bear the strains, and the shape of such Z-bars is such
 70 as to render them relatively weak. In my present construction the strains are disposed over the entire width of the channel-bar B, and as the flanges of the latter are thicker at their bases than at their free ends they will not yield.

Fifth. That in driving the units, especially where the same are of great length, the double-thick web is of the utmost importance in preventing distortion of such web.

In all respects my said piling presents advantages of importance over other known forms of interlocking sheet-piling.

Units of great length may be constructed by disposing a number of shorter lengths of said channels A and B or B and G in staggered relation so as to break joint with each
 85 other, and units so constructed would not be materially weaker than if made of full length and channels.

I claim as my invention—

1. In interlocking sheet-piling, a unit comprising two channel-bars of different widths, the smaller being secured within the larger and having the outer face of its web disposed in contact with the inner face of the web of
 95 the larger, there being free spaces between the outer faces of the flanges of the inner channel-bar and the inner faces of the flanges of the outer, and short flanges on the free ends of the flanges of said inner channel-bar overhanging said recesses, said overhanging
 100 flanges being of less depth than the greatest width of said free spaces, the latter being adapted to receive the flanges of adjacent channel-bars.

2. In interlocking sheet-piling, a unit comprising two channel-bars of different widths, the smaller being secured within the larger and having the outer face of its web disposed in contact with the inner face of the web of
 110 the larger, there being free spaces between the outer faces of the flanges of the inner channel-bar and the inner faces of the flanges of the outer, and short flanges on the free ends of the flanges of said inner channel-bar overhanging said recesses, said flanges of
 115 said channel-bars being thicker at their bases than at their free ends, and said overhanging flanges being of less depth than the greatest width of said free spaces, the latter being
 120 larger than and adapted to receive the flanges of adjacent channel-bars.

3. In interlocking sheet-piling, a unit comprising two channel-bars of different widths, the smaller being secured within the larger and having the outer face of its web disposed in contact with the inner face of the web of
 125 the larger, there being free spaces between the outer faces of the flanges of the inner channel-bar and the inner faces of the flanges
 130

of the outer, and short flanges on the free
ends of the flanges of said inner channel-bar
overhanging said recesses, said flanges of
said channel-bars being thicker at their bases
5 than at their free ends, and said overhanging
flanges being of less depth than the greatest
width of said free spaces, the latter being
larger than and adapted to receive the
flanges of adjacent channel-bars, and ribs on
10 the outerfaces of the webs of said outer chan-

nel-bars disposed adjacent to and parallel
with the side edges thereof.

In testimony whereof I have signed my
name in presence of two subscribing wit-
nesses.

GEORGE E. NYE.

Witnesses:

RUDOLPH Wm. LOTZ,
ARTHUR G. LOTZ.