

Z. S. Ayres,

Girder,

No. 120,228.

Patented Oct. 24, 1871.

Fig. 1,

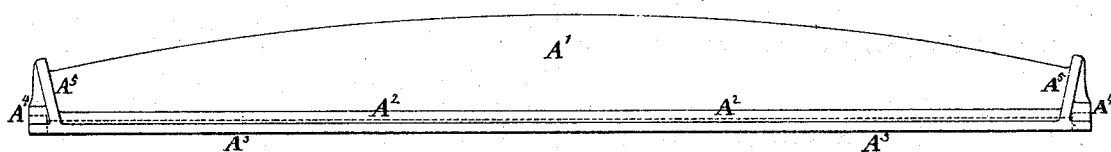


Fig. 2,

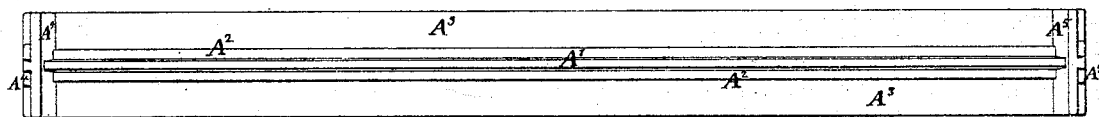


Fig. 3,

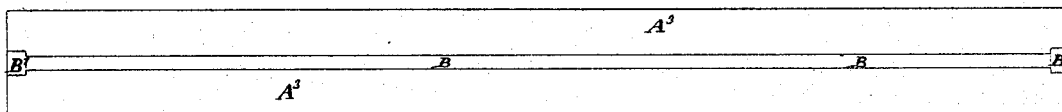


Fig. 4,

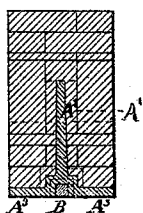
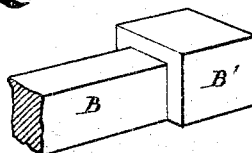


Fig. 5,



Witnesses,

C. C. Livings

A. Hoernum

Inventor,

Z. S. Ayres

by his atty
J. H. H. H.

UNITED STATES PATENT OFFICE.

ZEPHANIAH S. AYRES, OF NEW YORK, N. Y.

IMPROVEMENT IN GIRDERS.

Specification forming part of Letters Patent No. 120,228, dated October 24, 1871.

To all whom it may concern:

Be it known that I, ZEPHANIAH S. AYRES, of the city and county of New York, in the State of New York, have invented certain Improvements in Girders.

The girder is intended more particularly for use in the fronts of city buildings to support brick walls and afford a comparatively open space below. It is strong, and requires little depth below the first line of window-sills in the masonry, and affords a flat under surface against which to build the light framing which holds the large glass plates and the like below. Arched girders with ties have been long common. Flat girders having under surfaces substantially like mine have also been common without ties; but whenever a tie has been employed it has sacrificed in whole or in part the advantages due to the flat under surface.

My girder has a thin plain vertical web embraced within the substantial brick-work, by which it is held stiffly in position. The cast-iron portion is formed with a deep channel extending up into its body just sufficient or a very little more than sufficient to receive the tie.

The following is a description in detail of the best means of carrying out the invention.

The accompanying drawing forms a part of this specification. Figure 1 is a side elevation. Fig. 2 is a plan view. Fig. 3 is a base view from below. These figures show the girder alone. Fig. 4 is a cross-section of the girder with the wall built upon it. Fig. 5 is a perspective view of one end of the tie detached.

Similar letters of reference indicate like parts in all the figures.

The cast-iron portion of the girder is indicated by A¹ A², &c. The wrought-iron tie with its head is indicated by B B'. To provide space for the long groove in the cast-iron portion to receive the wrought-iron portion the casting is formed with heavy beads A² along the re-entering angles at the junction of the plain vertical web A¹ with the flat bed A³. A⁵ are parts corresponding to the skewbacks, made correspondingly to receive and support low arches or segments formed in the masonry, if such are desired in any case. A⁴ are slight elevations in

the casting at the end to properly cover and inclose the upper side of the heads B', which are welded on the body B of the tie or tie-rod. The heads B' match into corresponding enlargements at the end of the channel which receives the tie. The tie is made a little short, and is expanded by heat when it is inserted in the channel, as will be readily understood. The body B of the tie may be square, round, or of various other forms, the groove being correspondingly formed. A round section of the tie avoids the necessity for any re-entering angular line in the channel which receives it. A square form makes a nearly flush surface at the base of the girder. A form of section round on the upper side and flat on the lower face conforms to both these conditions, but involves the necessity of employing iron specially rolled or otherwise specially prepared for the purpose, while square or round iron can always be commanded.

My invention allows the cast-iron to be of equal thickness throughout, and gives a harmonious union of the wrought and cast-iron to obtain the maximum strength with the least material; gives a flat under surface; gives a strongly-supported plain web, and a broad bed adapted to fairly support the masonry thereon. The beads A² interfere but little with the laying of the bricks, which may be matched thereto with little labor. The strength of these girders has been proved by severe tests. They are now in great favor with builders and owners of property in the city. About a hundred have been already put into the fronts of the buildings on principal streets in this city during the few months past.

I claim as my invention—

The within-described construction of compound girder, the same having a cast-metal part, A¹ A² A³, with a plain under face and a wrought-metal tie, B, let up into the casting so as to lie just within the plane of the lower face and flush therewith, as herein specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

Z. S. AYRES.

Witnesses:

T. ALBERT EGLEHORT,
J. H. RAND.

(30)