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G. L. LUEBBERS

STUMP PULLING MACHINE

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2 Sheets-Sheet 2

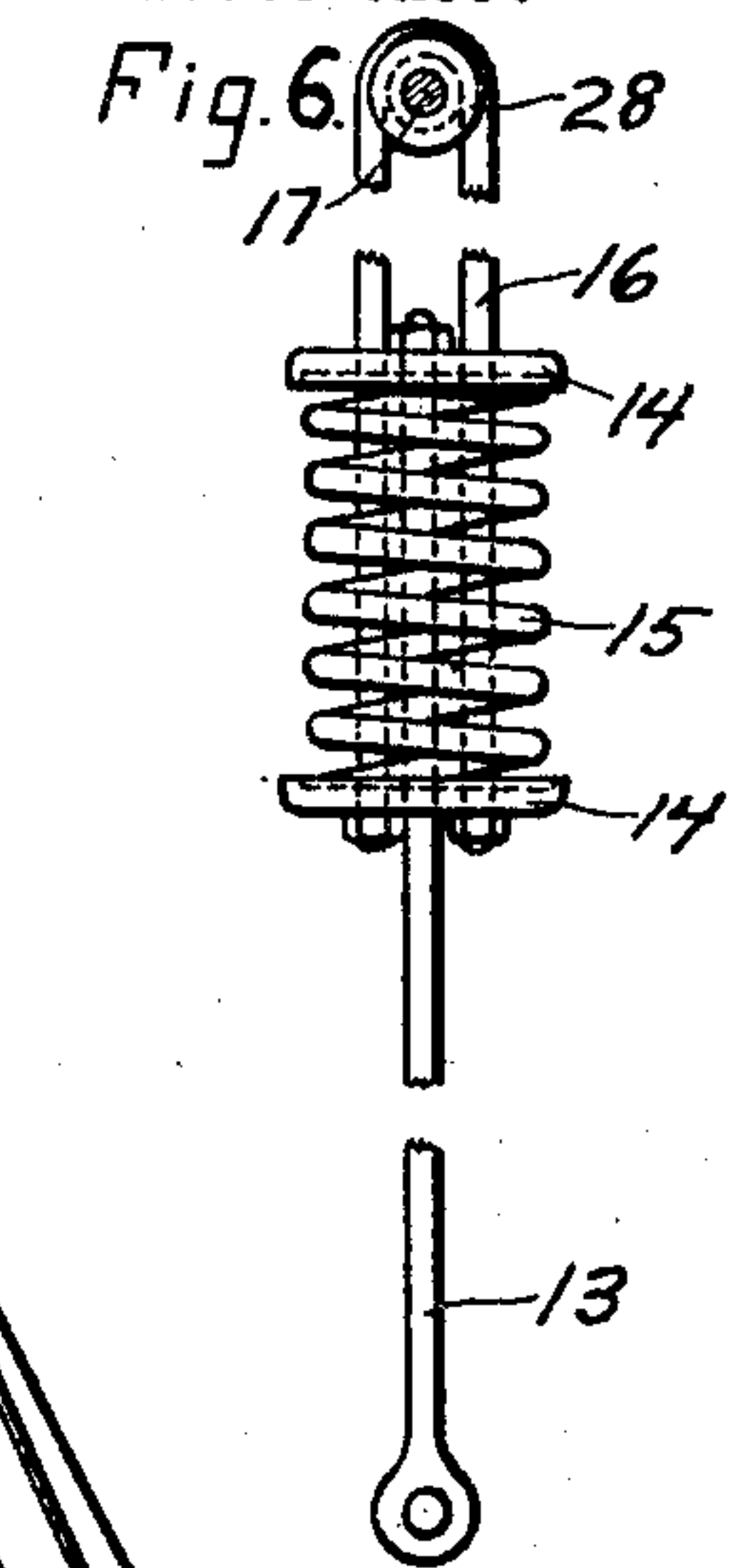
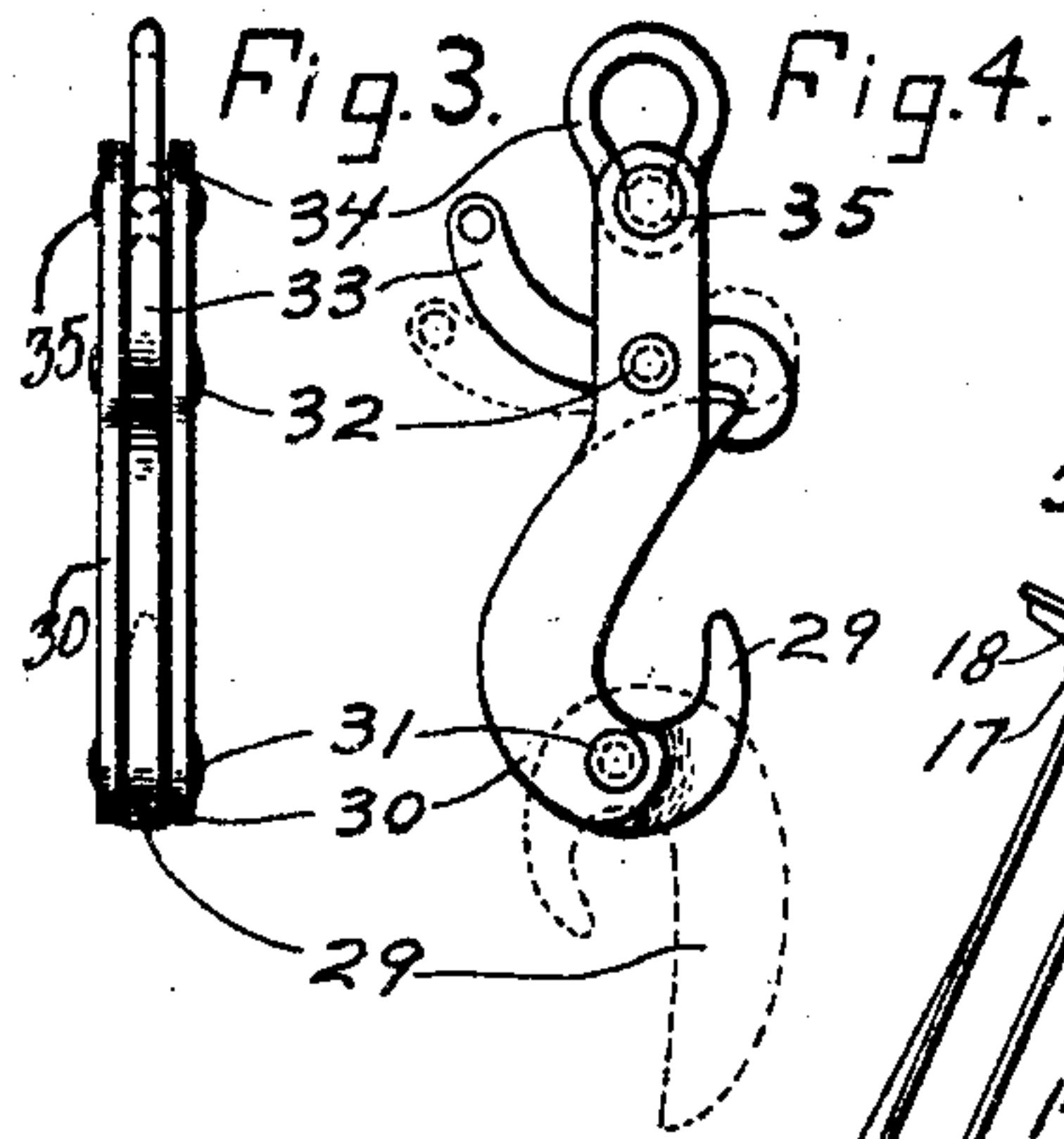
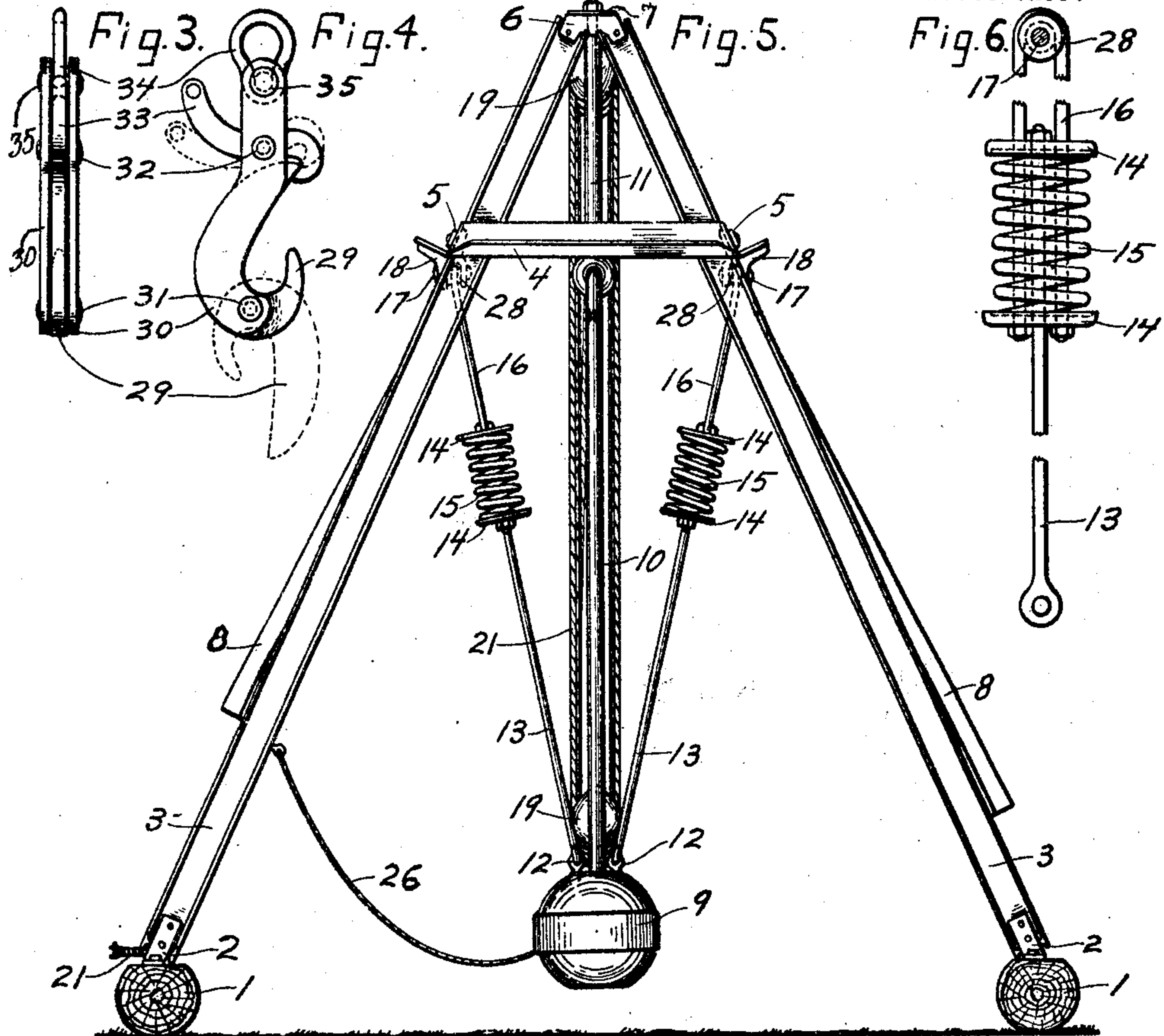
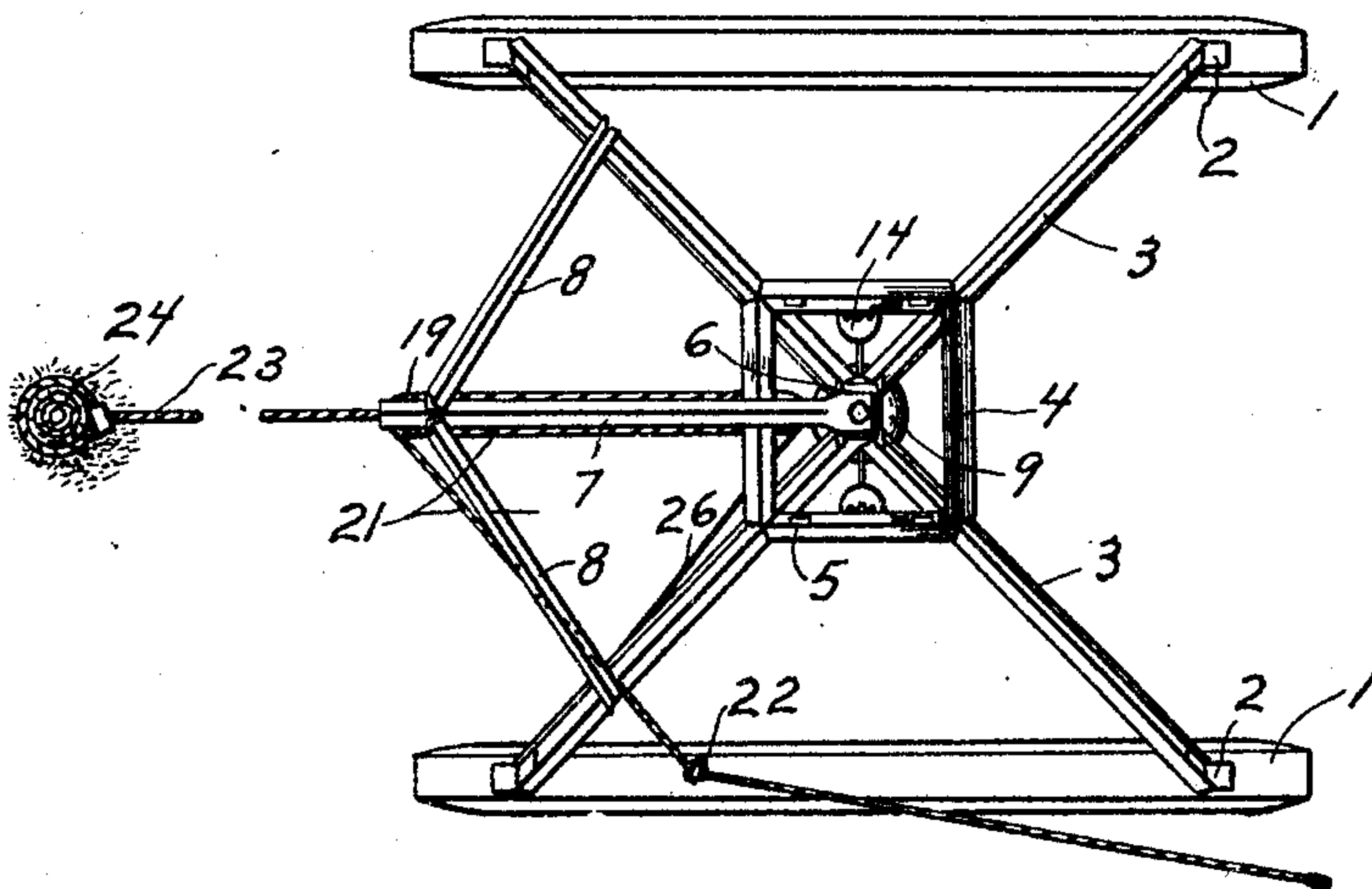


Fig. 7.



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STUMP-PULLING MACHINE.

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The invention relates to a new and improved form of stump puller in which a heavy weight is suspended in pendular manner from a suitable overhanging portable frame, with means provided to raise and suddenly release such weight from any desired height, which said weight being connected at approximately its center of gravity by means of a wire rope or chain to the stump to be extracted strikes same a sudden and heavy blow in a horizontal direction with the following useful and beneficial results:

1. The stump is speedily and cheaply extracted.

2. Due to the sudden jar much or all of the extraneous matter clinging to the stump is removed—which aids materially in disposing of the same.

It should further be noted that no anchoring of this machine is required—a great saving in time and labor. Also that the force applied to the stump by this machine conforms fittingly to that required for its extraction being a maximum at the beginning of its application, as is also required to break loose or dislodge the stump.

One form of the machine is illustrated in the accompanying drawings, in which Figure 1 is a side elevation of the entire machine with connection made to a stump, Figure 2 is a horizontal section along the line 2—2 shown in Figure 1, Figure 3 is a rear elevation of the trip-hook used, Figure 4 is a side elevation of the trip-hook, Figure 5 is an end elevation of the entire machine, Figure 6 is a detailed view of one of the snubber side springs complete with connecting rods and Figure 7 is a plan view of the entire machine connected to a stump.

The four I-beams 3 connected to the two parallel skids 1 by means of the foot-pieces 2 are brought together at their upper ends and connected to the casting 6, and constrained to their proper relative positions by the oblong angle frame 4 and the diagonal braces 5, which said diagonal braces 5 are connected at their eye ends by the hanger 11 which passes thru the eyes of the braces 5, the braces 5 being super-imposed the one on the other at this end as shown in Figure 2, the whole forming a rigid and strong frame of an arched pyramidal shape which is portable. The heavy weight 9 is suspended principally from the apex of this frame by means of the hanger 10, which

has an eye at its upper end engaging with the eye of the hanger 11, which hanger 11 passes thru the eyes of the diagonal braces 5 being thereby held in a position central with the frame and is attached to the casting 6 by means of screw threads and a nut. The hanger 11 having a shoulder just below the casting 6 allows the nut to be screwed down firmly. A further means of suspension of the weight 9 are the extensible snubber side spring assemblies shown in Figure 6 of which one is provided on either side of the weight 9 and connected as follows: The eye-studs 12 are screwed into the weight 9 and joined to the eye-bars 13 which pass centrally thru the circular caps 14 and the spring 15, having screw-threads and a nut at their upper ends. The U-bars 16 having screw threads and nuts at their lower ends also pass thru the circular caps 14 and the spring 15 and are connected at their upper ends through the grooved bushings 28, the pins 17, and the castings 18 to the oblong angle frame 4.

It will be seen from the above that the weight 9, together with its hanger 10, and the two side snubber spring assemblies complete, is free to swing in a pendular manner in an arc whose plane is vertical, parallel to the skids 1 and central between them. Means for lifting and releasing the weight 9 is provided as follows: The angle bar 7 extends horizontally and towards what might be called the rear of the machine being flattened out at one end and bolted to the casting 6 by means of the hanger 11 and supported at its other end by means of the two angle bars 8 which are connected at their lower ends to the I-beams 3. One of the multiple pulley blocks 19 is hung on the outer end of the angle bar 7 and the other connected to the weight 9 by means of the trip hook 20 and the eye-stud 25. By drawing on the tackle rope 21 the weight 9 will be raised to an elevated position as shown in outline in Figure 1 and released for the blow by means of the trip-hook 20, which will now be described.

Referring to Figures 3 and 4 the hook 29 is free to rotate between the side pieces 30 around the pin 31. When lifting a load it is constrained by the trip 33 which engages with its longer point as shown, but the trip 33 being capable of rotation about a pin 32 may be pulled into the position shown in outline, thereby releasing the load. It

should be noted that due to the fact that the point of bearing of the load being close to the pin 31 which is the center of rotation of the hook 29, the force required to keep the hook 29 locked in position is relatively small at the point of engagement with the trip 33, so that a relatively small pull on the trip rope 26 is all that is necessary to disengage the hook. The link 34, suspended from the pin 35, permits the suspension of the trip hook 20 to the pulley block 19.

It will be noticed from Figure 1 that the hanger 10 passes thru the weight 9 and has screw-threads and a nut counter-sunk into the bottom of the weight 9. The weight 9 is prevented from sliding on the hanger 10 by a shoulder as shown but is free to rotate. The wire rope 23 is connected to the stump 24 at one end and to the hanger 10 at the other end, the weight 9 being provided with a funnel shaped opening to admit same and to permit its unimpeded direct action. The connection being thus nearly at the center of gravity of the weight danger of a foul blow is diminished.

Having thus described the construction of the machine its operation will now be explained. The entire machine is drawn preferably some distance ahead of the stump to be extracted and lined so that the stump is approximately in the plane of the blow. The arched structural shape allows passing over obstructions if desired. The wire rope or chain 23 is connected to the stump 24 and its length so adjusted that the wire rope or chain 23 is taut when the weight 9 hangs vertically downward. The tackle having been adjusted as shown in Figure 1 the trip rope 26 may be adjusted to such length as in the judgment of the operator may be required to obtain the necessary strength of blow. By drawing now on the tackle rope 21 which passes thru the pulley blocks 22 and 19 the weight 9 will be raised until the trip-rope 26 trips the trip-hook 20 and the weight 9 descends, and because of its connection to the stump 24, strikes the latter a powerful blow in a horizontal direction. If insufficient to extract the stump the blow may be repeated.

As will inevitably occur at times, if the stump be not exactly in the plane of the blow the weight 9 will be deflected to one side an amount depending on the force of the blow and the amount of variation from the plane of the blow. In such case the snubber springs will come into action and will tend gradually to return the weight 9 to its normal central position without subjecting the frame to excessive strain.

It is obvious that there may be considerable variation in the design and materials used in the construction of the frame, the weight, its means of suspension, raising, releasing, snubbing and attachment to the stump, without in any way departing from the principal idea of my invention and I do not therefore limit myself exclusively to the design described except as hereinafter noted.

I claim:

A stump puller including a portable frame comprising a structural support and skids upon which said support is mounted, a heavy weight suspended from the upper portion of said structural support in a central position, said weight having an approximately funnel-shaped opening for the admittance and unimpeded action of a rope or chain connecting the stump to be extracted and the hanger passing thru said weight, two extensible elements comprising each a spring constrained between two cap plates with two draw-bars and their connections, each extensible element being suspended from opposite sides of the structural frame and attached at their lower ends to the above mentioned weight, the weight with its hanger and the two extensible elements being articulated in such manner at their upper ends as to be capable of swinging together as a pendular element, means of raising said pendular element comprising a structural extension of the main structural frame, a multiple pulley block depending therefrom, a similar multiple pulley block attached to said weight, and a rope threaded thru said pulley blocks, means for suddenly releasing said pendular element consisting of a trip hook and trip rope.

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