

No. 673,310.

Patented Apr. 30, 1901.

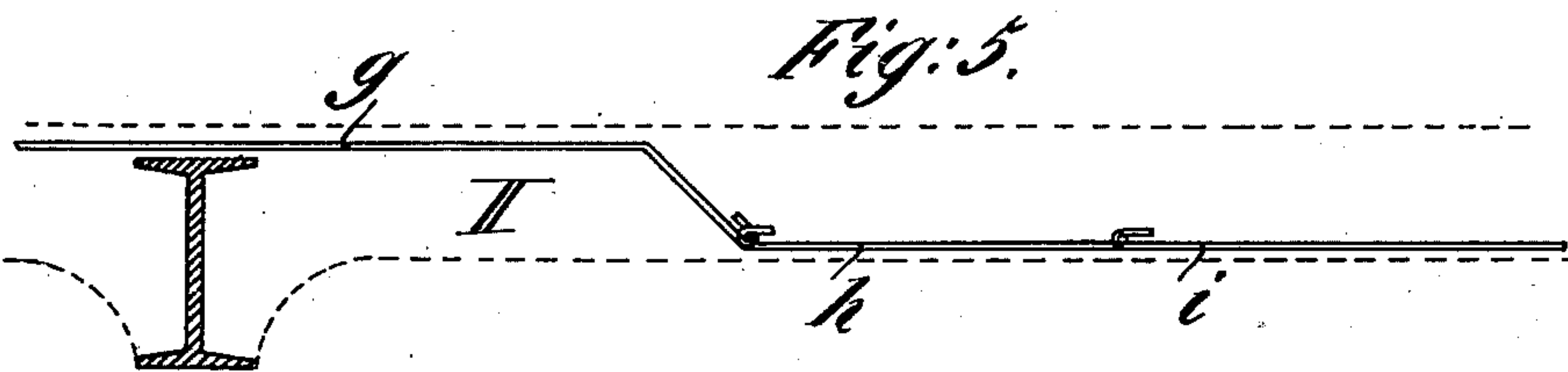
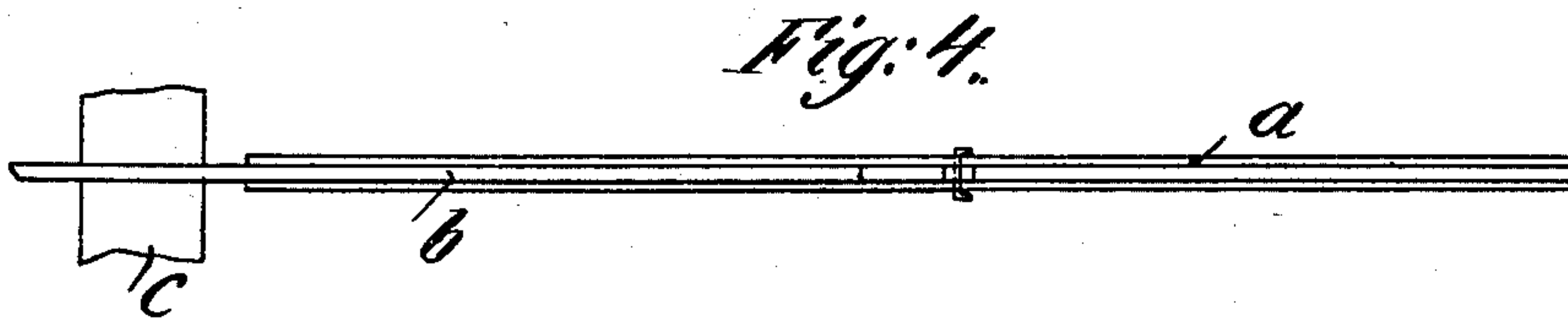
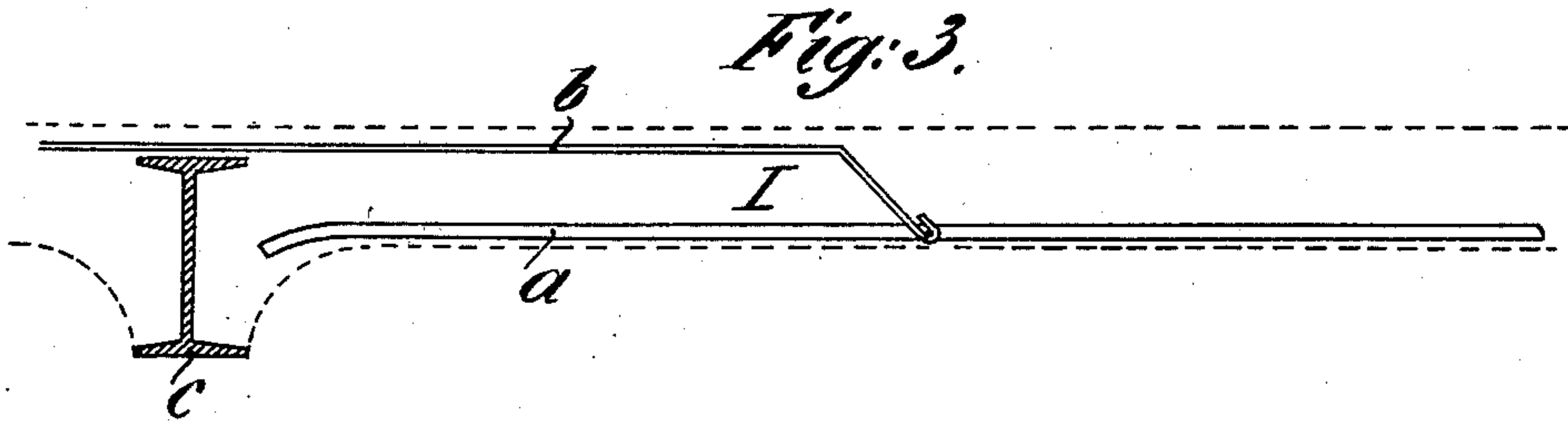
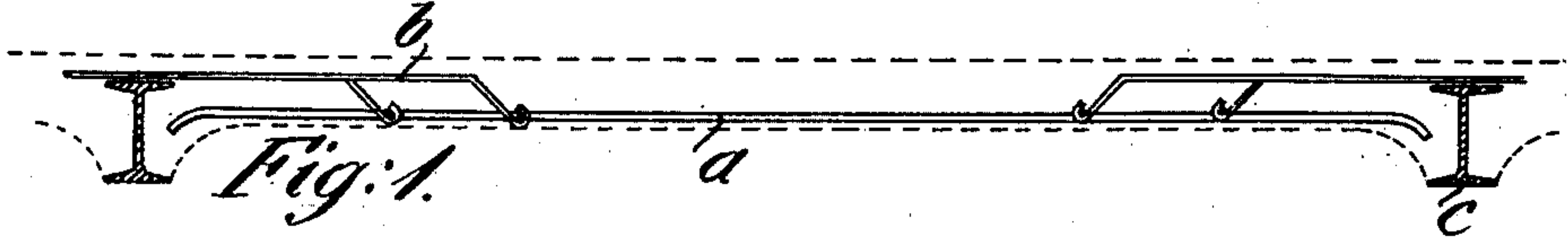
G. A. WAYSS.

CONSTRUCTION OF CEILINGS, FLOORS, &c., OF IRON AND CONCRETE.

(Application filed Feb. 6, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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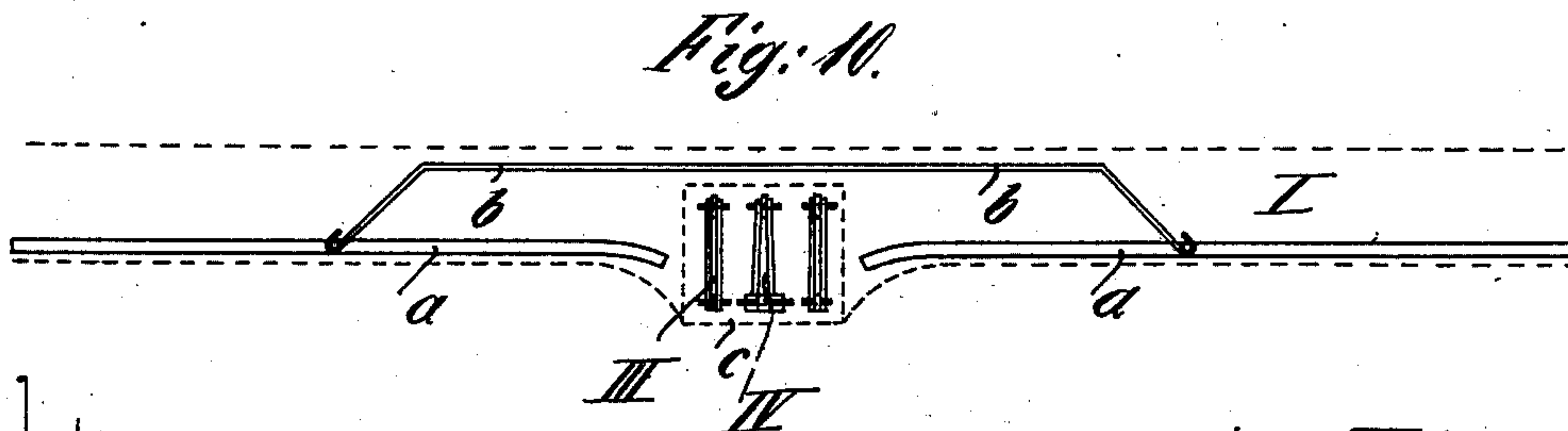
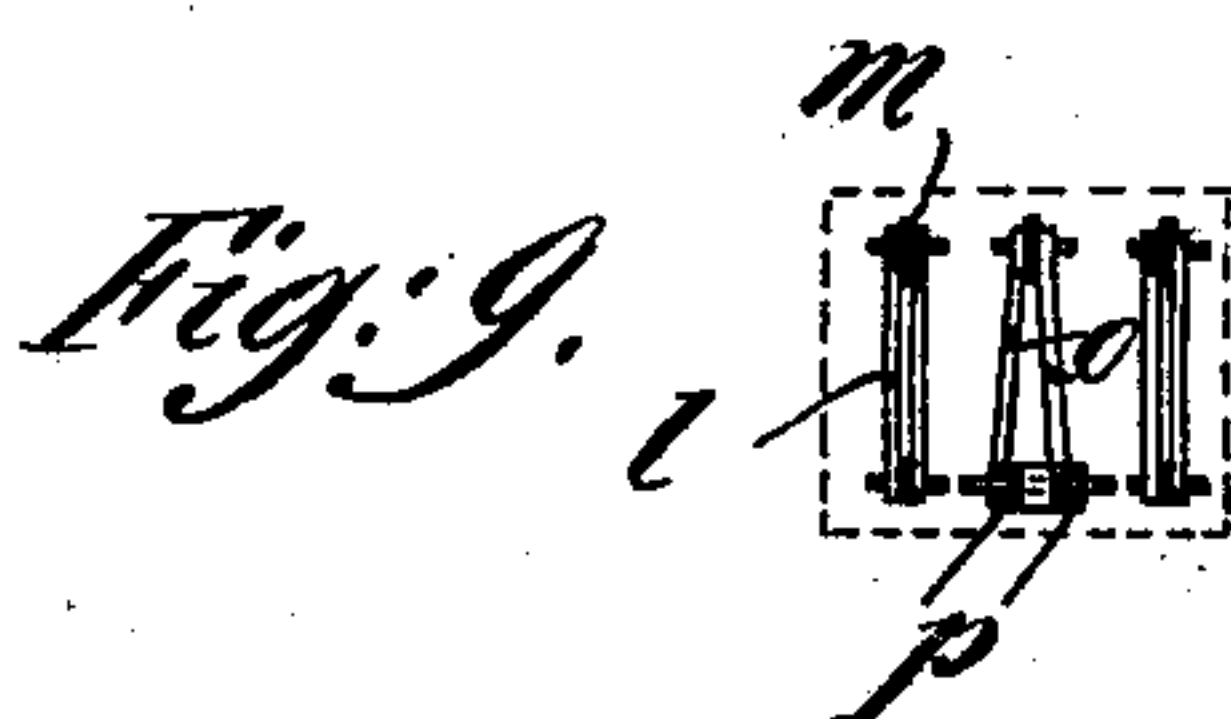
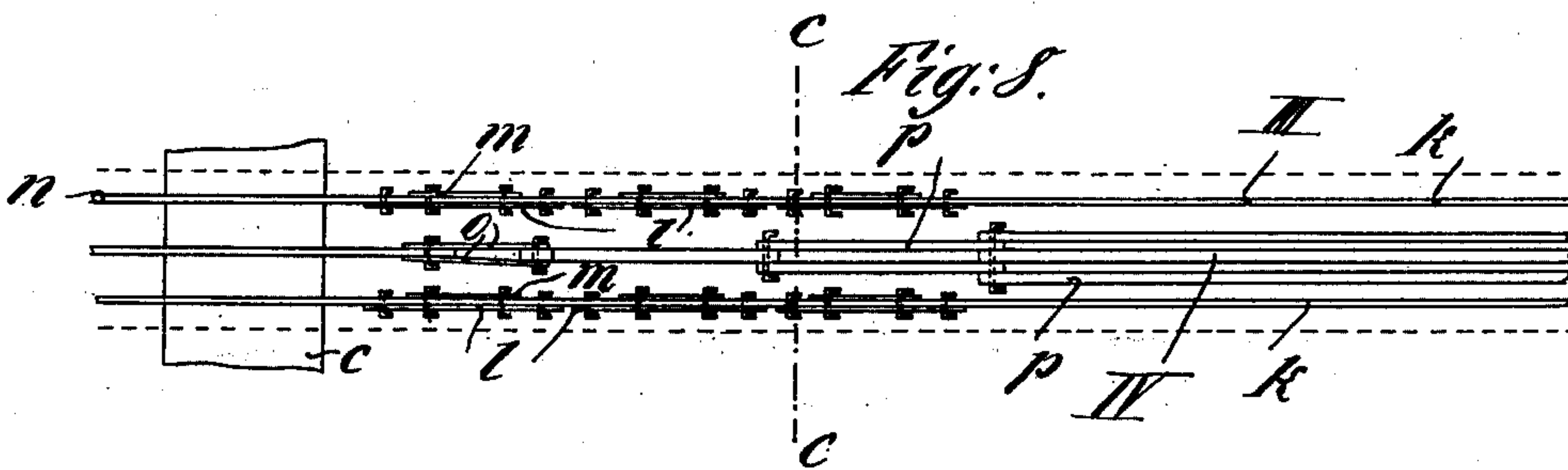
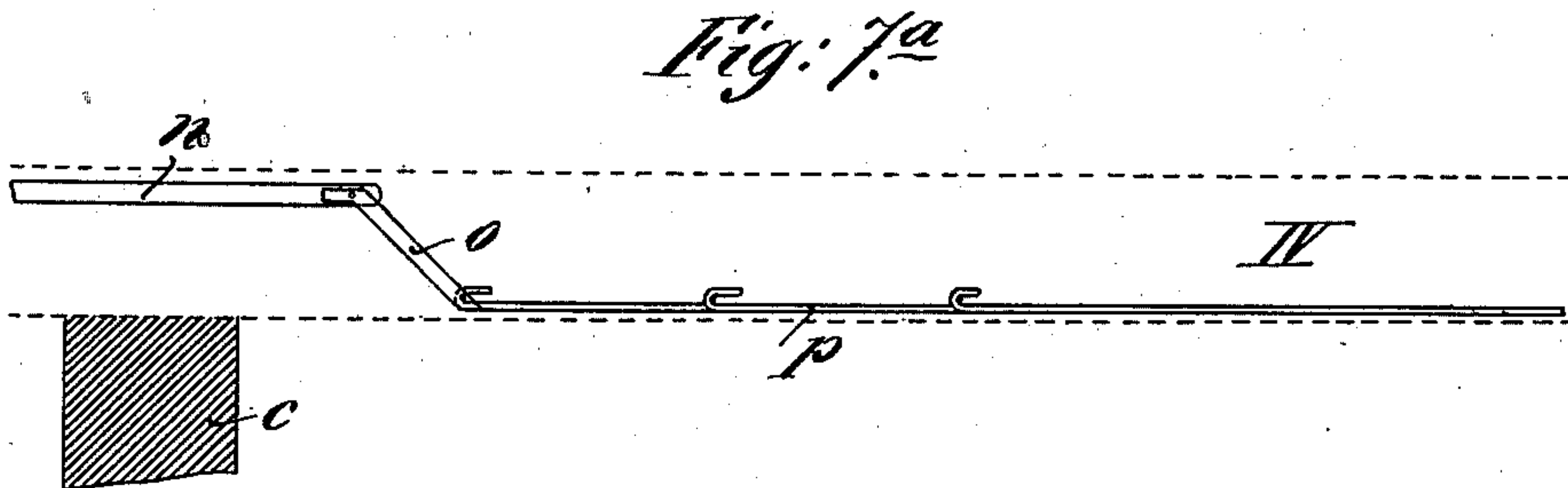
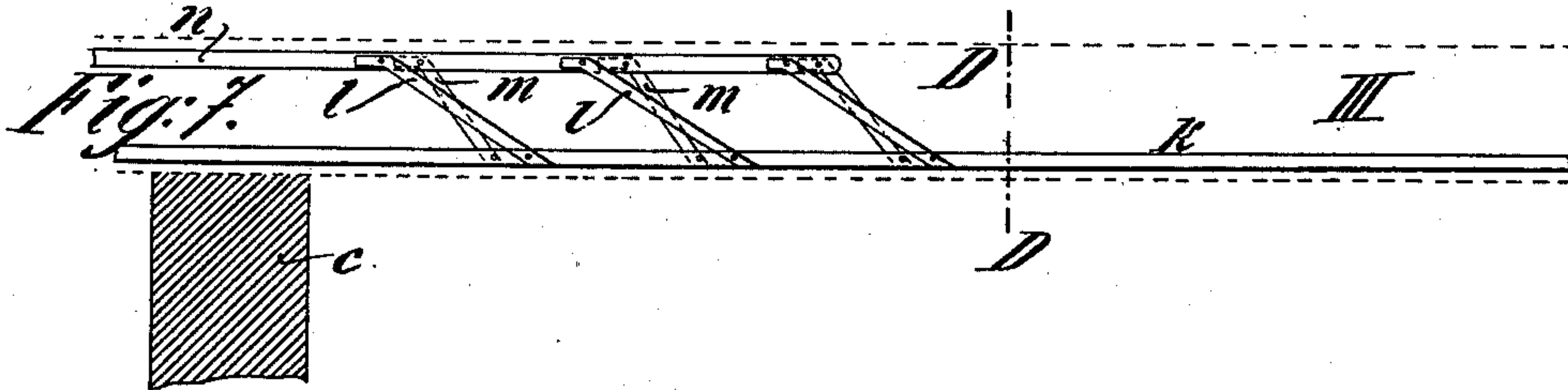
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(Application filed Feb. 6, 1901.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

GUSTAV ADOLF WAYSS, OF CHARLOTTENBURG, GERMANY.

CONSTRUCTION OF CEILINGS, FLOORS, &c., OF IRON AND CONCRETE.

SPECIFICATION forming part of Letters Patent No. 673,310, dated April 30, 1901.

Application filed February 6, 1901. Serial No. 46,179. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV ADOLF WAYSS, engineer, a citizen of the Republic of Switzerland, residing at 1 Uhlandstrasse, Charlottenburg, near Berlin, in the German Empire, have invented certain new and useful Improvements in the Construction of Ceilings, Floors, and other Like Parts of Iron and Concrete, of which the following is a specification.

This invention relates to the construction of ceilings, floors, and other like parts of iron and concrete, and is chiefly characterized by the fact that in the cement or beton are embedded advantageously in the direction from joist to joist iron strips arranged parallel one with the other in the form of bundles. These independently - embedded strips preferably consist of one or more members forming the backbone of the assemblage, so to speak, and from the same there branch subsidiary members in all directions. In certain cases the traversing members may be omitted. Preferably the arrangement is such as to provide alternately a bundle reaching right across and one formed with shorter intermediate members or branches. The configuration, size, and arrangement of the various members may obviously be made to suit the floor or ceiling and the stress to which the latter may be subjected. The various bundles or the like are preferably connected together by bolts.

The preferred form of iron strip employed in the construction of my improved floor or ceiling is that of ordinary hoop-iron, which may be placed edgewise or flat; but iron of other sections than that of hoop-iron may of course be used. The embedded portions are so arranged in the floor or the like as to have the sections of iron to correspond with the weight to be carried by any particular portion thereof. This can readily be effected by connecting together any number of members, which may, if desired, have various sections, according to requirements. The members reaching right across from joist to joist impart to the whole structure an intimate and firm bond, while the short or intermediate members can easily be placed in proper position during the building operation itself. This improved arrangement may be applied to any form and size of floor, ceiling, vault, or the like, whether straight or otherwise.

Furthermore, ceilings of this kind may be formed of a number of small parts previously prepared, say, in the form of bridge beams or pieces disposed side by side between supporting-joists. The same kind of beam may be employed for the purpose of strengthening plain ceilings of ordinary construction. Obviously the supporting-beams constructed in this manner need not in all cases reach across from one bearing-joint to the other. They may, in fact, be short and take the form of a console or bracket for supporting the ceiling or the like.

Referring to the accompanying drawings, Figure 1 is a vertical section of a ceiling constructed in accordance with the invention, and Fig. 2 is a plan of the same. Fig. 3 is a section taken on the line A A of Fig. 2, and Fig. 4 is a plan thereof. Fig. 5 is a section taken on the line B B of Fig. 2, and Fig. 6 a plan thereof. Figs. 7, 7^a, 8, and 9 show a beam constructed in accordance with the invention, while Fig. 10 shows a ceiling in combination with the beam.

In the ceiling shown in Figs. 1 to 6 two different forms of embedding material or bundles are used. The bundles I are formed with two flat bars *a*, placed on edge and reaching nearly over the entire width, and from the said bars *a* a number of limbs *b* extend, first upwardly and then horizontally over the beams *c*. The limbs *b*, branching from the bars *a*, are formed of hoop-iron disposed on the flat side and bent at their extremities, so as to form hooks, and are connected by bolts to the edgewise-arranged bars *a*, as shown in Figs. 1, 2, 3, and 4. If desired, the limbs *b* may also be placed on edge and simply be perforated and bolted to the bars *a* without the formation of hooks. The connecting-bolts are advantageously bent over at their projecting ends, Fig. 4, so as to prevent the limbs *b* from slipping off sideways.

In the arrangement II, Fig. 5, the bars *a* are omitted and the bundle is formed of bars *g* only, which latter correspond to the limbs *b* and are connected with each other by intermediate limbs *h* and *i* with hinge-joints. In order to provide a proportionately larger section of iron at the central portion of the ceiling, so as to correspond with the greater stress to which the same is subjected, I increase the

number of limbs or branches at such central portions. The limbs in this constructional arrangement are formed of flat hoop-iron bent into hooks at their ends and connected with one another by bolts.

In the form shown in Figs. 7, 7^a, 8, and 9 (which represent a beam constructed in accordance with the invention) the limbs are made of hoop-iron disposed edgewise. The hoop-irons *k* in the lower portion of the beam extend from one bearing-point to the other, and they are furnished with upwardly-inclined limbs *l m*, secured by bolts. These limbs *l m* are arranged in the upper portion of the beam and are connected with other similar hoop-iron limbs *n* by means of bolts. It is preferable to bend the inclined limbs *l m* so as to form an angle, as indicated at Fig. 7, and to place the said angle-piece flat against the iron *n*. Between the embedded bundles III are arranged other members IV, which, however, are not fitted with the main cross-bars. These latter members IV may be arranged as shown in the longitudinal section Fig. 7^a—that is to say, they may be formed of flat iron *n*, placed on edge and having downwardly-projecting limbs *o* in connection with limbs *p* and of a similar character as the limbs *b* shown in the construction first described. The number of limbs may here also be increased at the middle of the ceiling. The cross-section Fig. 9, taken on the line C C of Fig. 8, shows a suitable arrangement of this form of beam. The beams so constructed may be disposed side by side, so as to form a ceiling, or the said beams may be used as supporting-beams for a ceiling constructed of other material—wood, for example—or they may be employed in combination with an iron-beton ceiling, as indicated at Fig. 10. When forming arched ceilings or vaulted floors or curved beams, consoles, brackets, and the like, the embedded iron stiffenings are carved to the required shape.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is performed, I declare that what I claim is—

1. Iron and concrete construction more particularly adapted for ceilings, floors and other like parts, having embedded bundles extend-

ing from supporting-point to supporting-point, and other bundles arranged between said first-mentioned bundles and not extending from supporting-point to supporting-point and consisting of limbs connected with each other and of greater number at the middle of the construction as compared with the parts nearer the supporting-points, substantially as described.

2. Iron and concrete construction more particularly adapted for ceilings, floors and other like parts, having embedded bundles consisting of a member in the lower part of the construction and limbs leading to the upper part of the construction and connected to said member by bolts, substantially as described.

3. Iron and concrete construction more particularly adapted for ceilings, floors and other like parts, provided with embedded bundles having parallel members in the lower part of the construction and limbs leading to the upper part of the construction and having their lower ends extending between and secured to said parallel members, substantially as described.

4. Iron and concrete construction more particularly adapted for ceilings, floors and other parts, provided with embedded bundles consisting of a member in the lower part of the construction and limbs leading to the upper part of the construction and having hook-shaped ends united to said member by bolts, substantially as described.

5. Iron and concrete construction more particularly adapted for ceilings, floors and other like parts, provided with embedded bundles having a flat rail arranged in the lower part of the construction and having flat limbs leading to the upper part of the construction and formed with hook-shaped ends connected to said rail by bolts, substantially as shown and described.

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

GUSTAV ADOLF WAYSS.

Witnesses:

VICTOR TISCHLER,
ALVESTO S. HOGUE.