

(No Model.)

A. L. JOHNSON.
FIREPROOF FLOOR.

No. 550,177.

Patented Nov. 19, 1895.

Fig. 1.

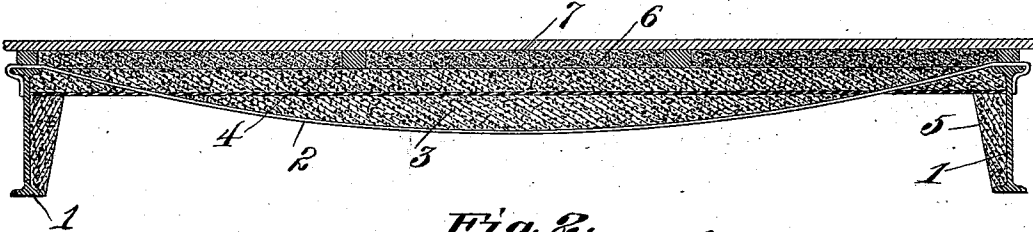


Fig. 2.

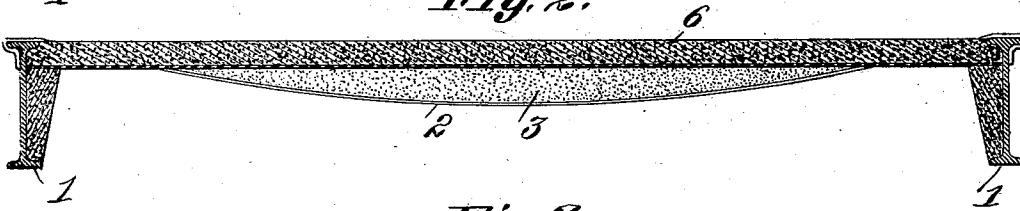


Fig. 3.

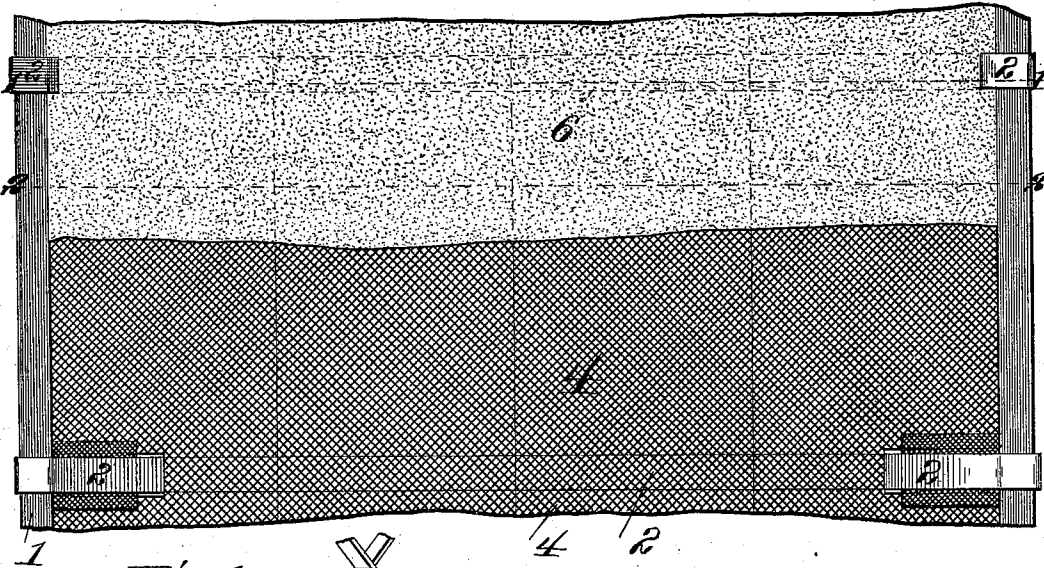


Fig. 4.

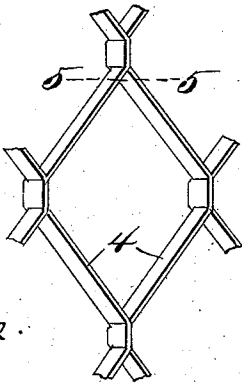
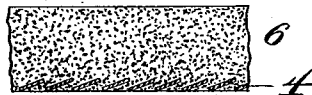


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT L. JOHNSON, OF ST. LOUIS, MISSOURI.

FIREPROOF FLOOR.

SPECIFICATION forming part of Letters Patent No. 550,177, dated November 19, 1895.

Application filed September 5, 1895. Serial No. 561,542. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. JOHNSON, residing in the city of St. Louis, State of Missouri, have invented a new and useful Fireproof Floor, of which the following is a specification.

My invention relates to concrete floors, and has for its principal objects to increase the strength and rigidity of such floors and reduce the cost of making them.

It consists in the arrangements and in the combinations of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a cross-sectional view of my construction on the line 1 1 of Fig. 3, with the top flooring mounted thereon. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 3, showing the suspension-strap and rib in elevation and with the top flooring removed. Fig. 3 is a plan view of the construction shown in Fig. 2 with the concrete partially broken away to show the expanded metal sheet. Fig. 4 is a perspective detail of the expanded metal, and Fig. 5 is a sectional detail through the concrete and expanded metal.

The main support of my floor consists of parallel I-beams 1, supported by the frame of the building. Over the tops of adjacent beams are fastened the ends of strong suspension straps or saddles 2, preferably of wrought-iron or steel and thin enough to be quite flexible. The ends of these straps 2 extend beyond the farther edge of the beams and are bent to conform to the shape of the beam, so as to lie close against the same, while the middle portion of the strap or saddle bends or curves down. The curve which a flexible flat wrought-iron or steel strap naturally assumes when its ends are supported at fixed points nearer together than the length of the strap is the line of stable equilibrium of such strap for supporting a vertical load distributed like a concrete floor—that is, the application of the concrete floor on such a strap does not tend to change the form of its curve, but produces a tensile stress only therein. Upon each of these straps or saddles 2 as a bottom plastic concrete is filled in up to the horizontal level desired, so as to constitute a stiffening or strengthening rib 3. Upon the tops of the several ribs 3, extending from one rib to an-

other, are laid bars or strips of metal, preferably sheets of expanded metal 4. The I-beams of concrete floors are generally protected from fire by having concrete haunches 5 built up on their lower flanges. In my construction the tops of these haunches are level with the tops of the ribs 3 and serve also to support the expanded metal 4, which extends sideways beyond the ends of the ribs 3 to rest on said haunches, the expanded metal being cut to straddle the suspension-straps.

Upon the expanded metal is laid plastic concrete 6 to any desired thickness, and upon this layer of concrete 6 is laid any desired kind of flooring 7.

In making my floor the suspension-straps 2 are first fitted over adjacent I-beams and adjusted parallel at the proper distance apart. Then suitable false work is built up to form side boxing for the strengthening-ribs 3 and haunches 5 and also to form a bottom for supporting the expanded metal 4, said bottom being flush with the tops of said ribs 3. The plastic concrete is then filled in such boxings to form the ribs and haunches, and then the expanded metal is laid on the tops thereof. Then the main layer of concrete 6 is laid upon the expanded metal 4 and worked through the interstices therein, so as completely to fill the same, the false work supporting the expanded metal and preventing waste of concrete. When the concrete hardens, the false work is removed.

On account of the interstices of the expanded metal being filled with concrete its tensile strength is very great. Other materials, such as strips of woven wire, may be substituted for expanded metal with fair results; but on account of the peculiar formation of expanded metal it has special advantages of its own.

What I claim is—

1. A floor consisting of beams, suspension straps fastened at the tops thereof and curved down in the intermediate portion in the line of stable equilibrium, concrete ribs on said straps, strips of metal on said ribs and a layer of concrete on said strips, substantially as described.

2. A floor consisting of beams, suspension straps fastened at the tops thereof and curved down in the intermediate portion in the line of stable equilibrium, concrete ribs on said

straps, sheets of expanded metal on said ribs and a layer of concrete on said expanded metal, substantially as described.

3. A floor consisting of flanged beams, suspension straps having their ends fastened at the tops thereof and curved down in the intermediate portion in the line of stable equilibrium, concrete ribs on said straps, haunches

on the flanges of said beams, sheets of expanded metal on said ribs and haunches, and a layer of concrete on said expanded metal, substantially as described. 10

A. L. JOHNSON.

In presence of—

JAMES J. O'DONOHUE,
JAMES A. CARR.