Nov. 11, 1952 F. W. JESSOP 2,617,620

ADJUSTABLE SHORE

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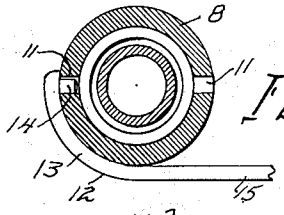


Fig. 4

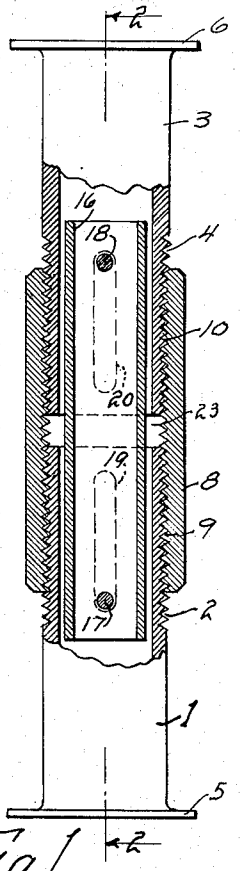


Fig. 1

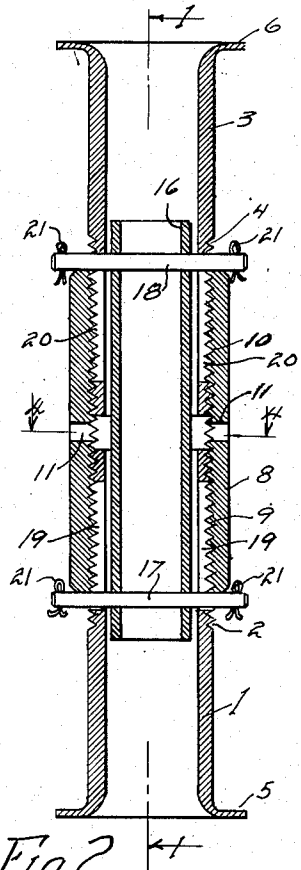


Fig. 2

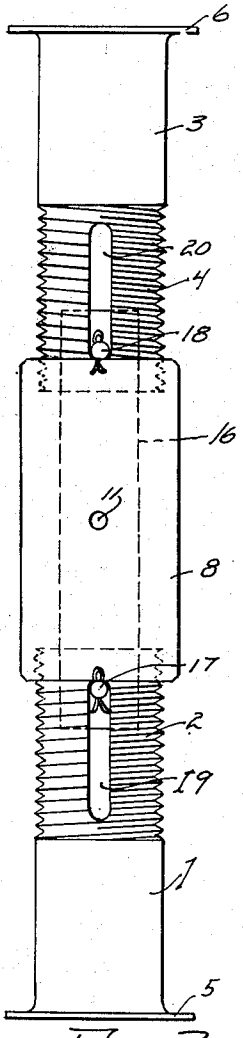


Fig. 3

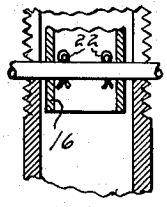


Fig. 6

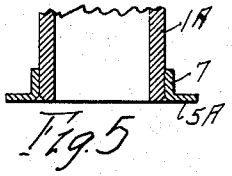


Fig. 5

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ADJUSTABLE SHORE

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9 Claims. (Cl. 248—354)

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This invention relates to adjustable shores and to shores particularly adapted to use in the galleries of mines.

Numerous constructions of shore are known comprising an elongated base part for resting at one end upon the ground (or other support) and an elongated load engaging part aligned longitudinally therewith and adjustable therealong longitudinally to adjustably extend or alternatively contract the over-all length of the shore.

In some cases, the shore is merely adjusted to the length at which it will support a load subsequently put on it; as for example to support a concrete mold for floors and the like of building structures into which concrete is to be poured. In other cases, the shore is forcibly extended between the support and the load for example to shore up a loaded floor to correct or prevent sagging. Such shores therefore are provided with a mechanism operable to contract or extend the over-all length of the shore, and to extend it with great force when, in use, force is needed.

Shores, so-called, are used in mines to support the roof of a gallery, or to hold the side walls apart, to prevent falling or collapsing, but in general comprise merely a strut of wood, and a wedge or wedges driven into place under or over an end of the strut.

This wooden-strut type of mine shore is cheap and came into use for that reason, and does effect economy when the wood is readily available near the mine. But the wood-strut type of shore has continued to be used in mines as a custom or habit, even when the strut must be transported long distances, and the economy is lost; and in any case any saving due to initial cheapness is lost because of the short life of such wood shores due to moisture effected decay.

This expense for mine shores is entailed largely because an extensible and contractable shore as a manufactured article and made of more durable material, such as iron or steel, and having a mechanism for forcibly extending it, has not heretofore been produced cheaply enough to replace the wood-strut type.

It is an object of the present invention to provide a mechanism-operated shore as referred to, which can be manufactured cheaply from steel or iron at a total cost favorably comparable with that of the wood-strut type, whereby it may be economically used in mines to replace the wood-strut type, with advantages thereover.

Another object is to provide such a shore which can be made largely from selected sizes of commercial steel or wrought iron pipe.

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Another object is to provide an adjustable shore comprising a base part and an extensible part of tubular form, and externally threaded with right and left hand threads respectively; and a coupling internally threaded with right hand and left hand threads meshed with the threads of tubular parts; whereby upon turning the coupling, the over-all length of the tubular parts may be decreased or forcibly increased with great extending force, and by small increments; and provided with a cheap simple means whereby upon turning the coupling on one part, the other part is prevented from being rotated thereby, and whereby movement of the tubular parts in the extending direction is limited to prevent unscrewing of the tubular parts from the coupling.

Another object is to provide an adjustable shore generally of two main parts coupled together, so designed that a few different lengths of the two main parts, when selectively assembled in pairs in the shore, will provide shores of a great variety of over-all lengths; so that the shore as thus selectively assembled will have a length approximating the length that will be used, and so that as a consequence, the shore will contain no more material than is needed and actually used in each instance, with resulting reduction of cost and increase of economy.

Other objects will be apparent to those skilled in the art to which the invention appertains.

The invention is fully disclosed in the following description taken in connection with the accompanying drawing, in which:

Fig. 1 is an elevational view, partly in longitudinal section of a shore embodying the invention and in contracted condition; and the view may be referred to the plane 1—1 of Fig. 2;

Fig. 2 is a longitudinal sectional view from the plane 2—2 of Fig. 1;

Fig. 3 is an elevational view of the shore in fully extended condition;

Fig. 4 is a cross-sectional view from the plane 4—4 of Fig. 2, with parts beyond the sectional plane omitted; and illustrating a tool for operating an extending and contracting mechanism of the shore;

Figs. 5 and 6 are fragmentary views of parts of Fig. 2 illustrating modifications.

Referring to the drawing, the shore is illustrated in an upright or vertical position for convenient reference, and at 1 is shown a lower or base part. In a preferred construction, it is made from a length of standard steel pipe of say three inches diameter, threaded on its out-

side as at 2, and beginning at its upper end, with say a right hand thread.

At 3 is shown the upper part, also made from a length of standard three inch pipe, threaded beginning at its lower end, with a left hand thread as at 4.

The upper and lower ends of the parts 1 and 3 are spun outwardly to provide respectively an annular foot 5 and annular head 6 as best shown in Fig. 2 to provide enlarged areas for obvious purposes.

Instead of providing the foot 5 and head 6, by spinning the wall of the pipe, the foot may be provided, as shown at 5A in Fig. 5 as a modification, by circumscribing the end of the lower pipe, here 1A, with an annularly bent piece of angle iron 7, and welding it to the end of the pipe 1A; and a head of similar construction may be provided for the upper pipe 3, as will be understood.

At 8 is a coupling, made from the stock from which standard couplings or connecting sleeves for threaded steel pipe are commonly made; and it is internally threaded from opposite ends to its middle with a right hand thread 9 in its lower half and a left hand thread 10 in its upper half and meshed respectively with the threads 2 and 4.

By this much of the structure, upon turning the coupling 8 in one direction, it will rise on the lower part 1, and the upper part 3 will also be propelled upwardly in the coupling; whereby the over-all length of the shore may be adjustably extended; and similarly it may be adjustably contracted by turning the coupling in the other direction.

The coupling is preferably provided with one or more perforations 11, whereby a tool 12 as in Fig. 4 may be used to turn the coupling. The tool 12 is of the spanner wrench type and comprises a curved part 12 conforming generally to the outside of the coupling, a lug 14 on one end to enter a perforation 11, and a handle 15 on the other end.

In the absence of special provisions, when the coupling 8 is rotated as described, and with the lower part 1 engaged at its foot 5, with say the ground, the upper part 3 would tend to rotate with the coupling and not be threadedly extended or contracted. To prevent this, an inner control element 16 is provided, disposed longitudinally within both pipe parts 1 and 3; and it also is made from a length of standard pipe, which suitably may be two and one-half inch pipe, so as to fit loosely with small clearance in the three inch pipe parts 1 and 3; and thereby be maintained substantially coaxially therein against undesired lateral shifting.

Adjacent the opposite lower and upper ends of the control element 16 long pins 17 and 18 are projected diametrically through perforations in it; and the ends of the lower pin 17 continue through diametrically opposite longitudinal closed end slots 19—19 in the lower pipe part 1, and the ends of the upper pin 18 continue through diametrically opposite longitudinal closed end slots 20—20 in the upper pipe part 3; the pins having free sliding movement in the slots.

With this provision, if the upper pipe part 3 should tend to rotate with the coupling 8, it would tend to rotate the pin 18 with it; this would tend to rotate the control element 16 and with it the lower pin 18; and the lower pin 18 would tend to rotate the lower pipe part 1; but since the latter is prevented from rotating by the engagement of its foot 5 with the ground, none of said rotational tendencies are effective and the upper pipe part 3 is prevented from rotating.

This not only insures that the upper pipe part 3 will be propelled, upwardly or downwardly, as the coupling 8 is rotated, but has another advantage as follows.

The upper and lower pipe parts 1 and 3 will by intention, project equal distance into the coupling 8 when the shore is fully contracted, as shown for example in Figs. 1 and 2; and thereafter they will always continue to project equal distances into the coupling, even when fully extended, as shown in Fig. 3; whereby the maximum extension for a given longitudinal extent of thread is insured since there is no liability that the thread on one pipe part will all be used up ahead of that on the other.

The said control element 16 and pins 17—18 in the slots 19 and 20 also perform another useful function as follows. The slots 19 and 20 are made of such length that when the shore, by turning the coupling 8, has been extended to its maximum safe over-all length, for example as in Fig. 3, that is with a number of threads on the pipe parts engaged with threads on the coupling sufficient to safely carry the load on the shore, further extension will be prevented by engagement of the pins 17 and 18 with the upper and lower ends of the slots 19 and 20 respectively as shown in Fig. 2, putting the control element 16 under longitudinal tension and positively stopping further extension of the shore.

The slots 19 and 20 are also made long enough so that engagement of the pins 17 and 18 with the other ends of the slots will not interfere with complete contraction of the shore as in Figs. 1 and 2.

Suitable clearance is provided between the ends of the coupling 8 and the pins 17 and 18, so that at all intermediate extensions of the shore less than maximum, the control element 16 may be considered as floating, and as suspended by the upper pin 18 engaging the upper end of the coupling 8. At the extremely contracted condition of the shore of Figs. 1 and 2, the ends of the slots 20 and 17 are stopped on the pins 18 and 17 and the adjacent inner ends of the parts 1 and 2 are thereby spaced apart as shown at 23, Fig. 1, which prevents the threads 2 and 4 on the parts 1 and 2 from running onto the merging right hand and left hand threads 9 and 10 at the middle of the coupling 8 where otherwise they might become mutilated.

The pins 17 and 18 overlap the ends of the coupling, and may have a drive fit transversely in perforations in the control element 16, but to avoid the necessity of care to effect that, and to make assembly of the parts convenient in the field, they may fit loosely and are prevented from being unduly displaced lengthwise by cotter pins 21—21 at their ends serving as stops.

If preferred and as a modification, the cotter pin stops may be provided at spaced points on the pins and inside the control element 16 as shown at 22 in Fig. 6, where upon shifting endwise the cotter pins engage the inner wall of the control element 16.

It will be observed that the lower and upper pipe parts 1 and 3 can be made of any desired length by cutting off pieces of pipe stock and threading them by the ordinary well known pipe threading machine; and that both pipe parts can be of the same length or if different lengths, and that the over-all length of the shore can thus be varied.

If a maximum amount of extension or contraction of the shore be selected, say six inches, it will be apparent that by making a stock of upper and lower pipe parts of a few different lengths, they may be selectively assembled to make shores of a great number of different over-all lengths and each shore will be of a length proportioned to the installation in which it is to be used and therefore have the minimum of material in it with a corresponding saving of construction cost.

As illustrative of this, upper and lower parts of the following eight lengths, one-half foot, one and one-half feet, two feet, two and one-half feet, three feet, four feet, five feet, and six feet can be variously combined to provide a series of shores differing from each other by six inches when contracted and having over-all lengths from two feet to nine feet, each extensible six inches.

For example, an upper part one and one-half feet long and a lower part two feet long make a shore three and one-half feet long, extensible to four feet.

From the foregoing, it will be seen that the shore consists essentially of one upper part, one lower part, one coupling, one control tube and two pins, or six parts that can be cheaply made of steel. The parts can be rust-proofed by any suitable or well-known process.

And because the parts 1 and 2 consist of merely lengths cut from long stock, and are not built up out of structural parts, a number of lengths of parts 1 and 2 as aforesaid may be made and stocked at no added cost, but in fact with a saving because of less material in the shorter ones; and this saving of cost is not possible with prior shores in which the parts are fabricated or built up out of several parts fastened together.

It will be seen therefore to be the intent and an advantage of the invention that shores of many lengths, a length for each job, with a minimum of extension and contraction sufficient for the job, may be made with saving in production cost and reduction of consumer price.

I claim:

1. An adjustable shore comprising upper and lower tubular elements, having axially aligned confronting end portions externally threaded with left hand and right hand threads respectively; a coupling element having left hand and right hand threads meshed with the threads of both tubular elements to propel the tubular elements apart when the coupling element is turned in one direction and draw them together when turned in the other direction; a control element within the tubular elements having lateral projections thereon at spaced portions thereof extending into vertically elongated slots in the tubular walls of the respective tubular elements; the slots disposed longitudinally of the tubular elements, so that upon propelling the tubular elements apart to a predetermined extent, the projections will bottom in the slots and stop further propulsion apart.

2. An adjustable shore comprising upper and lower tubular elements, having axially aligned confronting end portions externally threaded with left hand and right hand threads respectively; a coupling element having left hand and right hand threads meshed with the threads of both tubular elements to propel the tubular elements apart when the coupling element is turned in one direction and draw them together when turned in the other direction; a floating control element within the tubular elements having lateral projections thereon at spaced portions thereof extending into vertically elongated slots in the tubular walls of the respective tubular elements; the slots disposed longitudinally of the tubular elements, so that upon propelling the tubular elements apart to a predetermined extent, the projections will bottom in the slots and stop further propulsion apart; and rotation of one tubular element relative to the other being prevented by the interconnection therebetween provided by the floating control element and the projections thereof in the slots.

3. An adjustable shore comprising upper and lower tubular elements, having axially aligned confronting end portions externally threaded with left hand and right hand threads respectively; a coupling element having left hand and right hand threads meshed with the threads of both tubular elements to propel the tubular elements apart when the coupling element is turned in one direction and draw them together when turned in the other direction; a floating control element within the tubular elements having lateral projections thereon at spaced portions thereof extending into vertically elongated slots in the tubular walls of the respective tubular elements; and rotation of one tubular element relative to the other being prevented by the interconnection therebetween provided by the floating control element and the projections thereof in the slots.

4. An adjustable shore comprising upper and lower tubular elements having confronting axially aligned end portions; an external tubular coupling element threaded upon the end portions with right hand and left hand threads respectively, to expand and contract the length of the shore upon rotation of the coupling element in alternate directions; a floating control element inside of the tubular elements; abutment means on the floating element and the two tubular elements mutually engageable upon expanding the shore to a predetermined length to stop further extension and prevent running the coupling element off of the threads.

5. An adjustable shore comprising axially aligned upper and lower threaded shore elements and a coupling element threaded upon both shore elements and rotatable thereon to contract and extend the over-all length of the shore elements when rotated; each shore element provided with an abutment; a longitudinally extending control element having portions engageable with the abutments at a predetermined amount of extension of the shore elements to stop further extension thereof.

6. An adjustable shore comprising axially aligned upper and lower threaded shore elements and a coupling element threaded upon both shore elements and rotatable thereon to contract and extend the over-all length of the shore elements when rotated; each shore element provided with an abutment; a longitudinally extending control element having portions engageable with the abutments at a predetermined amount of extension of the shore elements to stop further extension thereof; and the control element having portions non-rotatably, but axially movably connected to both shore elements to prevent relative rotation of the shore elements at all contracted and extended positions thereof.

7. A shore comprising upper and lower axially aligned tubular shore elements each made from a length of a standard size of steel pipe stock and externally threaded; a tubular coupling made from a length of a standard size of pipe-coupling-stock and internally threaded, and screwed onto

the threads of both tubular shore elements; the directions of the several threads predetermined to cause the shore elements to be propelled apart to extend the over-all length of the shore, upon rotation of the coupling element; a control element made from a length of standard size steel pipe stock slidable within both shore elements; a longitudinal closed-end slot in each shore element; a pair of pins on the control element extending into the respective slots and slidable therein; the engagement of the pins with the walls of the slots preventing rotation of one shore element relative to the other; and the engagement of the pins with the closed ends of the slots stopping extension of the shore elements after a predetermined amount of extension.

8. An adjustable shore comprising a pair of elongated shore elements; alternately rotatable means connecting the shore elements and constructed to move them relatively toward or away from each other longitudinally upon alternate rotation of the rotatable means, providing a maximum possible range of adjustments for the over-all length of the shore; and control means comprising connection means longitudinally slidingly connected to the two shore elements preventing rotation of either shore element relative to the other during all length adjustments throughout said possible range.

9. An adjustable shore comprising a pair of elongated shore elements; alternately rotatable means connecting the shore elements and constructed to move them relatively toward or away from each other longitudinally upon alternate rotation of the rotatable means, providing a maximum possible range of adjustments for the over-all length of the shore; and control means comprising connection means longitudinally slidingly connected to the two shore elements preventing rotation of either shore element relative to the other during all length adjustments throughout said possible range; said connection means constructed to stop said relative movement of the shore elements away from each other longitudinally at the maximum over-all length adjustment of the shore.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,091,817	Dudgeon	Mar. 31, 1914
1,321,113	Longren	Nov. 11, 1919
2,009,090	Little	July 23, 1935