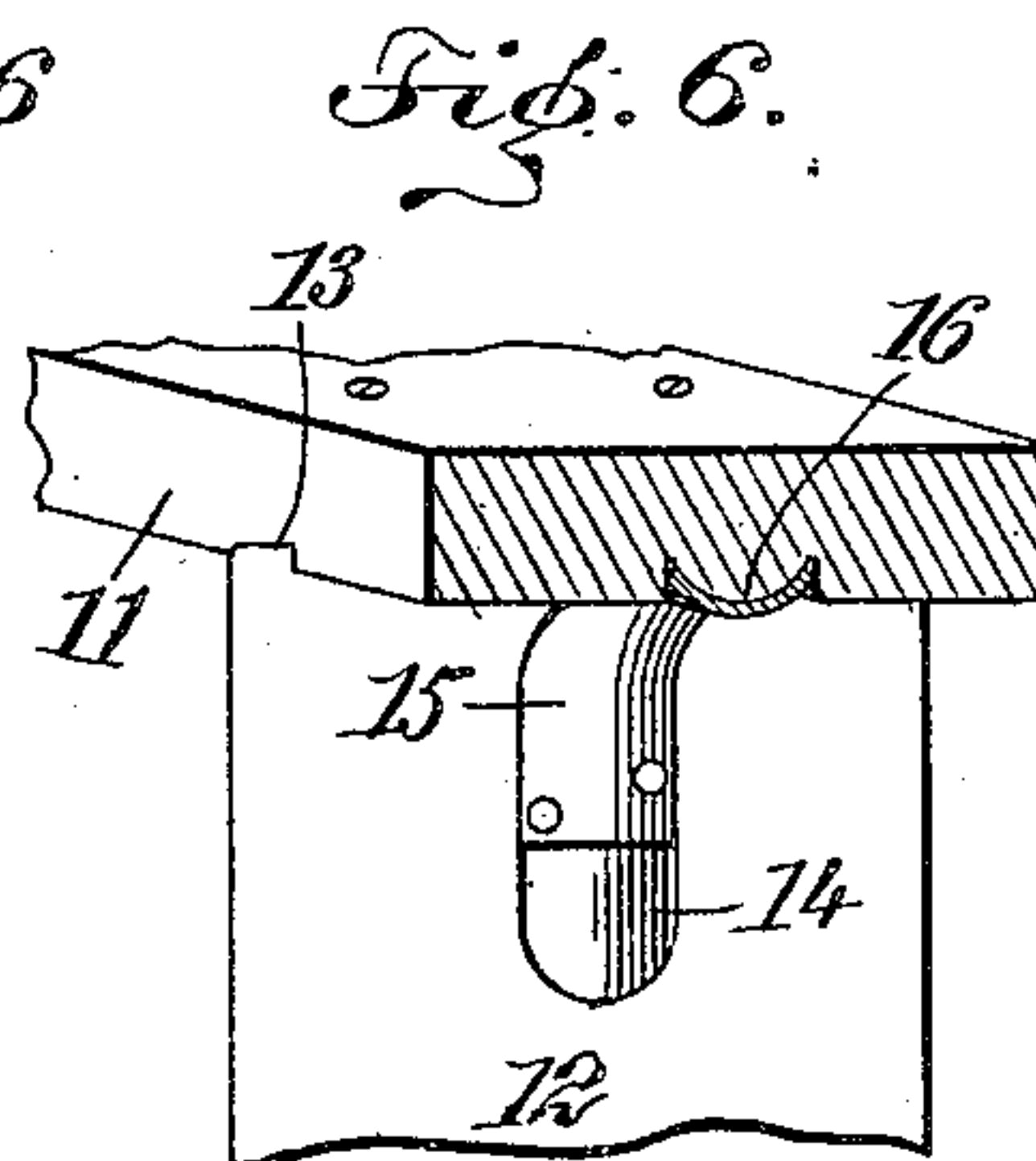
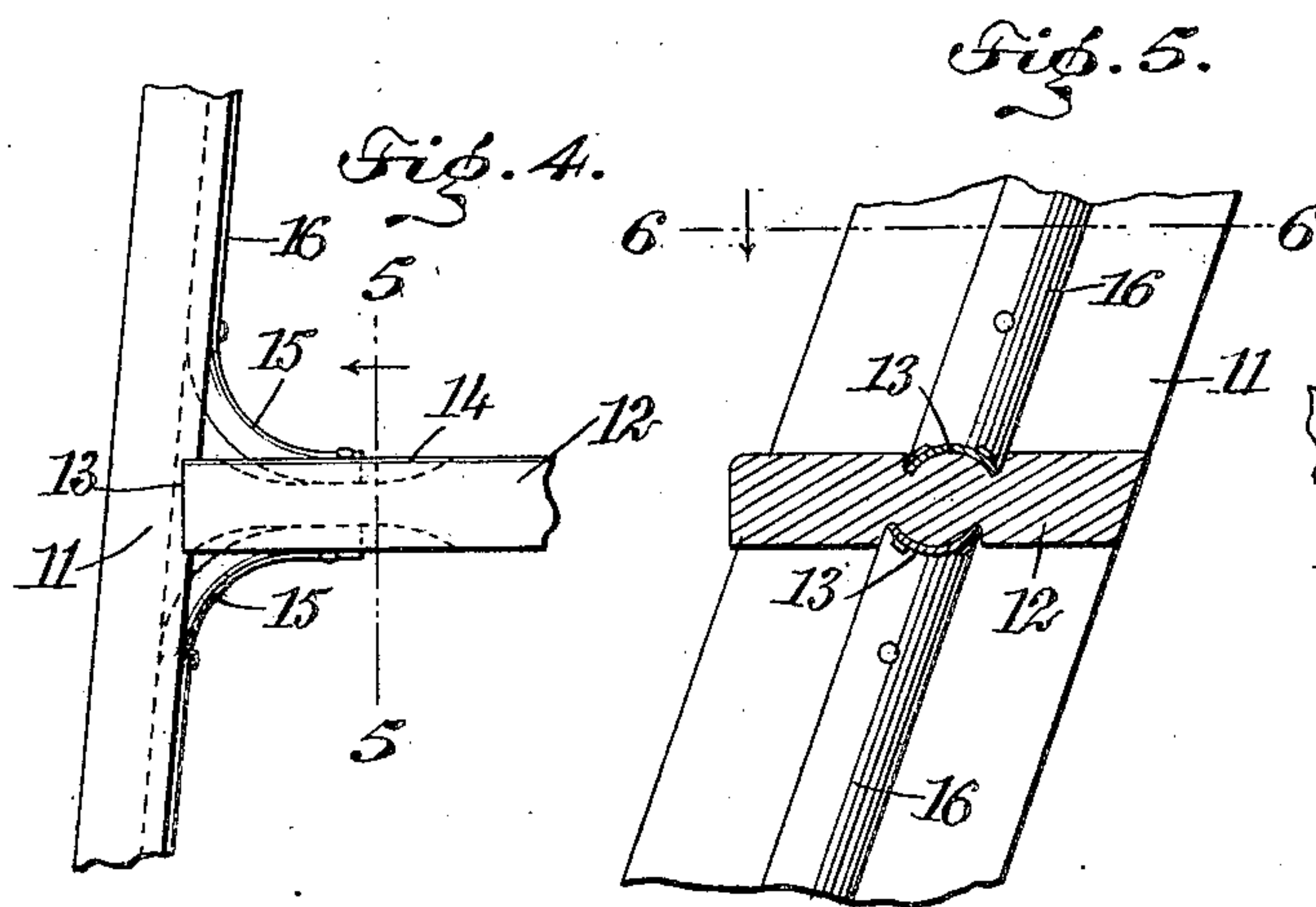
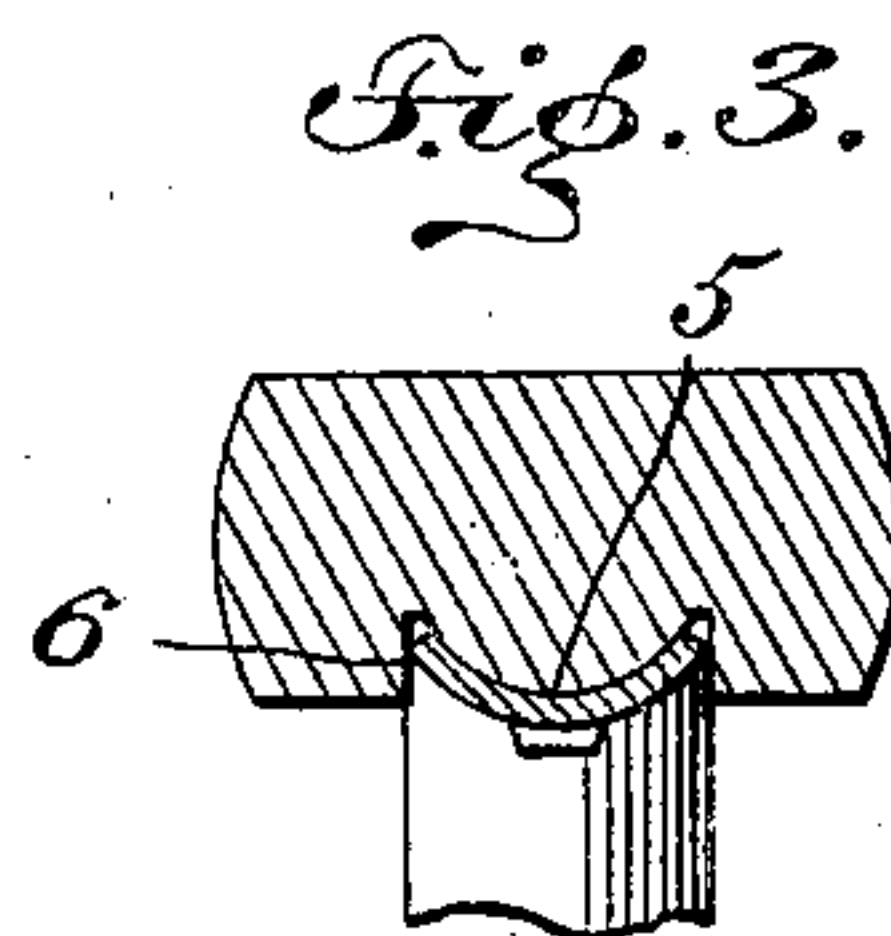
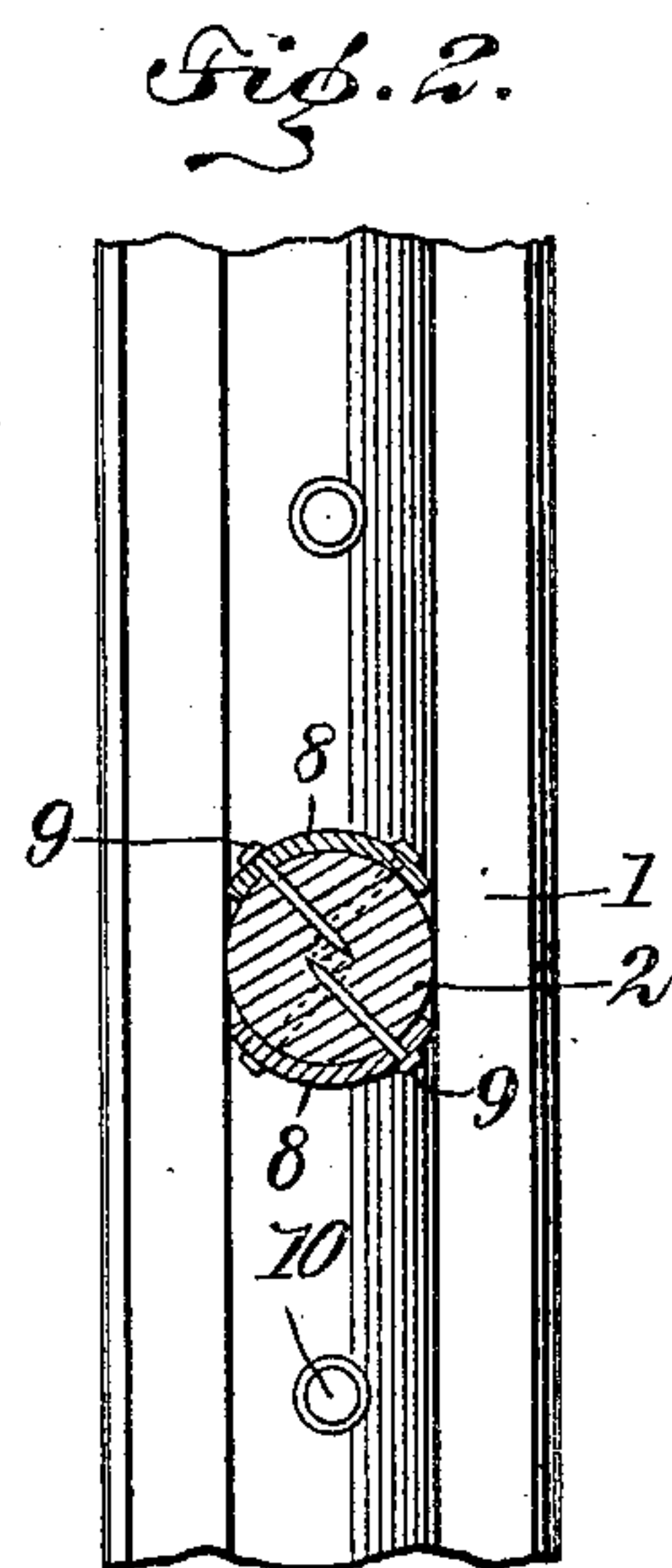
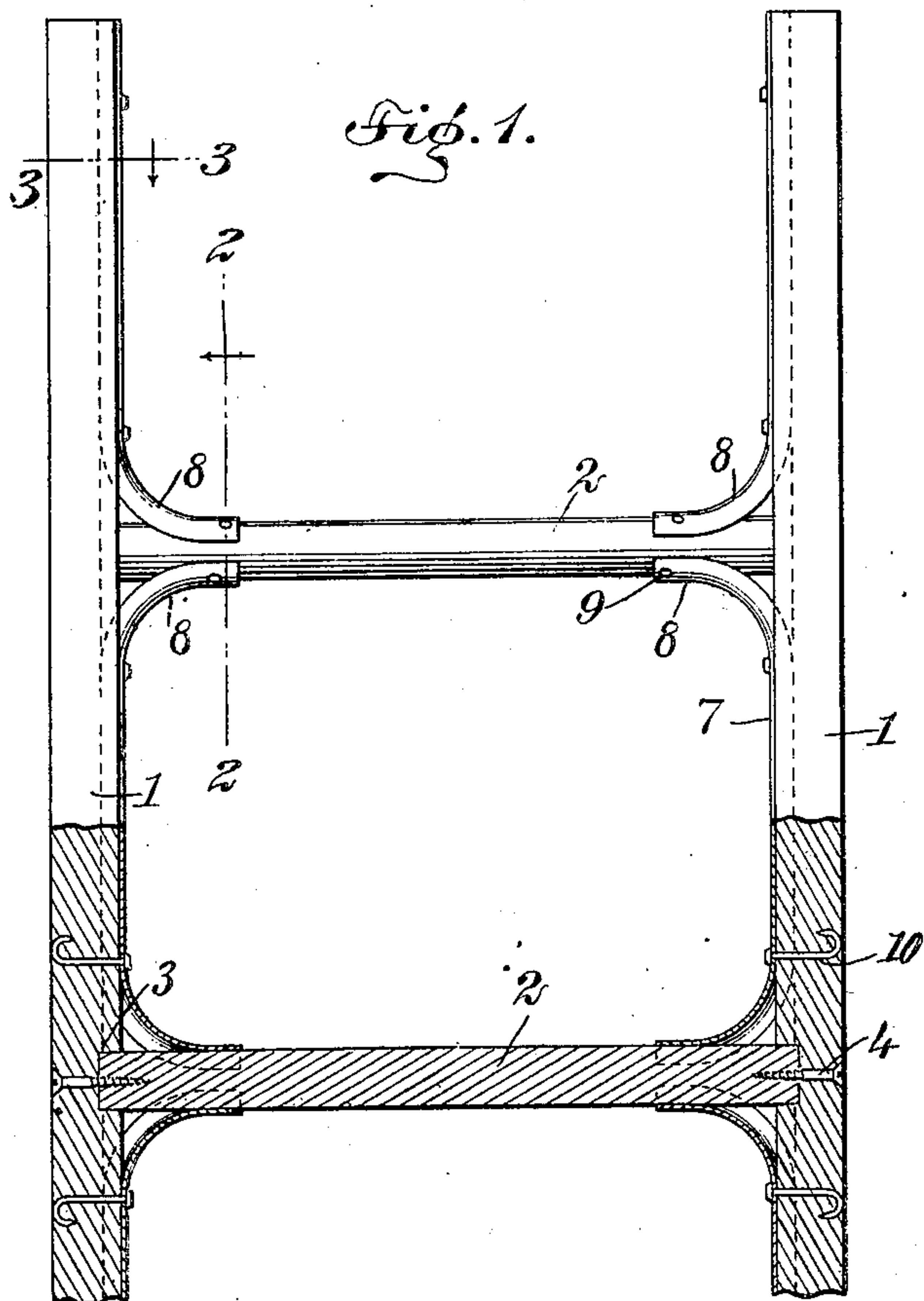


No. 897,157.

PATENTED AUG. 25, 1908.

E. ROWE.  
STEP LADDER.

APPLICATION FILED AUG. 4, 1906.



WITNESSES

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# UNITED STATES PATENT OFFICE.

EDWARD ROWE, OF INDIANA, PENNSYLVANIA.

## STEP-LADDER.

No. 897,157.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed August 4, 1906. Serial No. 329,232.

*To all whom it may concern:*

Be it known that I, EDWARD ROWE, a citizen of the United States, and a resident of Indiana, in the county of Indiana and State of Pennsylvania, have invented a new and Improved Step-Ladder, of which the following is a full, clear, and exact description.

This invention relates to step ladders, and the object is to produce a ladder having the rungs or steps thereof braced in such a way that their strength is materially increased, and to produce an arrangement whereby the side pieces of the ladder are relieved of strain in the vicinity of the steps or rungs.

The invention consists in the construction and combination of parts to be more fully described hereinafter, and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation showing a portion of a ladder partly shown in cross section, the same being constructed according to my invention; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a cross section on the line 3—3 of Fig. 1; Fig. 4 is a detail view showing a joint of the ladder when formed with steps and not with rungs such as shown in Fig. 1; Fig. 5 is a vertical section on the line 5—5 of Fig. 4; and Fig. 6 is a perspective in cross section on the line 6—6 of Fig. 5.

Referring more particularly to the parts, 1—1, represent the side pieces of a ladder connected at intervals by the rungs 2, which rungs are of round form as shown, and have their extremities set in recesses 3 provided on the inner faces of the side pieces as indicated. The side pieces are attached to the rungs by wood screws 4 as shown.

In applying my invention I provide the inner faces of the side pieces 1 with longitudinally disposed beads 5 which are of a half round form as shown in Fig. 3, so that longitudinal grooves 6 are formed at the side thereof. On the inner face of each side piece, between each pair of rungs I attach a brace 7; these braces are semi-tubular in form so that their bodies may be applied to the beads 5 as shown in Fig. 3. The extremities of these bodies are bent outwardly to form knees 8 which are attached to the upper and lower faces of the rungs, by suitable fastening devices 9 as shown. In this way, the adjacent rungs are connected by continuous braces,

the bodies of which are attached to the side pieces by suitable attachment devices such as clencher nails 5, in the manner illustrated. With this arrangement it will be understood that a weight upon an upper rung is supported very largely by the braces beneath, so that the rung directly beneath the weight is relieved of much of the strain. It will be understood of course, that the braces operate to transmit the strain to the side pieces, and in this connection it should be understood that at each rung a certain amount of pressure is transmitted through the knees in a downward direction. Thus, it will be seen that the pressure is distributed from the rung bearing the weight, through the entire length of the lower portion of the ladder. The semi-tubular form of the braces 7 adapts them admirably to engage the faces of the rungs, which are of a tubular form as indicated in Fig. 2.

When the ladder is constructed with steps instead of rungs, as indicated in Fig. 1, I provide an arrangement illustrated in Figs. 4 to 6, inclusive. As in step ladders, the side pieces 11 converge upwardly as indicated in Fig. 4. The steps 12 are attached in gains formed in the inner faces of the side pieces and the steps are formed on the upper and lower faces with recesses 14; these recesses have rounded beads 13 which extend longitudinally of the steps and afford means for attaching knees 15 of the braces 16 in the manner shown. By reason of the semi-tubular form of the braces it should be understood that their strength and stiffness is very much increased. I prefer to make these braces of wrought steel.

By forming the side braces in one piece having knees at the ends thereof, and a body integrally connecting the knees, advantage is derived, not only from the additional strength and rigidity which is given to the braces, but a further advantage arises on account of the increased facility with which the braces may be attached to the ladder. When of the form set forth above, the braces may be quickly brought into position by a lateral movement, the knees being held in engagement with the rungs or steps of the ladder. The rungs or steps, in connection with the sides of the ladder, operate to hold the braces in position, so that the fastening devices may be quickly applied. It will be seen that the steps or rungs operate as guides for bringing the braces into position,



and in their function of guiding, the effect is increased by forming the braces of semi-tubular shape, as described. Attention is also called to the fact that by making the body of the brace in a continuous piece from one rung or step to the next, the side rail of the ladder is materially strengthened, and this prevents breakages which frequently occur in the sides of ladders at the points where the ends of the braces abut where the construction involves the use of two braces which meet on the side of the ladder, as suggested.

Having thus described my invention I claim as new, and desire to secure by Letters Patent:

1. A ladder having side pieces, and rungs or steps connecting the side pieces, and braces having their bodies attached to said side pieces, extending continuously between adjacent pairs of said rungs or steps, and having integral knees formed at the extremities of said bodies engaging said rungs or steps.

2. A step ladder having side pieces with

rungs or steps connecting the same, and braces of semi-tubular form attached to the inner faces of said side pieces, extending continuously between adjacent rungs or steps, said braces having integral knees projecting laterally from the bodies thereof, and attached to said rungs or steps.

3. A step ladder having side pieces with rungs or steps connecting the same, said side pieces having longitudinally disposed bodies on the inner faces thereof, and semi-tubular braces applied over said bodies and extending continuously between adjacent rungs or steps, the said braces having integral knees formed at the extremities thereof, engaging the said rungs or steps.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD ROWE.

Witnesses:

J. P. BRALLINS,  
G. W. ROOF.