(No Model.)

J. J. SMITH.

PROCESS OF CONSTRUCTING WALLS, FLOORS, AND CEILINGS.

No. 594,812. Patented Nov. 30, 1897.

Fig 1.

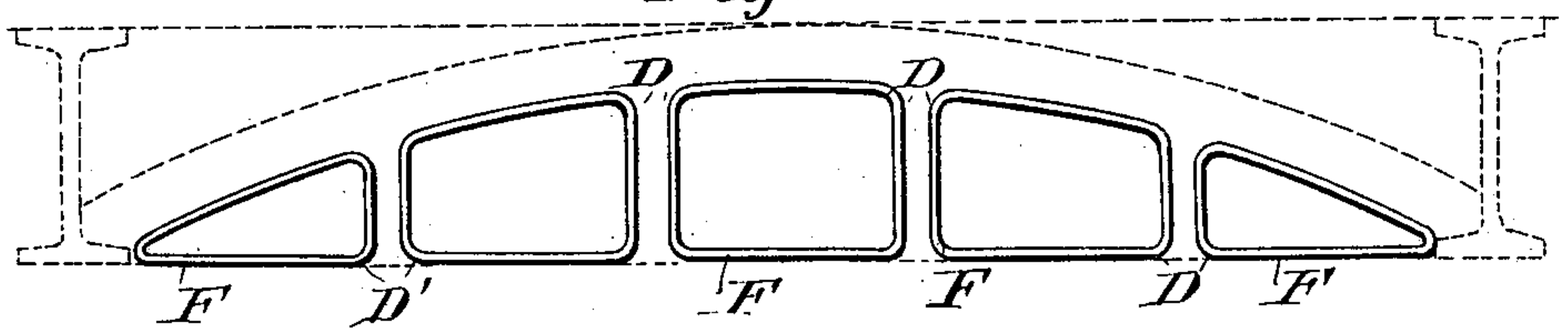


Fig. 2.

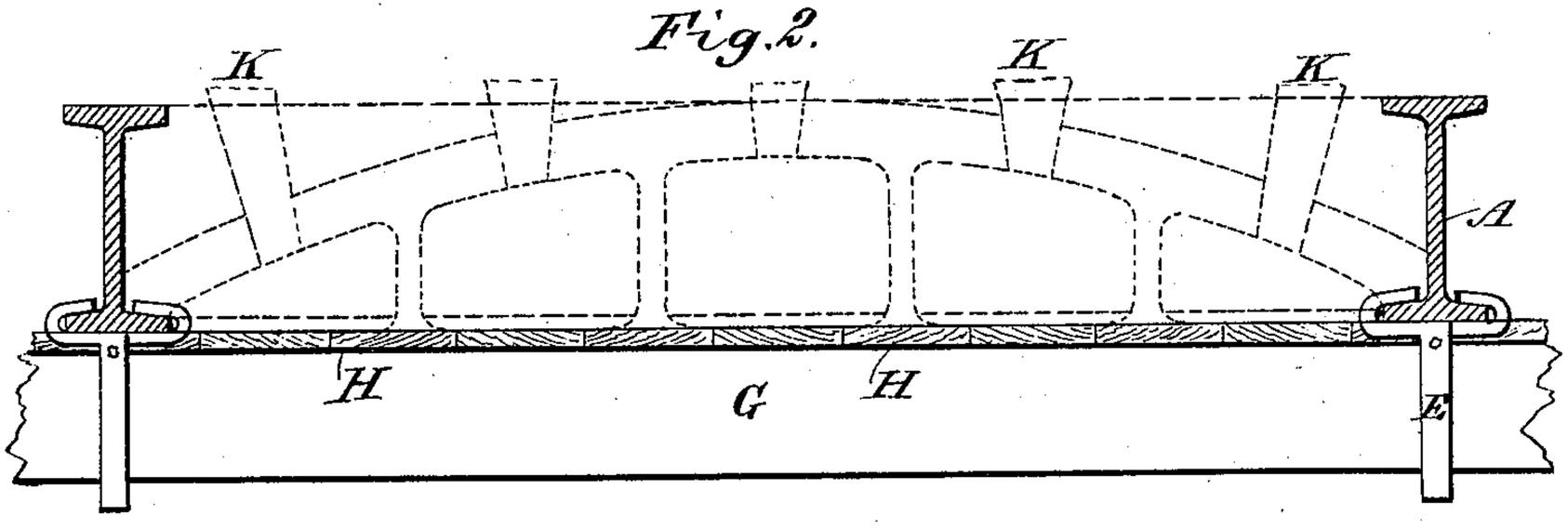


Fig. 3.

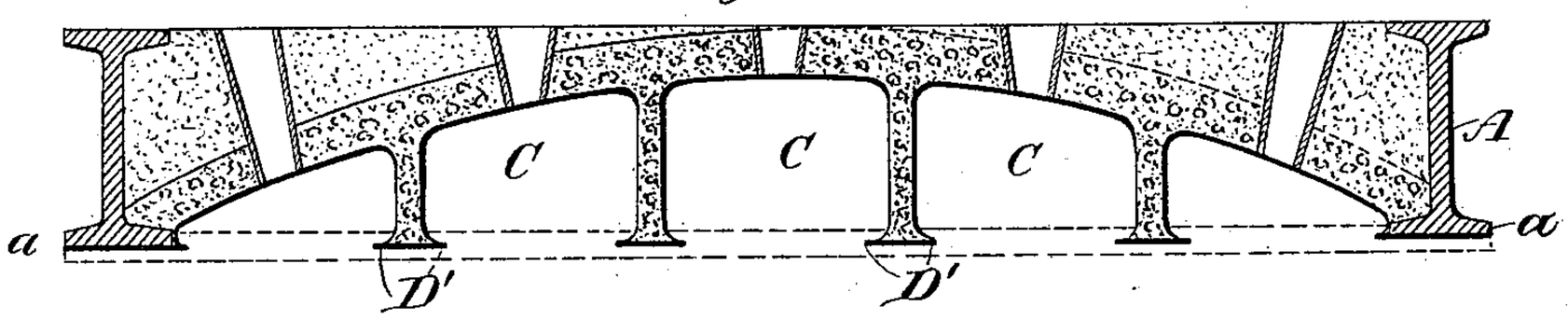
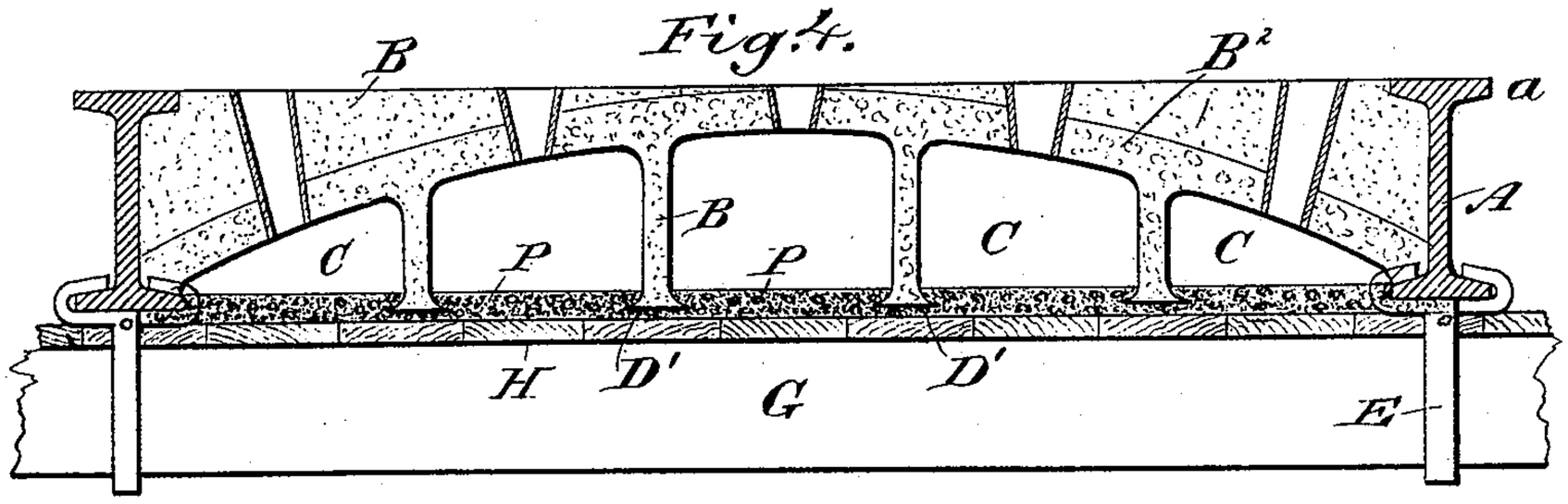


Fig. 4.



WITNESSES:

L. N. Legendre

S. J. Cop. Jr

INVENTOR

Justus Jesse Smith

BY

Stephen J. Cop.

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JUSTUS JESSE SMITH, OF NEW YORK, N. Y.

PROCESS OF CONSTRUCTING WALLS, FLOORS, AND CEILINGS.

SPECIFICATION forming part of Letters Patent No. 594,812, dated November 30, 1897.

Application filed May 1, 1896. Serial No. 589,919. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS JESSE SMITH, a citizen of the United States, residing at the city of New York, county and State of New York, have invented a new and useful Improvement in the Art and Process of Constructing Walls and Ceilings; and I hereby declare the following to be a full and true description of the same, enabling others skilled in the art to which it pertains to make the same.

My invention relates to the construction of walls, floorings, and ceilings such as are used in the construction of buildings. Its object is to cheapen the construction of such walls, ceilings, and floorings by the disuse of much of the material now universally used and substituting therefor a system of construction so arranged that the constructed work will be stronger, more durable, less liable to crack or be affected by heat or water, and be at the same time put up by comparatively unskilled labor quicker and at less cost than the same structures now can be.

My invention consists in the process described, and illustrated in the accompanying drawings, in which like letters refer to like parts in each view.

Figure 1 is a sectional view of cores used in forming the arches. Fig. 2 is a view of a hanging platform used in supporting the cores used in forming the primary and secondary arches. Dotted lines in Figs. 1 and 2 show an outline of the arch, &c. Fig. 3 is a view of the primary and secondary arches with hangers for the ceiling formed of concrete, the forming-cores having been removed. Fig. 4 is a view of the hanging platform in position to be used for the purpose of flooding on the ceiling. The ceiling is also shown as completed.

In the drawings, A represents **I**-beams, such as are usually used in the construction of buildings made of iron or steel. No alteration in the ordinary manner of laying the same is required either as regards weight, width, or distance. In the drawings a four-foot-six-inch width between beams is used as a basis for illustration. The beams A have the usual flange *a* on the bottom. In the process of construction an adjustable hanger E is attached to the lower flange *a* of these beams or to as many of them as may be required. This hanger is formed of two hinged parts and is bent in pincer form at the top. These pincers are adapted to engage the flange *a* of the **I**-beam and hang down a sufficient length to admit of a board G edgewise or any other suitable timber being lodged between the lower arms. Upon these boards G and with their upper surfaces parallel with the bottom of the **I**-beams is laid a firm smooth platform H of timber or other suitable material.

Upon the platform H are placed the core-boxes F. In the drawings these boxes are made of various shapes. They may be round or any shape that will admit of the spaces D between them being retained. It is also important to have those spaces flare at the bottom, as at D′.

When arranged as above, with a proper dam at the ends of the cores to restrain the spread of the material beyond desired limits, the concrete, preferably dry, of which the masonry B, B′, and B^2 is formed is placed in position on the cores F and into the interstices D between them, with a mass above them. The composition of the concrete is preferably first-class cement and fine well-calcined ashes of coal. Water is now thrown upon the mixture until it is of a proper consistency, when it is worked into an arched shape on top, as shown by dotted lines, Figs. 1, 2, 3, and 4. Before, however, the mass is wet plugs K are fixed in proper position and at intervals over the core-boxes. Now, as the platform H is closely laid, very little, if any, of the water can percolate through the joints between the boards, and the concrete lying in the spaces D, becoming set, in a short time forms a series of hanging beams B′. It is not absolutely essential to form the arch B^2, as the whole space from **I**-beam to **I**-beam can easily be leveled off; but I prefer to first form the arch B^2. After the concrete has had a proper chance to set the plugs K are removed and the cores removed or drawn out. The platform H is also taken away and an arch B, with a series of subarches C C, (see Fig. 3,) is formed, the hanging beams D D, with flanged ends D′, being presented to view.

The core-boxes F are made of metal or wood. They may be made also collapsible or in hinged sections, or they may be made of a

light material and permitted to remain in position. I do not desire to confine myself to any shape or mode of construction in this matter.

The construction of the arch being completed and the subarches being formed, I now proceed, after allowing the concrete to set properly, to flood on the ceiling. This is effected as follows: The platform H is again placed in position under the constructed arch, but this time a proper space—say about one inch—is left between the flange *a* of the I-beam and the platform for the thickness of the ceiling. A wet concrete or composition mixture is now poured through the holes left by the plugs K, which passes downward through the secondary arch-spaces C and flows over the level platform H. The flanged lower ends D' of the hanging beams D, when the concrete mixture is properly flooded on the platform, act as keys to support the ceiling P. When the concrete on the ceiling has set, the platform is removed, the hangers E taken away, and the plug-holes plugged with cement, and the ceiling is ready for the finishing coat of white plaster. The surface on top of the arch is now filled in, if the arch be made first, and the process may be repeated.

In the formation of concrete arches of this description between wooden beams strips of metal or wood may be nailed on the lower ends of the beams to form rests for the cusps of the arch.

The same construction can be used in the formation of vertical walls. It is well known by me that solid vertical concrete walls have been made for many years, but the erection of concrete vertical walls of a series of arches with spaces, such as is described, is believed to be new. The spaces left by the cores afford a first-class medium for ventilation-flues and pockets for the laying of the various pipes or conduits so largely used in modern building.

It is obvious that structures constructed on the principles set forth herein are fireproof to the limit of present possibilities.

Having thus described my process, what I claim as new, and desire to secure by Letters Patent, is—

1. The fireproof flooring and ceiling of the character described, which consists of primary arches spanning the interval between adjacent floor-beams; depending arms made integral with said arches, located within the cusps of said arches and extending longitudinally of said arches and parallel with said beams; a continuous ceiling, coincident with the chord-line of said arches and having the lower ends of the said depending arms embedded therein, substantially as described.

2. The fireproof flooring and ceiling of the character described, which consists of primary arches spanning the interval between adjacent floor-beams, the chord-line of said arches extending across the interval from one beam to the next; depending beams formed integral with said arches extending parallel with said floor-beams and having their lower ends extending into the chord-line of said arches; a series of plug-holes extending through the body of said arches between the said depending beams, and a continuous ceiling coincident with the chord-line of said arches and having the lower ends of said depending beams embedded therein, substantially as described.

3. In fireproof floorings and ceilings of the character described, the combination with a plurality of I-beams, concrete arches spanning the interval between adjacent I-beams the chord-line of said arches extending across from beam to beam; depending I-beams formed integral with the said arch with their lower ends extending into the chord-line of said arches and extending longitudinally of said arches and parallel with said beams; plug-holes extending through the body of said arches between the depending beams, and a continuous ceiling coincident with the chord-line of said arches and having the lower ends of the said beams embedded therein, substantially as described.

4. The fireproof flooring and ceiling of the character described, which consists of primary arches spanning the interval between adjacent floor-beams; depending beams made integral with said arches, located within the cusps of said arches and extending longitudinally of said arches and a continuous ceiling having the lower ends of the said depending beams embedded therein, substantially as described.

5. The fireproof flooring and ceiling of the character described, which consists of primary arches spanning the interval between adjacent floor-beams, the chord-line of said arches extending across the interval from one beam to the next; depending beams formed integral with said arches and extending parallel with said floor-beams; a series of plug-holes extending through the body of said arches between the said depending beams, and a continuous ceiling having the lower ends of said depending beams embedded therein, substantially as described.

6. The improved art of constructing fireproof flooring and ceiling of the character described, which consists in forming the arches and depending beams simultaneously *in situ*, by molding the same on core-boxes; then forming the ceiling after the arches and depending beams have become "fixed," by flooding concrete from above, through the body of said arches and on a temporary supporting structure, and causing the lower ends of said depending beams to become embedded in said ceiling, substantially as described.

JUSTUS JESSE SMITH.

Witnesses:
S. J. COX, JR.,
JOHN C. CENTER.