

Aug. 20, 1935.

F. MAZZINI

2,012,198

METAL STRUCTURE

Filed May 15, 1933

Fig. 1.

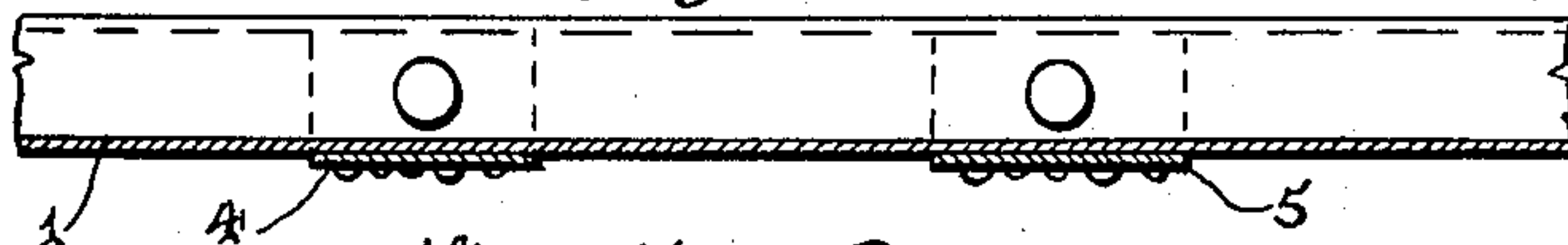


Fig. 2.

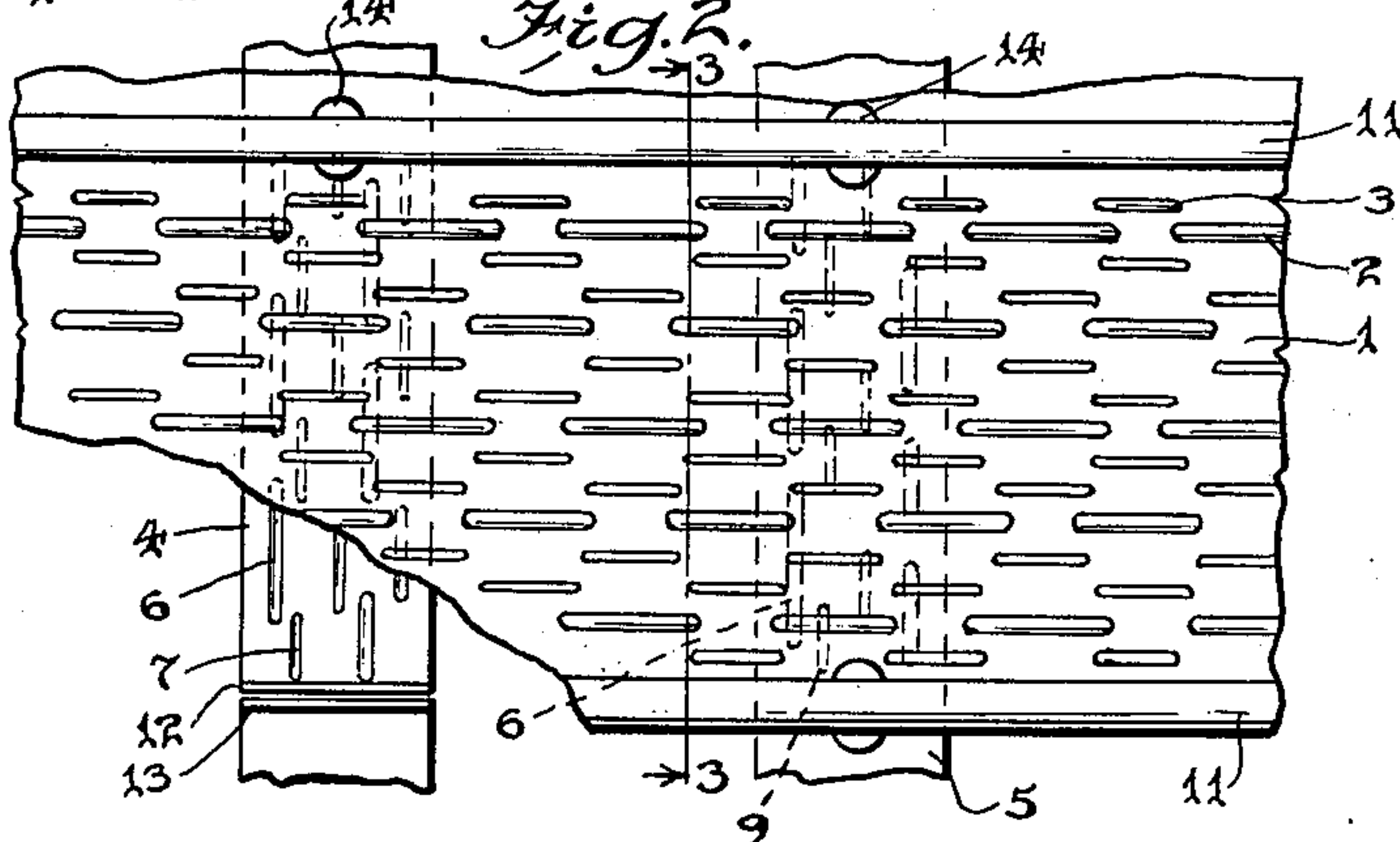


Fig. 4.

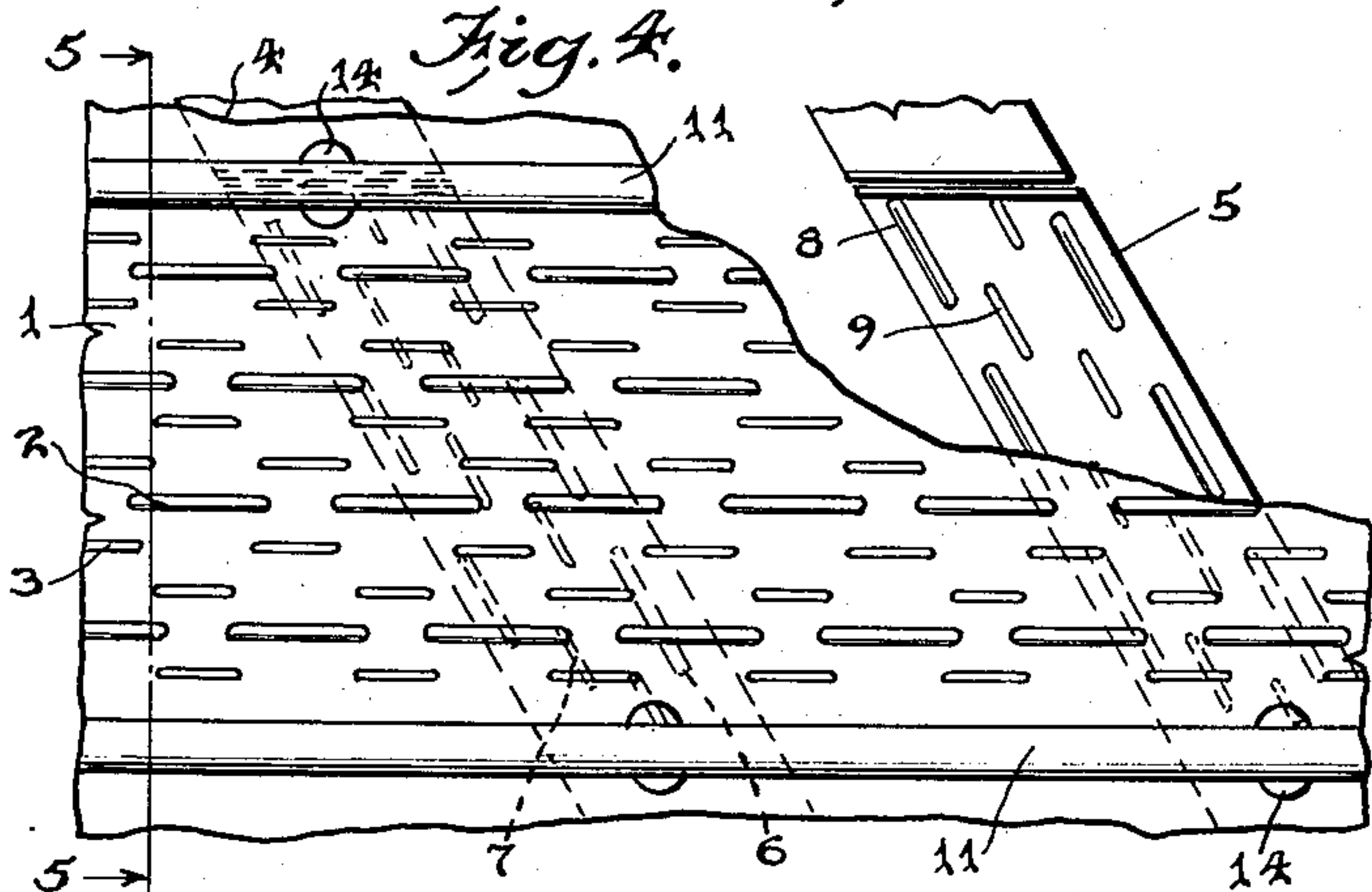
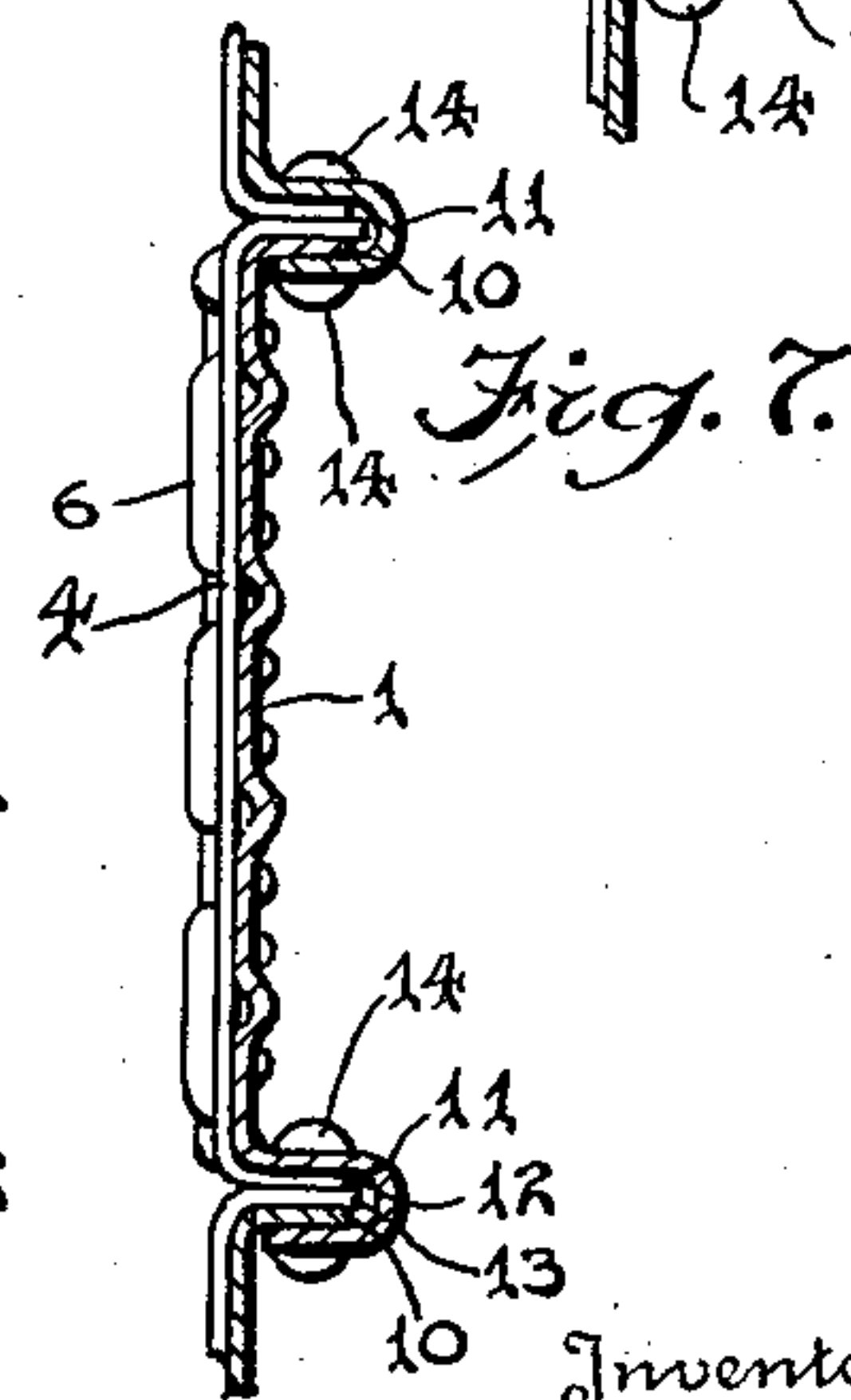
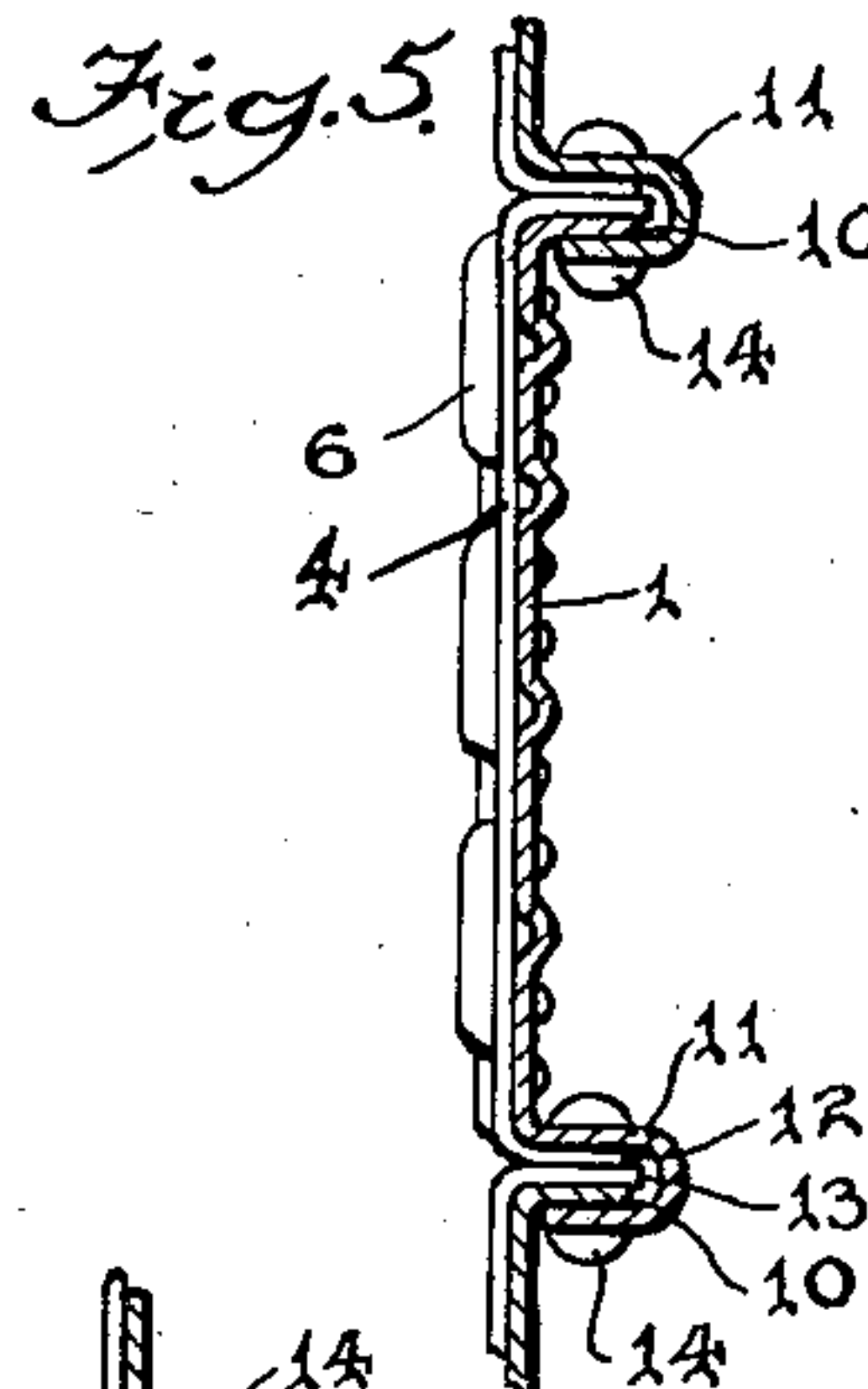
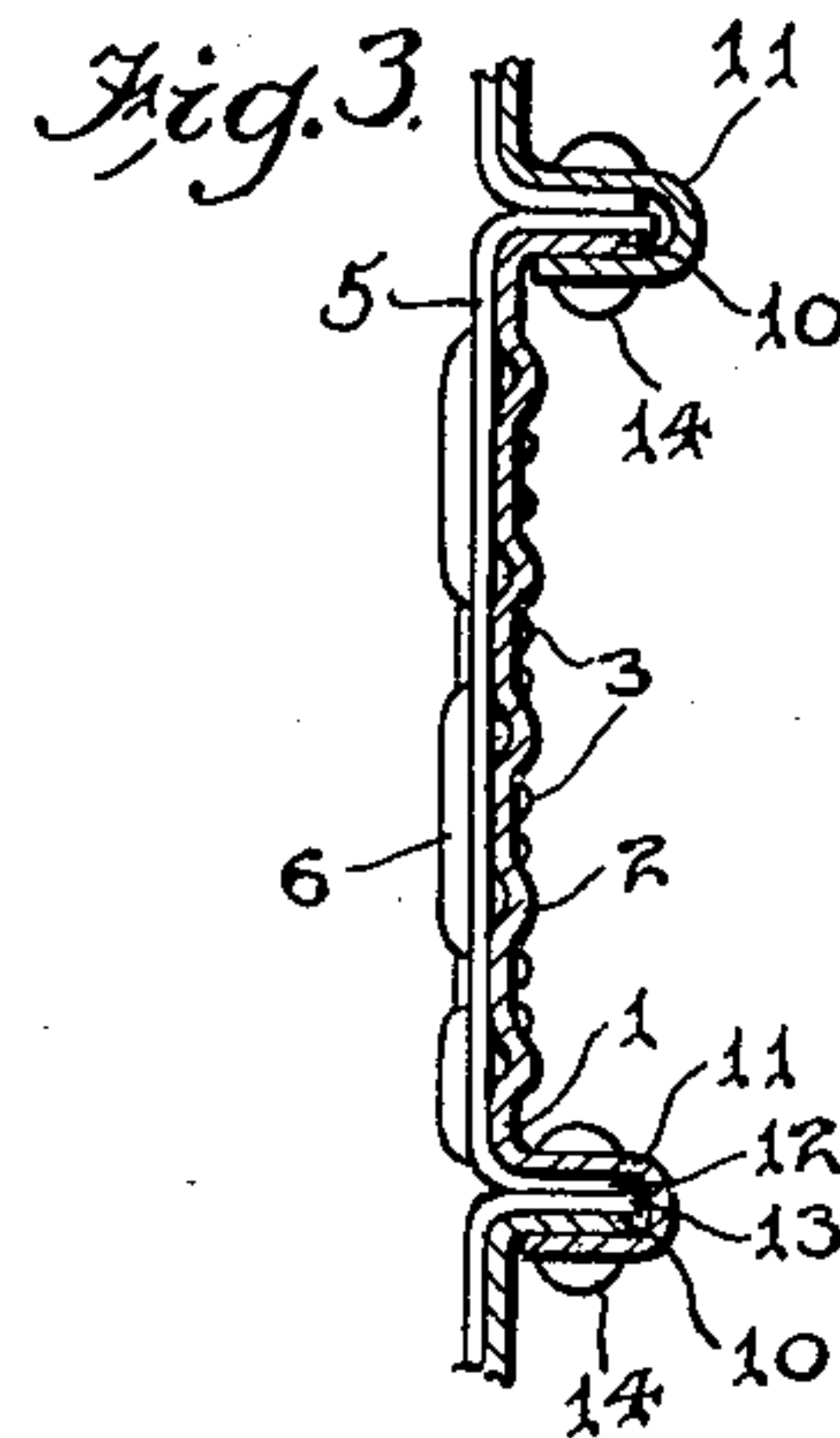
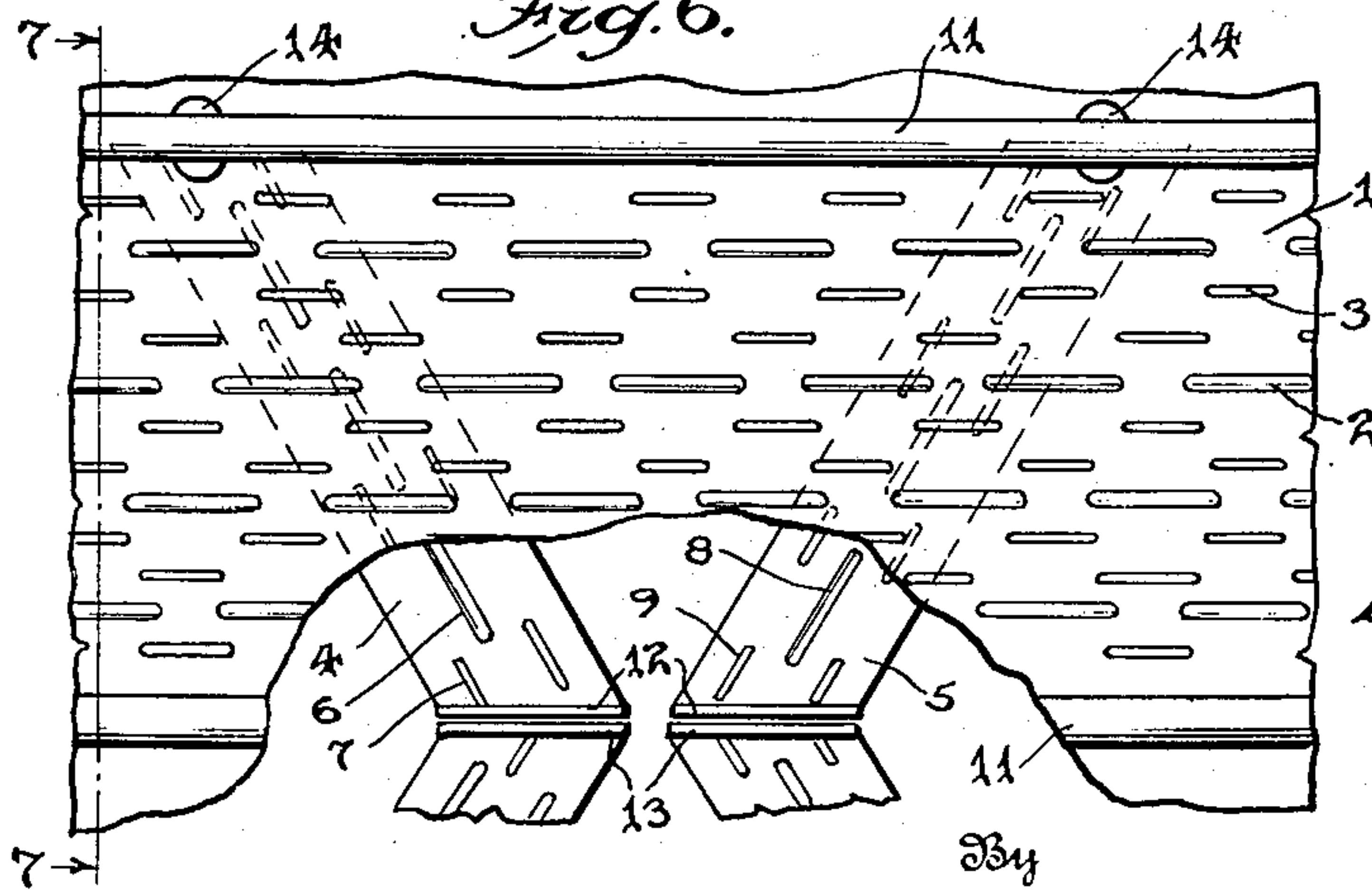


Fig. 6.



Inventor
Franco Mazzini,

Ernst Bönnehycke
Attorney

UNITED STATES PATENT OFFICE

2,012,198

METAL STRUCTURE

Franco Mazzini, Milan, Italy, assignor to Societa
Italiana Ernesto Breda per Costruzioni Mec-
caniche, Milan, Italy

Application May 15, 1933, Serial No. 671,229
In Italy June 18, 1932

6 Claims. (Cl. 189—34)

This invention relates to reinforced skin plat-
ing and other constructional parts of air and
water craft.

I have previously proposed in my British Pat-
ent, No. 387,869, complete accepted February 16,
1933, to form constructional parts for the build-
ing of aeroplanes and the like of thin plates
strengthened by raised parts or bosses produced
by local stamping and arranged in parallel rows,
if necessary staggered with respect to each other,
so that the raised parts of each row are inter-
posed between those of the two lateral rows.
This arrangement strengthens the plates in a di-
rection parallel to the rows of raised parts while
permitting their adaptation to curves in a trans-
verse direction.

It is, however, sometimes necessary for the
plates to be adjusted to multiple and complicated
curves in various directions, while being fully
strengthened in other directions. It is theoreti-
cally possible to vary as desired the distribution
of the raised parts so as to obtain in each zone of
the plates the degree and character of strength-
ening necessary; nevertheless it must be recog-
nized that this system is not convenient from the
practical point of view of convenient construc-
tion. This invention has for its object an ar-
rangement which not only renders the manufac-
ture very simple but it permits of an absolute
strengthening in zones having any shape, extent
and position, while leaving the other zones of
the strengthened plates adaptable to any neces-
sary curve in any direction whatever.

The invention resides in the main plating of a
structure or constructional part, strengthened
by means of rows of elongated bosses or raised
parts as aforesaid being reinforced by similarly
strengthened reinforcing plating and fixed in
any manner and in any desired location to the
main plating such that their bosses are aligned
in rows at any angle, or non parallel to the rows
of bosses in the main plating.

Ordinarily the pieces of reinforcing plating
may take the shape of rectangular or parallel-
ogram shaped bands, but they may also be of any
other shape. They may be arranged parallel to
each other or lie at any angle to one another,
they may be fitted at right angles to the rows of
bosses of the main plating or at any inclination
thereto. They may be fixed by riveting, bolting
or by welding, preferably autogenous.

In order to more clearly show the nature and
extent of the invention, there are shown on the
annexed drawing several simplified methods of
execution, given as examples in which:—

Fig. 1 is a transverse sectional view of a con-
struction plate according to the present inven-
tion,

Fig. 2 is a fragmentary elevational view of the
construction plate,

Fig. 3 is a sectional view taken on line 3—3
of Fig. 2,

Fig. 4 is a view similar to Fig. 2 illustrating
a modified form of the invention

Fig. 5 is a sectional view taken on line 5—5 of
Fig. 4,

Fig. 6 is another view similar to Fig. 2 illus-
trating a still further modified form of the in-
vention, and

Fig. 7 is a sectional view taken on line 7—7
of Fig. 6.

Referring to the drawing in each of the em-
bodiments shown metal plates 1 which are
strengthened by rows of bosses 2—3 are rein-
forced by bands 4—5 which, in their turn, are
strengthened by rows of bosses 6—7 and 8—9
which are aligned in a direction at an angle, that
is, non-parallel, to the alignment of the bosses
2—3 strengthening the plates 1. It is evident
that reinforced zones produced by the strength-
ened bands 4—5 applied by riveting, bolting or
welding, are created extending in any direction
owing to the effect of the non-parallel arrange-
ment of the bosses 2—3 of the plates 1 and the
bosses 6—7 and 8—9 of the reinforcing bands
4—5.

By suitably choosing the shape, width and po-
sition of the pieces 4—5, it is possible and easy
to strengthen zones of any shape and extent in
the plates of the structure.

As clearly shown in Figs. 3, 5 and 7, main plate
1 is provided with flanges 10 and 11 which serve
as a means of attaching the plates together.
These figures also illustrate the flanges 12 and
13 which cooperate with the flanges 10 and 11.
Rivets 14 or equivalent securing means cooperate
with the flanges of the main plates and reinforcing
strips and serve for connecting the main
plates together and the reinforcing strips to the
main plates.

What I claim is:

1. Reinforced constructional element of metal
plate comprising a main plate strengthened by
locally stamped elongated bosses arranged in par-
allel rows, said main plate having side flanges,
a plurality of strips of reinforcing plates asso-
ciated with the main plate and provided with
rows of strengthening bosses at an angle to the
rows of bosses of the main plate, said strips hav-
ing flanges cooperating with those of the main

plate, and means securing the flanges of the strips to the flanges of the main plate.

2. Reinforced skin plating for air and water craft comprising main skin plating strengthened
5 by locally stamped elongated bosses arranged in parallel rows, said main plating having side flanges, a plurality of strips of reinforcing plating associated with the main plating and provided with rows of strengthening bosses at an angle to
10 the rows of bosses of the main plating, said strips having flanges cooperating with those of the main plating, and means securing the flanges of the strips to the flanges of the main plating.

3. Reinforced constructional element of metal
15 plate comprising a main plate strengthened by locally stamped elongated bosses arranged in parallel rows, said main plate having side flanges, a plurality of strips of reinforcing plates associated with the main plate and provided with rows
20 of strengthening bosses at right angles to the rows of bosses of the main plate, said strips having flanges cooperating with those of the main plate, and means securing the flanges of the strips to the flanges of the main plate.

25 4. Reinforced skin plating for air and water craft comprising main skin plating strengthened by locally stamped elongated bosses arranged in parallel rows, said main plating having side flanges, a plurality of strips of reinforcing plat-
30 ing associated with the main plating and provided with rows of strengthening bosses at right angles

to the rows of bosses of the main plating, said strips having flanges cooperating with those of the main plating, and means securing the flanges of the strips to the flanges of the main plating.

5. Reinforced skin plating for air and water craft comprising main skin plating strengthened
5 by locally stamped elongated bosses arranged in parallel rows, said main plating having side flanges, a plurality of strips of reinforcing plates associated with the main plating and provided with rows of strengthening bosses in each strip
10 parallel to each other and at an angle to the rows of bosses of the main plating, said strips having flanges cooperating with those of the main plating, and means securing the flanges of the strips
15 to the flanges of the main plating.

6. Reinforced skin plating for air and water craft comprising main skin plating strengthened
by locally stamped elongated bosses arranged in parallel rows, said main plating having side
20 flanges, a plurality of strips of reinforcing plating associated with the main plating and provided with rows of strengthening bosses, the rows of bosses on one strip being at an angle to the rows of
25 bosses on another strip and the rows on both of said strips at an angle to the rows on the main plating, said strips having flanges cooperating with those of the main plating, and means secur-
ing the flanges of the strips to the flanges of the main plating.

FRANCO MAZZINI.