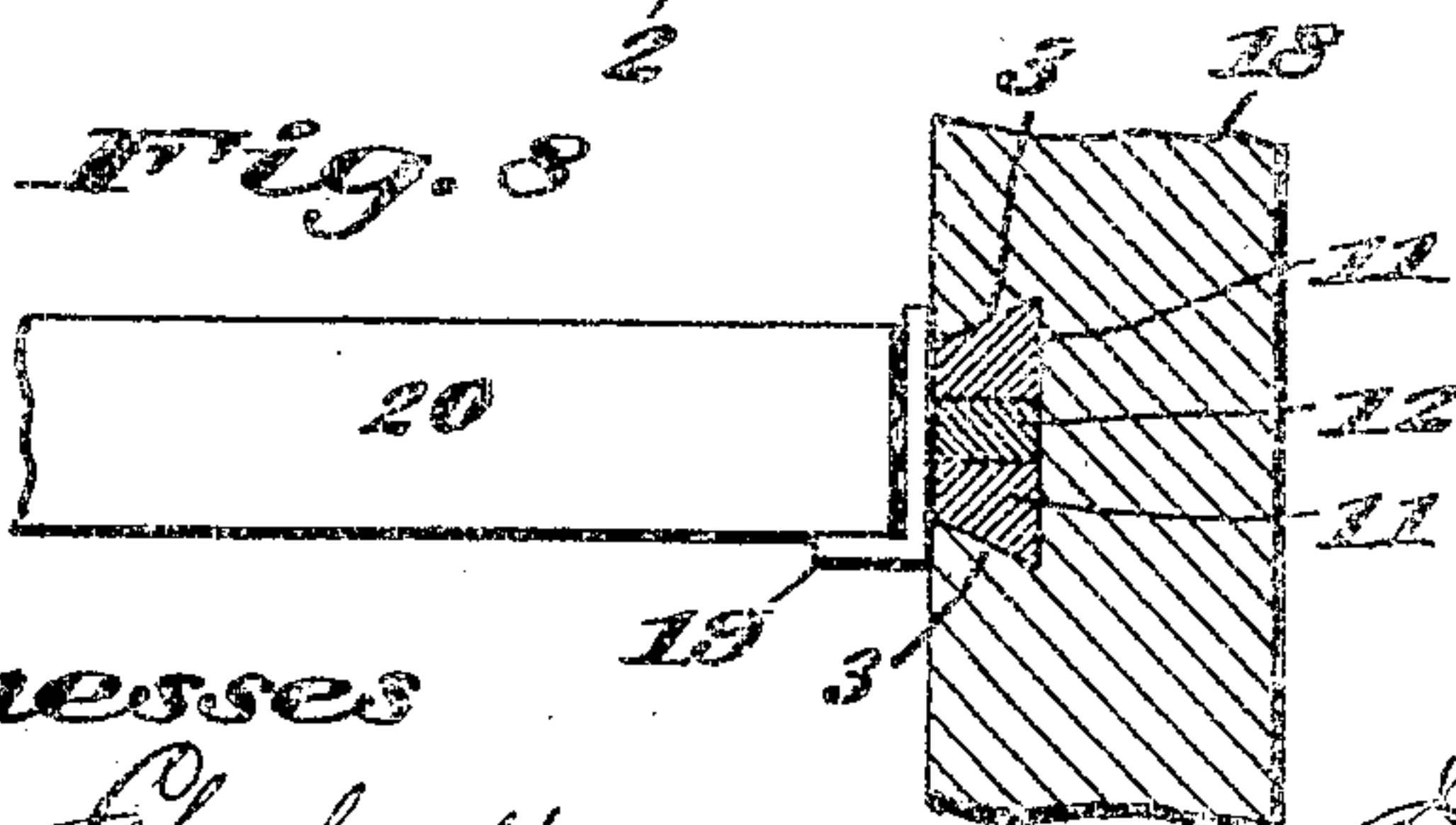
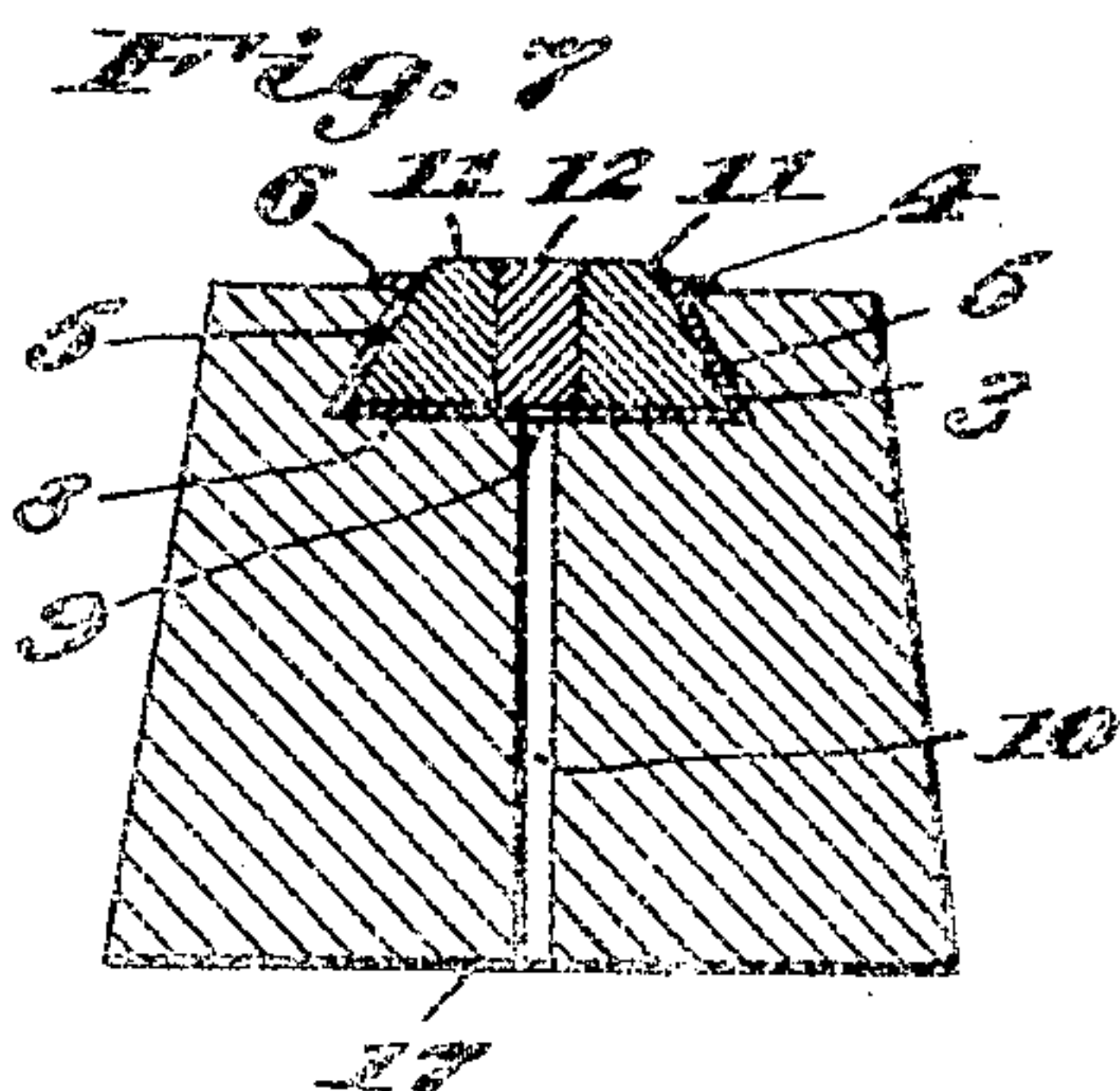
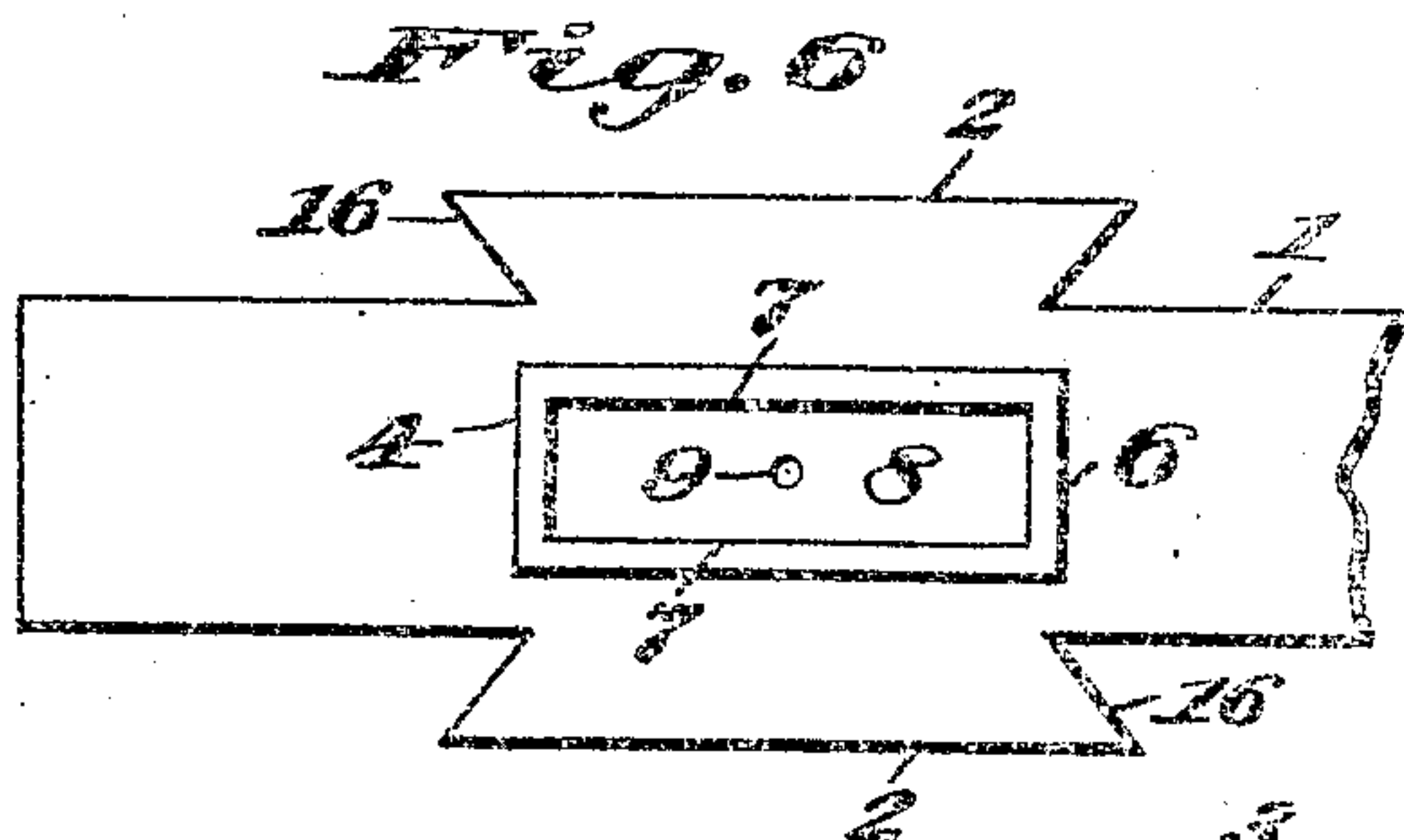
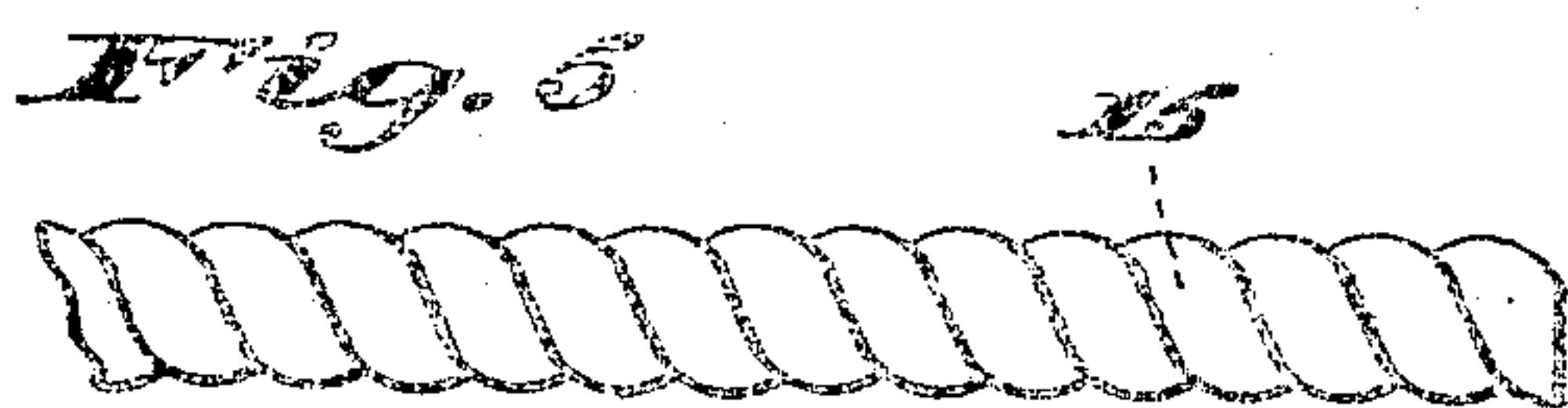
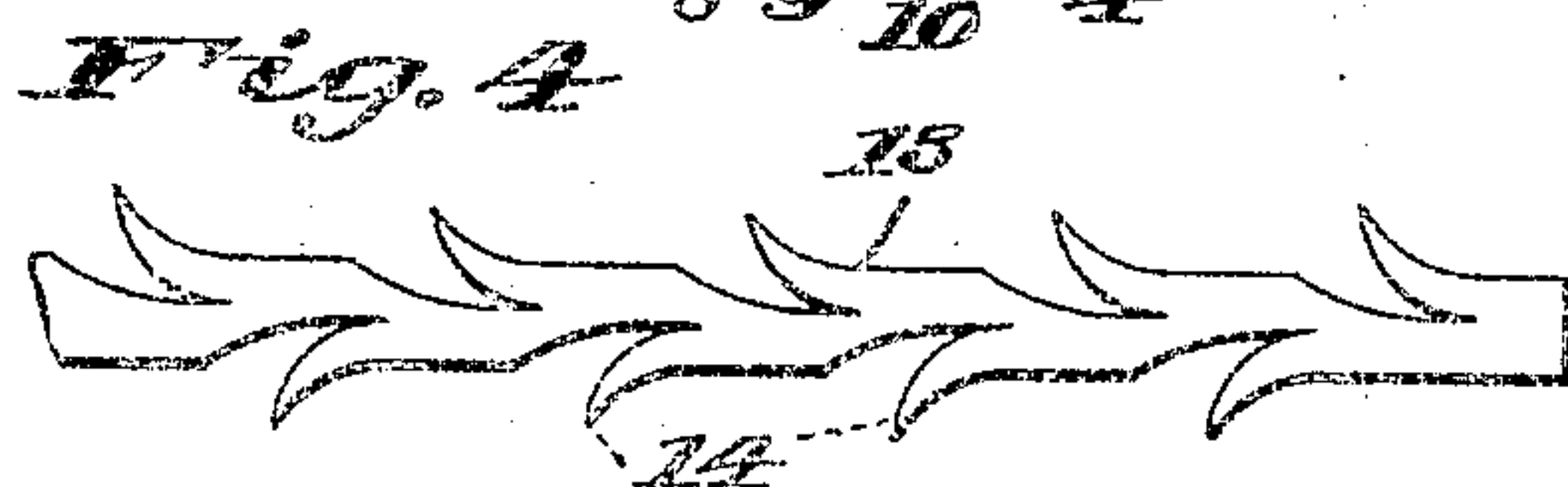
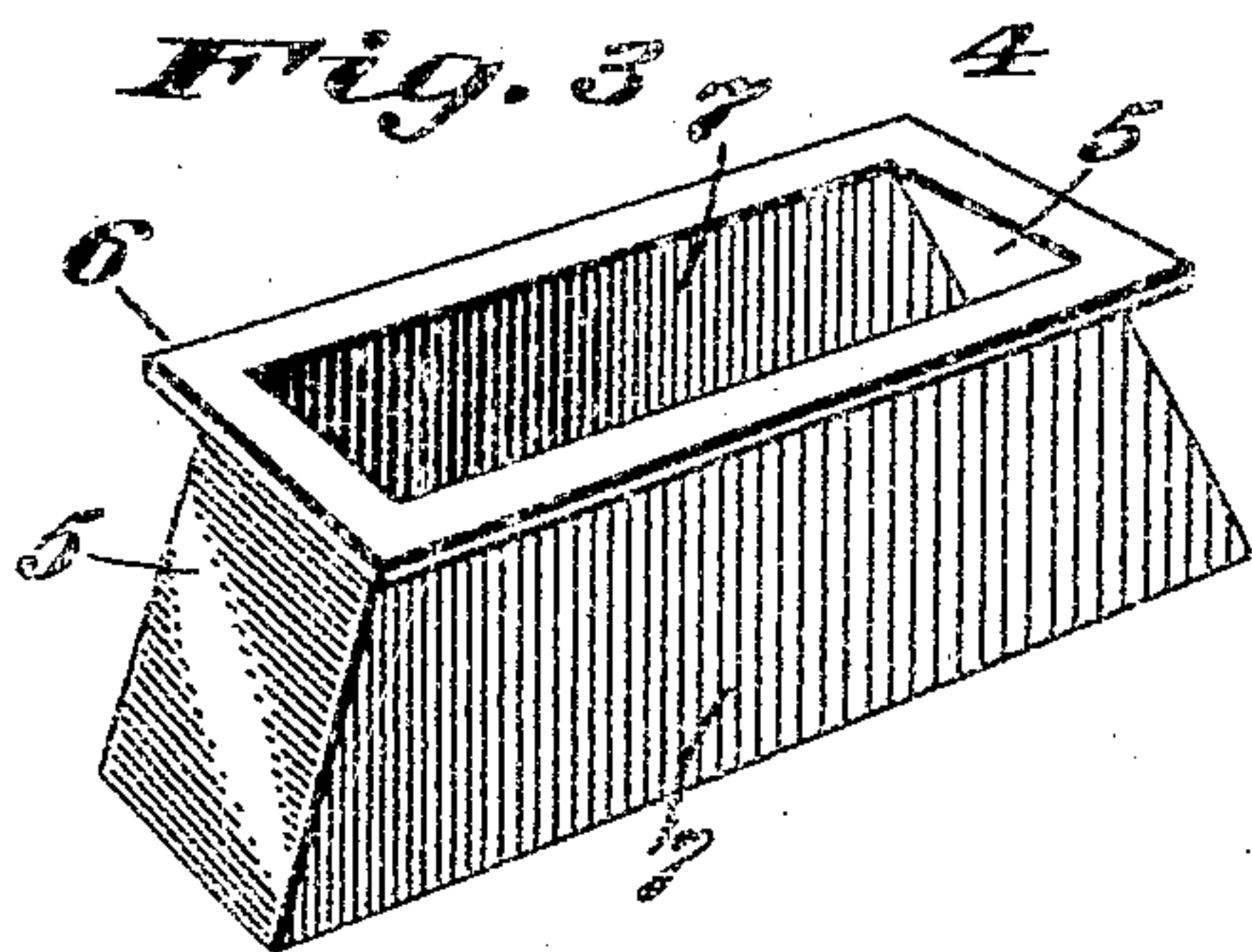
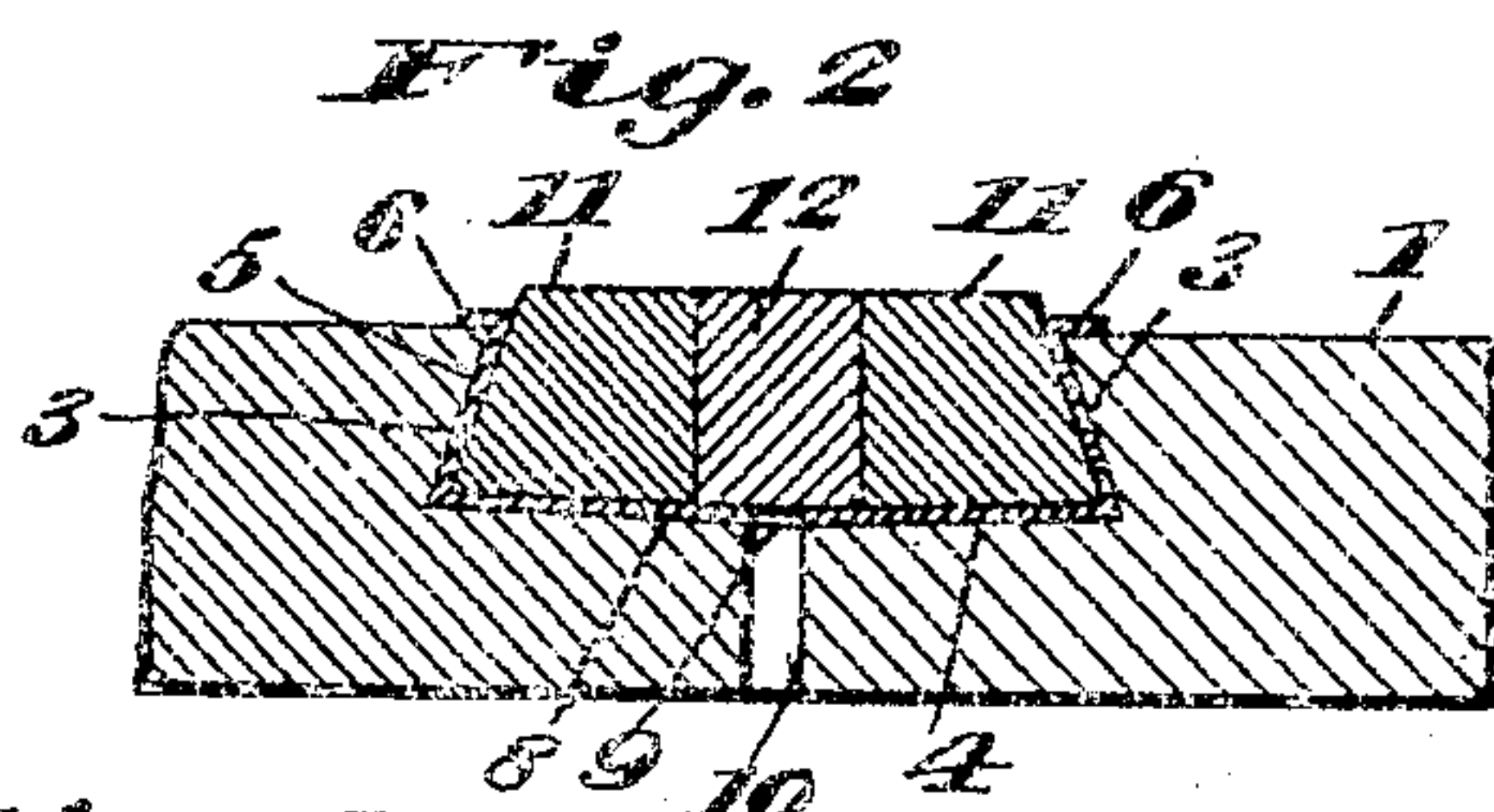
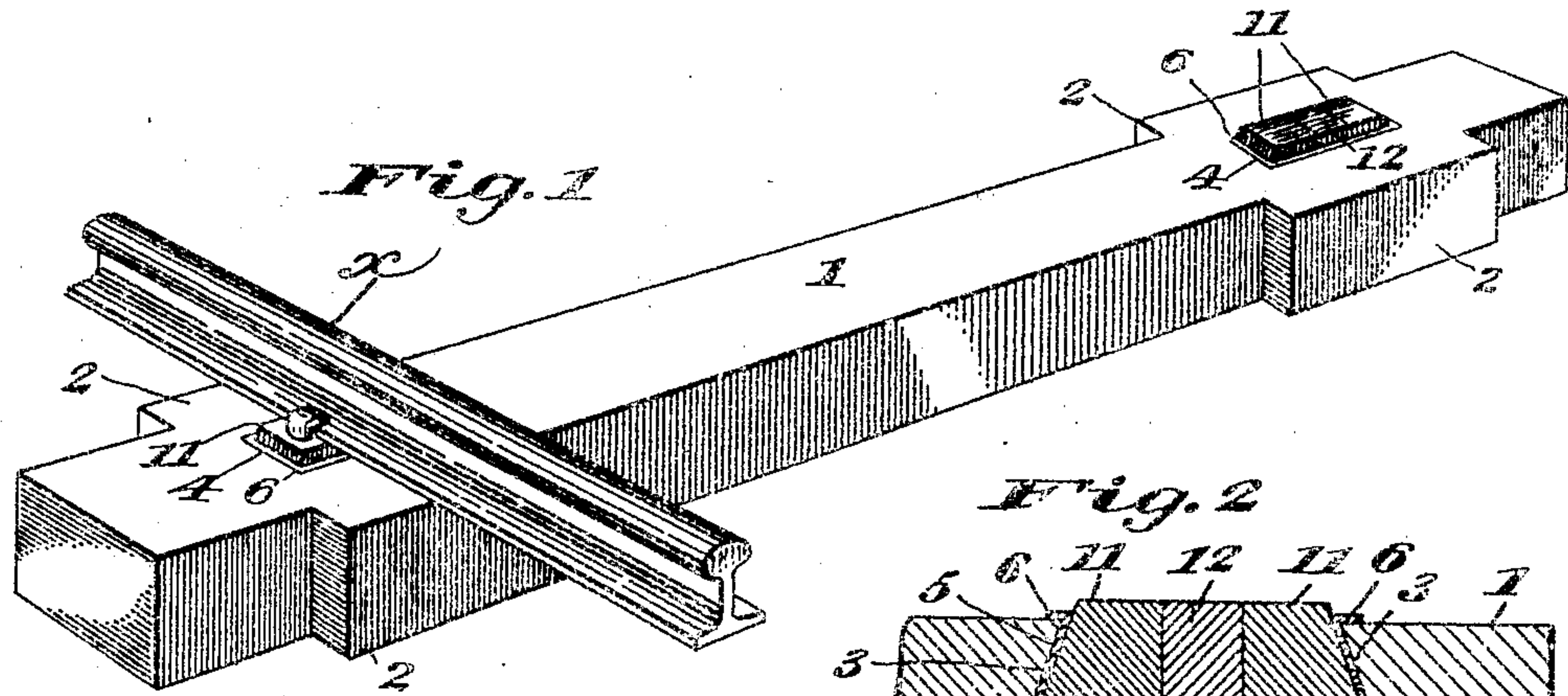


No. 786,648.

PATENTED APR. 4, 1905.

E. S. KEEFER.
CONCRETE STRUCTURE.
APPLICATION FILED JULY 30, 1904.



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CONCRETE STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 786,648, dated April 4, 1905.

Application filed July 30, 1904. Serial No. 218,847.

To all whom it may concern:

Be it known that I, EDWARD S. KEEFER, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Concrete Structures, of which the following is a specification.

This invention relates to certain improvements in concrete structures, and has for its object to provide for use in such structures generally means of an improved and simplified nature for securely holding or joining to molded concrete portions of the structure metal or wooden parts which it may be desired to embody in the structure, the invention being especially well adapted for embodiment in railway construction for holding the rails to concrete ties, for holding signal-tower rods upon a concrete base, &c., but being also well adapted for application in building structures for supporting floor-joists, doors, and the like.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved holding or joining means whereby certain important advantages are attained and the device is rendered simpler, cheaper, and otherwise better adapted to and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my improvements, Figure 1 is a perspective view showing my invention practically applied for holding a railway-rail to a concrete tie or sleeper. Fig. 2 is a sectional view taken vertically and longitudinally through one end portion of the railway-tie and showing in detail the construction of the means for holding the rail thereto. Fig. 3 is a perspective view showing the metal pan or casing forming part of the improved holding means and which in practice is embedded in the concrete structure. Fig. 4 is a detached detail view showing a short length of barbed

metal reinforce which is preferable for use for strengthening the concrete structure, and Fig. 5 is a view showing an alternative form of such reinforce formed of a twisted metal rod or strip. Fig. 6 is a plan view showing one end portion of a railway tie or sleeper, wherein my improvements are embodied in a modified arrangement. Fig. 7 is a sectional view showing the application of my improvements to the concrete base whereon is designed to be supported a signal-tower rod. Fig. 8 is a sectional view showing the application of my improvements in a building structure for supporting a floor-joist on a concrete wall.

Referring, primarily, to Figs. 1 to 4, 1 indicates as a whole a molded concrete railway cross-tie or sleeper, to which my improvements are applied for supporting and attaching a rail *x*. The tie 1 has at its opposite end portions wings or projections 2 2, integrally produced upon and extended out from its opposite sides at points adapted to underlie the rail *x* and afford at the points at which the improved attaching means are located an increased width to compensate for such strength of the tie or sleeper as may be lost by cutting or hollowing out the central part of the tie to receive the attaching means. By this arrangement of the tie 1 with wings or projections at opposite sides of its opposite ends it will be evident that a substantially uniform cross-section is afforded throughout the entire length of the tie, so that the same is given sufficient strength without unnecessary thickness at its central and end portions. In this way an economy is effected in the construction of the tie, since less material is employed therein, and, moreover, the projecting wings 2 2 are adapted by engagement in the ballast to more securely anchor the tie in position.

For imparting strength to the concrete ties or sleepers 1 provide the same with embedded metallic reinforces extended longitudinally within them, which reinforces are preferably formed from metal strips of the form shown in Fig. 4, having notched side portions, the metal between the notches being bent outwardly to produce curved barbs for engage-

ment in the concrete material. Such a reinforcement is shown in Fig. 4 in detail, 13 indicating the metal strip, and 14 14 indicating the barbs or points produced by notching and bending the opposite edge portions of the same.

In the widened part of the tie produced at each end thereof by means of the oppositely-arranged wings or extensions 2 2 is formed a cavity or recess wherein is embedded the means for holding or attaching the track-rail thereto, and in such recess, which I have indicated on Fig. 2 at 3, is arranged a metallic pan or casing 4, which has beveled end walls 5 5, which engage undercut ends of the recess or cavity 3, as clearly shown on the drawings.

The pan or casing 4 may be cast or otherwise formed from thin metal and has an outwardly-extended lip or flange 6 extended around its upper edge portion or mouth, which lip or flange 6 is designed to lie flush on top of the tie 1. The pan or casing 4 is also formed with vertical parallel side walls 7 7, aligned with the length of the tie, and with a bottom 8, having at its central portion an opening 9, the said bottom 8 being sloped downwardly from the sides and ends of the pan toward said central opening, so as to permit ready drainage of water should any collect within the pan or casing. The opening 9 in the bottom of the pan or casing is also aligned with an opening 10, produced in the under side of the concrete tie below the pan or casing and designed to receive a pin or tool by means of which the locking devices may be driven from the pans or casings, as will be hereinafter explained.

By means of the pan or casing 4 embedded within the concrete tie or sleeper the walls of the opening produced therein to receive the holding or attaching means are prevented from crumbling or being chipped away by the strains and pounding action of the wheels passing over the ties, so that the life of the concrete structure is considerably lengthened. The employment of the pans or casings also renders the process of molding the ties considerably less troublesome and expensive, since by the employment of said parts the molding of the recesses or cavities is accomplished without the use of removable cores or parts of any kind except such as is required for producing the openings 10.

The rail holding or attaching means held within the casing or pan 4 comprises blocks or pieces 11 11, of wood or like material, each of which has an end surface beveled or inclined to fit snugly upon the undercut inner end surface of the end wall 5 of the pan or casing, and said blocks or pieces 11 11 are arranged in pairs or sets, there being two of them within each pan or casing 4. The blocks or pieces 11 11 are of dimensions, measured lengthwise of the tie, such that when they are in place within the pan or casing with their inclined

ends fitted on the end walls 5 5 of the casing a space will be provided between the blocks or pieces of each set in which space is adapted to be received a central locking block or piece 12, of wood or other material, adapted to snugly fill such intervening space, as seen in Fig. 2. By this means it will be seen that when a pair or set of the wooden blocks 11 is inserted in one of the casings 4 and the space intervening them is filled by means of a locking-block 12 the blocks 11 are securely locked in place against dislocation from the casing by engagement of the beveled ends of the blocks upon the undercut end walls of the casing, so there is no likelihood of said blocks being accidentally dislodged from the tie. The blocks 11 and 12 are preferably arranged to extend slightly above the upper surface of the tie, and in use the rails *r* are laid upon the upwardly-projecting portions of the blocks, as shown in Fig. 1, the rail itself serving to hold the locking-block in position and having its flanges extended upon the top surfaces of blocks 11 11, so that spikes may be driven down into said blocks 11, as shown in Fig. 1, for securely holding the rail in position.

Since the blocks are extended slightly above the top of the concrete body portion of the tie, it is evident that a certain degree of elasticity is afforded to prevent damage to the concrete material from the pounding of the wheels in passing over the ties.

When it is desired to remove the blocks 11, so that they may be replaced with new ones, as will have to be done from time to time, it is only necessary to drive a pin or other tool through the opening 10 in the under side of the concrete tie against the central locking-block 12, which may thereupon be readily forced from its position between the blocks 11 11, which may thereafter be readily removed from the casing and replaced by fresh blocks, which latter will be locked in a similar way by means of a block 12 to hold them against accidental removal from the casing. By this construction it will be seen that the concrete tie is given all the advantages of a wooden tie, while being at the same time much cheaper and more durable. The wooden blocks 11, on which the rail is held, take up the vibration which would otherwise be transmitted directly from the rails to the concrete structure, so that damage of the latter is prevented, and the construction of the rail-holding means is also such as to be very inexpensive and capable of being readily replaced when damaged after use.

In Fig. 5 I have illustrated at 15 a modified form of reinforce for the concrete body portion of the tie or sleeper, wherein the reinforcement is formed from a length of metal rod twisted to produce a spiral formation adapted for secure engagement in the concrete material, as will be readily understood.

Fig. 6 represents a modified formation of

the concrete body portion of the tie, wherein the offset wings or extensions 2 2 at the rail-supporting part of the tie have beveled or undercut ends 16 for more secure engagement with the ballast to hold the tie in position on the road-bed.

In Fig. 7 I have illustrated the application of my improvements to a concrete base for signal-tower rods, wherein 17 indicates such concrete base, which is formed with an opening 10, extended in its under side, and has embedded in its upper part a pan or casing 4, with dovetailed ends in all respects similar to that above described with reference to Figs. 1, 2, and 3. In this casing 4 is held a pair of the blocks 11 and a removable central locking-block 12, affording a means of attachment of the rod to said base, which means is capable of ready replacement upon the removal of the central locking-block in a way similar to that above described.

In Fig. 8 I have illustrated the application of my improvements to a joist-support for building structures, and in this view 18 indicates a concrete wall of the building, which wall has embedded in it a pair of the blocks 11 and an intervening locking-block 12 which is removable from the front to permit replacement of the blocks 11 when worn or desired. In this view the casing is omitted, but it will be evident that the same may be employed, if desired. 19 indicates an angular support for the joist 20, which support is spiked or otherwise held to the block 11.

From the above description it will be evident that the improved attaching means is of an extremely simple and inexpensive nature and is capable of wide application in concrete and other structures generally, besides the special applications herein set forth—as, for example, for holding doors and the like in concrete supports and for holding rails in position on steel or other cast-metal or stone railway-ties or other structures—and it will be also obvious from the above description of my invention that the device is capable of some modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts of the device herein set forth in carrying out my invention in practice—as, for one instance, the pans or casings containing the wooden blocks 11 and 12 may be distributed in proper

positions and alinement along a bed of concrete in a street, railway, highway; or the like, and duly embedded in said concrete while the latter is in a plastic condition to suit and support track-rails of a railway, (either steam, electric, or other motive power,) or the said pans or casings and their wooden blocks may be distributed in stringer or sill fashion along railways, as well as in cross-tie or transverse position, and support rails laid upon them.

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

1. A railway-tie comprising a concrete body portion the extremities of which are provided with lateral wings or projections and have, between said wings or projections metallic casings embedded in them and provided with undercut end walls, blocks having end surfaces engaged on the undercut end walls of the casing and a locking-block interposed between said first-named blocks in the casing.

2. A concrete structure having embedded therein a metallic casing the end walls of which are undercut and inclined in opposite directions, blocks insertible in said casing with end surfaces inclined to fit the undercut end walls thereof and a locking-block insertible between the first-named blocks.

3. A concrete structure having embedded therein a metallic casing the end walls of which are undercut and oppositely inclined and the bottom of which is centrally perforated and is inclined downward from its edge portions toward said central perforation, blocks insertible in said casing with end surfaces fitting the undercut end walls thereof and a locking-block interposed in the casing between the first-named blocks.

4. A concrete structure having embedded therein a metallic casing the end walls of which are undercut and oppositely inclined and the upper edges of which are provided with an outwardly-directed flange, blocks insertible in the casing with end surfaces engaged on the undercut end walls of the same and a locking-block interposed between the first-named blocks.

Signed at Cincinnati, Ohio, this 26th day of July, 1904.

EDWARD S. KEEFER.

Witnesses:

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WILLIAM SCHUCHARDT.