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JOINT STRUCTURE FOR SUPERIMPOSED COLUMNS.

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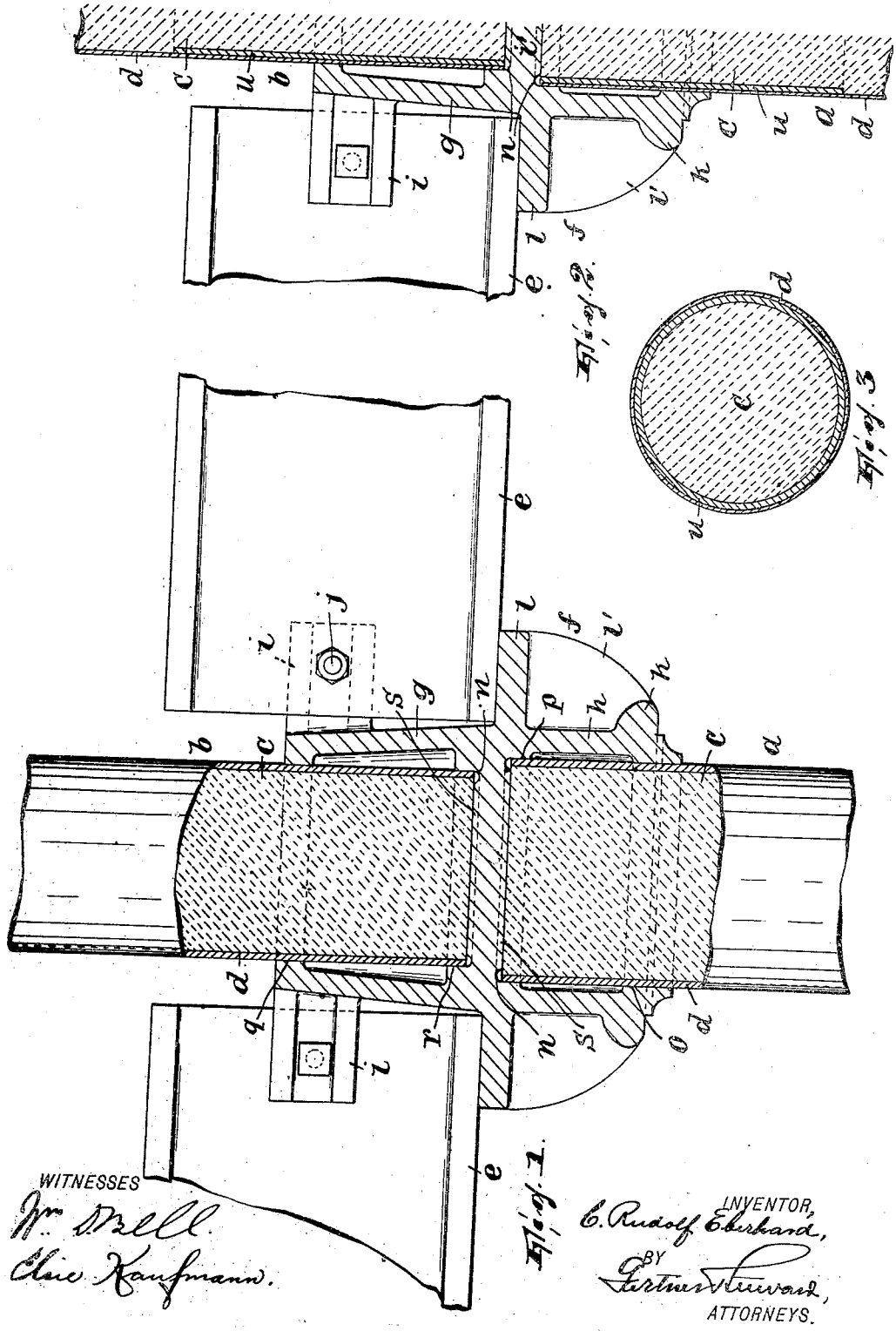


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES

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JOINT STRUCTURE FOR SUPERIMPOSED COLUMNS.

No. 880,285. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed November 25, 1907. Serial No. 403,647.

To all whom it may concern:

Be it known that I, CARL RUDOLF EBERHARD, a subject of the Emperor of Germany, residing in Paterson, Passaic county, New Jersey, have invented a certain new and useful Improvement in Joint Structures for Superimposed Columns; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to the construction of buildings and particularly to the means for supporting superimposed columns in proper relation to each other and to other parts of the building structure.

The principal objects of the invention are: (1) to provide a device serving as the means in hand which, while extremely simple and substantial in construction and not requiring other accessories for securing parts together than the bolts for attaching adjoining girders or beams to it, will reduce materially the labor and time incident to assembling the elements of a building frame; (2) as I prefer to employ a concrete or other monolithic type of column, to provide for the load being applied entirely on the concrete or body part of the lower column, thus saving undue stress on the shell in which such body part is usually incased or enveloped; and (3) to reinforce the columns against bending strains which may be exerted thereon as the result of eccentric loading.

My invention will be found fully illustrated in the accompanying drawing, wherein, Figure 1 is a view of so much of a building frame as is involved in the present invention, the adjoining portions of the two columns and the device forming the improved joint-structure appearing in vertical section; Fig. 2 is a substantially similar view, illustrating the manner in which the columns may be reinforced against the effects of eccentric loading; and, Fig. 3 is a horizontal sectional view, taken just below the joint-structure in Fig. 2.

In said drawing, *a* designates the lower column and *b* the upper column, each column comprising by preference the concrete or other monolithic body part *c* and a steel shell *d* enveloping the same; *e* designates alined girders which, as usual, are supported in about the plane of juncture of the two columns and in the manner hereinafter to be described.

f designates said joint-structure. This is preferably a casting comprising the upper socket portion *g* and the lower socket portion *h;* the former has cast integral with it the lugs *i* to which, by the bolts *j*, the ends of the girders are secured, while the latter may be exteriorly ornamented, as by the molding *k*, according to any suitable design.

l is lateral projections on the casting serving as a rest for the ends of the girders, as shown, and *l'* the usual reinforcing webs for said projections.

The socket portions *g* and *h* have a common horizontal separating wall *i'* which is formed also as an integral part of the casting and is adapted to take the thrust of each column, such wall being formed on each of its top and bottom surfaces with a continuous channel or groove *n* whose conformation is substantially similar to that of the steel shell of the corresponding column, excepting that such groove or channel is preferably slightly wider than the shell is thick. The lower socket portion is formed with the annular internal shoulders *o* and *p*, respectively disposed at or near the mouth portion of said socket portion and adjoining the wall *i';* similarly, the socket portion *g* has the internal annular shoulders *q* and *r* respectively disposed at or near the mouth thereof and adjoining the wall *i'*. The shoulders *o* and *p* are of such diameter that the column *a* may enter the socket portion *h* and fairly snugly fit therein, while the shoulders *q* and *r* have a similar diameter with respect to the column *b*. By shouldering the sockets internally in this manner the formation of protuberances in casting are less likely to occur on the inside of the sockets to interfere with the ready admission of the columns and prevent a perfectly perpendicular disposition of the columns in the joint-structure.

The annular grooving of the wall *i'* in the top and under sides thereof in the manner described above has for its effect to produce on the wall the tables *s* which, when the columns are in position, bear only against the body parts thereof, thus subjecting them alone to the compression action of the load.

The upper socket portion is preferably conical or tapering in form, as shown in the drawing, with a view to brace the same lat-

erally against any leverage which might chance to be exerted thereon by the upper column.

In the construction shown in Figs. 2 and 3 I have had in mind that eccentric loading is known to exert a tendency to bend the columns (particularly the lower one) to which they are of course not structurally adapted and the moment of which manifests itself at some point of contact between the column and the mouth of the member into which it is socketed (in the present instance, the joint-structure *f*). I therefore provide the columns (or at any rate, the lower one) with a reinforcing metal sleeve *u* which is interposed between the body part *c* and sleeve *d* of the column. If any bending strain occurs as the result of eccentric loading or otherwise it will be absorbed by the sleeve *u;* this will allow the shell *d* to be made with the minimum of thickness.

In some types of joint-structures, the cap portion for the lower column is applied when the column is inverted, thus permitting the shell to be filled with the concrete; the result is that the concrete mass may set in such manner as to leave a space between the head of the cap and the upper end of the concrete, so that when the column is in position the load will be borne by the shell. My construction not only allows the columns to be made independently of the joint-structure but leaves the ends of the columns exposed until the joint-structure is applied so that proper precautions may be taken against the concrete setting with its ends in planes lower than those of the ends of the shell.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a building construction, the combination, with superimposed columns, of an integral joint-structure therefor having vertically alined sockets respectively receiving the lower end of the upper column and the upper end of the lower column, said sockets each having internal continuous spaced shoulders bearing against the corresponding column laterally thereof, substantially as described.

2. In a building construction, the combination, with superimposed columns, of an integral joint-structure therefor having vertically alined sockets respectively receiving the lower end of the upper column and the upper end of the lower column, the upper socket being exteriorly conical, substantially as described.

3. In a building construction, the combination with a column comprising a monolithic body part and a metallic shell incasing said body part, of a socketed structure receiving in its socket one end of said column, said structure having a projecting table bearing against the end of the body part of said column and standing free or clear of the shell thereof, substantially as described.

4. In a building construction, the combination, with a column comprising a monolithic body part and a metallic shell incasing said body part, of a joint-structure having a socket receiving the end of said column, the wall of said socket opposed to the end of said column having an annular groove substantially coinciding with the end of the shell of said column, substantially as described.

5. In a building construction, the combination, with a column comprising a monolithic body part and a metallic shell incasing said body part, of a joint-structure having a socket receiving the end of said column, the wall of said socket opposed to the end of said column having a projecting table bearing against the body part of said column and of less diameter than the shell, substantially as described.

6. In a building construction, the combination, with a column comprising a monolithic body part and a metallic shell incasing said body part, of a joint-structure having a socket receiving the end of said column, and a reinforcing sleeve for said column projecting into said socket, substantially as described.

7. In a building construction, the combination, with a column comprising a monolithic body part and a metallic shell incasing said body part, of a socketed structure receiving in its socket one end of said column, and a reinforcing sleeve for said column projecting into said socket, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 22 day of November 1907.

C. RUDOLF EBERHARD.

Witnesses:

JOHN W. STEWARD,

WM. D. BELL.