May 30, 1939. P. B. BUCKY 2,160,454

SUPPORTING DEVICE

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Fig. 1.

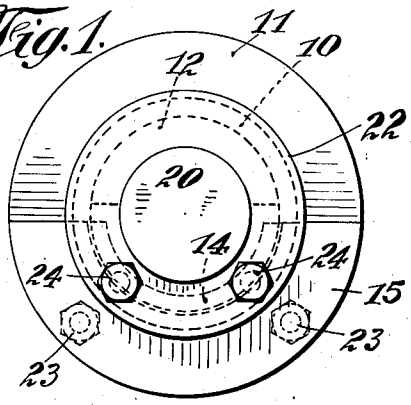


Fig. 4.

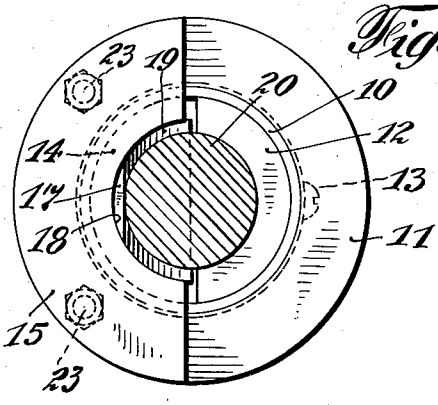


Fig. 2.

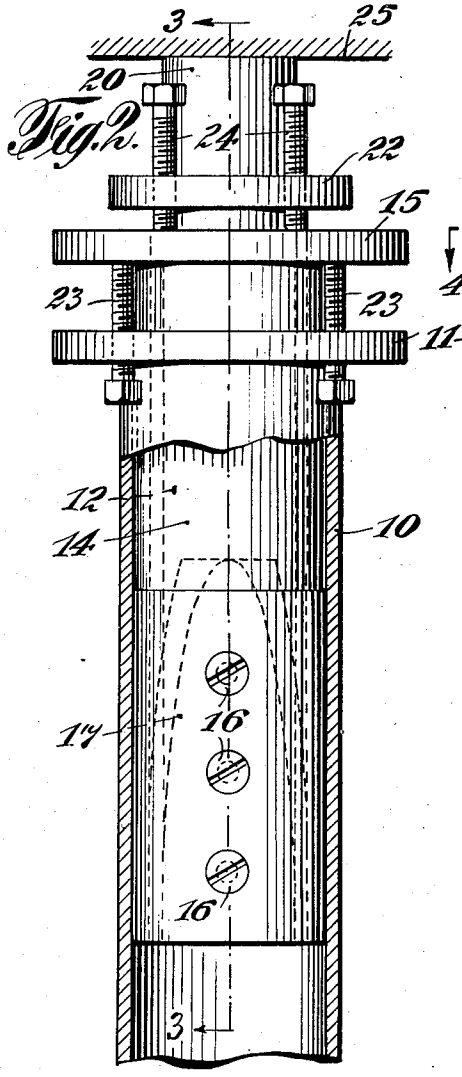


Fig. 3.

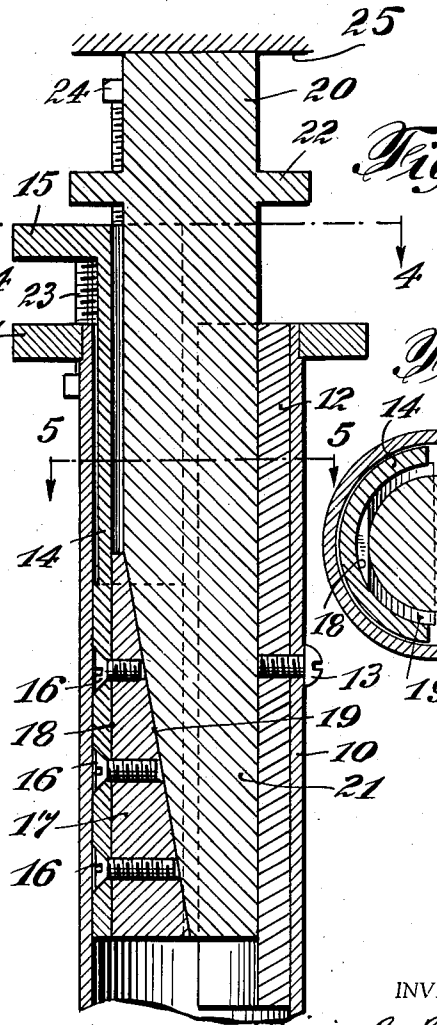
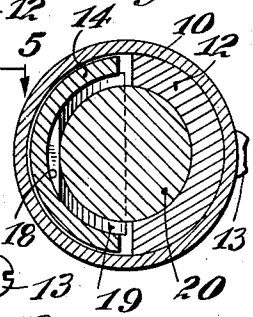


Fig. 5.



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Fig. 6.

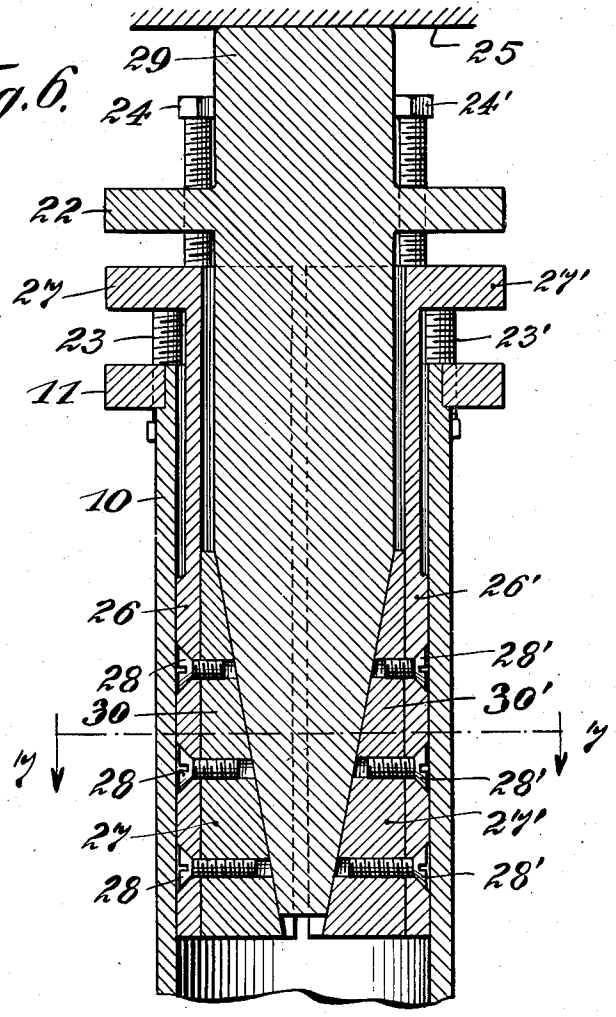
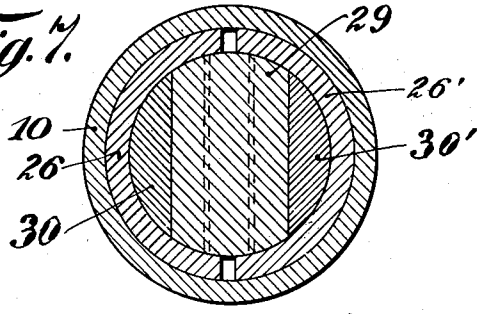


Fig. 7.



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UNITED STATES PATENT OFFICE

2,160,454

SUPPORTING DEVICE

Philip B. Bucky, Bronxville, N. Y.

Application March 31, 1937, Serial No. 133,951

4 Claims. (Cl. 248—354)

My invention refers to supporting devices and refers particularly to supporting devices adapted for temporary use, although they may be employed as permanent means of support.

Although the devices of my invention have many applications, I will refer to them particularly as a means for the temporary support of roofs, or any overlying material, as in mine excavations, as a means of clearly defining their construction and application.

In mining excavations, it is frequently necessary to support the roof and overlying material of the excavation during operations, the supporting means thus being incident to the excavating, in order to protect the miners.

While in some cases these supports must be of permanent character, in other operations it is not necessary or desirable to mechanically support the roof after that portion of the mine has been excavated, and in such instances it is customary to remove the supports after they have served their purpose and move them to the advanced portion of the excavation in which the operation is proceeding.

The usual method of accomplishing this result is to erect a support column of wood, or iron, between the floor and the roof, the length of the column being less than the distance between the roof and the floor, and then hammering and pounding two opposed wedges between the top of the column and the face of the roof until the weight of the overlying material will be borne by the supporting-column.

The placement of columns of this character causes considerable difficulty at times because of the height of the wedges from the floor, but great difficulty is experienced in releasing the column from its supporting position, which can be accomplished only by driving the wedges apart. As only the broad flat ends of the wedges are exposed when they are in abutting position, and as the driving effect must be applied to the opposite thin edges of the wedges, which are not exposed, in order to release them, it is evident that this operation is not easily accomplished.

It is further evident that in the application of the present employed devices, the full force and weight of the roof is exerted directly downwardly upon the base of the supporting column, which necessitates a firm, hard supporting surface below the base of the column.

The devices of my invention overcome all of the above mentioned and other, objectionable features of the present employed devices and presents means whereby supports of the character described can be erected and removed with ease and rapidity without the employment of hammers and other impacting implements.

In a broad way my devices comprise a hollow tube of circular or of other cross section, within which are one or more wedge-shaped members capable of being raised by means of expanding means between the tube and the wedge-shaped member or members, and an independent wedge-shaped member abutting upon the first mentioned wedge-shaped member or members and the inner face of the tube, so positioned that the upper movement of the first wedge-shaped member or members will raise the second wedge-shaped member, and if desired, an inner lining member being attached to at least a portion of the hollow tubular member upon which the plunger or the wedge-shaped member or members can abut.

The construction of my devices, their application and the results produced from their use will be understood by a consideration of my specification and the accompanying drawings in which similar parts are designated by similar numerals.

In the accompanying drawings illustrating one form of my devices,

Figure 1 is a top plan view of one form of my device,

Figure 2 is a side view of the device of Figure 1 partly broken away for purposes of clearness of description,

Figure 3 is a section through the line 3—3 of Figure 2,

Figure 4 is a section through the line 4—4 of Figure 3,

Figure 5 is a section through the line 5—5 of Figure 3,

Figure 6 is a vertical cross-section of a modified form of my device,

Figure 7 is a section through the line 7—7 of Figure 6.

The particular form of the device of my invention illustrated in Figures 1 to 5 of the accompanying drawings comprises a hollow cylindrical member, or shell, 10, open at both ends and carrying the fixedly attached annular flange 11. A segmental tubular member, or filler, 12, which may or may not be fixedly attached to the inner face of the shell 10 by means of a threaded bolt 13, or by other suitable means, the member 12 extending less than half way around the shell 10.

Longitudinally movable within the shell 10 is a segmental tubular member 14 carrying an extended flange 15, said member 14 extending less than half way around the shell 10. Fixedly attached to the member 14 by means of the thread-

ed bolts 16, 16, or other means is a wedge-shaped member 17, having an annular face 18 and an inclined face 19.

Longitudinally movable within the device, constructed as described, is a cylindrical supporting member, or plunger, 20, the lower portion 21 of which is wedge-shaped, the angle of the wedge being such that the member 20 will abut upon the inner face of the member 12 and the face 19 of the wedge-shaped member 17. The plunger 20 carries the extended flange 22.

The flange 11 has a plurality of threaded openings for the reception of the threaded members 23, 23 and the flange 22 has a plurality of threaded openings for the reception of the threaded members 24, 24.

The operation of the device in supporting a roof, or similar object, is as follows:

The lower end of the device is placed upon the floor, or upon some object resting thereon, beneath the roof to be supported, and the flange 15 moved upwardly by means of the threaded members 23, 23. This upward movement of the flange 15 carries with it the members 14, 17 and 20 until the upper face of the member 20 abuts upon, and supports, the roof 25, as shown in Figures 2 and 3. Members 23, 23 are now loosened or removed.

It will be noted that the force caused by the pressure of the plunger 20 upon the roof 25 results in a downward pressure upon the floor and a lateral outward pressure against the inner sides of the shell 10.

When it is desired to remove the device, the threaded members 24, 24 are moved downwardly against the flange 15.

It is evident, particularly from Figure 3, that when the flange 15 is free to move downwardly, a slight downward movement of the flange 15, will move the wedge 17 downwardly, thus removing the pressure abutment between it and the plunger 20, thus allowing the plunger 20 to move downwardly and away from the roof 25, and will follow the wedge 17 in its downward movement.

It will be noted that the pressure of the roof 25 is not upon the threaded members 23, 23 or 24, 24 but is directly upon the plunger 20 and transmitted to the casing 10, through the members 12, 17 and 14, thus insuring great strength and stability to the device.

The modified form of my device shown in Figures 6 and 7 consists of the shell 10 open at both ends and carrying the fixedly attached annular flange 11. Longitudinally movable within the shell 10 are two segmental tubular members 26, 26', having the extended annular flanges 27, 27' and each extending less than half way around the shell. Fixedly attached to opposed faces of the lower portion of these two segmental tubular members 26, 26' are two wedge shaped members 30, 30', said attachment being accomplished by means of the threaded bolts 28, 28, 28', 28', or other means.

Longitudinally movable within the device constructed as described, is a cylindrical supporting member or plunger, 29, the lower opposed portions of which are wedge-shaped, the angles of the wedges being such that the member 29 will abut upon the inclined faces of the wedge-shaped members 27, 27'. The device has the threaded members 23, 23' and 24, 24' as described with respect to the device shown in Figures 1 to 5.

The operations incident to the application of this modified form of my device are similar to those previously described.

While I have illustrated my device in a vertical position, it is evident that it can be employed in a horizontal, or other, position as a supporting device.

I do not limit myself to the particular size, shape, number, arrangement or material of parts illustrated and described as these are given simply as a means for clearly describing the device of my invention.

What I claim is:

1. A support comprising a shell of constant interior sectional shape, a first segmental member within said shell abutting the inner face thereof and having a wedge-shaped lower portion, a second segmental member within said shell abutting the inner face of the shell, means between said first segmental member and said shell adapted to move said first segmental member longitudinally in said shell, a longitudinally movable plunger positioned between said segmental members, said plunger having a wedge-shaped lower portion coacting with and complemental to said segmental wedge-shaped portion and means between said first segmental member and said plunger adapted to move said plunger and said first segmental member relative to each other.

2. In a supporting device, in combination, a shell of constant interior shape and dimension, a first segmental member having a wedge-shaped lower portion with a plane surface, and arranged to abut on a portion of the inner surface of said shell, a second segmental member of constant inner section within said shell and abutting on a portion of the inner face thereof, means between the first said segmental member and said shell adapted to move said first segmental member longitudinally in said shell, a longitudinally movable plunger positioned between said segmental members, said plunger having a wedge-shaped lower portion co-acting with and complemental to said plane surface of said wedge of said first segmental member and the inner surface of said second segmental member, and means between said first segmental member and said plunger adapted to move said first segmental member and said plunger relative to each other.

3. A support comprising a shell of constant interior sectional shape and having an outwardly extended flange, a first segmental member within said shell abutting the inner face thereof and having an outwardly extended flange and a wedge-shaped lower portion, a second segmental member similar to the first said segmental member within said shell abutting the inner face of said shell and having an outwardly extended flange, means between the flanges of said segmental members and the flange of said shell adapted to move said segmental members longitudinally in said shell, a longitudinally movable plunger positioned between said segmental members, said plunger having an extended flange and having a wedge-shaped lower portion coacting with and complemental to said segmental wedge-shaped portions of said segmental members and means between the flanges of said segmental members and the flange of said plunger adapted to move said plunger and said segmental members relative to each other.

4. A support comprising a shell of constant interior shape and dimension and having an outwardly extended flange, a first segmental mem-

ber within said shell abutting the interior face thereof and having an outwardly extended flange and a wedge-shaped lower portion with a plane surface, a second segmental member similar to the first said segmental member within said shell abutting the inner face of said shell and having an outwardly extended flange, means between the flanges of said segmental members and the flange of said shell adapted to move said segmental members longitudinal in said shell, a longitudinally movable plunger positioned between said segmental members, said plunger having an extended flange and having wedge-shaped lower portions with plane surfaces coacting with and complemental to said segmental wedge-shaped portions and means between the flange of said segmental members and the flange of said plunger adapted to move said plunger and said segmental members relative to each other.

PHILIP B. BUCKY.