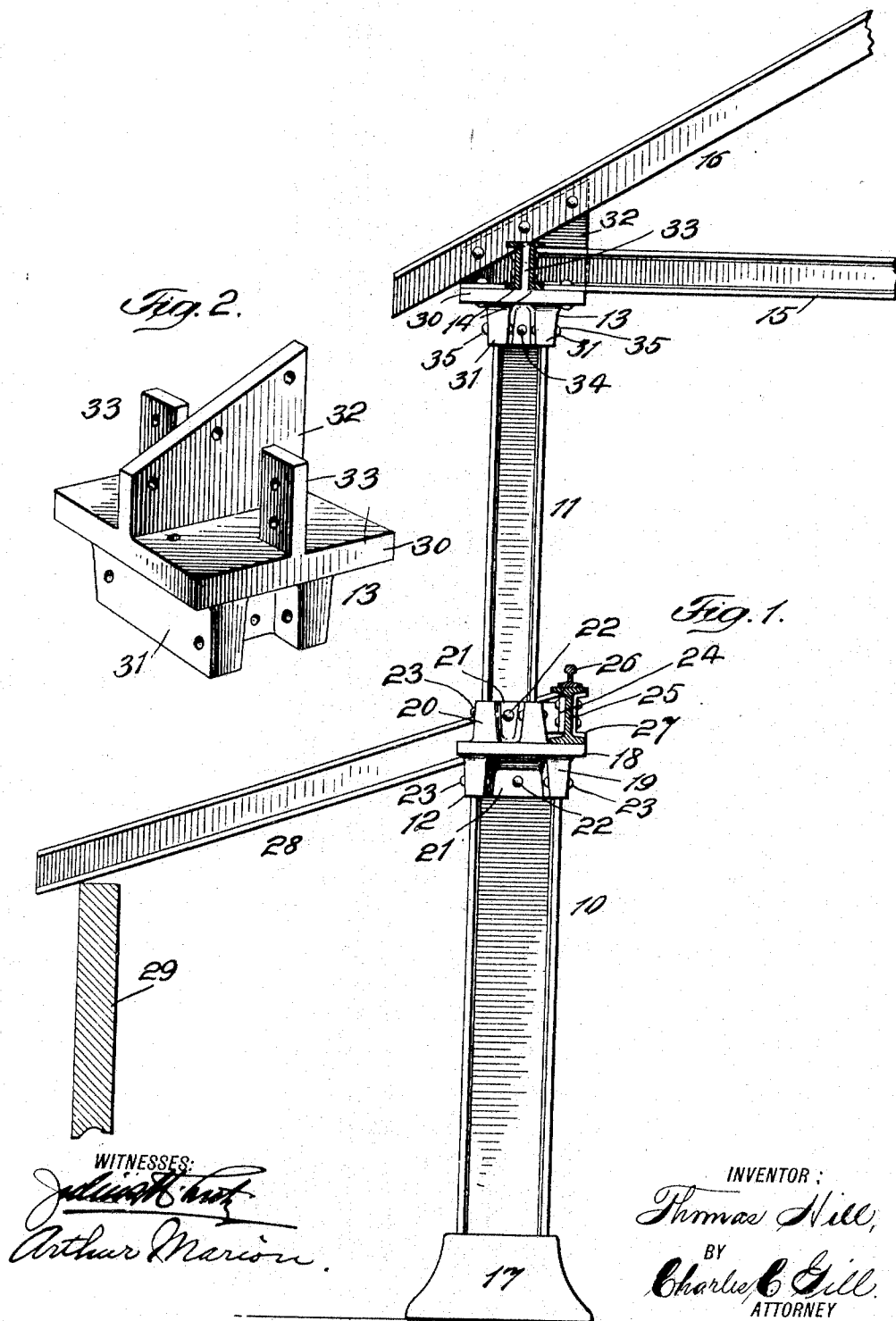


T. HILL.  
METALLIC BUILDING STRUCTURE.  
APPLICATION FILED MAY 7, 1915.

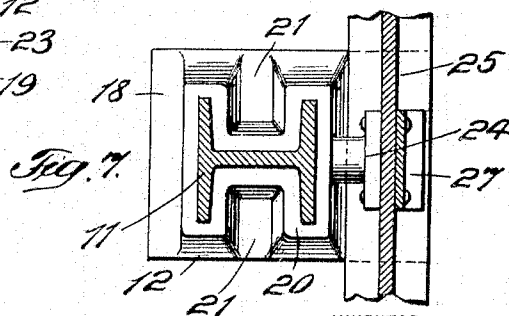
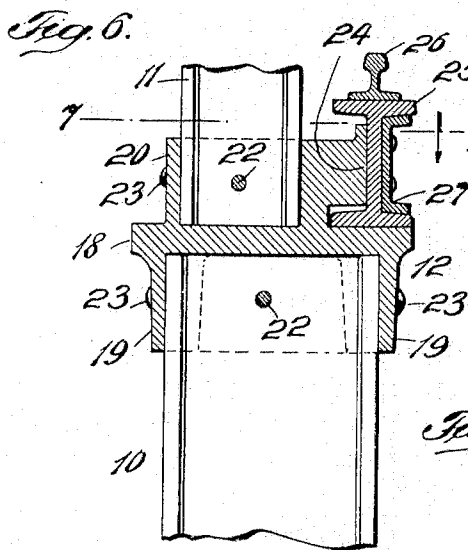
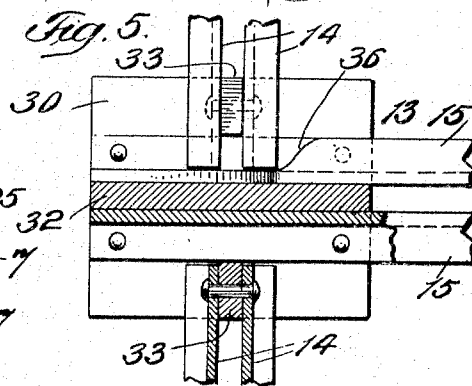
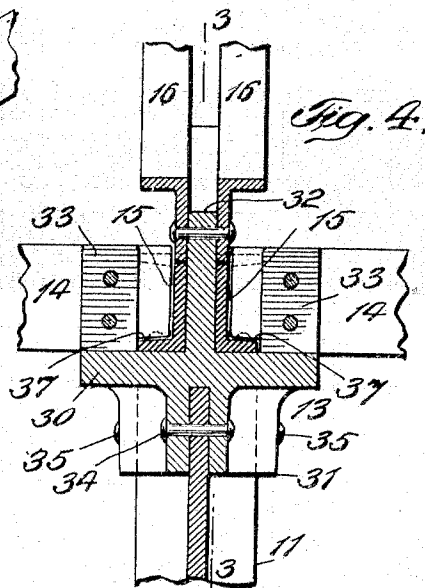
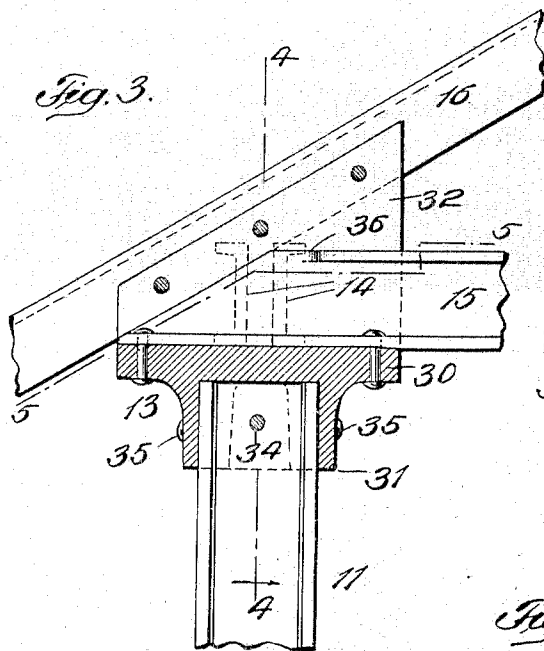
Patented Mar. 5, 1918.  
2 SHEETS—SHEET 1.



1,258,408.

T. HILL.  
METALLIC BUILDING STRUCTURE.  
APPLICATION FILED MAY 7, 1915.

Patented Mar. 5, 1918.  
2 SHEETS—SHEET 2.



WITNESSES:  
*Julius H. Hill*  
*Arthur Marion*

INVENTOR:  
*Thomas Hill*  
BY  
*Charles B. Gill*  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

THOMAS HILL, OF JERSEY CITY, NEW JERSEY.

## METALLIC BUILDING STRUCTURE.

1,258,408.

Specification of Letters Patent.

Patented Mar. 5, 1918.

Application filed May 7, 1915. Serial No. 26,458.

*To all whom it may concern:*

Be it known that I, THOMAS HILL, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Metallic Building Structures, of which the following is a specification.

The invention pertains more particularly to novel cap-sockets adapted to receive the adjoining ends of beams in architectural structures, these cap-sockets being of an integral character and having for their object the dispensing with a large number of pieces riveted together. The cap-sockets of my invention are each integral and may be employed for receiving the adjoining ends of two vertical beams or sections of a column or the upper end of one vertical column or beam and also the adjacent ends of girders, trusses and the like. The columns, beams, girders and trusses employed in connection with my invention may be of the well-known structural shapes, and the cap-sockets made the subject of my invention have been designed to receive these structural shapes and at the same time dispense with the complexity of plates and rivets at present employed in building construction at the adjoining ends of columns, beams, girders and the like.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 illustrates in edge elevation and partly in section, one unit of a shop building construction embodying my invention;

Fig. 2 is a detached perspective view, on a larger scale, of a cap socket employed upon the upper end of the upper section of the vertical column shown in Fig. 1 and adapted to receive the girders and truss beams;

Fig. 3 is an enlarged vertical sectional view, partly broken away, of the construction at the upper end of the upper column section, including the horizontal and truss beams, the section being taken on the dotted line 3—3 of Fig. 4;

Fig. 4 is a vertical section through the same taken on the dotted line 4—4 of Fig. 3;

Fig. 5 is a transverse section, partly broken away, through the same on the dotted line 5—5 of Fig. 3;

Fig. 6 is a central vertical section through the cap structure located upon the upper end of the lower column section and receiving the lower end of the upper column section, and

Fig. 7 is a horizontal section through the same taken on the dotted line 7—7 of Fig. 6.

In the drawings I illustrate, as an example of my invention, a section of shop building construction, and in this construction there will be a number of vertical columns, girders, truss beams and the like, all corresponding with one another and being as numerous as the size of the building may require. I therefore only illustrate in the drawings one unit or part of the building, it being understood that the invention is comprised in each unit such as the one shown.

In the drawings, the vertical column is composed of two end to end rolled steel H beams 10, 11, an integral socket 12 receiving the upper end of the lower section 10 and the lower end of the upper section 11, and an integral cap socket 13 secured upon the upper end of the upper section 11 and affording means for receiving and having secured thereto longitudinal and transverse pairs of channel girders 14, 15, respectively, and a pair of parallel angle beams or trusses 16.

The column, at the lower end of the section 10, is secured upon a base 17 of suitable construction. The column section 11 is less in horizontal dimensions than the column section 10, as shown.

The cap socket 12 has a substantially central plate member 18, and a downwardly extending section 19 conforming to the general outline of the column section 10 and formed with a recess following said outline to receive or be placed upon the upper end of said column section 10. The cap socket 12 also has a section 20 extending upwardly from the plate member 18, and this section 20 conforms in general outline to the lower end of the column section 11 and con-

tains a recess following said outline to snugly receive the lower end of said column section 11. In their opposite vertical sides the sections 19, 20 are recessed inwardly, as  
 5 at 21, so as to avoid the use of an undue amount of metal and afford sections of reasonable thickness close to the webs of the column sections 10 and 11 and through which rivets or the like 22 may be passed  
 10 in securing the cap socket 12 to the column sections 10, 11. The cap socket 12 is further secured to the column sections 10, 11 by rivets 23 which extend through corner portions thereof and the flanges of the column  
 15 sections 10, 11, the inner ends of said rivets being exposed at the recesses 21. The cap socket 12 thus becomes very securely fastened to the adjoining ends of the column sections 10, 11, both from the fact that said  
 20 cap socket snugly receives said ends and affords a bearing therefor and also from the fact that the rivets or the like 22, 23 extend at right angles to each other and engage both the webs and the flanges of  
 25 the column sections.

The cap socket 12 at the side thereof facing inwardly into the shop, is formed integrally with a T-plate section 24, shown more clearly in Figs. 6 and 7, whose lower edge  
 30 is above the plate member 18 of the cap socket and whose upper edge is about on a level with the upper edge of said socket, and to this plate is riveted a crane girder 25 upon which is secured a track rail 26  
 35 for a crane and which girder 25 finds a seat upon a laterally extending portion of the plate member 18 of the cap socket 12. In order to increase the security of the crane girder 25 I apply to the outer face thereof  
 40 an angle plate 27 and extend the rivets by which the girder is secured to the plate 24 through said plate 27, as shown in Figs. 1, 6 and 7.

It is customary in shop construction to  
 45 have a crane girder 25, and it is also customary in shop construction to have rolled beam columns formed of two sections connected together adjacent to the crane girder, but in all these constructions known to me  
 50 the adjoining ends of the column sections and the crane girder have been connected together by a great multiplicity of individual plates and rivets tending to the increased cost of construction and decreased efficiency  
 55 thereof. The cap socket 12 provided by me affords in one integral piece highly efficient means for connecting the adjoining ends of the column sections and supporting the crane girder. The means provided by me  
 60 for connecting the adjoining ends of the column sections and supporting the crane girder is of great simplicity, durability and efficiency, and being an integral casting may be quickly applied to position, this making  
 65 a great saving in labor as well as adding

to the desirability and efficiency of the structure.

The main shop room for heavy machinery is between the rows of columns, and at the outer sides of said columns a room may be  
 70 provided for benches and workmen, and ordinarily this room will have a low roof formed from girders or beams 28 supporting glass frames through which the light  
 75 may pass. The beams 28 may be supported at their inner ends from the sides of the girder 25 and at their outer ends upon a wall or the like 29.

The cap socket 13 upon the upper end of the column section 11 is of special impor-  
 80 tance, and it is illustrated in perspective in Fig. 2 in which it may be seen that said socket comprises a horizontal plate member 30, a downwardly extending socket member 31, an upwardly projecting central  
 85 flange member 32 and upwardly projecting plate or flange members 33, the member 32 extending transversely of the building and the members 33 longitudinally thereof, and all of the parts mentioned being in one in-  
 90 tegral casting. The socket member 31 conforms to the general outline of the upper end of the column section 11 and contains a socket closely fitting upon or receiving the  
 95 upper end of said column section. The cap socket 13 is secured to the column section 11 by rivets 34 extending through the sides of said cap socket and the web of the column  
 100 section, and by rivets 35 which extend through the corner portions of the cap socket 13 and the flanges of said column section, means being provided in the cap socket and column section to receive said rivets.

The longitudinal and transverse girders  
 105 14, 15 have a bearing upon the plate member 30 of the cap socket 13, and these girders are arranged in pairs and of channel shape, as may be seen in Fig. 5. The web portions of the pairs of girders 14 face each  
 110 other and engage the opposite faces of the flanges 33 of the cap socket and are riveted thereto, the rivets extending through the webs of said girders and said flanges. The girders or beams 14 may be riveted through  
 115 their lower flanges to the plate member 30 of the cap socket, if desired.

The parallel girders or channel beams 15 engage the opposite faces of the flange 32 and have their lower flanges riveted to the plate member 30 of the socket 13. The  
 120 outer upper end portions of the girders or beams 15 are cut off at an angle, as shown in Fig. 3, from a point adjacent to the inner girders 14, the upper flanges of the girders being cut inwardly to the web portions  
 125 thereof, as at 36 in Fig. 5, whence the web portions of said girders or beams are cut downwardly on an inclined line to match the lower edge of the truss beams 16. The girders or beams 15 rest flat upon the plate  
 130

member 30 of the cap 13, and the inner ends of the longitudinal beams or girders 14 are cut away at their adjoining ends, as at 37 (Fig. 4), between the flanges 32, 33 so that the lower flanges of the beams or girders 15 may continuously engage the plate member 30.

The truss beams or girders 16 are the roof girders and they are employed in pairs and are of angle shape, as shown in Fig. 4. The girders or beams 16 face each other at the opposite sides of the flange 32 and are securely riveted to said flange. The lower edges of the girders or beams 16 rest on the upper inclined end edges of the girders or beams 15, as shown in Figs. 3 and 4, and hence not only becomes supported by rivets securing them to the flange 32, but also from the fact that they are parallel and rest on the end portions of the beams or girders 15.

The cap socket 13 is in one integral casting, and affords means for securing it upon the column section 11 and for receiving the longitudinal and transverse girders or beams 14, 15 and roof girders or beams 16, and this cap socket 13 being in one integral piece avoids the necessity for using the many pieces now commonly employed at the upper ends of columns where the ceiling and roof beams or girders are secured. I regard the cap sockets 13 as of particular importance in building construction because of its great efficiency and durability and the ease with which it may be applied to position and receive the adjacent parts of beams, girders and the like to be connected with the upper end of the columns. A cap socket 13 will be at the upper end of each column of the building, and its use increases the strength and durability of the building construction, effects a great reduction in the number of parts to be riveted together, and saves a great deal of labor and expense.

The beams, girders, etc., employed in my construction are of well known commercial shapes, and I have constructed the cap sockets 12, 13 of my invention with the view of adapting them for rolled beams of commercial shape. My invention as a whole has been designed with a view of dispensing with many parts commonly employed in making joints in buildings constructed of structural beams, adding increased strength and reliability to building structures, cheapening the material-cost of such structures, saving time in erecting such buildings and lessening the labor-cost of construction.

What I claim as my invention and desire to secure by Letters-Patent, is:

1. In a metal frame building structure, a vertical column beam, a cap-socket therefor comprising integrally a horizontal plate-member, a depending vertical socket-member having a socket therein conforming to

and receiving the end of said beam and a transversely extending upwardly projecting vertical plate-member, means securing said cap-socket to said column beam, a transverse girder beam upon said horizontal plate-member cut off on an incline on its upper outer end edge below the upper edge of said vertical plate-member, and an inclined roof beam secured to the face of said vertical plate member and partly supported at its end on the upper inclined edge of said girder beam.

2. In a metal frame building structure, a vertical column beam, a cap-socket therefor comprising integrally a horizontal plate-member, a depending vertical socket-member having a socket therein conforming to and receiving the end of said beam and a transversely extending upwardly projecting vertical plate-member, means securing said cap-socket to said column beam, parallel transverse beams upon said horizontal plate-member at opposite sides of said vertical plate-member and cut off on an incline on their upper outer end edges below the upper edge of said vertical plate-member, and parallel inclined roof-beams secured to the opposite faces of said vertical plate-member and partly supported at their ends on the upper inclined edges of said transverse beams.

3. In a metal frame building structure, a vertical column beam, a cap-socket therefor comprising integrally a horizontal plate-member, a depending vertical socket-member having a socket therein conforming to and receiving the end of said beam, longitudinally extending upwardly projecting plate-members and a transversely extending upwardly projecting plate-member between said longitudinal plate-members, means securing said cap-socket to said column beam, longitudinal beams secured to said longitudinal plate members and seated on said horizontal plate-member, transverse beams secured on said horizontal plate-member, and inclined roof-beams secured to the opposite faces of said transverse plate-member.

4. In a metal frame building structure, a vertical column beam, a cap-socket therefor comprising integrally a horizontal plate-member, a depending vertical socket-member having a socket therein conforming to and receiving the end of said beam, longitudinally extending upwardly projecting plate-members and a transversely extending upwardly projecting plate-member between said longitudinal plate-members, means securing said cap-socket to said column beam, longitudinal beams secured to said longitudinal plate members and seated on said horizontal plate-member, transverse beams secured on said horizontal plate-member, and inclined roof-beams secured to the opposite faces of said trans-

verse plate-member, said transverse beams of New York and State of New York, this  
being cut off on an incline on their upper 4th day of May, A. D. 1915.  
outer end edges below the upper edge of  
said transverse plate-member, and said roof  
5 beams being partly supported on said in- THOMAS HILL.  
clined end edges of said transverse beams.  
Signed at New York city, in the county

Witnesses:

ARTHUR MARION,  
CHAS. C. GILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."