Dec. 8, 1931. W. V. O'BRYAN 1,835,515

JACK KNIFE MINE POST

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Fig. 1.

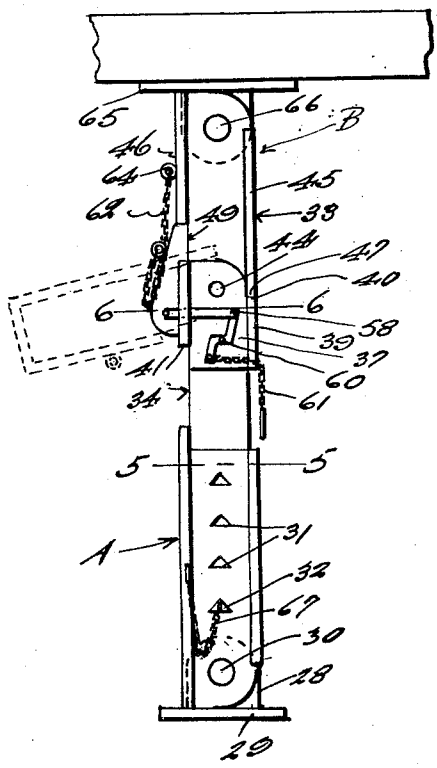


Fig. 2.

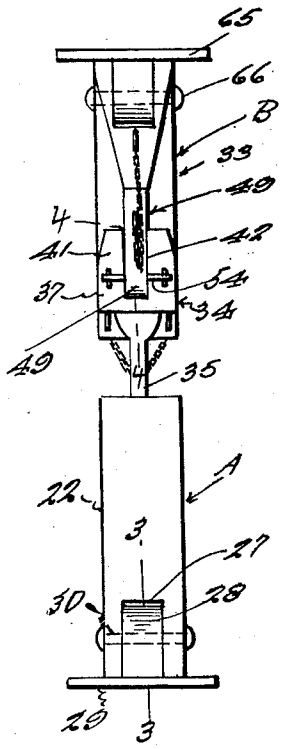


Fig. 3.

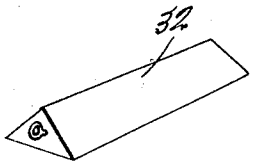
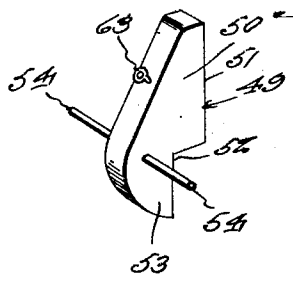


Fig. 10.



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JACK KNIFE MINE POST

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Fig. 3

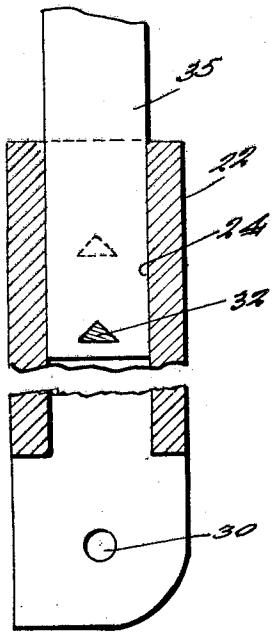


Fig. 5

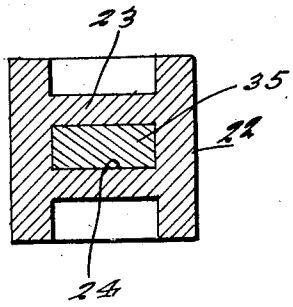


Fig. 6

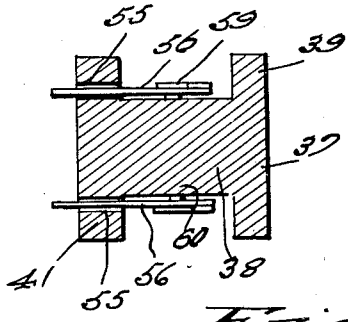


Fig. 4.

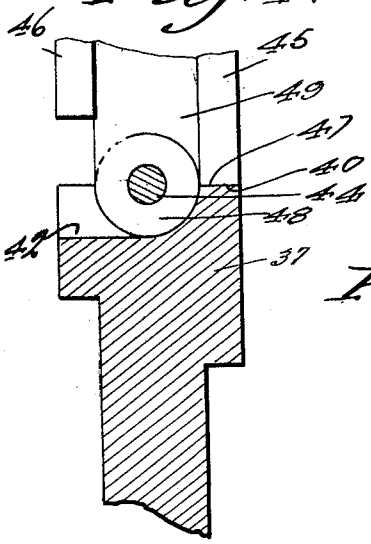


Fig. 8.

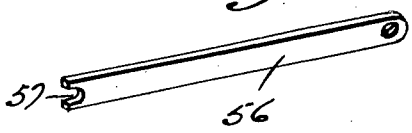
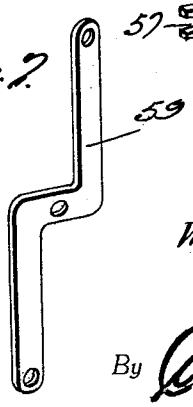


Fig. 7



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Fig. 11.

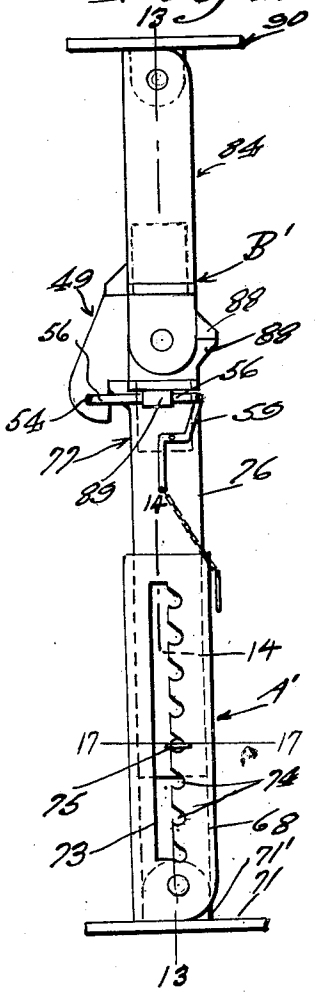


Fig. 12.

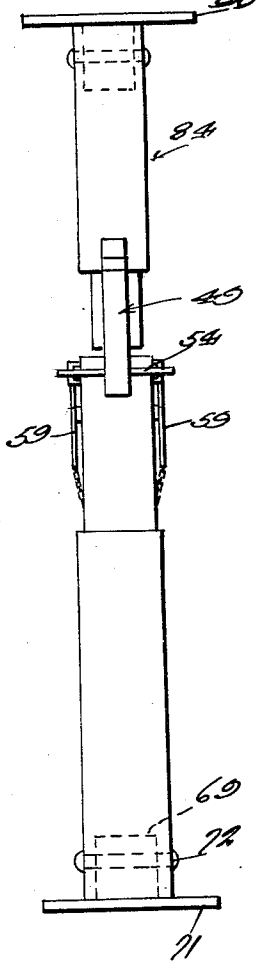


Fig. 13.

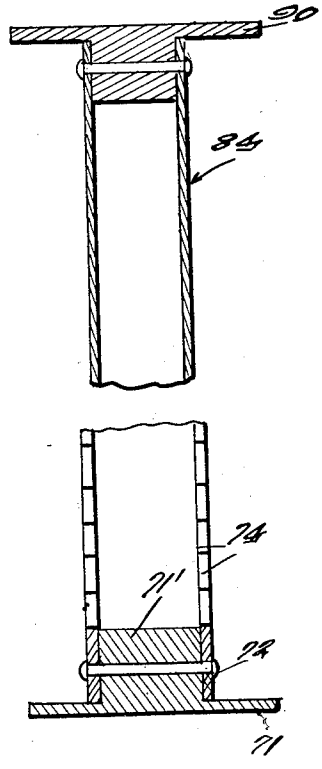


Fig. 22.

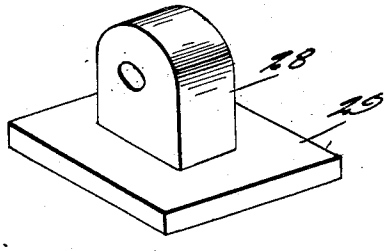
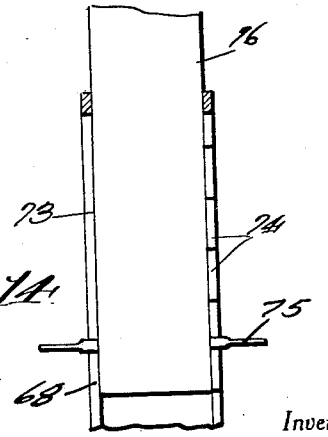


Fig. 14.



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JACK KNIFE MINE POST

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Fig. 15.

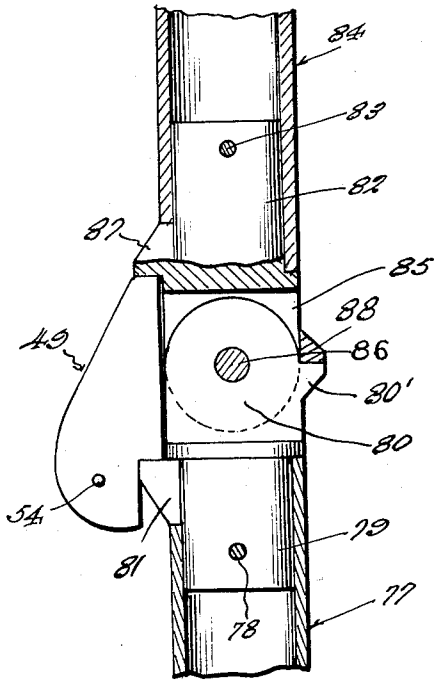


Fig. 16.

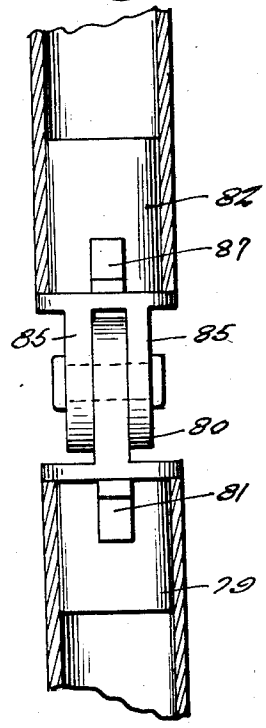


Fig. 18.

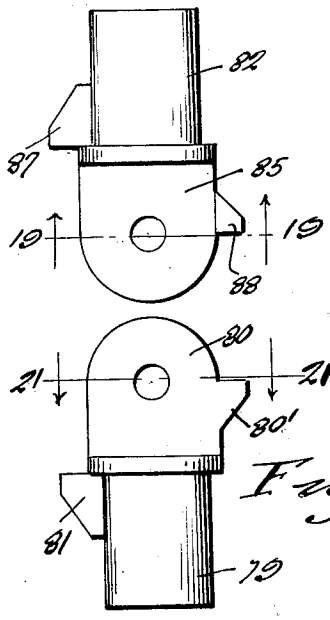


Fig. 19.

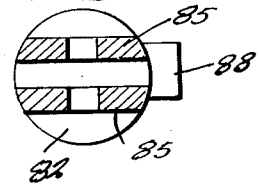


Fig. 21.

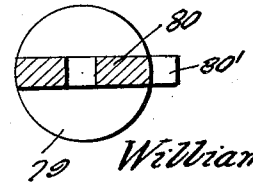


Fig. 17.

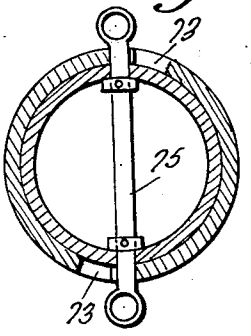


Fig. 20.

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UNITED STATES PATENT OFFICE

WILLIAM V. O'BRYAN, OF LATROBE, PENNSYLVANIA

JACK KNIFE MINE POST

Application filed April 21, 1930. Serial No. 446,047.

This invention relates to mine posts adaptable to open face, open end, or for long wall work in coal mines, and an object of the invention is to provide a support for disposition between the floor and the roof of a mine that is adjustable in length and that may be collapsed with ease and dispatch, when it is desired to remove the post.

Further objects of the invention are to provide a post of the character referred to that is strong, compact and durable, very simple in its method of assembly, very convenient to install, thoroughly reliable for its intended purpose, and comparatively inexpensive to manufacture and operate.

With the foregoing and other objects in view, the invention consists of a novel construction, combination and arrangement of parts as will be hereinafter more specifically described and illustrated in the accompanying drawings, wherein is disclosed an embodiment of the invention, but it is to be understood that changes, variations, and modifications may be resorted to without departing from the spirit of the claims hereto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is a side elevation of one form of the invention in low supporting position,

Fig. 2 is another side elevation thereof taken at right angles to Fig. 1,

Fig. 3 is a fragmentary detailed vertical section taken substantially on the line 3—3 of Fig. 2,

Fig. 4 is fragmentary detailed vertical section taken substantially on the line 4—4 of Fig. 2,

Fig. 5 is a transverse section taken substantially on the line 5—5 of Fig. 1,

Fig. 6 is a transverse section taken substantially on the line 6—6 of Fig. 1, looking downwardly,

Fig. 7 is a perspective view of one of the key operating levers,

Fig. 8 is a perspective view of one of the key operating rods,

Fig. 9 is a perspective view of the locking pin,

Fig. 10 is a perspective view of the key,

Fig. 11 is a side elevation of the tubular form of the post,

Fig. 12 is a side elevation thereof, taken at right angles to Fig. 11,

Fig. 13 is a broken-away vertical sectional view taken substantially on the line 13—13 of Fig. 11,

Fig. 14 is a detailed vertical section taken substantially on the line 14—14 of Fig. 11,

Fig. 15 is an enlarged fragmentary side elevation partly broken away, taken through the joint of the tubular post with the key in locked position,

Fig. 16 is a view similar to Fig. 15, with the locking teeth removed and taken at right angles thereto,

Fig. 17 is a transverse sectional detail taken substantially on the line 17—17 of Fig. 11,

Figs. 18 and 20 are elevations on the hinges,

Figs. 19 and 21 are transverse sections taken on lines 19—19 and 21—21 of respective Figures 18 and 20, looking in the direction of the arrows, and

Fig. 22 is a perspective view of the hinge locking pin.

The invention broadly comprehends in both forms thereof, a mine post formed of a rockable socket portion A which telescopically receives the hinged sectional portion B that is also rockable. The two portions are adjustable longitudinally, and all parts are formed of metal preferably of steel. The socket portion A and the hinged portion B of the post, are rockable in one direction only and that is in the direction in which the hinge rocks, so that when the hinge is in locked load supporting position, the construction provides for a rigid post that is collapsible merely by pulling on a chain that removes the locking key.

Referring to the form of the invention shown in Figs. 1 to 10 of the drawings, the socket member A is an elongated blank of metal 22 substantially I-shaped in cross section, the web 23 of which is formed with spaced walls, to form a substantially rectangular socket 24.

One side of the lower end of the member A is cut away and rounded to permit rocking movement of said member on the base member 29.

There is also a recess 27 in the lower end of the blank to receive the upstanding apertured lock 28 on the end of the plate 29 that is pivoted to the lower end of this blank by means of a bolt 29 that passes through the aperture in the lock and apertures 30 in the lower end of the blank.

In each of the confronting side walls of the web 23, there is a series of complemental triangular openings 31, which are in alinement with each other to receive the detachable pin 32 which is also triangular in cross section and long enough to extend across the web. This series of openings 31, provides a longitudinal adjustment of the socket member A with respect to the hinged member B.

The hinged member B is formed of two sections, indicated generally at 33 and 34. The lower section 33 is formed with an elongated tongue 35 which is rectangular in cross section, which is provided with a series of triangular openings 36, and this tongue slides in the socket 34 of the web. The openings in the tongue are in alinement with the series of openings 31 so that the pin extends through any selected one of the series of the openings on the tongue for locking the lower sections 34 to the socket members B in adjusted position.

On the free end of the tongue 35 is an enlarged head 37 which is of the same cross sectional area and disposed in the same complemental relation as the blank of the socket member A, with the exception that the web 38 is solid. The one flange 39 of the head 37 is stepped below the upper end of the head to form an abutment or stop 40. Above the abutment 40, the complemental flange 41 and web 38 are formed with a recess 42 that extends through the flange and web.

The walls of the web 38 on each side of the recess 42 are provided with alined openings 43 to receive the ends of the hinge pin 44.

The upper section 33 of the hinge portion B is also I-shaped in cross section, and has the lower end of one flange 45 stepped below the complementary flange 46 to form an abutment 47 that bears on abutment 40 to provide a rigid post in load supporting position.

A reduced rounded apertured ear 48 depends from the lower end of the web 49 and is movably seated in the recess 42 and pivoted to the pin 44 which extends therethrough. The ear 48 is seated in the inner portion of the recess 42, leaving the outer portion thereof free to receive detachable locking teeth indicated generally at 49.

The locking key 49 is formed of an elongated metal block 50 having a flat surface 51 and a latch 52 at the end of the flat side which forms a lip 53. The flat side 51 seats in the outer portion of recess 42 and the upper end of the block 50 bears against the lower end of the flange 46 when the hinge is locked thereby, and the lip 53 overlaps the outside of the head 37 about the edge of the recess 42.

A pair of pins 54 project from the sides of the key, one on each side in alinement with a pair of openings 55 in the flange 41 of the head 37, when the key is seated. The outer portions of a pair of operating rods 56, extend through these openings and are formed with U-shaped grooves 57 on their outer ends.

These rods are pivoted at their inner ends and at 58 to substantially Z-shaped levers 59 pivoted as at 60 intermediate their ends, one on each side of the web 38 of the head 37. To the free ends of these levers are connected chains 61, which when pulled outwardly, move the rod 56 inwardly, whereupon the rod engaging the pins 54 will kick the teeth 49 out of its seat to collapse the post.

The key has one end of a chain 62 connected to a staple 63 thereon and the other end of the chain is secured to a staple 64 anchored to the flange 46 of the upper section 33. The upper end of section 33 has a plate 65 rockably connected thereto as at 66 similar in all respects and for the same purposes as the plate 29 that is rockably connected to the socket portion A.

These plates 29 and 65 are of greater area than the cross section of the respective parts of the post, so that when they bear against the floor and roof respectively in the mine, the vertical support of the post covers a relatively wide area.

It is to be noted that by the arrangement of the locking movement of the plate, they permit the hinged portions B and socket portion A to rock to the right on the hinge pin 44 when the key 49 is kicked out of position. The pin 32 is also chained as at 67 to the socket portion B to prevent its being lost during the use thereof.

Referring now to the tubular post as illustrated in Figs. 11 to 21 inclusive, the parts operate in the same manner as in the first embodiment of the invention, but owing to the adaptation of the tubular parts, to the purpose of the invention, slightly different arrangement thereof is necessary.

In this tubular form of the invention, the socket A′ is a tubular sleeve 68 having a peripheral U-shaped recess 69 at its lower open end with the walls, at the lower corner of the recess rounded to permit rocking movement.

A relatively large plate 71 has an upstanding apertured lug 71′ seated in the lower end

of the sleeve within the recess, and a bolt 72 extends through the apertures in the sleeve and the lug by which the socket portion rocks on the plate.

This plate is similar in all respects to the plate shown in Fig. 22, and is used with the first-described post.

The peripheral wall is formed with a pair of diametrically opposed elongated slots 73, and along one longitudinal edge of each slot are a series of downwardly directed notches 74 to receive the outer ends of the adjusting pin 75 which extends through the lower portion of the lower section, indicated generally at 77, of the hinged member B'.

The lower section 77 is hollow and anchored in the upper end thereof by means of a rivet 78 is the shank 79 having an upstanding apertured hinge ear 80 projecting above the end of the section 77. On the periphery of the shank is a radially projecting jaw 81 that engages one end of the key 49. The periphery of the ear 80 has a lateral lug 80' extending therefrom.

The shank 82 of the companion hinge is anchored by a rivet 83 to the lower end of the upper section, indicated generally at 84 of the hinge member B' and this upper section is also tubular. Depending from the shank are a pair of spaced apertured hinge ears 85 between which is pivoted on the pin 86, the upstanding hinge gear 80.

The shank 82 also has a radially projecting jaw 87 in alinement with the jaw 81 and the key 49 is detachably seated within the two jaws when the post is in load supporting positions. The ears 85 likewise have lugs 88 thereon which bear on lugs 80' when the sections are in vertical position.

These lugs prevent the hinge from breaking in two directions, the same as the abutments 40 and 47 in the first-described form of the post.

In the tubular form, the operating rods 56 slide in tangential horizontal small sleeves 89 secured to the outer periphery of the lower section 77, otherwise the kicking out of the keys 49 is performed by the same parts and operate as in the first described form of the invention.

The plate 90 is attached to and the upper end of section 84 is modified the same as the lower end of the sleeve 68 to receive the rocking plate 71.

In the application of the invention, and particularly the form of the invention shown in Figs. 1 to 10 of the drawings, the hinge member B is adjusted with respect to the socket member A to the height of the roof to be supported by the post. The pin 32 is inserted in the proper opening in the socket member A and the tongue member 35.

The hinge sections 33 and 34 are moved to vertical position and the key 49 is inserted in the place, whereupon the pins 54 bear against the outer end of the operating rods 56.

In this position, the post is in rigid vertical position supporting the load of the roof on the post. Now to collapse this form of the invention, all that is necessary to be done, is to pull downwardly on chain 61, whereupon the key 49 will be kicked out of position, and the weight will cause sections 33 and 34 to pivot on the hinge pin 44, thereby collapsing the post.

The operation of the form of the invention shown in Figs. 11 to 21 inclusive, is the same as has been heretofore described with the invention shown in Figs. 1 to 10 of the drawings, with the exception that in adjusting the socket members A' with respect to the hinge member B'.

Now to move the hinged member B' it is necessary to rotate the hinged member B' to the left as shown in Fig. 11 of the drawings, so that the pin 75 will register with the slots 73.

With the pin 75 registering with the slot 73 the hinged member B' may be moved vertically with respect to the socket member A'. When the height is adjusted as desired, the hinged member may be turned so that the pin 75 engages in the desired notches, whereupon the two members A' and B' are locked in adjusted position.

The collapsing operation in the tubular form of the invention is the same as in the other forms of the invention.

The present embodiment of the invention has been disclosed in considerable detail merely for the purpose of exemplification, since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It is to be understood that by describing in detail herein any particular form, structure, or arrangement, it is not intended to limit the invention beyond the terms of the several claims or the requirements of the prior art.

Having thus described my invention, what I claim as new is:—

1. A device of the class described comprising a pair of sections pivotally connected together, the adjacent ends of the sections having projecting parts at one side of the device for engaging each other when the sections are in alinement, the adjacent ends of the sections being recessed at the opposite side of the device to permit rocking movement of the sections toward said side of the device, a key engaging the portions at the recessed part to hold the sections in alinement, a sliding member supported by one section and manually operating means for moving said member against the key to force the key out of contact with the sections.

2. A post comprising two sections, a knuckle connecting the sections, a key lo-

cated between parts of the two sections for holding the sections in alinement and manually operated means for moving the key from between the sections, such means consisting of a member slidably supported on one section, a lever pivoted to said section and having its upper end pivoted to the said member and a flexible member connected with the lower end of the lever, whereby when said flexible member is pulled the lever will cause the sliding member to engage the key and force it out of contact with the sections.

In testimony whereof I affix my signature.

WILLIAM V. O'BRYAN.