

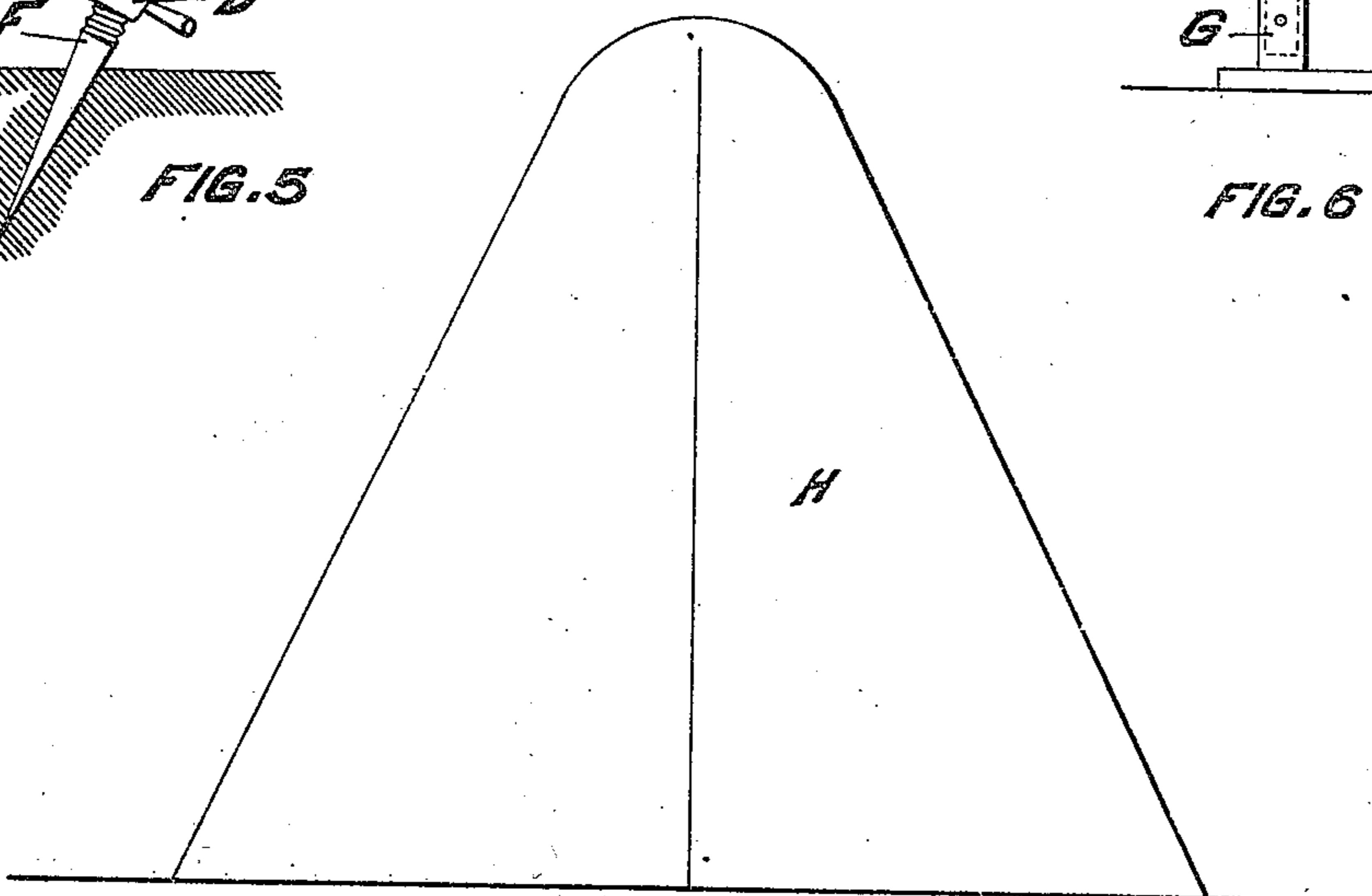
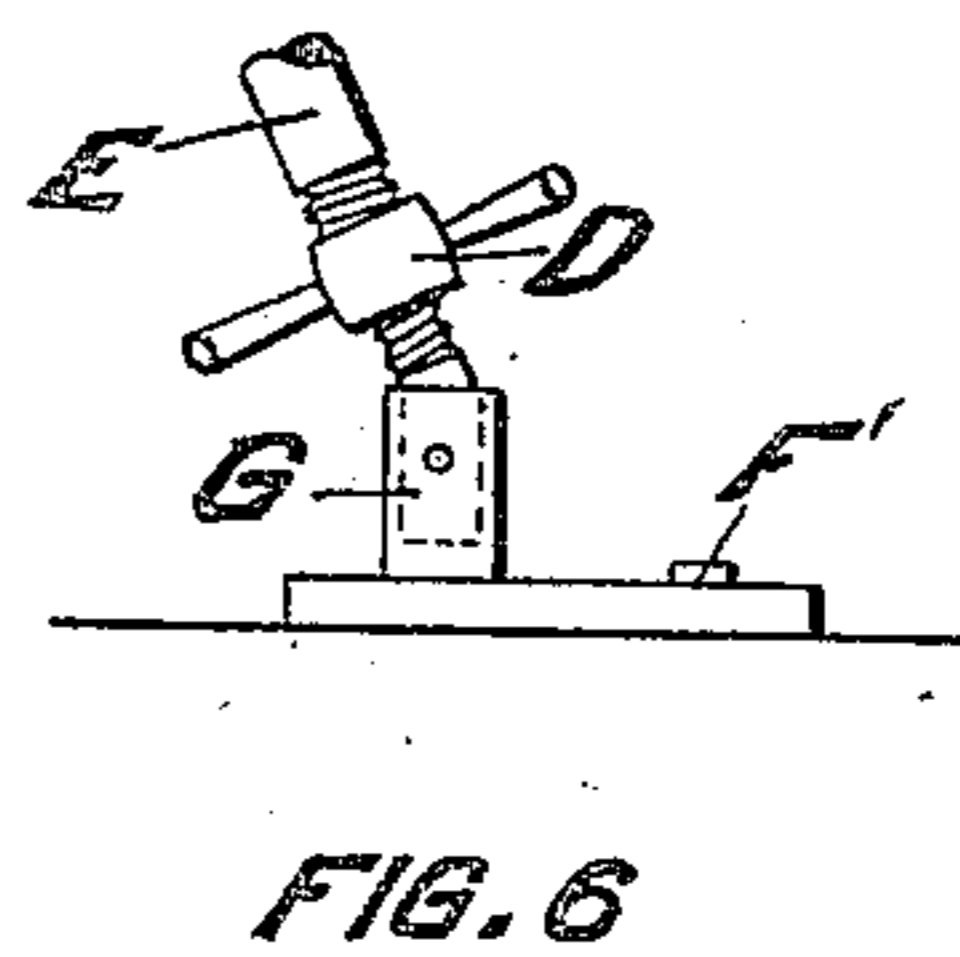
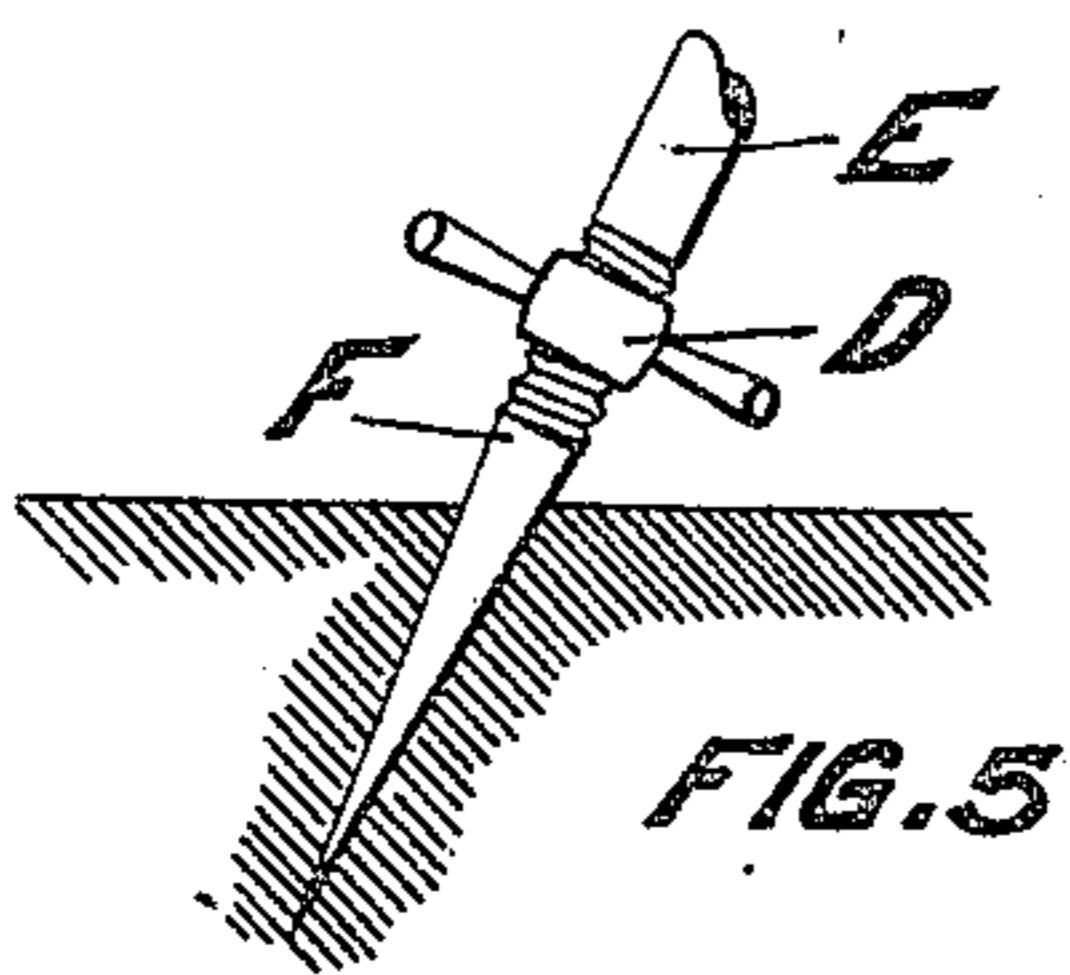
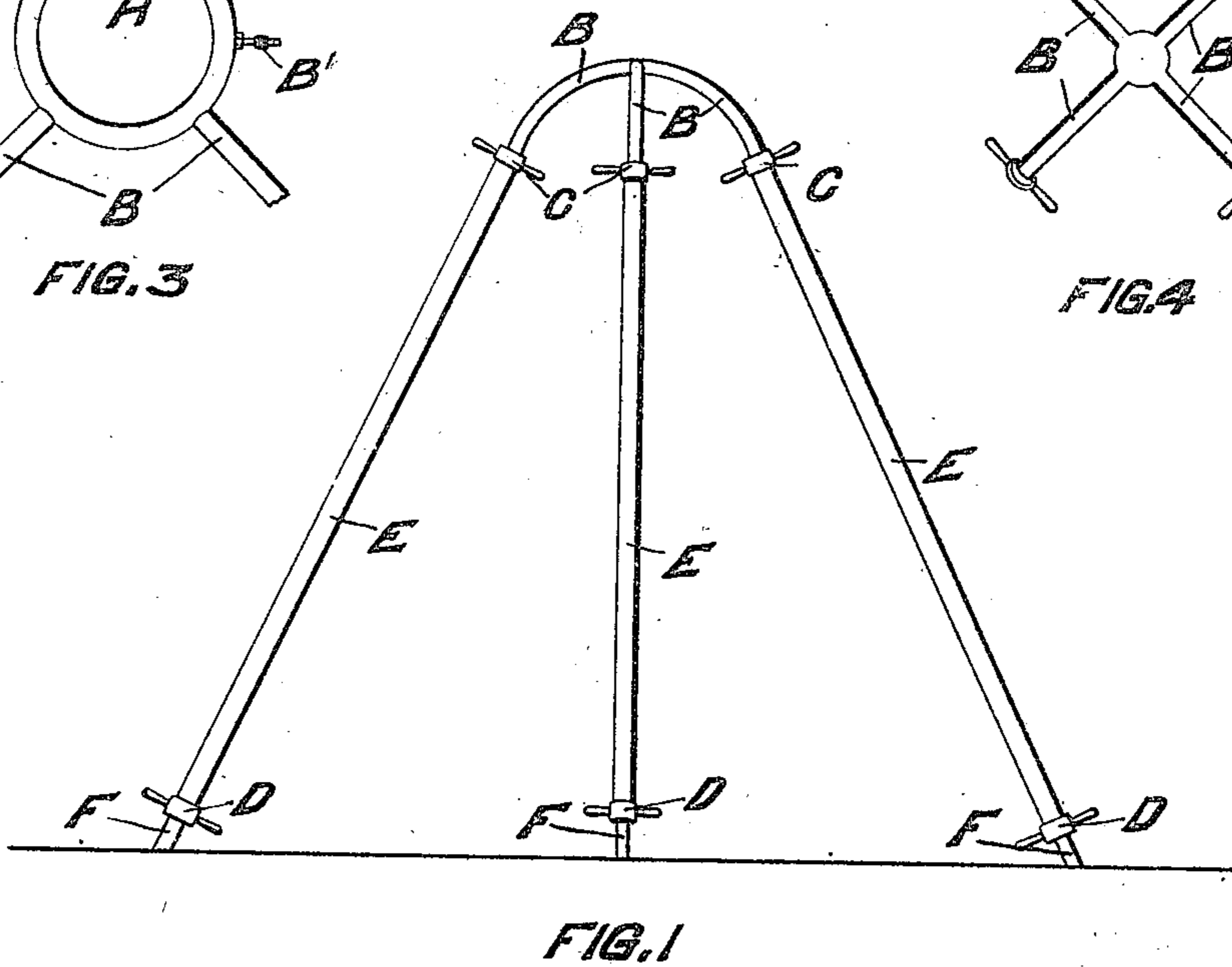
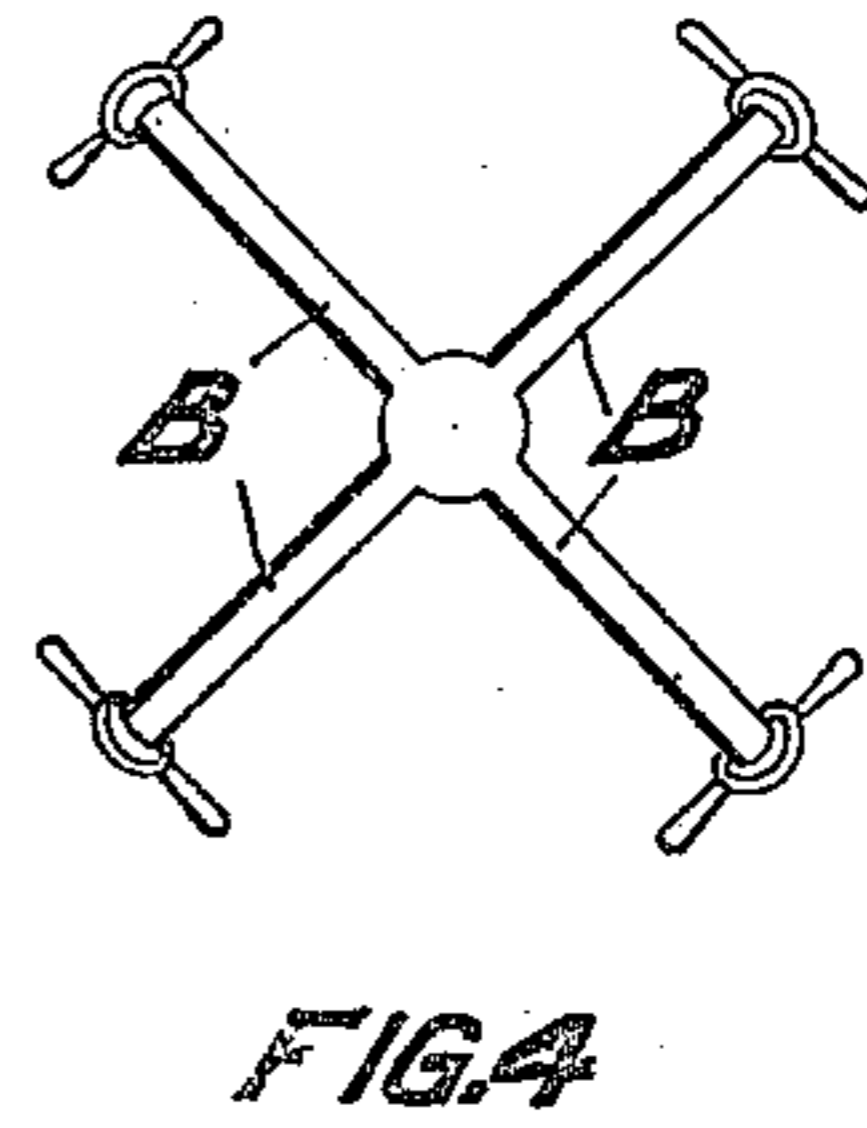
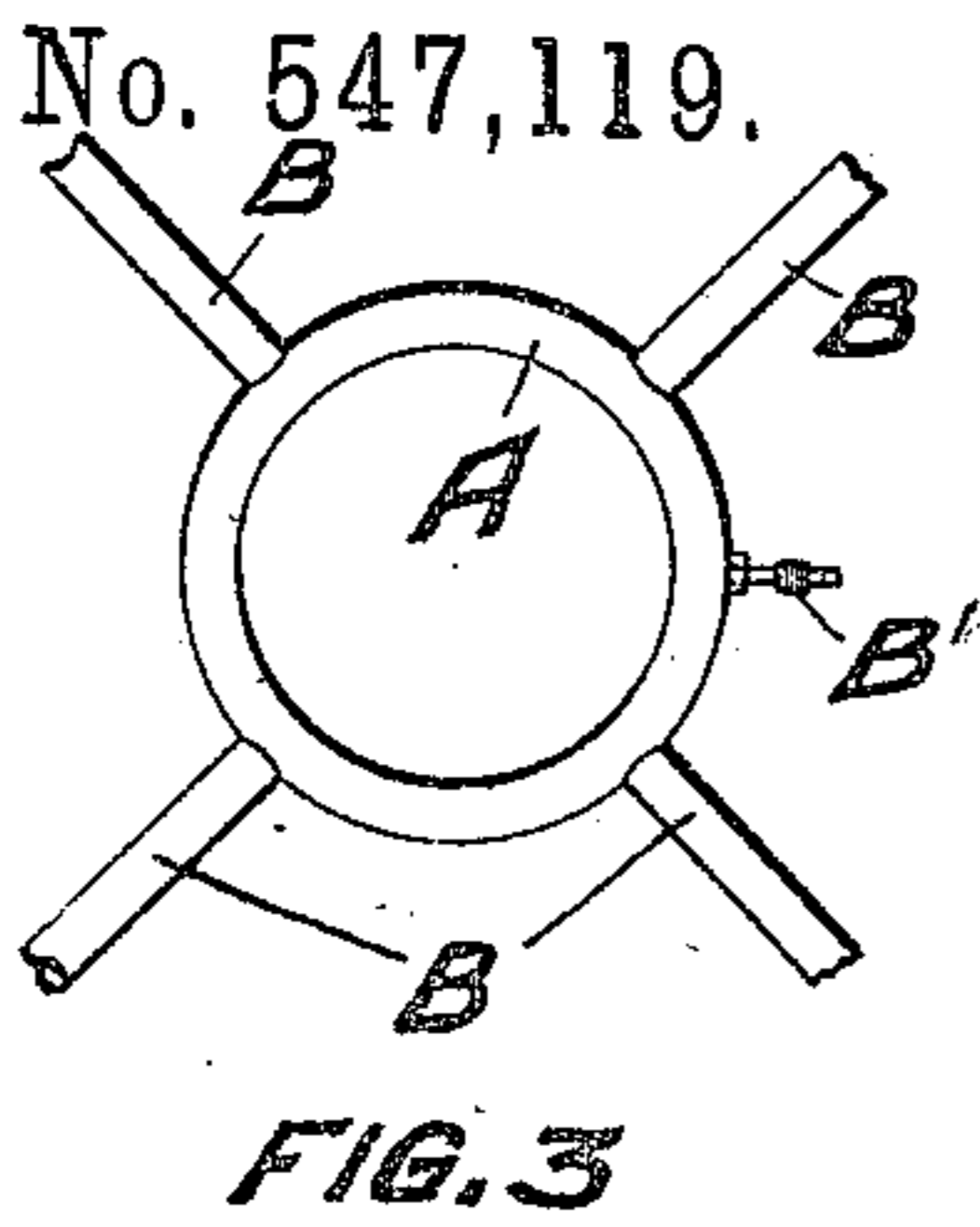
(No Model.)

2 Sheets—Sheet 1.

H. HEATON, Jr. & H. D. HOPE.  
TENT.

No. 547,119.

Patented Oct. 1, 1895.



Witness:  
E. H. Sturtevant  
E. A. Scott

FIG. 2

Inventors:  
Harry Heaton, Jr.  
Henry Donald Hope  
by *Richardson* attorney

(No Model.)

2 Sheets—Sheet 2.

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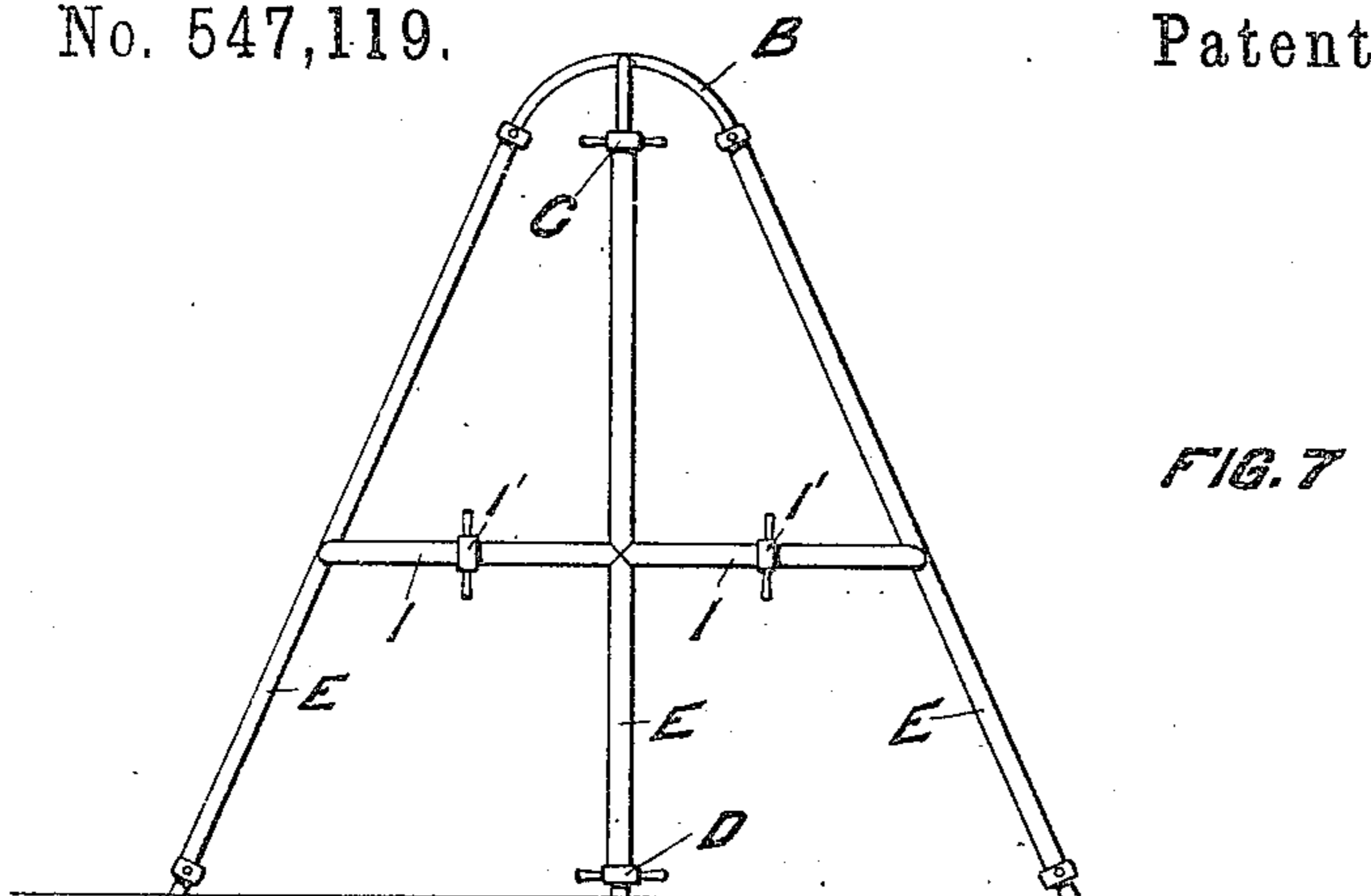


FIG. 7

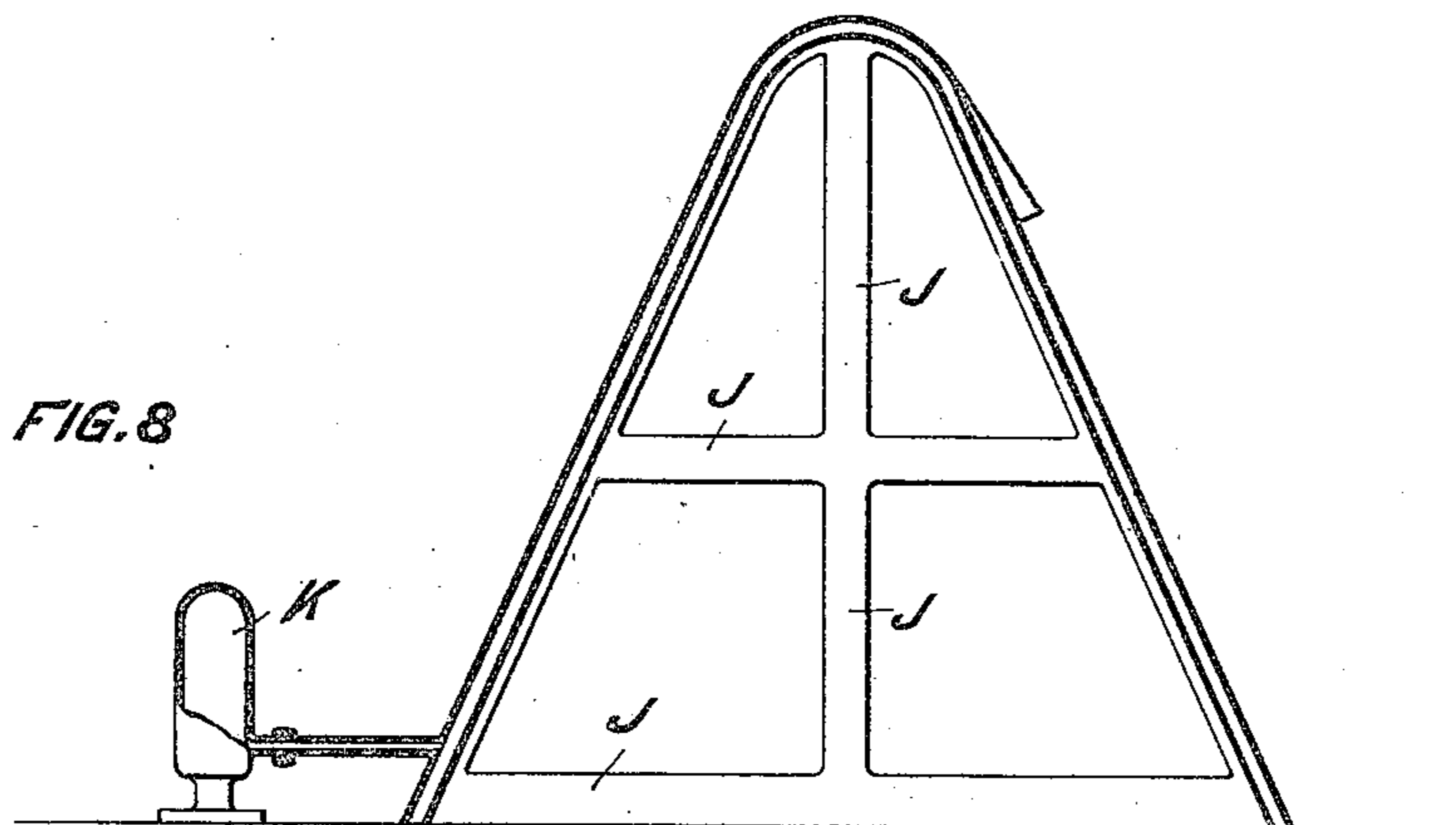


FIG. 8

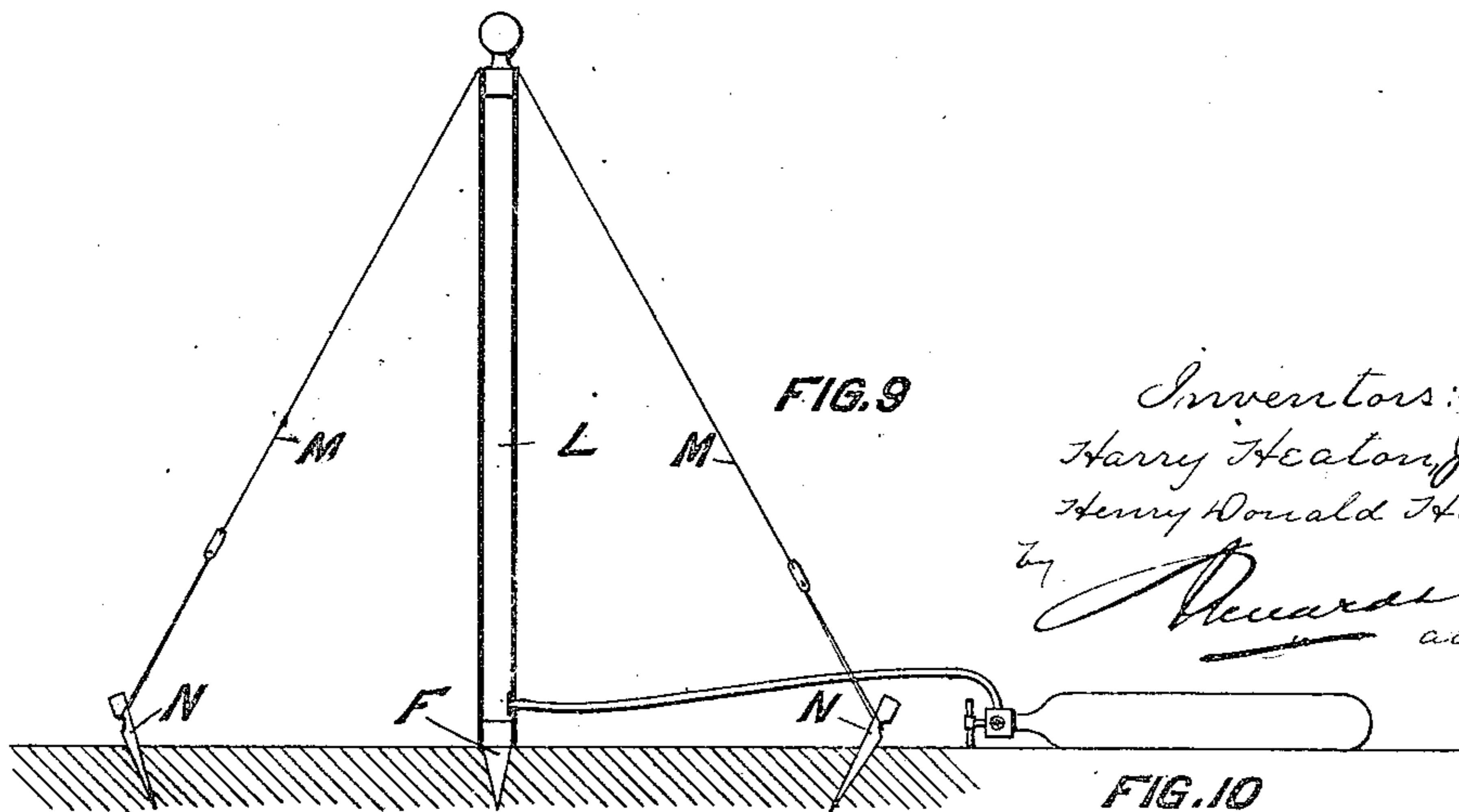


FIG. 9

Inventors:  
Harry Heaton, Jr.  
Henry Donald Hope  
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E. H. Shulerant  
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FIG. 10

# UNITED STATES PATENT OFFICE.

HARRY HEATON, JR., OF KING'S NORTON, AND HENRY DONALD HOPE,  
OF BIRMINGHAM, ENGLAND.

## TENT.

SPECIFICATION forming part of Letters Patent No. 547,119, dated October 1, 1895.

Application filed December 20, 1894. Serial No. 532,464. (No model.)

*To all whom it may concern:*

Be it known that we, HARRY HEATON, Jr., residing at Lifford Mills, King's Norton, in the county of Worcester, and HENRY DONALD HOPE, residing at 55 Lionel Street, Birmingham, England, citizens of Great Britain, have invented certain new and useful Improvements in Tents, of which the following is a specification.

Our invention relates to tents, and is especially applicable to military tents.

Our object is to dispense with the tent-poles at present in use and to provide a pneumatic or a hydraulic system of support by which it is only required to pump up the tent with an inflator or a pump for liquids to produce the necessary rigidity of form.

Part of our invention also consists in a method of inflating tents supported by pneumatic tubes or cells or chambers.

Referring to the two accompanying sheets of drawings, Figure 1 shows, in elevation, a system of flexible tubes arranged as inflated by air or distended by water to act as tent-poles. Fig. 2 is an external elevation of a tent so supported. Fig. 3 is a plan showing one arrangement of tubes for supporting the upper part of the tent. Fig. 4 is a plan showing another arrangement for the same purpose. Fig. 5 shows one mode of connecting the tubes to a tent peg or spike. Fig. 6 shows a plate-fastening to form the attachment to the ground. Fig. 7 shows a tent framework with cross-tubes as well as upright tubes. Fig. 8 shows, in section, a tent with bands or cells attached to the canvas. Fig. 9 shows a single-tube tent, and Fig. 10 shows a gas-bottle as applied to charging a tent.

In one method of carrying our invention into effect we construct a tubular ring A, Fig. 3, of any suitable metal, rubber, or other material to support the crown or upper part of the tent, and we provide this tubular ring with projecting tube-pieces B B B B and an ordinary pneumatic-tire valve B' with a convenient nozzle attachment for inflating or charging.

To the projecting tube-pieces B B B B, Fig. 3, we attach suitable canvas-covered india-rubber tubes and these tubes we construct of such length as to take the place of tent-poles.

The tubes are looped or attached to the interior of the tent in any convenient manner and attached to the tent-pegs driven in the ground just as poles are attached. Instead of adopting the ring-tube A with the attached tubes B, the cross-tubes B may be connected together at the center, as shown in Figs. 1 or 4.

The rubber or other flexible air-tight tubes E may be connected to the tubes B by screw-couplings C, and similar couplings D may be used for connecting to the spikes F. The spike F and its connection D are shown more clearly at Fig. 5. A plate G with coupling D and spike F' is shown at Fig. 6. The tubes E are suitably stopped up at their lower ends by plugs or other devices.

On inflating the system by pumping into the tubular ring or other portion of the system the pneumatic tubes become rigid and supply an efficient support for the tent-cloth. The tubes may be so formed and so looped or tied to the canvas of the tent as to give any desired outline of tent. Preferably we attach these tubes to the tent in an easily-detachable manner, so that upon deflation the tubes may be removed and packed up in small bulk for ready transit.

At Fig. 7 we show the pneumatic tubes E connected by cross-tubes I, which may be coupled together by couplings I'. These cross-tubes are inflated, together with the other parts of the system, and so provide lateral support and rigidity. An entire framework of pneumatic tubes may be so arranged, and in some cases spikes or pegs may be dispensed with.

In the arrangement of tent hereinbefore described we use four pneumatic tubes and one metal tubular ring or corresponding cross-tubes, but we may adopt a greater or less number of tubes, as we desire.

Our invention may be carried into effect according to several modifications. For example, the canvas of the tent may be made with cellular straps or bands J, Fig. 8, passing vertically to form vertical ribs and horizontally to form horizontal ribs. On inflating these ribs or the system of ribs or cells the tent at once assumes its required position and firmly maintains its dimensions as if supported by the ordinary tent-poles. More than

one tubular ring may be used, or metal tubes may be adopted in other forms than rings, depending on the particular shape of the tent to be produced.

5 The tubes may be distended by hydraulic pressure instead of air-pressure, the same arrangements as hereinbefore described being adopted. Where hydraulic pressure is adopted we add to the system an air-vessel, as K,  
10 Fig. 8, and supply the vessel with compressed air to keep up the liquid pressure in the event of slight leakage.

Instead of constructing a tent with multiple tubes, as E, Figs. 4 and 7, or with cellular  
15 strips or bands, as J, Fig. 8, we sometimes provide a single central-pole tent, as shown at Fig. 9. The central pole L is a pneumatic tube of considerable diameter, provided with a spike F at the lower end and having ropes  
20 M attached at the top and carried to pegs N, as shown. The central pneumatic or hydraulic tube L, with its ropes, is shown at Fig. 9 without the canvas.

Another part of our invention relates to  
25 tents, as hereinbefore described, and consists in a method of charging such tubes or cells without an inflator or pump. For this pur-

pose we use a metal bottle of the kind commonly used to hold compressed gas, and we charge such bottle with air or even liquid  
30 carbonic acid at high pressure. To inflate the tent we apply the bottle to the nozzle of the system and charge it to any desired pressure. Safety or reducing valves may be used  
35 to prevent bursting. Such a bottle is shown at Fig. 10 connected up to a nozzle and pneumatic tube in the act of inflating the central tube of the single-tube tent of Fig. 9.

Having now particularly described and as-  
40 certain the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

In combination in a tent frame, the pneumatic tubes formed in sections, the spikes or fastenings and the couplings between the sec-  
45 tions of the tubes and between the tubes and the fastenings, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

HARRY HEATON, JR.  
HENRY DONALD HOPE.

Witnesses:

ALBERT E. PARKER,  
H. SIBBERING WOOD.