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PATENTED JUNE 23, 1903.

H. BECHER.

CONCRETE COLUMN WITH BALL BEARING.

APPLICATION FILED MAR. 24, 1903.

NO MODEL.

Fig 1

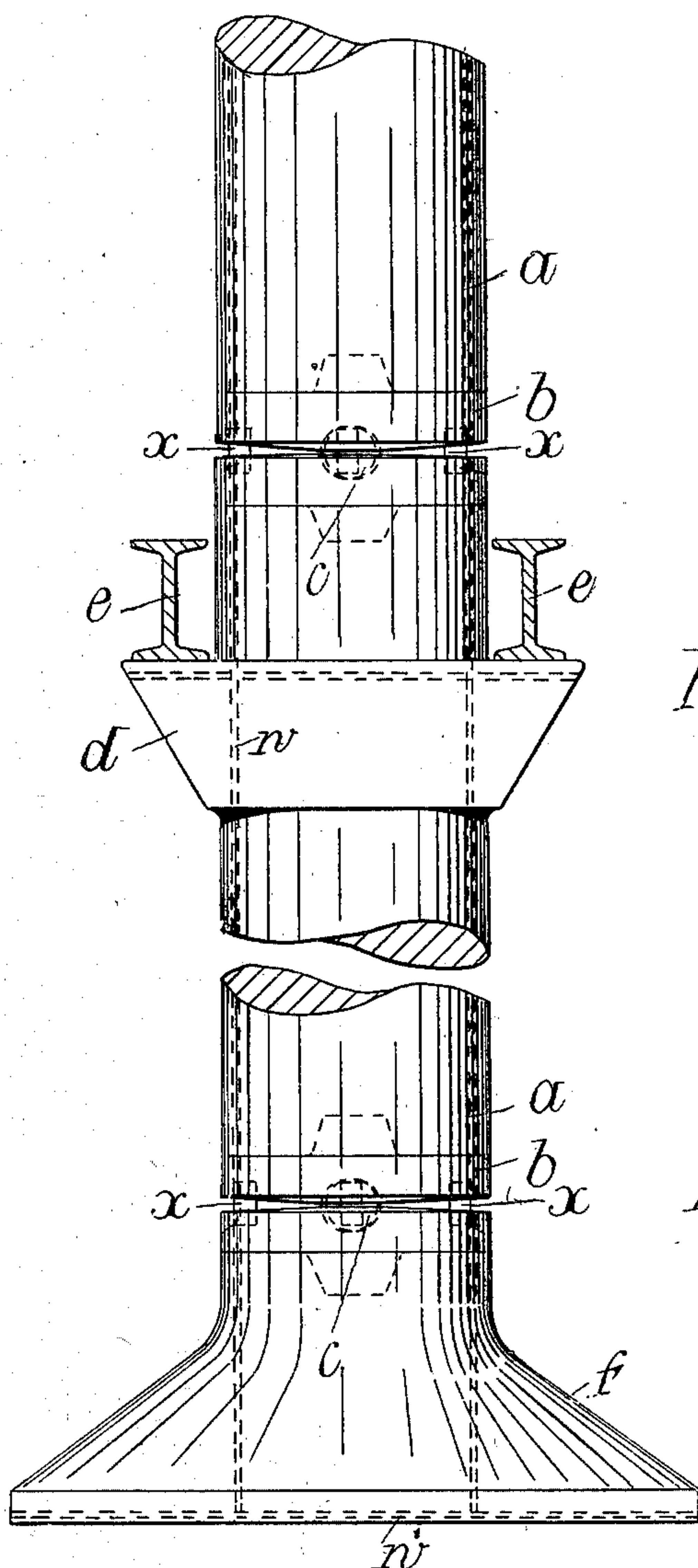
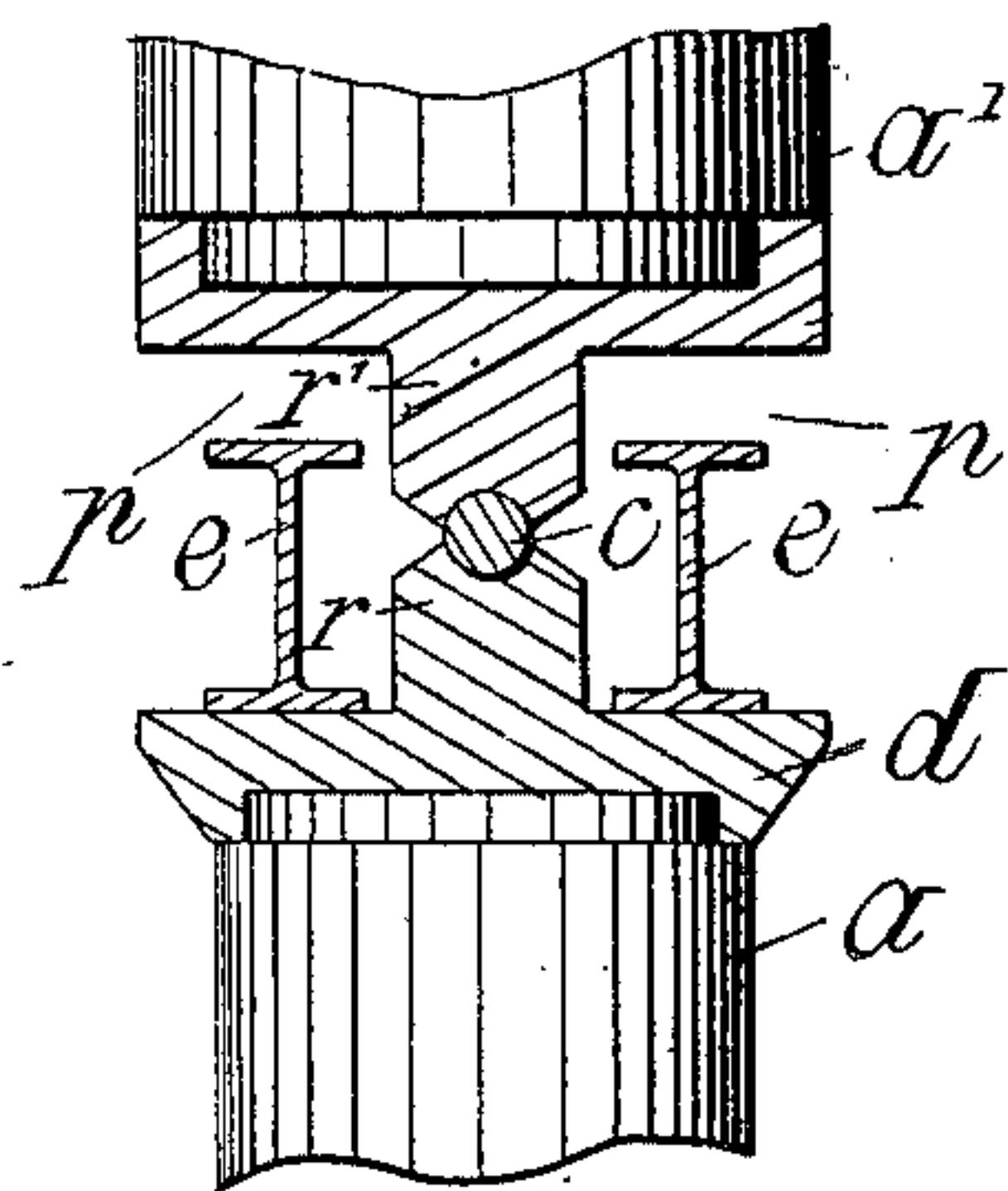


Fig 3



Fig 2



Witnesses
C. W. Clement.
J. J. McCarthy.

Inventor
Heinrich Becher
by
Fred S. Seward
Attorney.

UNITED STATES PATENT OFFICE.

HEINRICH BECHER, OF BERLIN, GERMANY.

CONCRETE COLUMN WITH BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 731,743, dated June 23, 1903.

Application filed March 24, 1903. Serial No. 149,336. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH BECHER, a civil engineer, and a subject of the King of Prussia, Emperor of Germany, residing at 71 Linienstrasse, in the city of Berlin, in the German Empire, have invented a certain new and useful Concrete Column with Ball-Bearing, of which the following is a specification.

This invention has references to columns made of concrete, beton, or the like and of any desired size and shape and provided with embedded iron framing, such columns being capable of supporting great loads and also of being manufactured on a large scale the same as iron columns, so as to be ready for use whenever required in the erection of a building, where they may be set up and connected to other structural elements, like ordinary iron columns or beams. From the columns of this kind as heretofore constructed my invention is especially distinguished by providing means on such columns for directly supporting the girders and beams of the upper floor and by the insertion of ball-bearings or the like between the superarranged upright columns, whereby a safer more reliable distribution and transmission of the strain and of the load of the structure is obtained than with other arrangements of this kind.

My invention is shown on the accompanying drawings, by way of example, in Figures 1 and 2 in elevation in different forms of construction, Fig. 2 illustrating a modification of the column and Fig. 3 a modification of the ball-joint inserted between the column and its base.

In the drawings, *a* is the shaft of the column. *w* designates the skeleton iron framing, which is indicated in dotted lines and which of course may be of any desired form suitable for the purpose. *b* is a sleeve or casing at the end of the adjoining sections of the column. The broadened base of the column is indicated at *f*. The metal sleeves or casings *b* are provided with suitable sockets for the reception of balls *c* or of equivalent means, which are interposed in suitable places between the meeting faces of the columns of the different stories and between the columns and their bases.

The adjoining faces of the metal cases sur-

rounding the free ends of the columns are preferably somewhat curved, so as to localize the pressure on as small a surface as possible and to eliminate the influence of side thrusts and variation of length. Snugs *x* may be provided on the top surface of the lower column to serve as an additional means for securing more efficient distribution of load.

At some part of its length and at a distance from the top end corresponding to the height of the floor for the support of which the column is intended the column is provided with a broadened or flaring-out part *d* or with suitable brackets, which serve for the support of the horizontally-placed iron beams *e*, upon which the floor is laid. These brackets or broadened or flaring-out or funnel-shaped portions of the column may have any desired configuration most suitable for the particular purpose.

In the modification of my invention shown in Fig. 2 the top end of the column is likewise used as a direct means for securing the beams for the support of the floor and ceiling. In this modification the meeting faces of the columns of the two succeeding stories are recessed at *p*, so as to allow the floor to engage with the column and leaving a part *r r'* of reduced diameter on the meeting ends of the superarranged columns *a a'*, in which reduced part the socket-and-ball bearing is arranged as in the form illustrated in Fig. 1 of the drawings. The bottom of the recessed part of the lower column may be somewhat broadened, as shown in the drawings; but this is not absolutely necessary, and the shaft of the column may also be straight throughout without deviating from the spirit of my invention.

By providing ball-joints at the joining ends of the columns the load which otherwise would operate in the sides of the column is directed toward the center line and is distributed uniformly around the same, which is of importance in the manufacture of concrete or the like columns, inasmuch as thereby the stability and the strength and the life of the column are greatly increased as compared with those constructions of columns where they are made to rest on their base with their whole sectional area, and it also increases the crushing strength of the column and prevents un-

due wear of the meeting faces of the super-
arranged columns, inasmuch as by this means
undue abrasion and wearing off of these parts
are avoided.

5 A form of ball-joint which I have found of
advantage for some purposes is shown in Fig.
3 of the drawings.

In manufacturing my improved column I
proceed in the following manner: I first
10 make a hollow pattern of wood, plaster-of-
paris, of iron, or from other material, this
pattern having the shape of the column it is
desired to manufacture and consisting of de-
tachably connected sections. To this pattern
15 I attach the iron casings or shoes for the ball-
joints and at the inside of the said pattern
I arrange the iron supports *w*. Beton, con-
crete, or similar material is then poured into
the cavity or the mass is forced in by pound-
20 ing or otherwise, and the column is then al-
lowed to set and harden, which takes about
twenty-eight days on an average.

By inserting the ball-joints at or approxi-
mately at the center line there is practically
25 no load on the concrete or beton itself, and
damage from friction of the adjoining parts
is avoided. Columns of this kind are fire-
proof and afford great stability. They may be
made on a manufacturing scale and may be
30 erected above each other for supporting sev-
eral stories.

What I claim, and desire to secure by Let-
ters Patent of the United States, is—

1. A column comprising the combination

with a shaft of concrete or beton and an iron 35
skeleton framing embedded therein of floor-
supporting means on the upper end of said
shaft and integral therewith and metal shoes
or casings on the ends of the shaft.

2. In a concrete or beton column a funnel- 40
shaped outwardly-flaring extension near the
upper end of said column, an iron framing,
metal shoes or casings at the ends of said
shaft and joints at about the center of said
casings or shoes.

3. In a concrete or beton column, a column- 45
shaft, lateral floor-supporting means integral
with the column shaft near one end thereof,
a separate base, metal shoes on said base and
on both ends of the shaft, revoluble joints 50
journaled in said shoes and at about the center
line of the column, substantially as described.

4. In a concrete or beton column, a column-
shaft, lateral floor-supporting means integral
with the column shaft near one end thereof, 55
a separate base, slightly curved metal shoes
on said base and on both ends of the shaft,
ball-joints journaled in said shoes and at
about the center line of the column, substan-
tially as described. 60

In witness whereof I have hereunto signed
my name in the presence of two subscribing
witnesses.

HEINRICH BECHER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.