

No. 877,139.

PATENTED JAN. 21, 1908.

W. TATARINOFF.
HYDRAULIC PRESS.

APPLICATION FILED NOV. 6, 1906.

2 SHEETS—SHEET 1.

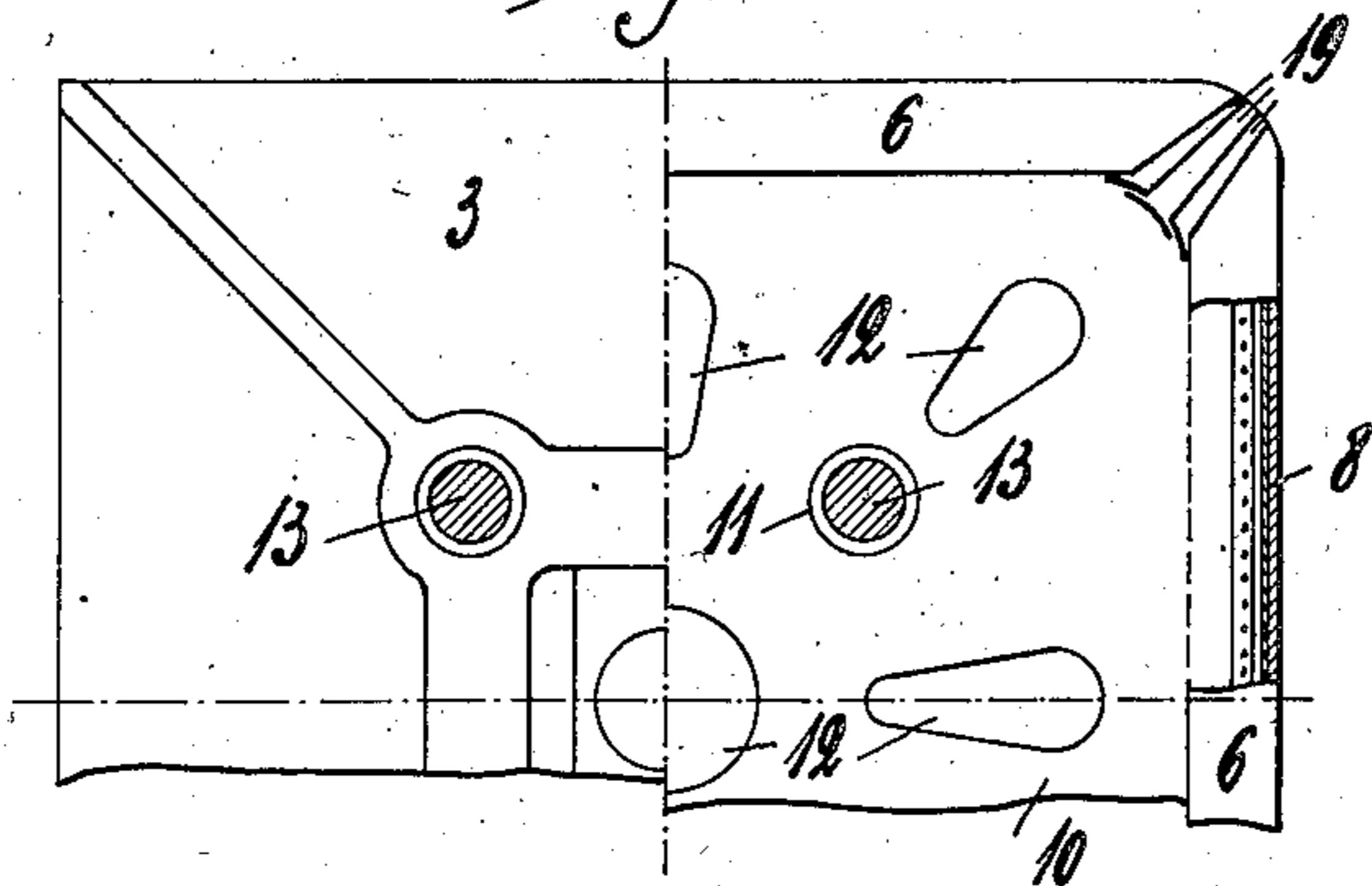
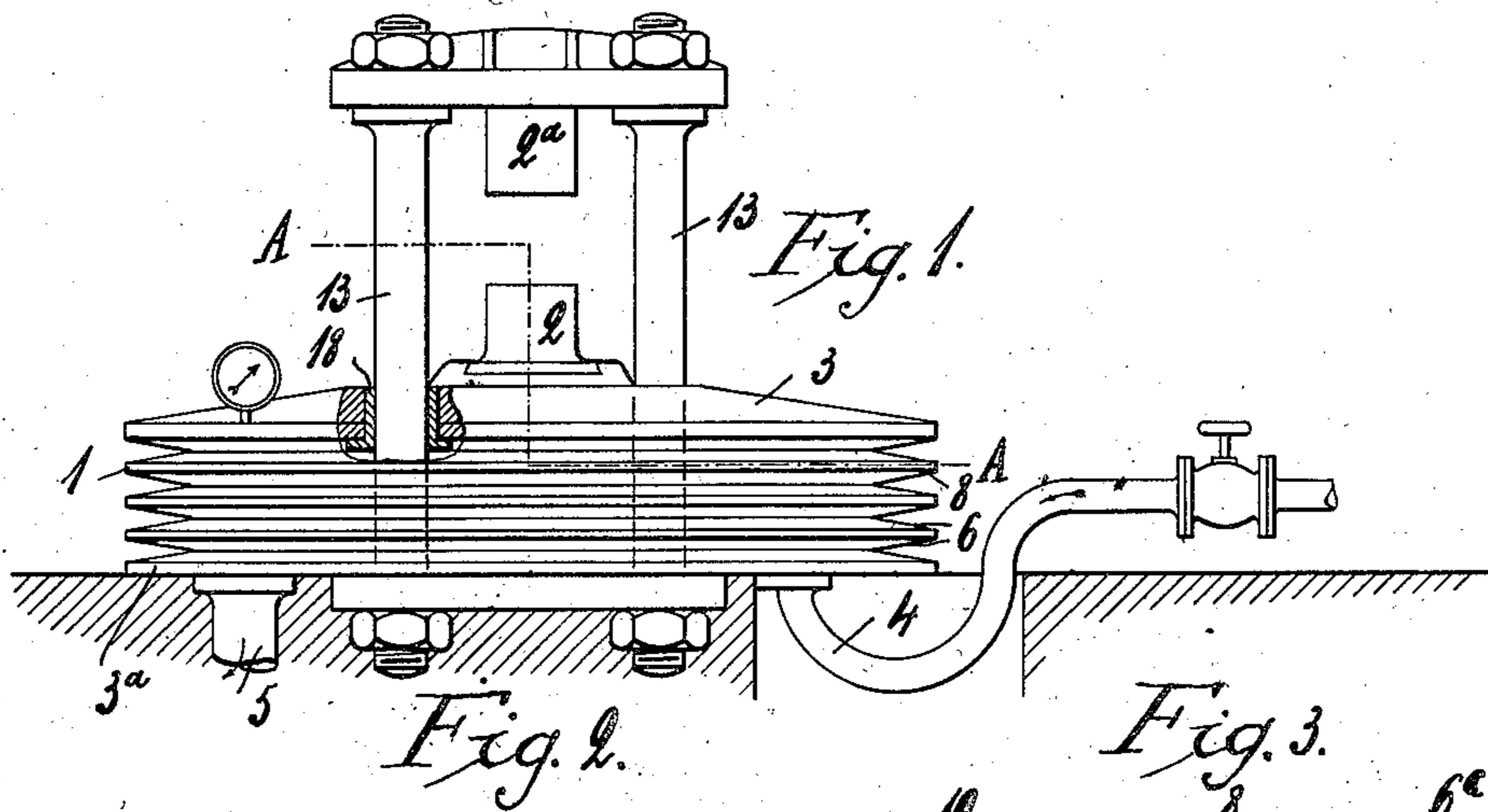
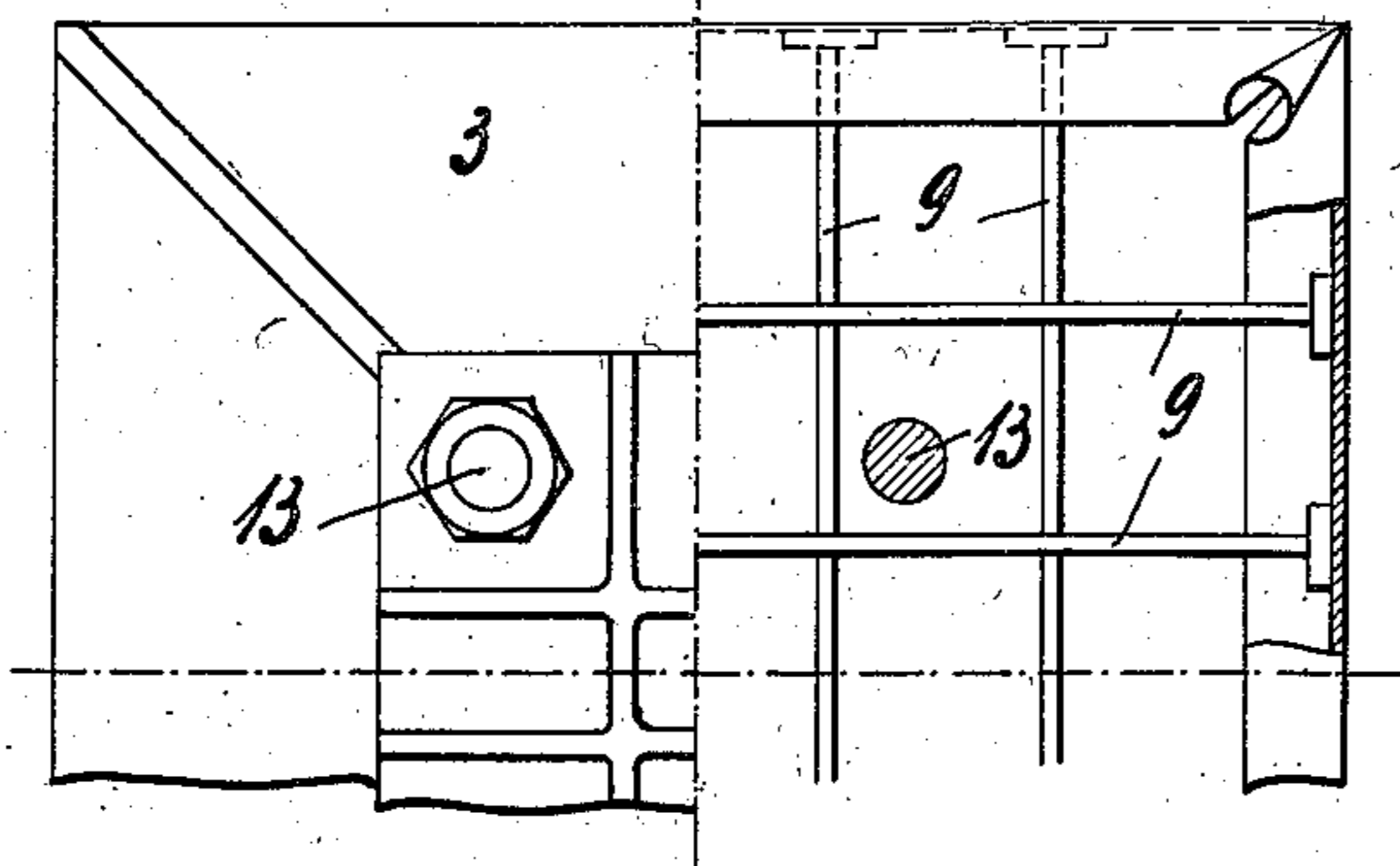


Fig. 4.



Witnesses.

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Inventor.

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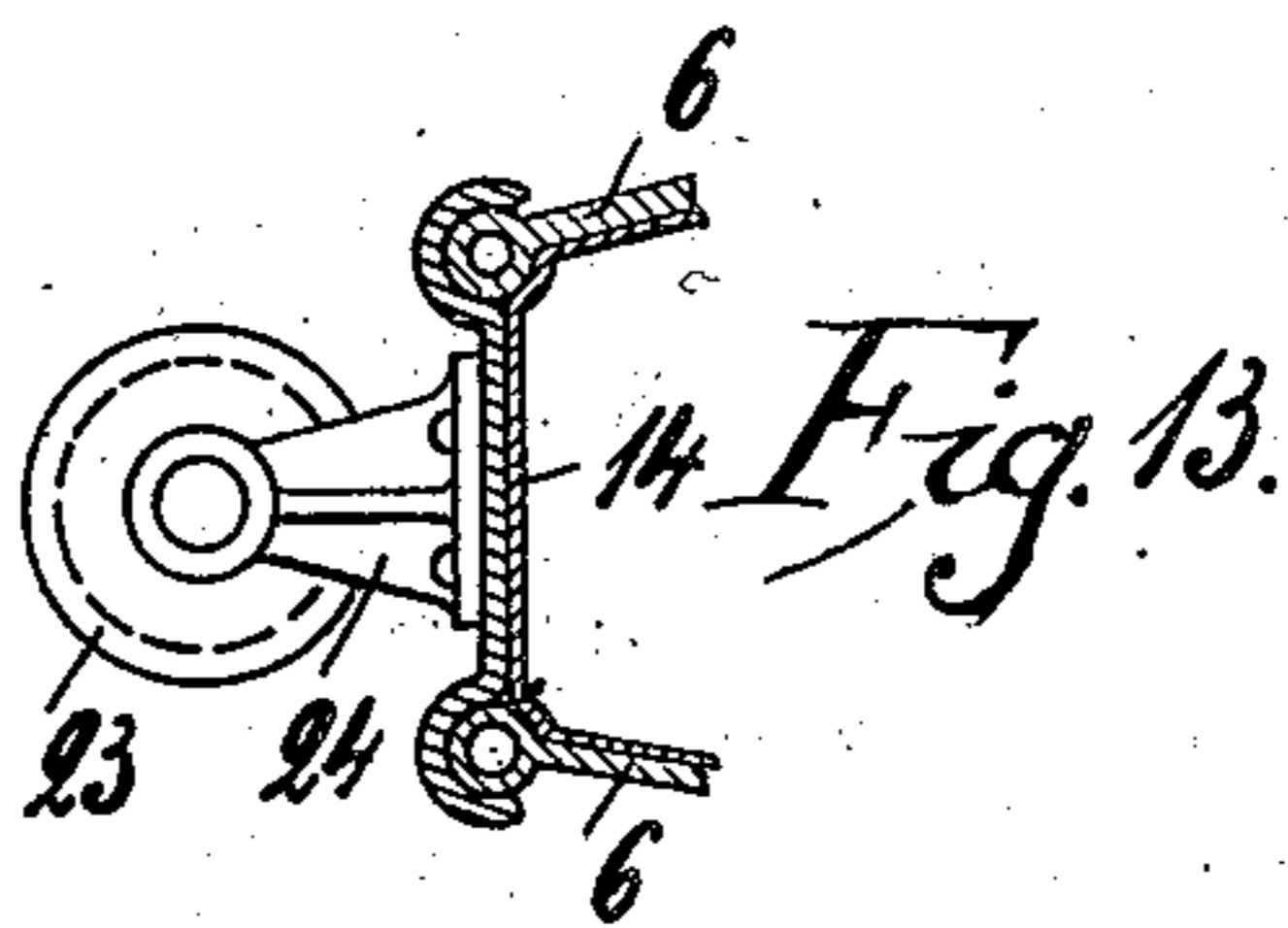
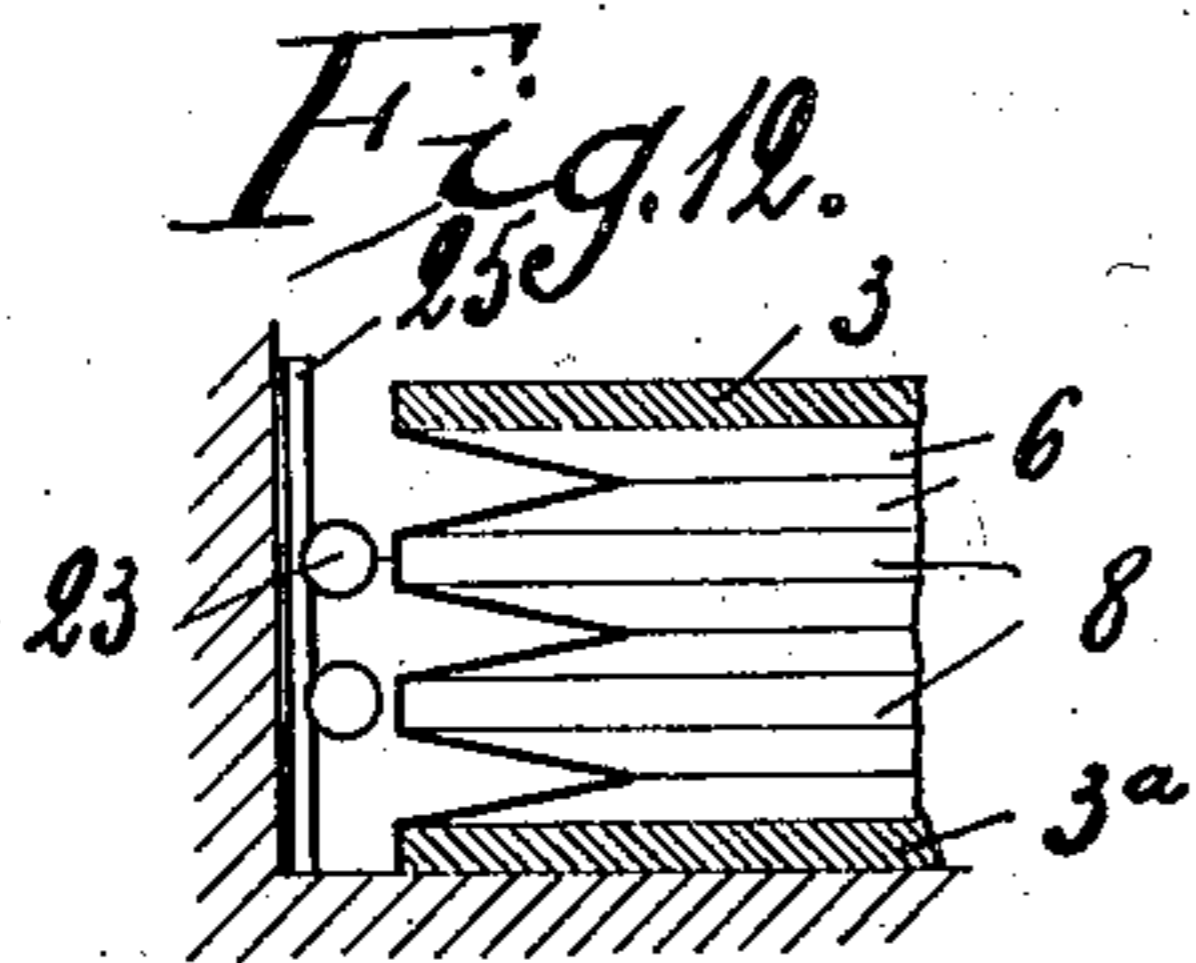
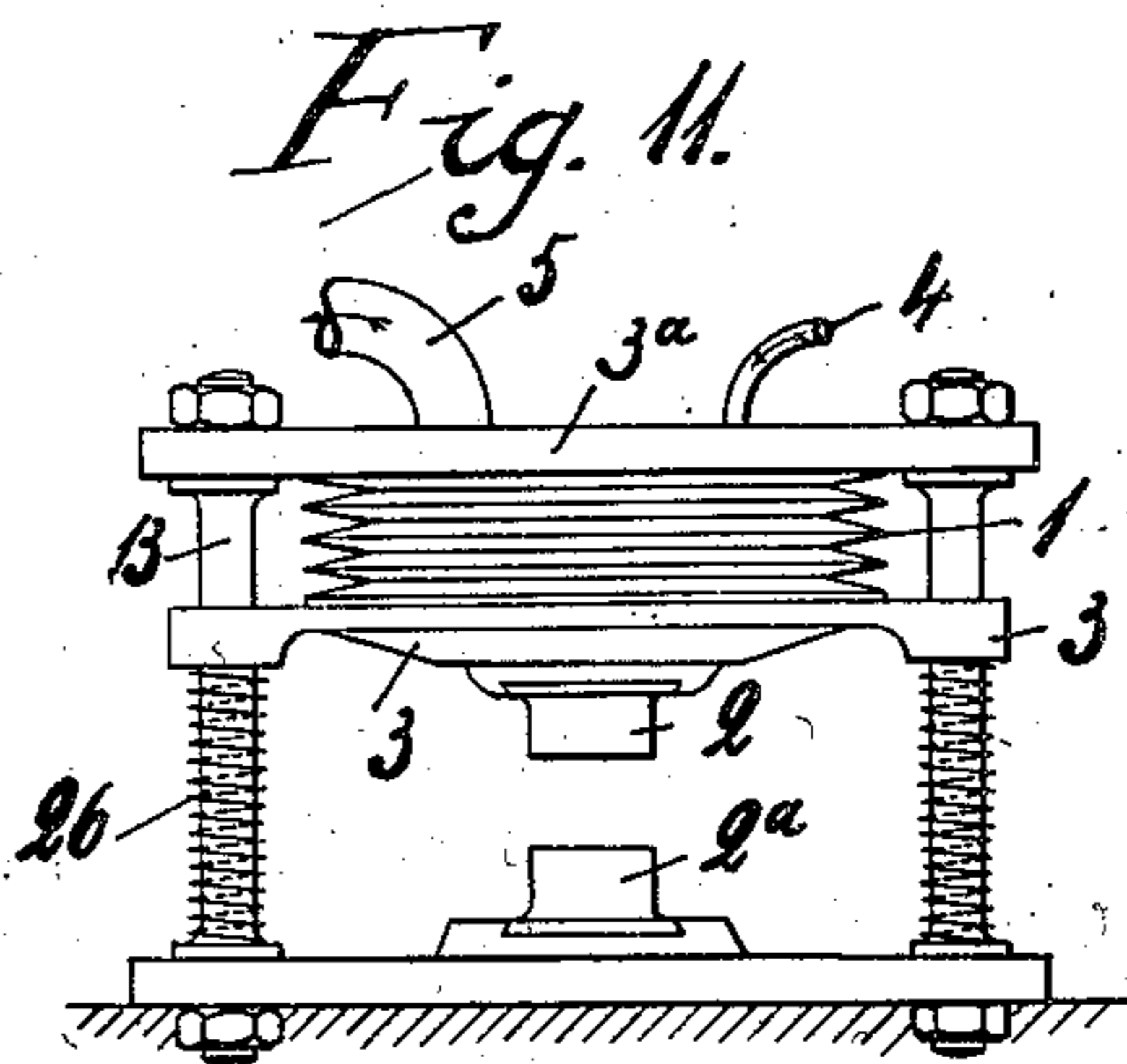
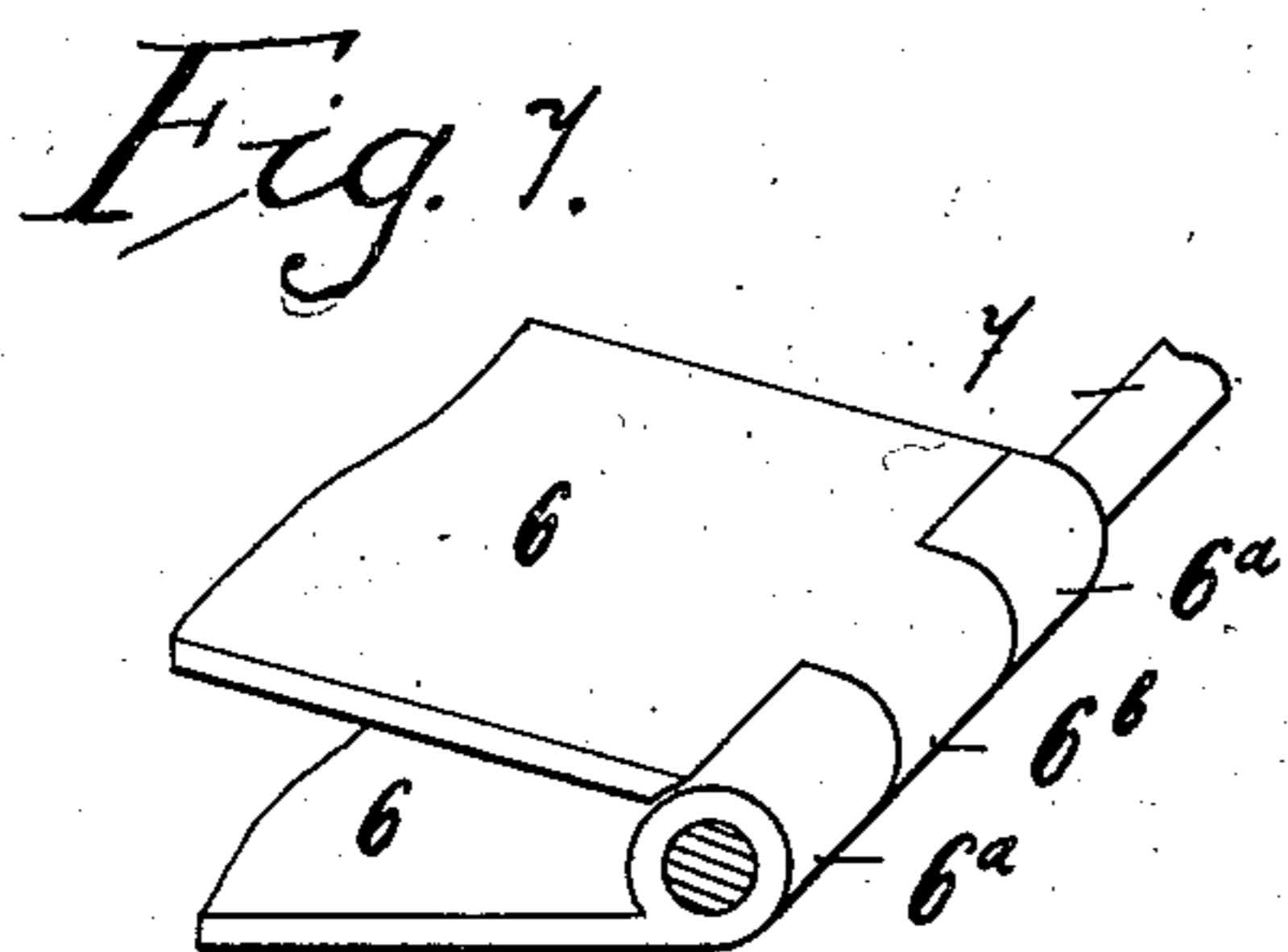
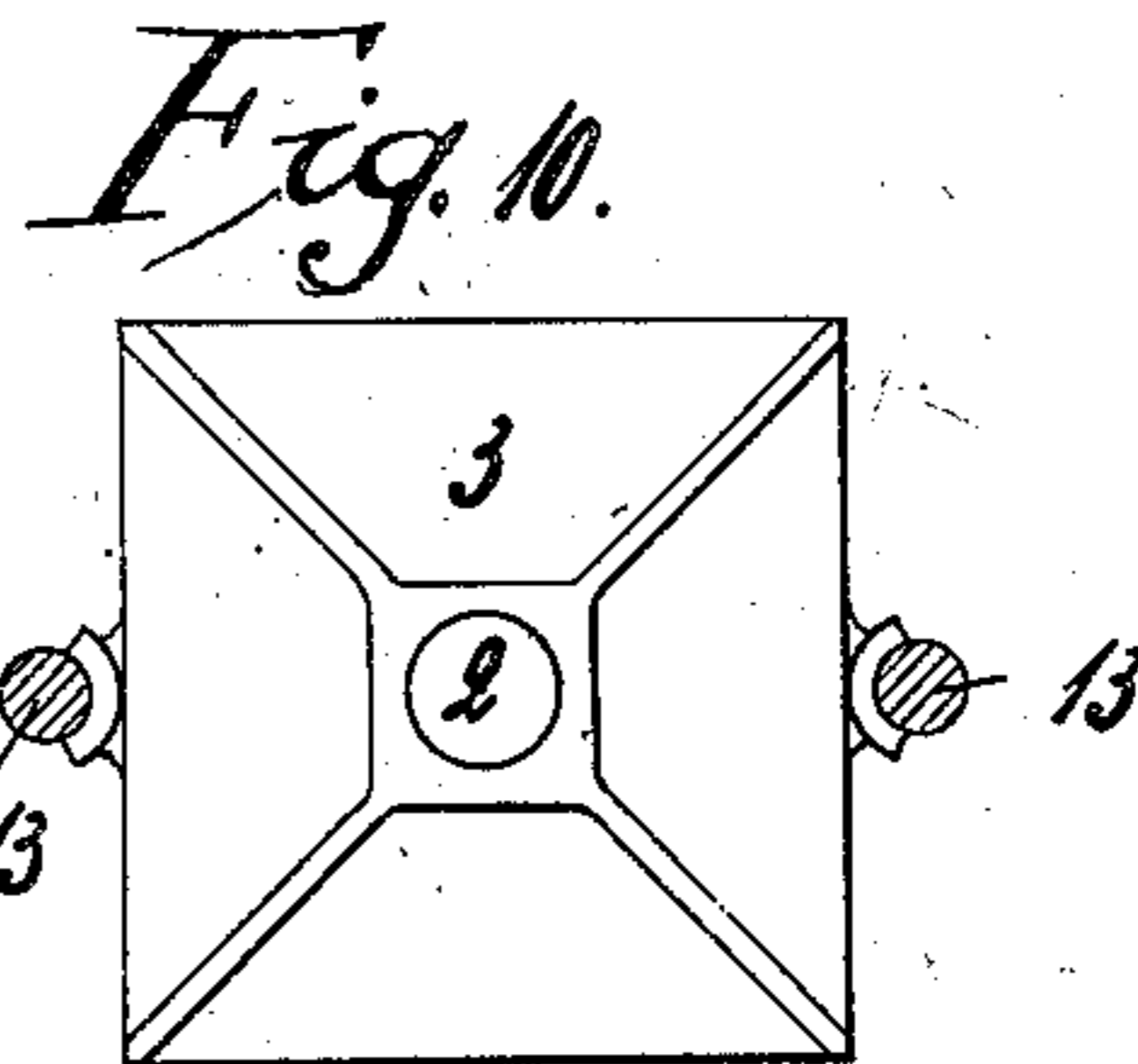
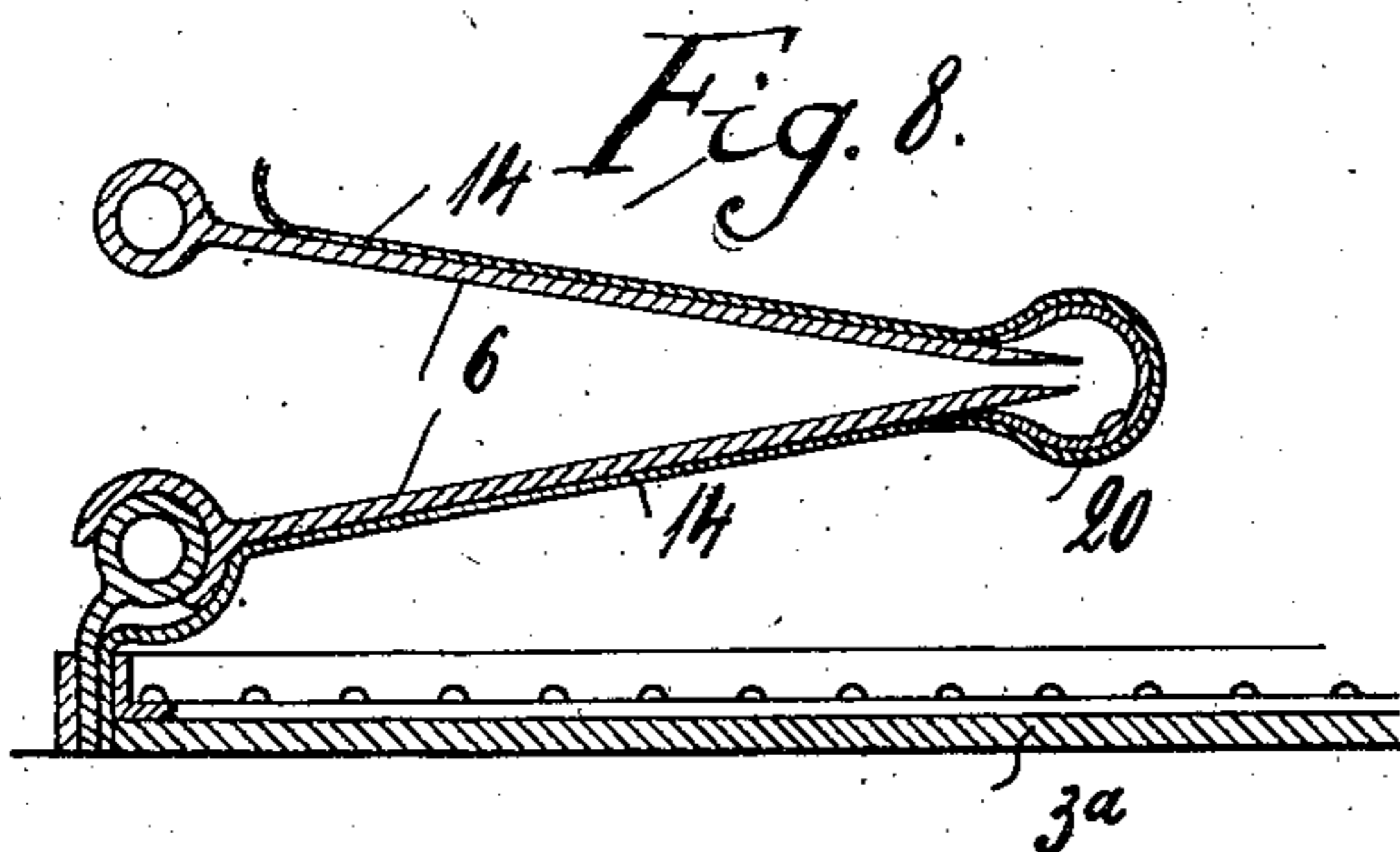
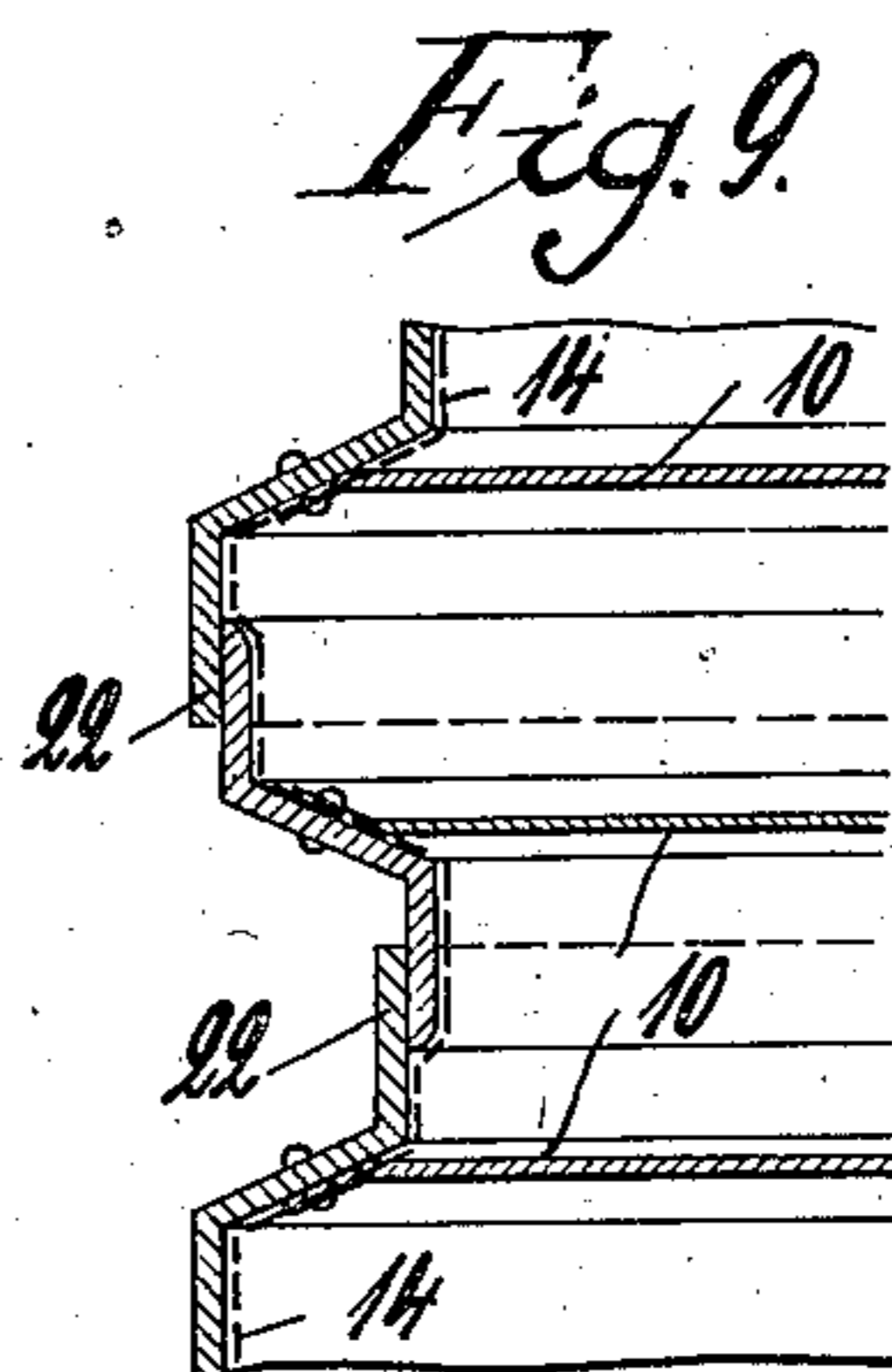
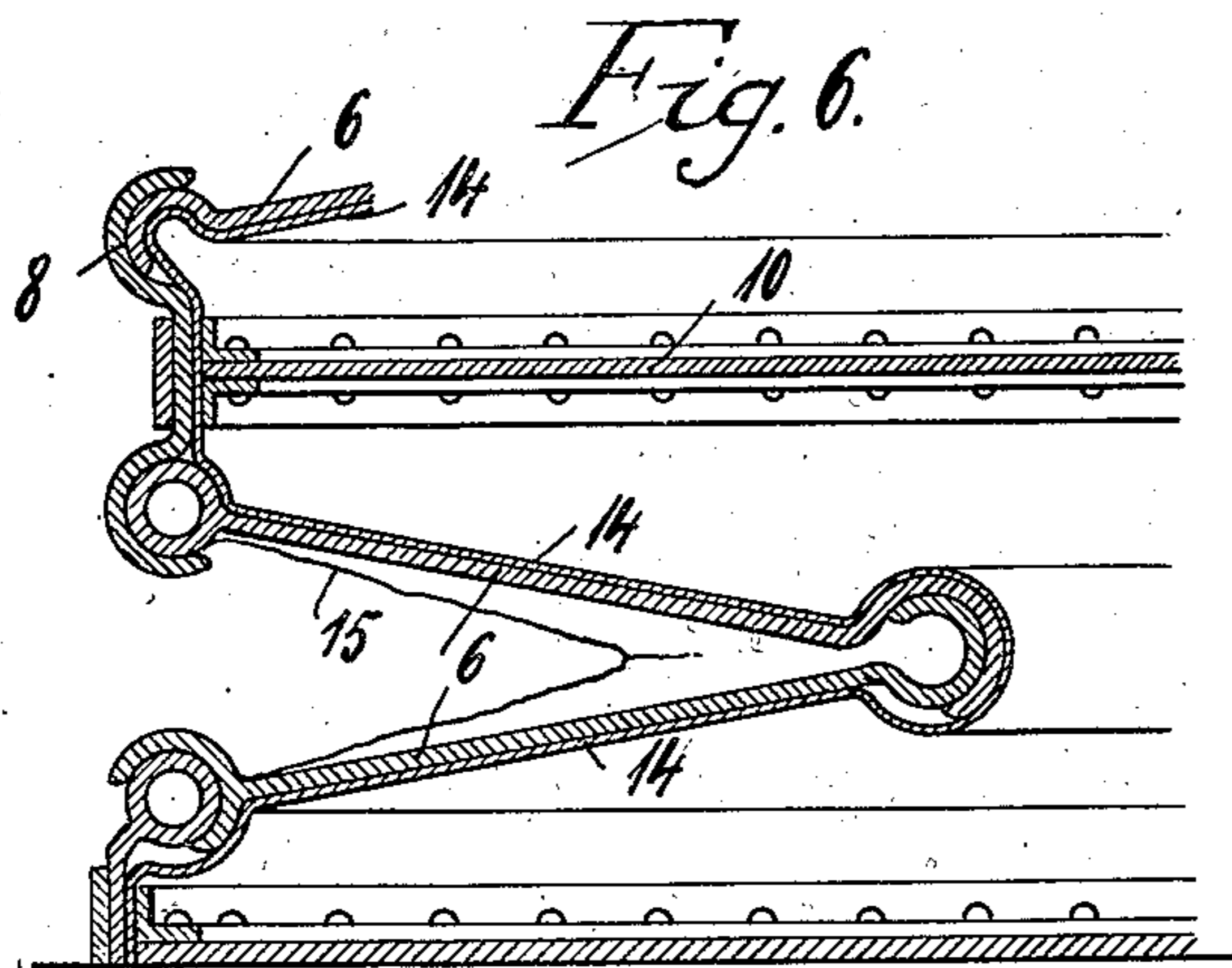
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2 SHEETS—SHEET 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

WLADIMIR TATARINOFF, OF ST. PETERSBURG, RUSSIA.

HYDRAULIC PRESS.

No. 877,139.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed November 6, 1906. Serial No. 342,258.

To all whom it may concern:

Be it known that I, WLADIMIR TATARINOFF, a citizen of the Russian Empire, residing at St. Petersburg, Russia, have invented certain new and useful Improvements in Hydraulic Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention has for its object a pistonless press for use with fluids under pressure such as water, gas, steam, in which high pressure is obtained not by an increase in the tension of the working fluid but mainly by an increase in pressure surface; this avoids the use of very costly and complicated accessories (such as the compressor, high pressure accumulator, and especially pipes capable of withstanding high pressure) of the hydraulic presses at present in use which work often with a pressure as great as from 200-300 atmospheres.

In a press constructed according to the present invention in place of the hydraulic cylinder there is used a bellows like receiver whose rigid upper (or lower) end surface or cover for performing the press action, is moved by the entrance of the pressure fluid into the receiver the bellows like folds of which open out. If the folds of the bellows are not made large and proper care is taken for the stiffening of the same, the cross section of the container may be as large as desired, without fear of bursting the bellows as the pressure of the working fluid is low.

The accompanying drawings illustrate the invention.

Figure 1 shows in side elevation a press constructed according to this invention. Fig. 2 a horizontal section on the line A-A of Fig. 1. Fig. 3 is a detail of Fig. 2 to a larger scale. Fig. 4 is a horizontal section and plan similar to Fig. 2 of a modified construction of the press shown in Figs. 1 to 3. Fig. 5 is a detail of Fig. 4 to a larger scale. Figs. 6, 7, 8 and 9 show different constructions of the bellows like sides of the container. Fig.

10—shows in horizontal section a modification of the press. Fig. 11—shows in side elevation a further modification of same. Fig. 12 is a diagrammatic section of details of construction, and Fig. 13—a detail of Fig. 12 to a larger scale.

The upper end 3 of the folding receiver 1 carries one press plate 2 of the press and is provided with stuffing boxes 18 of any suitable construction for the passage of the columns 13, which are fixed to the bed plate 3^a forming the lower end of the receiver, and carry the upper press plate 2^a which may be immovable or made adjustable to various levels by any well known means. The receiver 1 is supplied with fluid through the pipe 4 and can be again emptied through the pipe 5 which is provided with a cut off arrangement of any suitable construction not shown in the drawings. The receiver is preferably of rectangular cross section and provided with rounded (Fig. 2) or sharp (Fig. 4) corners. The bellows folds are formed of iron or steel plates 6 (or of cast iron plates etc.) whose inner and outer longitudinal edges are hinged or connected together in a similar manner. In Fig. 6 the inner edges rounded by bending or otherwise, of a pair of plates 6 engage with each other, while in Fig. 7 these edges are provided with eyes 6^a, 6^b through which a round rod 7 passes; the construction shown in Fig. 8 differs in that the inner edges of the plates 6 lie freely against each other and are held together by a single or a row of spring clamps 20, while the outer edges have hinge like supports. The single folds of the bellows so formed are separated from each other and held together by means of a rigid ring 8 made as shallow as possible. The rings 8 are preferably made of four parts firmly connected at the corners of the receiver by means of bolts or rivets; the parts opposite each other are so held together by rods 9 (Fig. 4) that the sides are relieved of inside pressure as far as possible whereby it is rendered possible to make the sides comparatively slight. This double system of stiffening rods 9 on each ring 8 may be replaced by a stiffening disk or plate 10 Fig. 2 also arranged at the middle level of the ring 8; the plate may be connected to the

entire perimeter of this ring, holes 12 being provided for the free circulation of the working fluid and holes 11 for the passage of the press columns, when the latter are not as in Figs. 10 and 11 outside the receiver 1. Lastly the described or like inside stiffeners may be replaced by outside supports, capable of withstanding the pressure of the fluid. This construction is illustrated in Figs. 12 and 13, trusses 24 being secured to the outer surface of the ring 8 at distances apart and being provided with rollers 23 guided on supporting upright 25.

The plates 6 are connected at the corners of the receiver in the same manner as the bellows of a concertina, that is to say, by insertions made of flexible material, which easily pucker and which are sufficiently strong to withstand the inside pressure upon the small triangle produced by filling out the receiver. Rubber or rubbered fabric and the like is a suitable material for these insertions which are shown at 15 in Figs. 3 and 5. In order to relieve the insertions 15 as far as possible from inside pressure, the gaps in the corners, when the latter are rounded as in Figs. 2 and 3 may be covered with scale like plates 19 overlapping each other, which are connected by hinges 21 to the ring 8 and can slide upon each other when the end corners 6^c of the plates 6 approach or move from each other.

When the receiver has sharp corners as in Figs. 4 and 5, the flexible insertions 15 which are fixed to the plates 6 by means of rivets 16 or the like are surrounded, if desired, with wire gauzes 17 made as flexible as possible.

When the cross section of the receiver is round the sides of the latter are preferably constructed of several Z-shaped telescopic rings 22 Fig. 9, the rings being stiffened by means of plates 10 or rods in the manner shown in Figs. 2 and 4 or the pressure may be transmitted to a support or supports by rollers as shown in Figs. 12 and 13.

In order to prevent the loss of fluid (and consequently pressure) in the movable connections of the plates 6 and the rings 8, the respective parts of or even, as shown in Figs. 6, 8 and 9, the whole of the inside surface of the bellows may be provided with linings 14 of rubbered fabric or the like.

The modification of the press shown in Fig. 11 differs in that the receiver 1 with the movable press plate 2 is arranged at the top, springs 26 being provided to raise this plate after each downward movement of same.

What I claim is:

1. A press of the character described comprising end members, and rigid plates forming folds between the end members hinged at their inner and outer edges.

2. A press of the character described, comprising end members, a plurality of rigid plates connecting the end members hinged

together and connecting members hinged to the rigid plates.

3. A press of the character described, comprising end members, a plurality of rigid plates connecting the end members hinged together at their inner edges and connecting members hinged to the outer edges of said plates.

4. A press of the character described comprising end members, a plurality of rigid plates forming folds between and connecting the end members hinged together at their inner edges, connecting members hinged to the outer edges of said plates, and means for stiffening the connecting members.

5. A press of the character described, comprising a stationary press-plate, a receiver for the working fluid comprising end members, hinged plates forming folds between the end members, rings connecting the fold-forming plates, a press-plate carried by one of the end members, and means for stiffening the connecting rings.

6. A press of the character described, comprising a stationary press-plate, a receiver comprising end members, hinged plates forming folds between the end members, rings connecting the fold-forming plates, a press-plate carried by one of the end members and stiffening members within the receiver.

7. A press of the character described, comprising a bed-plate, columns fixed thereon, a press-plate carried by the columns, a folding receiver for the working fluid, a press-plate carried by the receiver, stuffing boxes in the receiver for the passage of the columns, and means for charging and discharging the working fluid.

8. In a press of the character described, a receiver comprising end members, fold-forming plates between the end members, spring clamps connecting the inner edges of the plates, rigid rings connecting the outer edges of the latter, and means for flexibly connecting the corners of adjacent plates.

9. In a press of the character described, a folding receiver comprising end members, fold-forming plates between the end members, spring clamps forming a hinge connection of the inner edges of the plates, rings connecting the outer edges of the latter and scale plates connecting the corners of the fold-forming plates.

10. In a press of the character described, a bed-plate, supporting columns mounted thereon, a press-plate carried by the supporting columns, a movable end member, a press-plate carried thereby, a plurality of fold-forming plates between the base and end member, spring clamps forming a hinge connection between the inner edges of the plates, rings pivotally connected with the outer edges of the latter, stiffening members

for said rings, scale plates connecting the corners of the plates, a flexible lining for the corner connections, means for charging the receiver with a working fluid, and means for
5 withdrawing the fluid.

11. A press of the character described comprising end members, a plurality of rigid plates hinged together and connecting the end members, connecting members hinged

to the rigid plates and expansible corner 10 pieces connecting the rigid plates.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

WLADIMIR TATARINOFF.

Witnesses:

G. NAZAROFF,

W. STEININGER.