

Nov. 11, 1947.

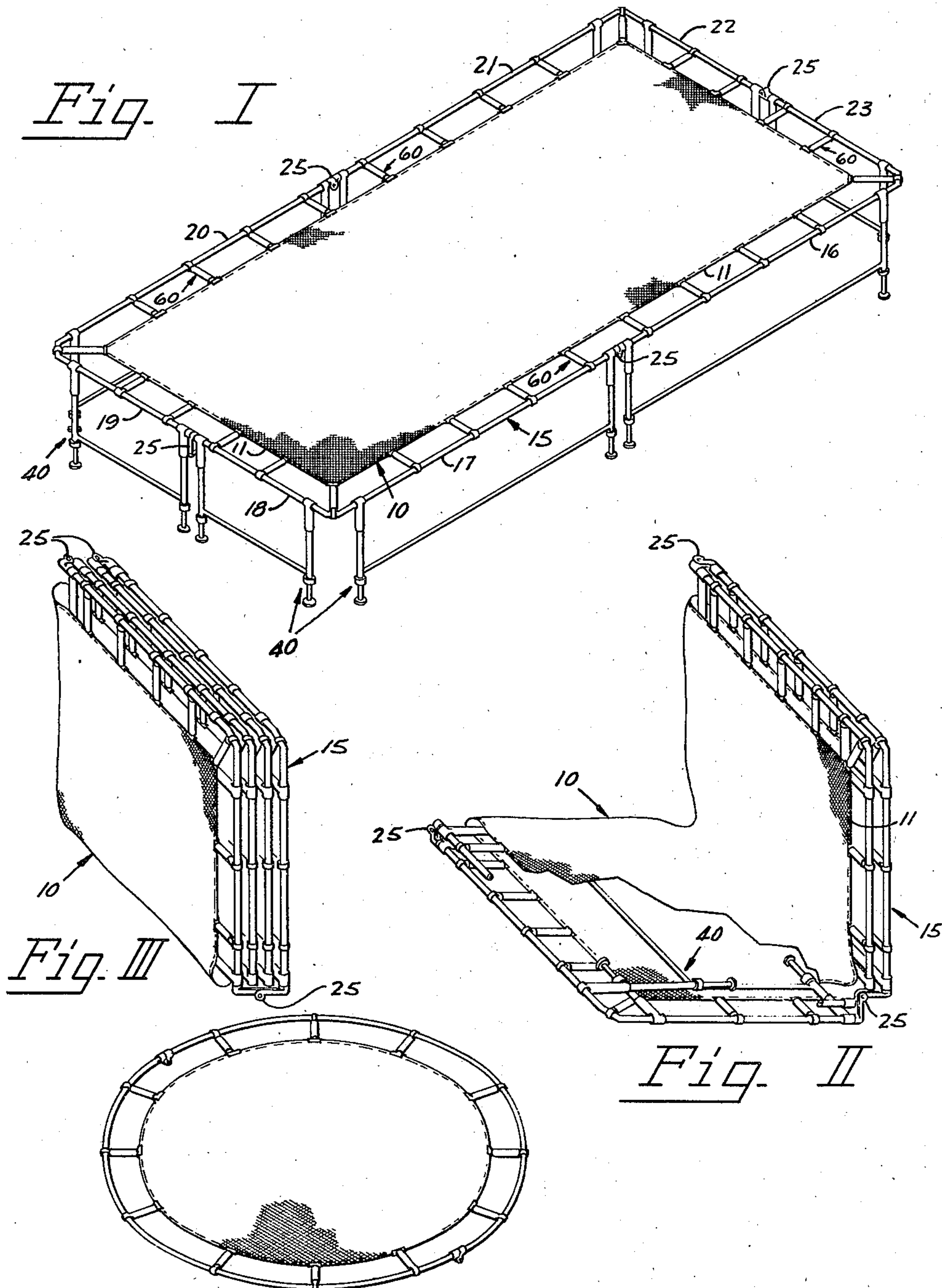
O. D. GEER

2,430,714

LIFE NET

Filed May 21, 1945

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

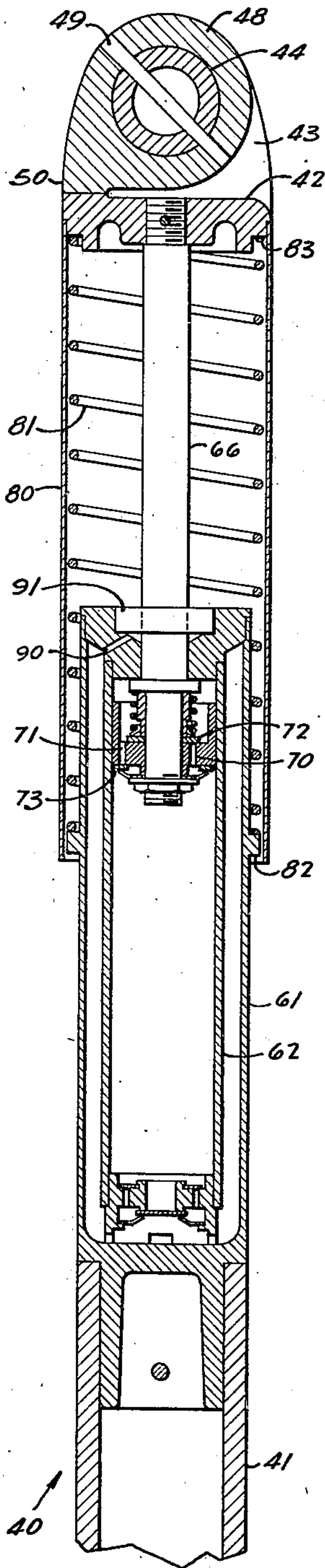


Fig. VII

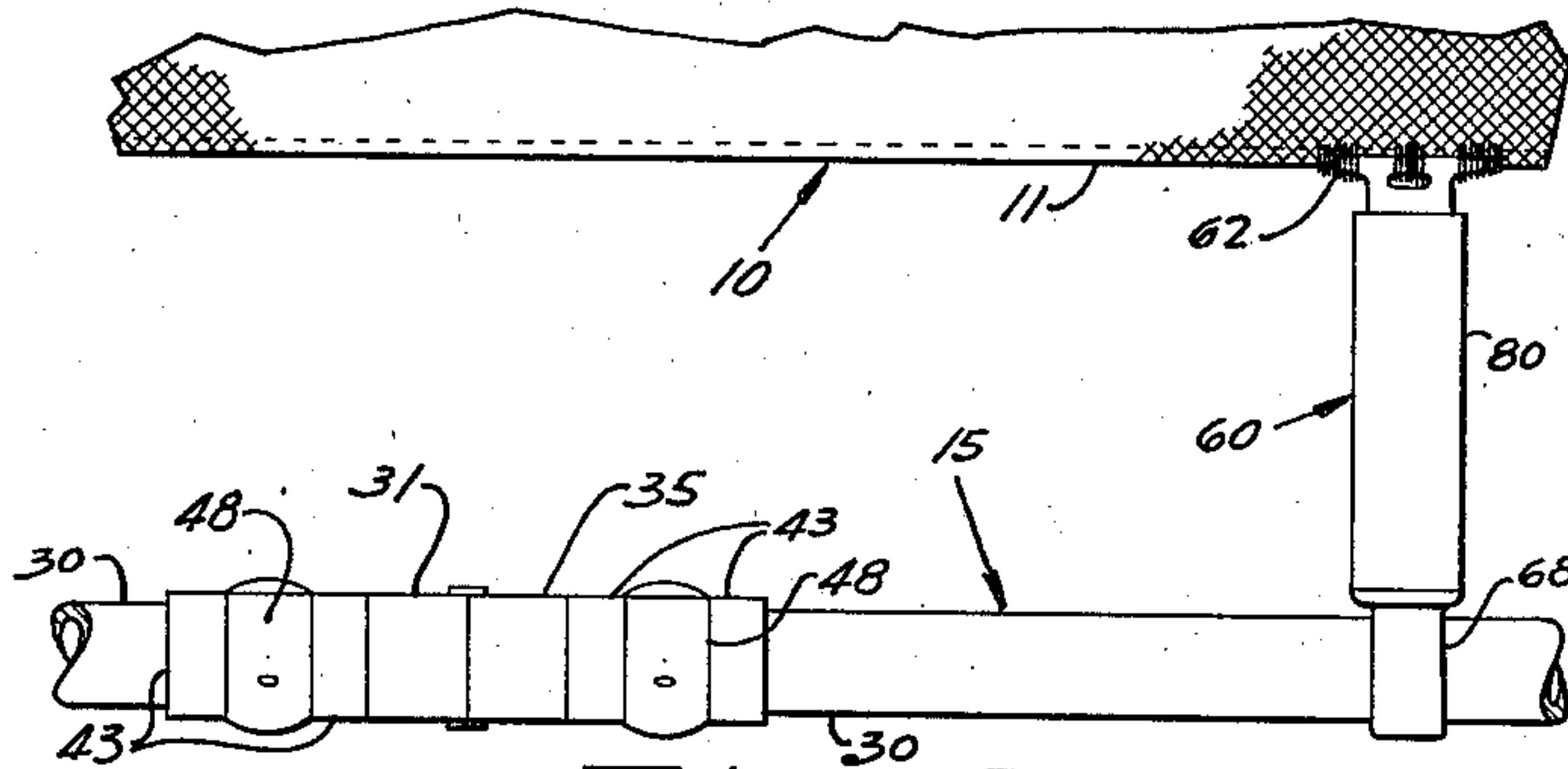


Fig. VI

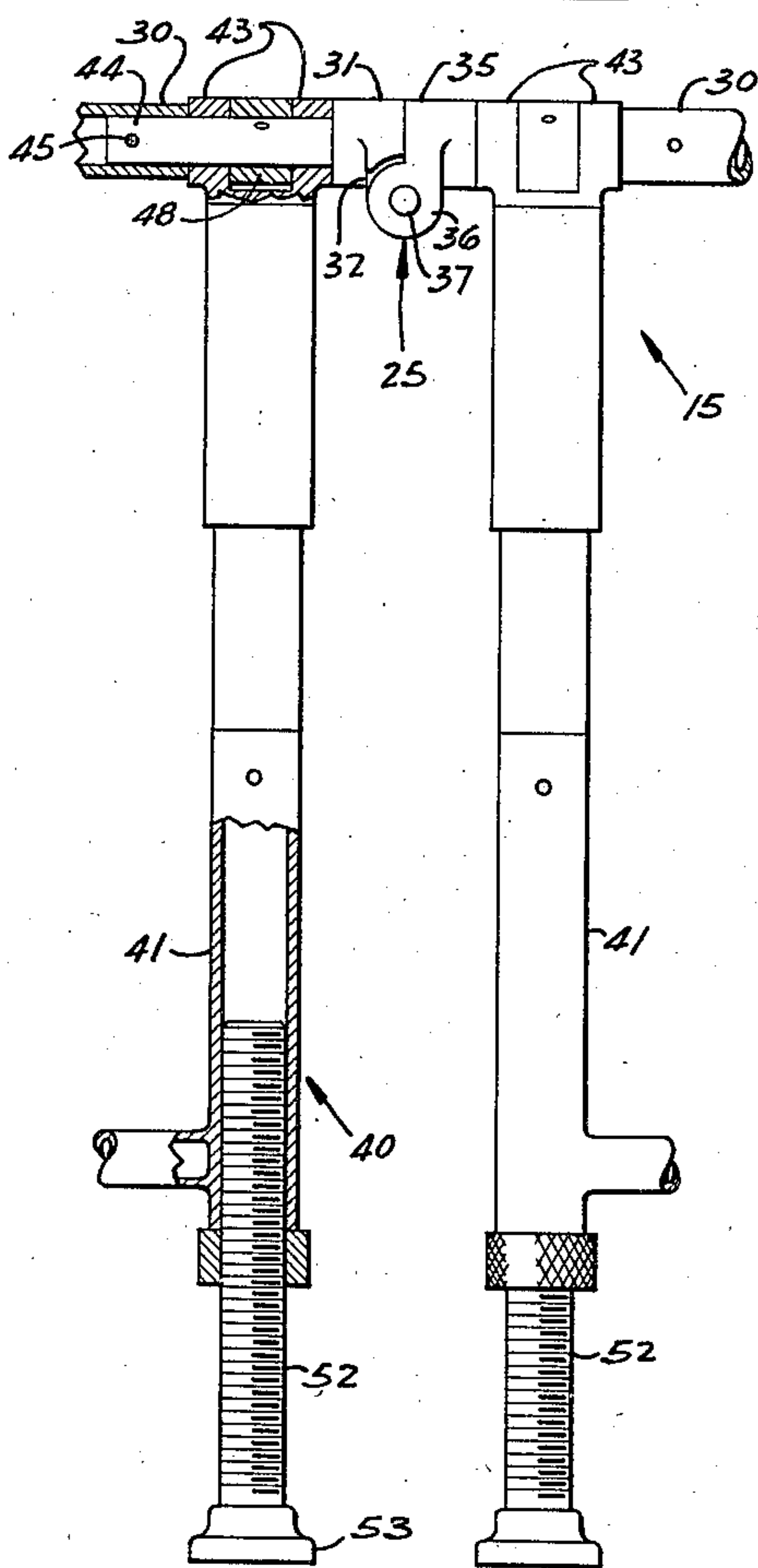


Fig. V

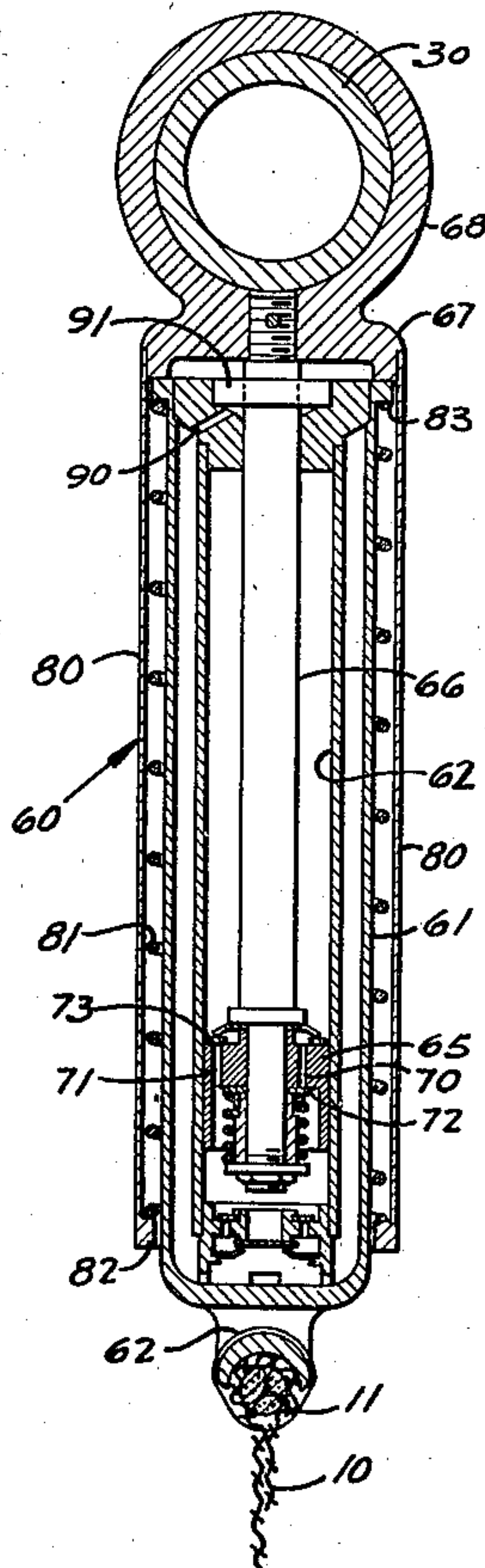


Fig. VIII

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LIFE NET

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This invention relates to a firemen's net into which people may jump from a burning building, the same being extremely durable, requiring fewer firemen to hold the same in use, and which is able to better receive the shock of impact of persons jumping into the net.

An object of the invention is to provide a durable net made of a suitable metal and provided with shock absorbing means for receiving the impact of the person landing on the same; to provide such a type of net which is suitably supported on a frame; to provide shock absorbing means incorporated in the legs of the frame itself; to provide a type of net which may be folded up into a small compass in order to take up less room in transportation to and from fires and which yet is strong, durable, and easily set up for use at the building or other place of use.

Further objects and advantages are within the scope of this invention such as relate to the arrangement, operation and function of the related elements of the structure, to various details of construction and to combinations of parts, elements per se, and to economies of manufacture and numerous other features as will be apparent from a consideration of the specification and drawings of a form of the invention, which may be preferred, in which:

Figure I is a perspective view of the net set up for use;

Figure II shows how the net may be folded; while

Figure III shows it in folded compact position;

Figure IV illustrates a modification of the invention in which the net is circular instead of rectangular in shape;

Figure V is an elevational view partly in section enlarged to show the legs and part of the frame of the supporting stand;

Figure VI is an enlarged view of the connection between the net and the frame of the stand;

Figure VII is in vertical, sectional view showing the shock absorber means located in the legs of the stand, while

Figure VIII is a longitudinal, sectional view of one embodiment of a shock absorbing connection between the net and the frame of the stand.

My present invention involves a foldable firemen's net comprising primarily the net portion proper, which is preferably made of a suitable metal connected to a stand through the medium of suitable shock absorbing means to cushion the fall of the person jumping into the net, the stand being provided with legs which also have included as part thereof shock absorbing elements, the

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entire device being foldable so as to be readily transported in compact form to or from a fire or otherwise retained in collapsed position, but readily put up in case of any emergency. Of course, the net could be used for other purposes besides those specifically referred to herein.

In Figure I, the net 10 preferably consists of interwoven aluminum or alloy wire mesh of sufficient strength to withstand the shock of a person jumping into the net from various heights depending upon the use to which any particular net made in accordance with my invention may be put. The net 10 may be rectangular in shape as illustrated in Figure I or circular as illustrated in Figure IV. The net 10 has a marginal rim or edge 11 illustrated in enlarged view in Figure VIII and which may be made of a fire resistant cord or other suitable material. The cord 11 forms means to which one end of the shock absorbing elements are attached to connect the net 10 to the collapsible supporting stand 15.

The frame of the stand 15 is made of sections of metal tubing, the sections indicated at 16, 17, 18, 19, 20, 21, 22, 23, each pair of sections being hinged together by folding hinge joints 25 as shown in Figure I so that the frame may be folded twice as indicated in Figures II and III.

One embodiment of hinge joint 25 forming the means to permit folding of the stand, is illustrated in Figures V and VI where it will be seen that the tubing 30 of the frame proper carries at one end for each section (section 16 for example) a collar 31 having a downwardly extending offset ear 32, while the abutting tube 30 of an adjacent section (17 for example) carries a collar 35 having two spaced offset ears or extensions 36, the single ear 32 and the offset projections 36 each having aligned openings therein to receive a suitable pintle 37 forming the bearing for the hinge. Various embodiments of a suitable folding hinge may be made to connect the abutting sections of the frame tubing 30 in the manner similar to that indicated.

The supporting stand 15 is provided with suitable posts or legs 40 arranged in pairs for each foldable section as indicated in Figure I and each of the legs 40 is hinged to the frame so that the posts may also be folded upwardly and underneath the net as indicated.

One embodiment I have found satisfactory for the upright posts and for a pivoted leg connection between the legs of the stand and the frame thereof which are strong and durable is illustrated in Figures V and VII. The legs 40 are made preferably of suitable tubing 41, the upper

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end of which is provided with a hinging collar 42 preferably provided at its upper end with spaced integral bearing members 43 adapted to turn on the stub shaft 44. The shaft 44 is pinned, keyed, or otherwise fixed as indicated at 45 to the tubing 30.

In the embodiment illustrated in Figure V the shaft 44 is made integral with the collar 31 for the frame hinge. Interposed between the bearing members 43 is a stop member 48 fixed by pin 49 to the stub shaft 44. The stop element 48 has an extension 50 on the outer periphery thereof as shown which is adapted to contact with the upper portion of the housing of the shock absorber member connected with the legs as indicated in Figure VII to prevent the legs from swinging outwardly too far upon being set up in vertical position.

The supporting posts or legs 40 may be constructed likewise of aluminum alloy tubing, and each leg will contain one shock absorber element to further aid in cushioning the shock of the person contacting the net. The legs or posts 41, as shown in Figure V are provided with adjustable extensions 52 and each extension is preferably provided with a rubber foot 53, each post or leg 40 being thereby independently adjustable to provide for suitably locating the stand on uneven ground, for example.

As heretofore indicated, the net 10 is connected with the frame 15 through a plurality of absorbing elements and each post or leg 40 has a similar shock absorbing element located therein. One embodiment of a suitable type of such shock absorbing means is illustrated in Figures VII and VIII, Figure VII showing the incorporation of the same in the post or leg 41 and Figure VIII showing the connection of the shock absorbing elements between the net 10 and stand or frame 15.

I have illustrated herein an hydraulic type of shock absorber which is primarily intended to absorb or cushion the shock in one direction only—that present when the person hits the net—although my shock absorbers are also arranged to resist whatever rebound is necessary in practice. These shock absorbing means thus constitute mainly a one way shock absorber which is controlled by a return spring to bring the parts back to normal position.

As illustrated in Figure VIII, the shock absorber 60 for connecting the net to the frame includes primarily a suitable housing 61 connected as, for example, by wire serving shown at 62 with the cord 11 of the net 10.

As fundamental in hydraulic shock absorbers, within the housing is the working cylinder 62 for the fluid used and arranged to move therein against the resistance of the fluid, is a slidable piston 65 connected by the piston rod 66 to the head 67, the rod being screw-threaded in place as shown. The head 67 has a circular bearing element 68 which is arranged to turn on the tubing 30 of the frame of the stand 15.

In the embodiment illustrated, the shock absorber has a double casing to provide for an enlarged reservoir capacity for the shock absorbing fluid, and to this end, the inner working cylinder 62 forms with the housing 61 an annular space indicated for this purpose, it being understood that the piston 65 slides within the inner housing 62. The piston 65 has in it two sets of openings 70 and 71 controlled by suitable valves 72 and 73 arranged to permit practically unrestricted flow of the fluid in one direction past the piston and

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restrict such flow in the opposite direction to form the shock absorbing means.

Each shock absorber 60 is provided with an outer housing or dust guard 80 and within this guard and suitably contacting at opposite ends portions of the shock absorber which move relative to each other, is a spring 81 adapted to return the parts of the shock absorber to normal position after being actuated due to impact of the person jumping into the net. To this end, it will be noted that in Figure VIII, I have illustrated the use of the dust guard 80 which is fixed to the head 67 attached to the frame 30. At the other end of the dust guard 80 is an integral ring or collar 82 fixed to the guard. The spring 81 contacts the ring 82 at its lower end and at its upper end engages a fixed abutment 83 integral with the other of the two main relatively moving portions of the shock absorber such as illustrated in Figure VIII.

Likewise a similar type of shock absorber is illustrated in Figure VII as incorporated in each of the upright posts or legs 40. In this embodiment the shock absorber illustrated is substantially the same in internal mechanism as that shown in Figure VII for connecting the net to the frame with the exception that the return spring 81 is anchored a little differently. Thus, in the shock absorber shown in Figure VII for use in the post or leg 40, the collar 82 is attached in fixed relation to the housing 61. When the person hits the net, this, of course, causes the top of the shock absorber to move downwardly and this collar stays in the fixed position while the top abutment 83 compresses the spring 81. On recoil, the spring 81 returns the parts to normal position.

In both shock absorbers of Figures VII and VIII, a passage 90 is provided to drain the hydraulic fluid wiped from the piston rod by the oil ring 91 back into the reservoir.

Operation

The arrangement of one embodiment of my invention set up for use is illustrated in Figure I. In case a person jumps into the net, it will be understood that both sets of shock absorbers, namely, those in the supporting legs or posts and those connecting the net 10 to the frame will resist the action since the passage of the shock absorber fluid through the openings in the piston 65 are arranged to resist such movement between the piston and the casing in the direction of movement caused by the person striking the net with the result that the shock is absorbed. Upon return the passages permit an almost unrestricted or freer flow of liquid in the opposite direction so that the spring 81 in both instances (Figures VII and VIII) may readily return the parts to initial position.

By providing the pivoted posts or legs and the articulated joints for the frame, as previously described, it will be understood that the life net shown in Figure I may be folded up readily as indicated in Figures II and III since the legs are first folded in and then the net 10 and supporting frame folded twice as indicated to provide the compact arrangement shown in Figure III. The circular type of net, illustrated in Figure IV is also intended to be folded up as in the one embodiment.

It is apparent that, within the scope of the invention, modifications and different arrangements may be made other than is herein disclosed, and the present disclosure is illustrative

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merely, the invention comprehending all variations thereof.

What I claim is:

1. In a life net in combination a metallic foldable frame; foldable legs to support said frame above the ground; shock absorbing means in said legs arranged to check recoil; a foldable receiving net inside said frame and spaced from the periphery thereof; and shock absorbing means adapted to resist movement in one direction greater than in the opposite direction including a plurality of elements adapted to support said net from said frame; said means adapted to absorb the shock of impact of a person jumping into said net.

2. In combination a net; a reinforcement surrounding the perimeter of said net; a supporting stand, said stand having a frame and legs for spacing the net from the ground; said legs having shock absorbers located in the same to resist shock between the frame and the ground; and a shock absorbing and recoil checking means interposed between said reinforcement of said net and said frame, one portion of said means con-

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nected to said net and a portion relatively movable with respect to said first mentioned portion rotatably connected to said frame and a spring in said shock absorber means for returning said portions thereof to normal position.

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