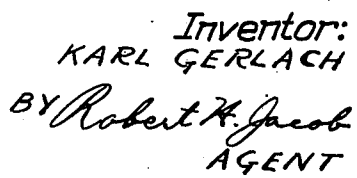


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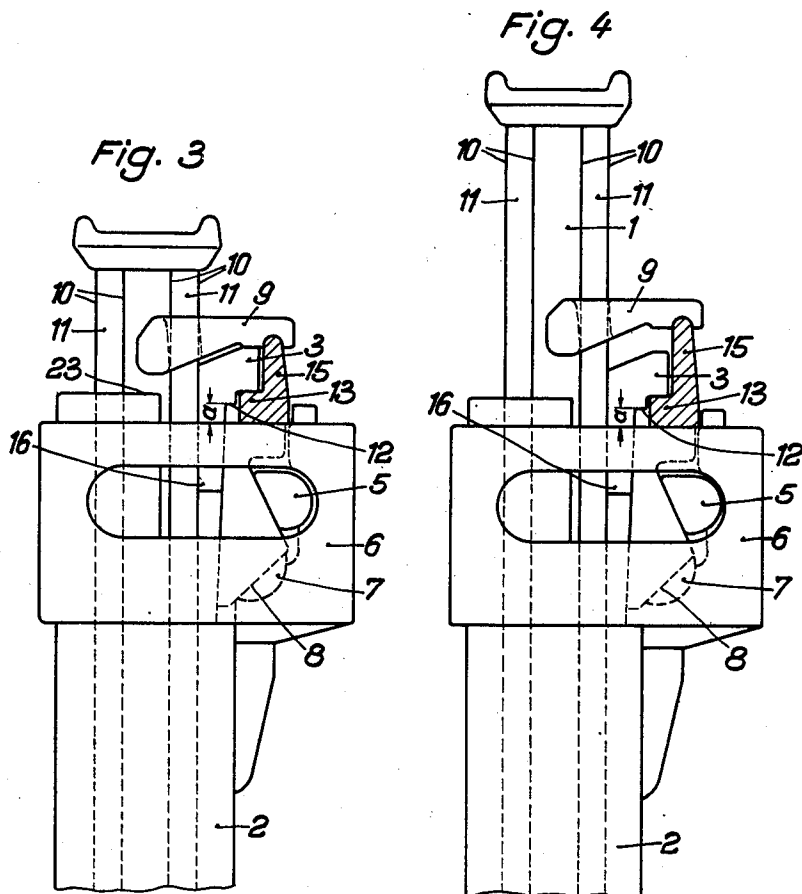
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MINE STEMPEL COMPRISING TWO TELESCOPING SECTIONS

Filed Dec. 13, 1950

3 Sheets-Sheet 2



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Fig. 6

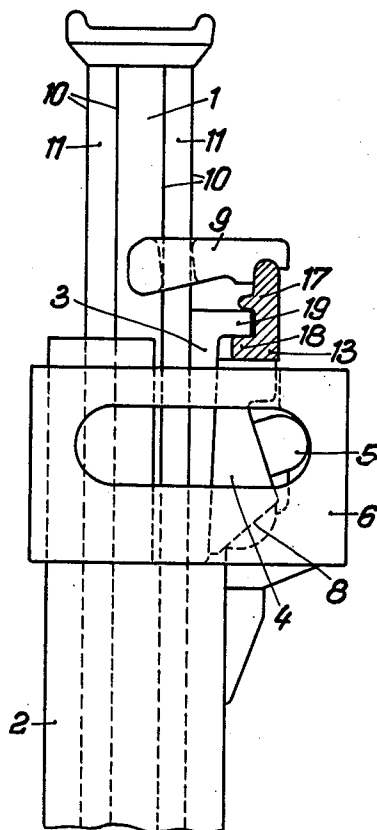
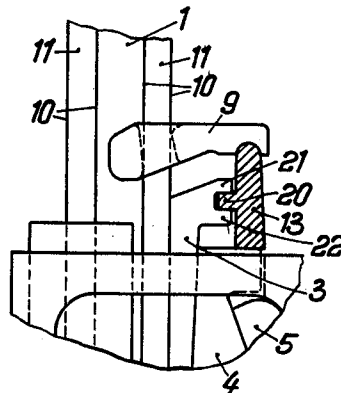


Fig. 7



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MINE STEMPLE COMPRISING TWO
TELESCOPING SECTIONS

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6 Claims. (Cl. 248—354)

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The invention relates to a mine prop or stemple in two parts in which the inner stemple is under the control of a key or wedge which may, for example, be slidable in the rigid pocket of a lock and which carries the key along over a portion of its path of travel as it sinks into the lower stemple. By carrying along this sliding wedge the resistance of the stemple against yielding is to be rapidly increased if the inner stemple sinks into the lower stemple under the effects of mountain pressure. However, as soon as the stemple has attained its maximum engagement pressure, the further sliding of the wedge must cease and the inner stemple should sink into the lower stemple independently.

For the course of the stemple resistance it is of decisive significance in such mine stemples to attain the same initial position of the sliding wedge each time the stemple is set. For this purpose the sliding wedge was provided with abutments which limited the possibility of its movement upwardly and which, during placing was brought into the starting position either automatically, by means of a spring, or manually. The manual operation had the disadvantage of being dependent on the carefulness of the operator. Also, by means of the spring it was not possible to reliably attain an initial position which was the same in all cases, because the spring was first of all subject to phenomena of weakening and was frequently hampered in its effectiveness by unexpected resistances. Besides, also the sensitivity of the spring to interference caused by the rugged conditions of the mining operations was a disadvantage.

It is the object of the invention to avoid these disadvantages and the invention resides primarily in bringing the sliding wedge always into the same initial position by the use of guiding means.

In accordance with the invention this can be achieved thereby that the initial position of the sliding wedge or friction key is determined by an intermediate member which is introduced between the sliding wedge and the outer stemple or the stemple lock, or any other fixed point.

A further essential proposal in accordance with the invention is to combine the means for determining the initial position of the sliding wedge with a setting device, for example, in the form of a cross-key. In this respect the invention can preferably be realized for stemples in which the sliding wedge is connected with the inner stemple by an automatically releasable coupling. In that case the setting device which is combined with the intermediate member may, for the pur-

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pose of setting, engage the coupling member and set the stemple simultaneously as the intermediate member is introduced. The coupling member may, for this purpose, be in the form of a load clamp which wedges itself on the inner stemple and rests at one end upon the sliding wedge.

In accordance with a particularly preferred embodiment of the invention the sliding wedge and the intermediate member may be coupled by compulsory guide means in such a manner, that for each position of the intermediate member there is a predetermined corresponding position of the sliding wedge. For example, the sliding wedge and the intermediate member may, for this purpose interengage by means of recesses in the form of grooves.

By means of such a grooved engagement the position of the sliding wedge is absolutely fixed upwardly and downwardly in any desired initial position, so that it is assured that the sliding wedge always assumes its desired predetermined initial position as the intermediate member is operated.

More in particular, the invention may be realized, for example, in that the sliding wedge is provided with a shoulder or abutment which engages a groove or recess in the intermediate member. On the other hand, embodiments of the invention are possible where the intermediate member engages a groove in the sliding wedge by means of a ledge or projection.

For the case where the intermediate member is used simultaneously as a setting device for a wedge clamp which engages the inner stemple, there exists a further essential advantage of the present invention in the possibility of bringing the intermediate member to rest upon an insert in the stemple lock which is not automatically locking, instead of the stemple lock proper.

In iron mine stemples where the inner stemple is wedge shaped, it is possible to realize the invention in a manner that the wedge clamp which clamps itself to the inner stemple by means of its edges and rests at one end upon the sliding wedge, forms a temporary coupling between the inner stemple and the sliding wedge and is made to engage the parallel wall planes of the profile of the inner stemple.

The parallel wall planes may, for example, be provided upon ribs or other projections of the cross-section of the inner stemple which are independent of the wedge or tapered form of the inner stemple. In this manner the advantage is obtained that independently of the wedge shape of the inner stemple reliable wedging of the load

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clamp is assured. This is not always the case, when the load clamp engages the wedge shaped planes of the inner stemple, because the tolerance between the clamp and the downwardly tapering inner stemple becomes too great if the inner stemple is pulled out of the outer stemple during setting.

Further advantageous details of the invention are shown in the drawing in which the invention is illustrated by way of examples and in which:

Fig. 1 is a side elevation of a mine stemple in accordance with the invention in robbed condition;

Fig. 2 is a plan view in accordance with Fig. 1;

Figs. 3 and 4 show the same stemple in side elevation in two different setting positions;

Fig. 5 is a view from the right hand side of Fig. 4;

Figs. 6 and 7 show two further embodiments of the invention.

In the drawings like reference numerals refer to corresponding parts. 1 is the inner stemple which is preferably tapered or wedge shaped, 2 is the outer stemple and 3 the sliding wedge which is supported by a horizontal key 5 in the stemple lock 6 by way of an insert 4 which is not self locking. The insert 4 here rests in the stemple lock 6 against a movable insert member 7 by means of the key plane 8 which is not self locking. 9 is the wedge clamp which can be made to engage the parallel wall planes 10 of the inner stemple which are provided upon parallel walled ribs 11 on the inner stemple section.

In Fig. 1 a two section mine stemple is shown in robbed, i. e. in fully inserted condition. The loading or wedge clamp 9 in this case rests upon the sliding wedge 3 as well as upon outer stemple 2 so that the coupling with the inner stemple 1 is released. The sliding key 3 rests upon the lock 6 with its plane 12.

In Fig. 3 an intermediate member 13 has been placed between sliding wedge 3 and lock 6 in such a manner, that the sliding wedge is pulled out of the stemple lock 6 by a predetermined amount and a space a is formed between the upper edge of the lock 6 and the plane 12, over which distance the sliding wedge 3 is carried along by the wedge clamp 9 when the inner stemple sinks so that the sliding wedge 3 is assigned a predetermined path in order to thus obtain a definite resistance curve of the stemple. The initial position of the sliding wedge 3 is therefore determined by the intermediate member 13. It is seen from Fig. 5 that the intermediate member 13 is provided with a slope 14 by means of which the intermediate member may readily be moved between the sliding wedge 3 and lock 6.

A key 15 is rigidly connected with the intermediate member 13 which key rests at its lower end upon the lock 6 and whose upper oblique edge rests under the load clamp 9.

The operation takes place in the following manner: The key 15 with the intermediate member 13 is pushed between sliding wedge 3 and lock 6 of the inserted stemple in accordance with Fig. 1 until the sliding wedge 3 has reached its full height a . Since the load clamp 9 now rests no longer upon the lower stemple 2 it is possible to pull the inner stemple manually to the overhanging slope and the load clamp 9 holds it in this position because as the inner stemple 1 is released it immediately and automatically assumes a wedged position.

If the key 15 is now driven in as shown in Figs.

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4 and 5 it presses the inner stemple upwardly against the overhang by means of load clamp 9 which as a result of this movement is wedged upon the inner stemple 1. Since the intermediate member 13 extends with even thickness along the setting key 15 no movement of the sliding key 3 takes place during setting operation. It must be mentioned here that the sliding wedge is provided with abutments or shoulders 16 to limit the movement in an upward direction.

Now the horizontal key 5 is fastened as the intermediate member 13 is removed with the setting key 15. The wedge clamp 9 then drops upon the wedge key 3 and wedges with the ribs 11 of the inner stemple 1 when the inner stemple 1 begins to sink into outer stemple 2 under the influence of the mountain pressure. As a consequence of this wedging the inner stemple 1 carries along the sliding wedge 3 downwardly over a predetermined distance, i. e. the distance a , whereupon the wedging clamp 9 comes to rest upon the abutment 23 of the stemple lock 6 or of the outer stemple 2 and its wedging effect is eliminated.

In the example illustrated intermediate member 13 and the wedge key 15 are combined into a unitary member. Naturally their separate embodiments are possible. Besides it is possible to form the intermediate member 13 in a manner that its thickness can be varied by adjustable means and to thus change the distance a for the sinking path of the sliding wedge within certain limits.

The arrangement of the upper edge of the intermediate member 13 which engages the sliding wedge 3 determines the height of withdrawal of the sliding wedge so that it is possible for example, to raise the sliding wedge during setting by distances of approximately $\frac{1}{4}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ " or 1". Since the sinking path of the sliding key 3 determines the pressure absorption the pressure curve of the stemple is thus changed. In robbing the stemple the loading clamp 9 can be disconnected. This disconnecting can be aided by additional means as, for example, springs or the like.

It is also possible to provide the arrangement in such a manner as to divide the key 15 so that the raising of the sliding key by the intermediate member 13 is effected from the lock side while the raising of the inner stemple 1 is effected at the back side by means of a special wedge clamp which serves only for setting. In this connection the key and the intermediate member have as a whole a bifurcated form.

In the embodiment in accordance with Fig. 6 the intermediate member 13 is provided with two ledges 17 and 18 which engage a shoulder 19 of the sliding wedge 3 in the manner of a groove. By means of such a groove-like engagement between sliding wedge 3 and intermediate member 13 the position of the sliding wedge 3 is determined with absolute certainty by driving in the intermediate member 13 which is in the form of a key more or less deeply, so that the adherence to a definite path of the sliding wedge is insured. The intermediate member 13 may here as in the previously described illustrations be formed as a setting key and for this purpose it may engage the wedge clamp 9. Suitably it does not rest upon the stemple lock 6 here but upon the insert 4. When the stemple is set the insert 4 is here pressed downwardly as the intermediate member 13 is driven in and in view of its key plane 8 which is not self locking and

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the insert piece 7 all tolerance in the stemple lock can be eliminated and particularly the inner stemple 1 can be securely pressed between the back of the lock or the opposite side of the outer stemple 2. In driving in the horizontal key 5 the insert 4 in lock 6 which is not self locking is secured in its position and simultaneously the lock is placed under tension. Now if upon elimination of the setting device and thus also of the intermediate member 13 the inner stemple 1 sinks downwardly under the mountain pressure and carries along the sliding key 13 by way of the wedge clamp 9 downwardly, a large amount of the stemple load becomes immediately effective in the lock 6 before the inner stemple can sink in without encountering noticeable resistance to eliminate unusual tolerances between the portions of the lock.

In the embodiments in accordance with Fig. 7 the intermediate member 13 which is also constructed as a setting device is provided with a ledge 20 which engages one or two ledges 21 and 22 of the sliding wedge 3. The manner of operation is the same here as explained in connection with the embodiment of Fig. 6.

Having thus fully described my invention and its method of operation with reference to the embodiments shown in the drawings, I claim:

1. A mine stemple comprising two telescoping sections, a lock secured to the outer of said sections, clamping means extending intermediate said lock and the inner of said sections, a sliding wedge disposed intermediate said lock and said inner section and means adapted to determine the initial position of said sliding wedge comprising an intermediate member defining a ledge movably disposed intermediate said sliding wedge and said outer section adjacent said lock.

2. A mine stemple comprising two telescoping sections, a lock secured to the outer of said sections, clamping means extending intermediate said lock and the inner of said sections, a sliding wedge disposed intermediate said lock and said inner section and means adapted to determine the initial position of said sliding wedge comprising an intermediate member defining a ledge movably disposed intermediate said sliding wedge and said outer section adjacent said lock, said intermediate member including a portion defining a transverse key having a sloping surface in engagement with said clamp, whereby said inner stemple may be moved vertically in response to horizontal movement of said intermediate member.

3. A mine stemple comprising two telescoping sections, a lock secured to the outer of said sections, clamping means extending intermediate said lock and the inner of said sections, a sliding wedge disposed intermediate said lock and said

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inner section and means adapted to determine the initial position of said sliding wedge comprising an intermediate member defining a ledge movably disposed intermediate said sliding wedge and said outer section adjacent said lock, said intermediate member having a conformation defining a slope at the end of said ledge which first engages said sliding wedge.

4. A mine stemple comprising two telescoping sections, a lock secured to the outer of said sections, clamping means extending intermediate said lock and the inner of said sections, a sliding wedge disposed intermediate said lock and said inner section and means adapted to determine the initial position of said sliding wedge comprising an intermediate member movable transversely of said sections and an insert member disposed in said lock having surface engagement with said sliding wedge, with said intermediate member and with components of said lock.

5. A mine stemple comprising two telescoping sections, a lock secured to the outer of said sections, clamping means extending intermediate said lock and the inner of said sections, a sliding wedge disposed intermediate said lock and said inner section and means adapted to determine the initial position of said sliding wedge comprising an intermediate member movable transversely of said sections and an insert member disposed in said lock having surface engagement with said sliding wedge, with said intermediate member and with components of said lock, said intermediate member including a portion defining a transverse key having a sloping surface in engagement with said clamp, whereby said inner stemple may be moved vertically in response to horizontal movement of said intermediate member.

6. A mine stemple comprising two telescoping sections, a lock, a sliding wedge adapted to be carried along by said inner stemple over a portion of its path of travel, and means adapted to determine the initial position of said sliding wedge including a clamp in engagement with the inner stemple and an intermediate member movable transversely of said telescoping sections adjacent said lock, said intermediate member including a shoulder adapted to engage a conformation on said sliding wedge and a sloping portion adapted to engage said clamp.

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