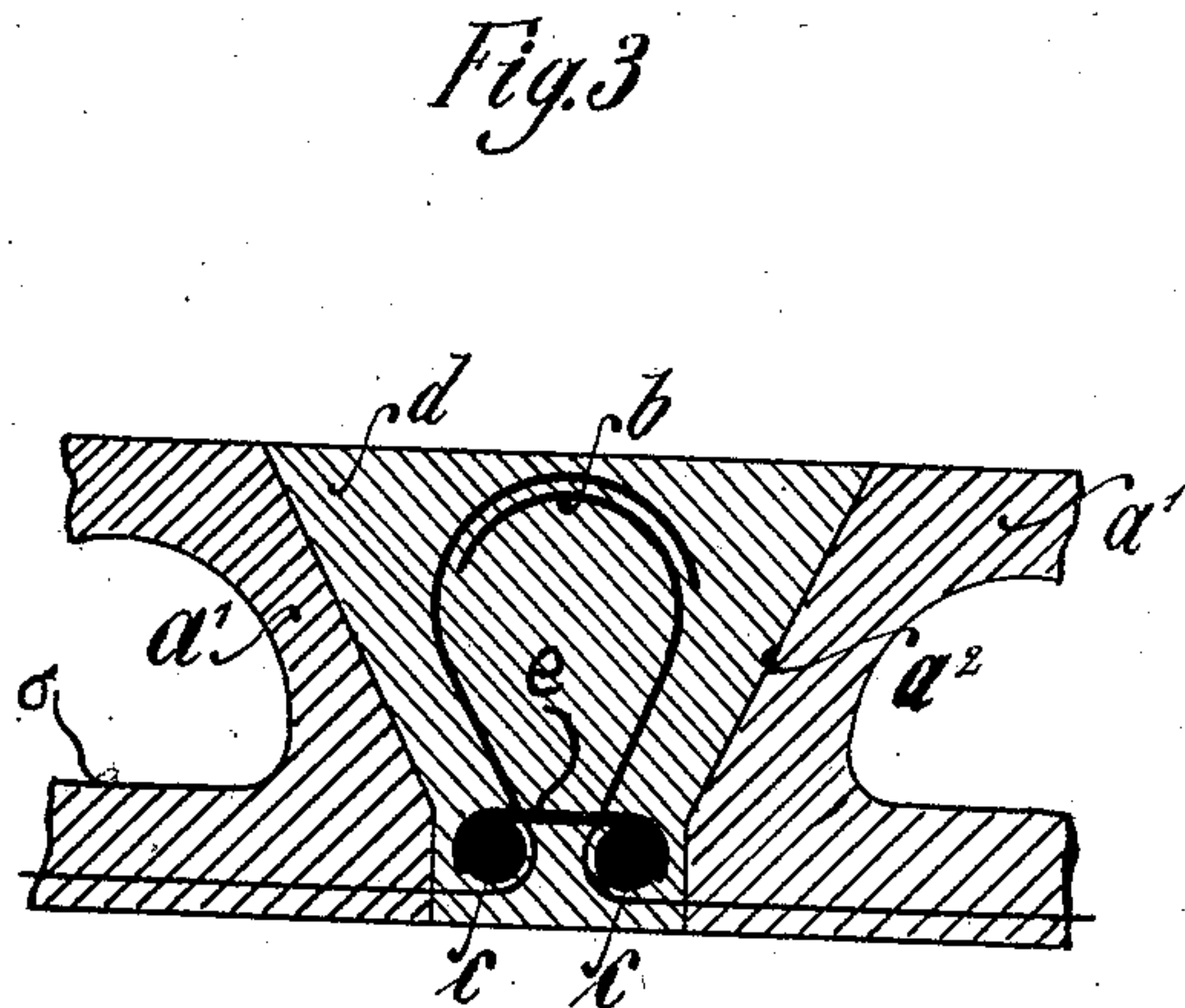
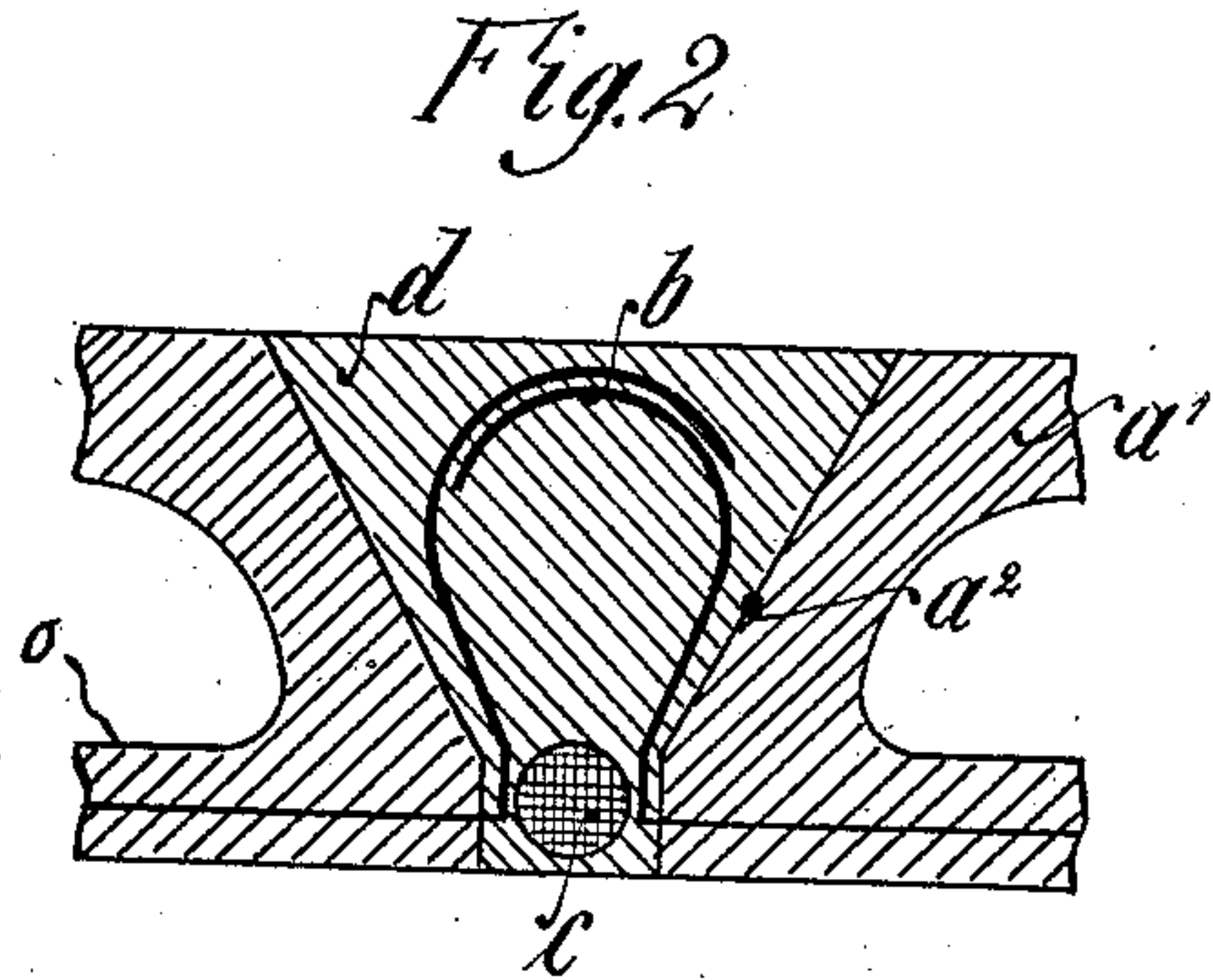
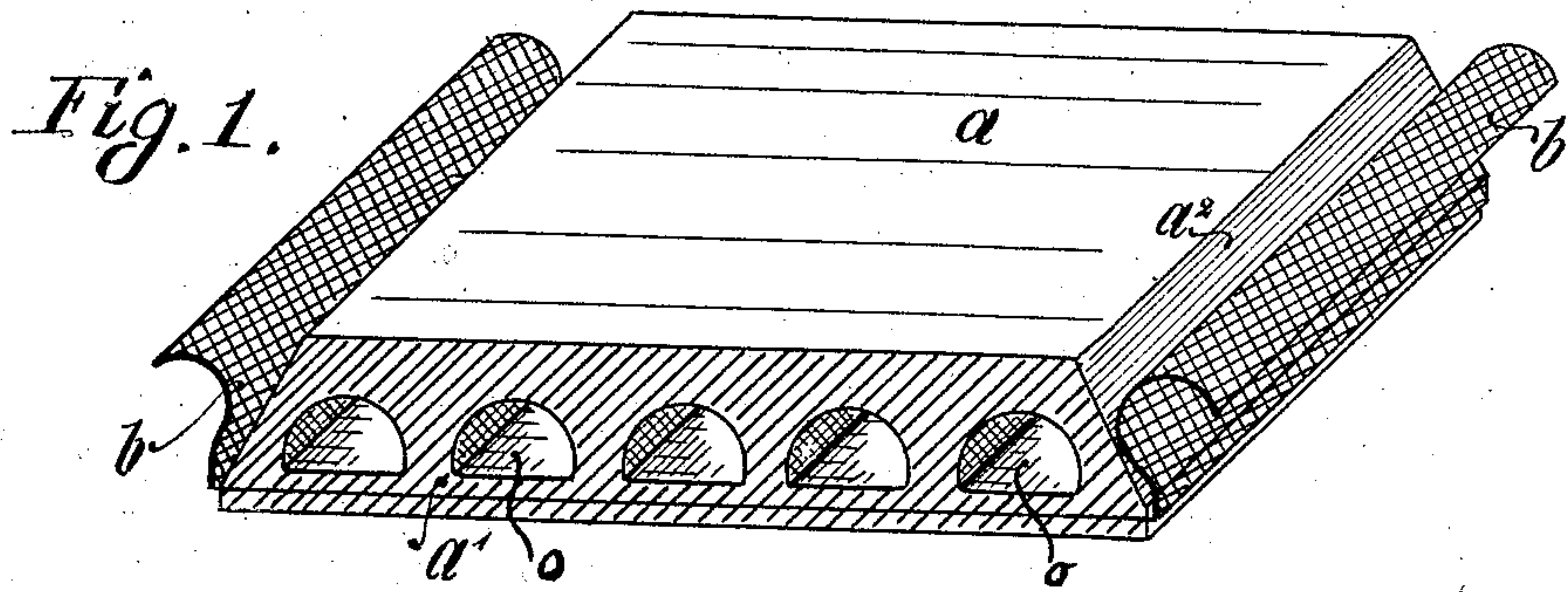


No. 845,361.

PATENTED FEB. 26, 1907.

A. KIEFER.  
INNER ROOFING.  
APPLICATION FILED NOV. 16, 1905.



Witnesses:  
*Otto Riese*  
*Paul Hardy*

Inventor:  
*Adolf Kiefer*,  
per *Kiefer*  
Attorney



# UNITED STATES PATENT OFFICE.

ADOLF KIEFER, OF HEIDELBERG, GERMANY.

## INNER ROOFING.

No. 845,361.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Application filed November 16, 1905. Serial No. 287,585.

*To all whom it may concern:*

Be it known that I, ADOLF KIEFER, a citizen of the German Empire, residing at Kronprinzenstrasse 6, Heidelberg, Baden, Germany, have invented new and useful Improvements in Inner Roofing, of which the following is a specification.

This invention relates to specially-constructed concrete junction-slabs provided with tie-wings, by means whereof with the introduction of one or more iron rods and a wedge-shaped filling of cement mortar between their opposing end surfaces a firm union of such slabs is effected, forming a massive self-bearing inner roof or ceiling. The accompanying drawings display an example of this concrete junction-slab as constructed and the mode in which the conjoining of two of these slabs is secured.

Figure 1 is a perspective representation of a junction-slab with its mountings. Fig. 2 gives a cross-section at the point of junction of two such slabs where a single iron bar is used; and Fig. 3, the same, but where two bars and clamps are used.

$a$  is a concrete junction-slab having a number of transverse openings running through from side to side, with floors  $o$  somewhat below its center. The surfaces  $a'$  may be plain or cut into grooves and studs, and they come squarely together in the ceiling. The surfaces  $a''$  are perpendicular for a certain distance from the bottom and then run obliquely back, as shown in Fig. 1, in a single slope, or on this latter line may be slanted farther inward and then brought outward again to such original inclination. An oblong sheet of stout wire-network is bedded in the wet concrete while the junction-slab is being constructed. It is set above the under surface of such slab and below the floors  $o$ , whatever transverse openings may be molded therein. The end of this wire-network sheet, which projects at each end of the slab, forms a tie-wing  $b$ . These tie-wings  $b$  are bent upward at right angles, first perpendicularly, then in an outward sweep, and finally in an inward curve.

When two slabs are assembled for junction, one tie-wing is brought over the other, so that thus placed together the tie-wings  $b$  in contour somewhat resemble a lyre. When this is considered sufficient, a single round iron bar  $c$  is laid centrally between the opposing lower surfaces of the junction-slabs in what may be termed the "region of strain."

The space between the two slabs is filled in with cement mortar  $d$ . Owing to the special construction of the slabs, this filling of cement mortar, as shown in Figs. 2 and 3, is given the shape of a wedge. When such wedge is hardened, it holds the tie-wings and iron bars securely embedded along its entire length and forms a binding adequate to resist any strain and to bear any load involved.

In place of a single bar two rod iron bars are used in cases where it is considered needful to counteract any lateral pressure on the abutments which may arise. They are laid fronting the lower parts of the surfaces  $a''$  in the region of strain. Each bar is set in the corner formed by the bending upward at right angles of the tie-wings  $b$ , as seen in Fig. 3. There they are held firmly fixed at a certain distance each from each by clamps  $e$  at suitable intervals. When the filling  $d$  has set, they are maintained thus in position and lateral pressure against the abutments caused by loading of the inner roof is effectively counteracted. So constructed and put together each slab forms an integral portion of a total single inner roof or ceiling. If circumstances render it desirable or convenient, such inner roof or ceiling of one story or chamber may form the floor of the story or chamber next above. An absolutely secure inner roofing or ceiling or flooring is thus created and wholly self-bearing. No joists nor beams nor pillars nor props of any kind are needed for its support. They are made wholly superfluous, while at the same time pressure of load and compressive strain are effectually met. Such inner roofing or ceiling can be produced as above to a width of ten meters. Its simplicity assures a low cost price and yields immense technical advantages.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. A ceiling of concrete and iron comprising a number of junction-slabs of concrete laid in abutting relation, the abutting joints of the said slabs being beveled so as to produce a wedge-shaped groove between each adjoining pair, mortar in the said wedge-shaped grooves to bind the slabs together and a wire-netting reinforcement for the junction-slabs the ends of which extend into the mortar in the wedge-shaped grooves and are bent upwardly to lie within the region of the pressure zone of the floor.

2. A ceiling of concrete and iron compris-



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laid in abutting relation, the abutting joints  
of the said slabs being beveled so as to pro-  
duce a wedge-shaped groove between each  
5 adjoining pair, mortar in the said wedge-  
shaped grooves to bind the slabs together, a  
wire-netting reinforcement for the junction-  
slabs the ends of which extend into the mor-  
tar in the wedge-shaped grooves and are bent  
10 upwardly to lie within the region of the pres-

sure zone of the floor, an iron rod situated  
over said wire-netting reinforcement where  
is projects forth from the slab, and clamps  
connecting the iron rods of neighboring slabs.

In witness whereof I have hereunto signed 15  
my name in the presence of two witnesses.

ADOLF KIEFER.

Witnesses:

H. W. HARRIS,  
JOS. H. LEUTE.