

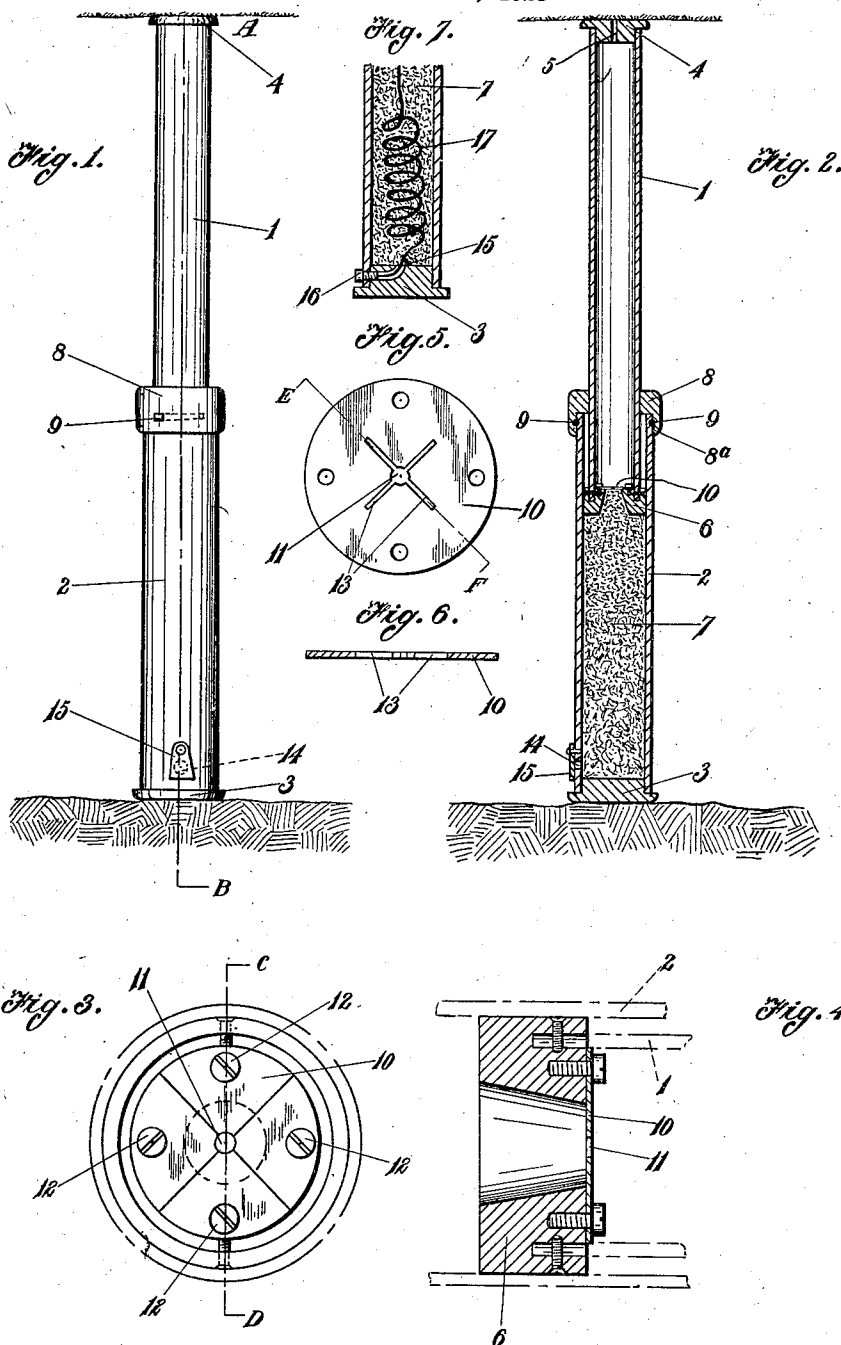
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PIT PROP

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PIT PROP

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My invention relates to an improved pit prop for mining and other purposes which is capable of being adjusted in length to suit the position in which it is to be used.

5 The object of this invention is to provide a simple arrangement of adjustable pit prop adapted to be altered in length to suit the position in which it is to be used, and which affords a means for taking up exceptional strains without causing bending or fracture of the prop.

10 Broadly a pit prop according to my invention comprises two tubular members slidable one within the other and adapted to be held in selected relative positions by a filling medium introduced into one of the tubular members, being provided whereby under excessive pressure the filling medium escapes from the tubular member accommodating it.

20 According to the preferred form of this invention my improved pit prop is formed in two parts each of tubular form one adapted to telescope into the other. A suitable foot is secured to the end of one tubular portion and a cap or head is secured to the opposite end of the other tubular portion. The larger tubular member preferably comprises the base or lower portion of the prop whilst the smaller tubular member fits in the upper end thereof. Upon the lower end of the upper member is provided a collar which is a good fit in the lower member. This collar constitutes a piston or abutment which rests on material packed into the lower portion and is provided with means for releasing some of the material when the pressure on the prop causes the material to be compressed beyond a predetermined extent. For this purpose a conical opening may be formed in the piston or in an interchangeable plate secured thereto. Suitable means for adjusting the size of the opening may be provided.

45 Into the lower and larger tubular portion of my improved pit prop is placed a quantity of stone dust, sand or other suitable material. A sufficient quantity of this is placed in the lower member until it supports the upper member at the desired height. The two portions are then held in place by

means of a collar placed around the upper end of the lower member and secured by suitable locking pins. This collar projects above the top of the lower member and also engages around the upper member where it enters the lower and acts as a "gland" in which the upper member is guided. The stone or other dust in the base of my adjustable pit prop forms an adequate support to retain the upper portion at the desired height. Whilst under excessive load some of it will escape through the conical opening in the piston or abutment. The conical opening thus acts as a release valve for some of the stone or other dust and its size and shape is arranged or adjusted to permit this to occur before the load becomes sufficient to cause bending or fracture of the weakest part of the prop which is the upper member.

70 The base or foot may comprise a suitable iron casting having a recess formed therein for the reception of the bottom end of the lower tubular portion of the pit prop. This may be secured in position by one or more pins passed through holes therein so as to engage partly in the casting and partly in the tubular member. The cap upon the upper end of the pit prop may also be formed of a suitable iron or other casting having a recess in its underface adapted to fit over the top of the upper tubular portion of the prop. A suitable hole may be provided in the centre of this casting if desired. A suitable opening may be provided in the lower member near its base from which the stone or other dust may be raked out when it is desired to release a pit prop for removal or in order to afford a fine adjustment by removing a small quantity of the dust. A suitable cover may be normally secured over this opening.

95 In order that my invention may be clearly understood and readily carried into effect I have appended hereto a sheet of drawings illustrating an embodiment of same, and wherein:—

Fig. 1 is an elevation showing my improved prop in use.

Fig. 2 is a sectional elevation on the line A—B of Fig. 1.

Fig. 3 is a plan view of the slidable abutment or piston.

Fig. 4 is a section on the line C—D of Fig. 3.

Fig. 5 is a plan view of a slightly modified form of apertured plate for use with the said piston or abutment.

Fig. 6 is a section on the line E—F of Fig. 5, and

Fig. 7 is a detail sectional elevation view of the lower prop member showing a device for extracting the packing material from the prop for reducing the height of the prop.

Referring to the drawings the pit prop illustrated consists of an upper tubular metal part 1 slidable in the slightly larger diameter interior of a lower tubular metal part 2 which has fitted to it a flanged metal or other suitable base plate 3.

The upper end of the upper tubular prop member 1 is fitted with a flanged cap 4 which has an opening 5 for a purpose hereinafter explained. The lower end of this upper member 1 is fitted with a cylindrical body 6 having a nice sliding fit in the lower prop member 2 and thereby acting as a form of piston or abutment between which and the base 3 is compressed the medium 7 which resists the downward movement of the upper prop member 1. This medium 7 may consist of any suitable granular or fine particle material and can be fed into the lower prop member 2 by removing the base 3 or through a suitable opening in the base 3 or the side of the member 2 such opening being normally closed by a suitable closure member. Alternatively the filling medium 7 can be delivered into the upper end of the lower member 2 by removing the upper member 1.

The upper member 1 is guided through a metal cap 8 detachably secured to the top of the lower prop member 2, this cap having a collar portion 8^a embracing the upper end of the member 2 and secured in position by passing locking pins 9 through openings in the collar portion 8^a registering with grooves in the sides of the lower member 2.

Should the load acting on the prop become excessive it is desirable to allow the upper prop member 1 to gradually slide downwards thus avoiding sudden prop fractures and giving an indication that the roof is dangerous. This sliding movement can be obtained by making the piston 6 of annular form and securing across its upper face a thin metal or other suitable disc 10 having a fairly restricted central opening 11 through which at excessive loads the filling medium 6 can be forced. It is preferred to have the inner surface of the annular piston 6 conical as shown to assist in the passage

of the filling medium through the opening 11, and for the same purpose the disc 10 can be composed of a number of relatively movable segments, for instance four as shown in Fig. 3, each secured to the piston 6 by a screw 12.

Instead of forming the disc 10 of a number of segments it can be formed with a number of slits 13 (see Figs. 5 and 6) radiating from the central opening 11, the disc being of a fairly flexible nature.

Any filling material passing into the upper prop member 1 can be removed through the opening 5 in the cap 4.

When it is desired to reduce the effective height of the prop some of the filling medium 7 can be removed from the lower prop member 2. One convenient method of effecting this is to provide one or more openings 14 in the lower end of the member 2, each such opening 14 being normally closed by a movable cover plate 15. The introduction of a suitable tool through the hole 14 will loosen the material in the lower prop members and enable the desired quantity to be withdrawn through the hole.

Instead of having one or more holes 14 in the side of the member 2, a hole 15 (see Fig. 7) can be formed in the centre of the base plate 3 so as to curve downwards and to radiate horizontally through the base plate, its outer end being normally closed by a screw plug 16. The passage of the filling medium through this opening 15 can be assisted by a wire 17 of a preferably flexible nature attached to the plug 16 and passing through the opening 15 into the interior of the lower prop member 2. The removal of the plug 16 will draw the wire 17 with it, with a consequent loosening and releasing of some of the filling material. The wire may be of sufficient length to occupy a considerable proportion of the space and thus allow adjustment according to the amount of wire withdrawn. If desired the hole may be of such a size that the wire will cause some of the sand or the like to come out with it.

An adjustable pit prop constructed according to my invention is exceedingly durable and may be used for many years in different positions. The stone or other dust being slightly compressible affords a suitably resilient supporting material and the releasing means such as the conical opening and apertured disc permits some of the material to escape so as to prevent the prop being subjected to excessive loads thus avoiding the risk of damage to the prop. It is capable of being readily and quickly adjusted in length in accordance with the position in which it is required to be used and it affords a safe and effective support.

I claim:—

1. A support comprising a tubular mem-

ber closed at one end, a second tubular member slidable within said first mentioned tubular member and terminating therewithin in a piston-like abutment, granular material filling the space between said abutment and the closed end of said first mentioned tubular member, and an aperture near the closed end of said first mentioned tubular member, said aperture being closed by a plug to which is attached a flexible wire which extends within said granular material and is adapted when withdrawn to remove some of said granular material thereby enabling the axial length of said support to be reduced.

2. A support comprising a tubular member closed at one end, a second tubular member slidable within said first tubular member and terminating therewithin in a piston-like abutment, granular material filling said first mentioned tubular member against which said abutment rests, a conical opening in said abutment having its larger end adjacent said granular material, and an apertured disc formed in segments affixed to said abutment for substantially closing the inner end of the conical opening therein.

3. A support comprising a tubular member closed at one end and having an aperture near said end, a second tubular member slidable within the first mentioned tubular member and terminating therewithin in a piston-like abutment, a flexible wire and granular material filling the space between said abutment and the closed end of said first mentioned tubular member, said wire being withdrawable through said aperture thereby enabling the axial length of said support to be reduced.

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