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STRUCTURAL ELEMENT FOR BUILDINGS

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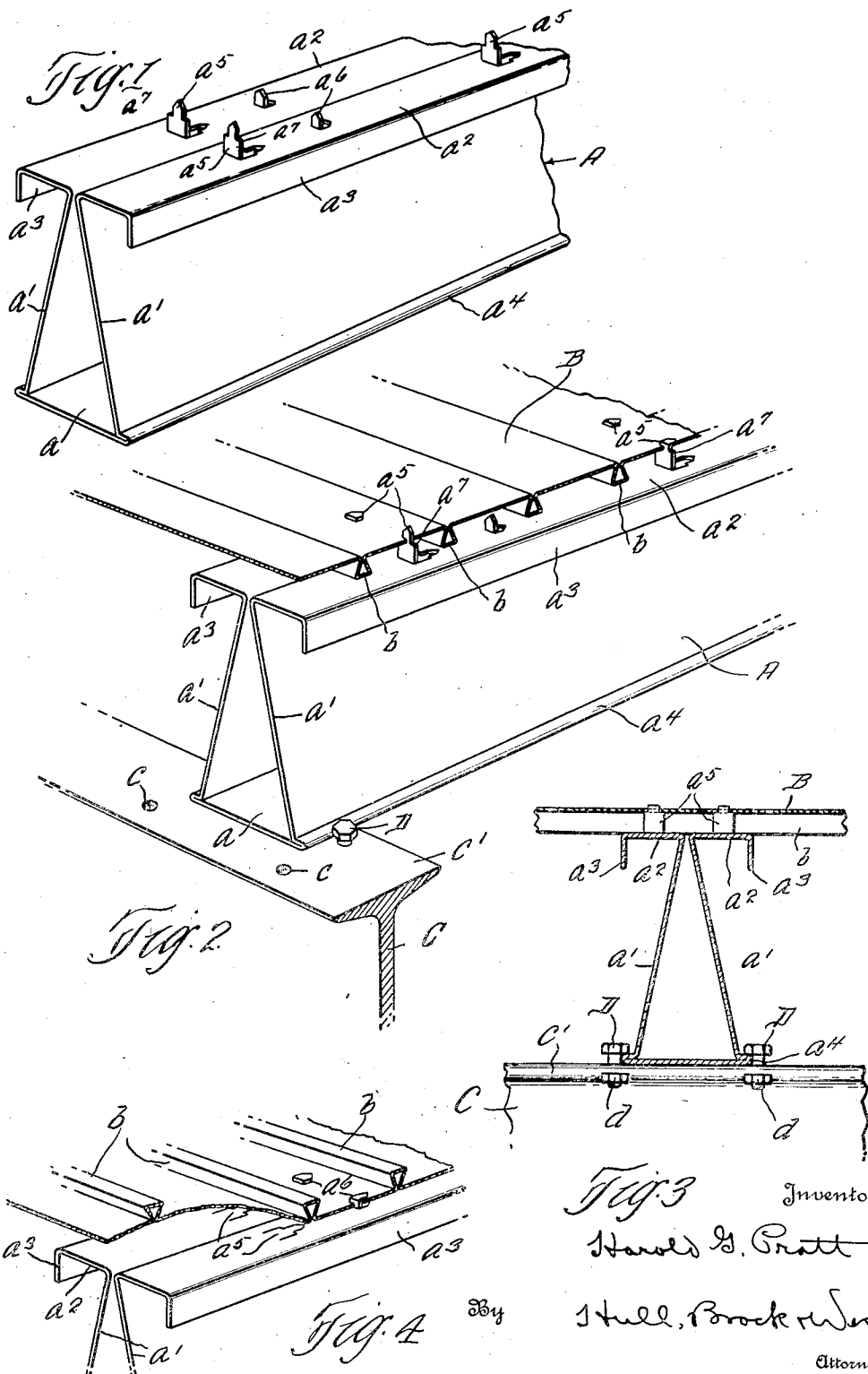


Fig. 3
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STRUCTURAL ELEMENT FOR BUILDINGS

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This invention relates to improvements in that class of structural building members or elements that are commonly known to the trade as "metal timbers." Elements of this class are distinguished from ordinary I-beam or channels principally by the fact that they are made of sheet metal.

Among the objects which I have in view is to provide an element of the above mentioned class that is made of relatively thin sheet metal so as to minimize weight and cost and is of such cross section as will insure adequate strength and rigidity and permit of its production by standard methods and equipment.

Another object is to provide a structural element of the aforesaid class that is especially convenient of use in that it is designed to facilitate attachment to girders or other supports, and for quick and easy connection with parts supported by it, such as roof and floor plates.

A further and more limited object is to produce an element of the foregoing nature that is especially intended for use with sheet metal floor or roof plates of the ribbed type, an example of which will be found in Letters Patent No. 1,574,586 issued February 23, 1926, and to this end I provide the element with integral fastening means or prongs for holding engagement with said plates, there being preferably shouldered and non-shouldered prongs for use with said plates accordingly as the plates are applied to the elements with their ribs toward or away from the same.

The foregoing and other objects are attained in the embodiment of the invention illustrated in the accompanying drawing wherein Fig. 1 is a fragmentary perspective view of my improved structural element; Fig. 2 is a similar view showing the element incorporated in a building construction; Fig. 3 is a transverse section through the element and includes associated parts of the building construction; and Fig. 4 is a view similar to Fig. 2 showing the ribbed plate inverted with respect to the position it occupies in Figs. 2 and 3.

The element, designated generally by the

reference character A, is constructed of a single piece of sheet metal of suitable gage, the thickness of the metal depending upon the cross sectional size and the length of the element and the use to which it is to be put. The element consists of a base a , webs a' that converge upwardly from the lateral edge portions of the base a , and flanges a^2 that extend outwardly from the upper edges of the webs a' and are parallel with the plane of the base a . The outer edges of the flanges a^2 are preferably turned downwardly, as shown at a^3 , to impart strength and rigidity to said flanges.

The aggregate width of the flanges a^2 is approximately equal to the width of the base a , and where the webs a' join the base, the material is desirably turned over and inwardly upon the base a relatively short distance to provide what may be termed base flanges, the same being designated a^4 .

Struck upwardly from the flanges a^2 are prongs a^5 and a^6 , the former having shoulders a^7 that are spaced above the plane of the flanges a^2 a distance equal to or slightly greater than the length of the prongs a^5 .

My improved building element is designed for use especially with floor and roof plates of the kind disclosed in the above mentioned patent, and in Figs. 2, 3 and 4 the element is shown associated with such plates. Each of these plates, designated B, consists of a flat sheet of metal provided with hollow ribs b projecting from one face thereof, each of the ribs being substantially triangular in section with its base remote from the body of the sheet and connected to such sheet by convergent sides. The spacing of the shoulders a^7 of the prongs a^5 from the faces of the flanges a^2 is substantially equal to the distance between the bases of the ribs b and the adjacent surface of the plate B.

In the incorporation of my improved structural element in building constructions, its ends are placed upon suitable supports, such as I-beam girders, a fragment of one of such girders being shown at C in Figs. 2 and 3. In order to hold the elements in place upon said girders, bolts or equivalent fastening means, designated D, are engaged

through apertures *c* in the top flanges *c'* of said girders and the heads of said bolts overlie the base flanges *a'* of the element A, and nuts *d* are applied to the ends of said bolts.

8 If the construction is that of a roof, the plates B are applied to the elements A with their ribs *b* engaging the flanges *a*. When the plate is first placed in position it bears upon the points of the prongs *a'*, and the
10 workman then pounds the plate in the immediate vicinity of said prongs until the prongs puncture the plate and project there-
above. The plate is then driven down upon the shoulders *a'* and the ends of the prongs
15 are turned over in the manner illustrated in Figs. 2 and 3.

In case the construction is that of a floor, the plates B are inverted so that their ribs *b* extend upwardly, and preparatory to ap-
20 plying the plates to the elements in this position the prongs *a'* are broken off or bent downwardly into the openings from which they were originally struck so that only the prongs *a'* are left standing. The plate is
25 brought to rest upon these prongs and by the same operation as that above described the prongs are caused to penetrate the plate and are clinched thereabove so as to effectively secure the plate in immediate contact
30 with the flanges *a'*.

By reference to the aforesaid Patent No. 1,574,586 it will be seen that suitable material is applied to the top surfaces of the plates B in the completion of the roof or
35 floor.

Having thus described my invention, what I claim is:

1. A building element for use with ribbed plates, said element having a surface where-
40 with said plates are adapted to be engaged with their ribs toward said surface, and a plurality of prongs projecting from said surface, said prongs having shoulders that
45 are spaced from said surface a distance substantially equal to the depth of the ribs of said plates.

2. A building element for use with ribbed floor or roof plates, said element having a
50 surface wherewith said plates are adapted to be engaged with the ribs either toward or away from said surface, and a plurality of prongs projecting from said surface, cer-
tain of said prongs having shoulders that
55 are spaced from said surface a distance substantially equal to the depth of the ribs of said plates.

3. A building element for use with ribbed floor or roof plates, said element being con-
60 structed of sheet metal and having a surface wherewith said plates are adapted to be engaged either with their ribs turned toward or away from said surface, and prongs struck
65 from the material of said element, certain of said prongs having shoulders spaced

from said surface of the element a distance substantially equal to the depth of said ribs.

4. A building element for use with ribbed floor or roof plates, said element consisting
70 of a sheet metal member having a base, webs extending upwardly from the lateral edges of the base, flanges extending outwardly from the upper edges of the webs in a plane substantially parallel to the base, and prongs
75 struck from said flanges and projected upwardly, certain of said prongs having shoulders spaced from the flanges a distance substantially equal to that of the depth of the ribs of said plates.

5. A building element for securing ribbed
80 roof or floor plates to beams and consisting of a sheet metal member having a base, the lateral edges of which are turned inwardly to provide base flanges, the said element hav-
ing webs converging upwardly from the
85 lateral edge portions of the base and terminating in oppositely disposed flanges extending substantially parallel with the base flanges, the said last mentioned flanges hav-
ing prongs struck up therefrom, certain of
90 said prongs having shoulders thereon and adapted for engagement with said plates to secure the same in place.

In testimony whereof, I hereunto affix my
signature.

HAROLD G. PRATT.

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