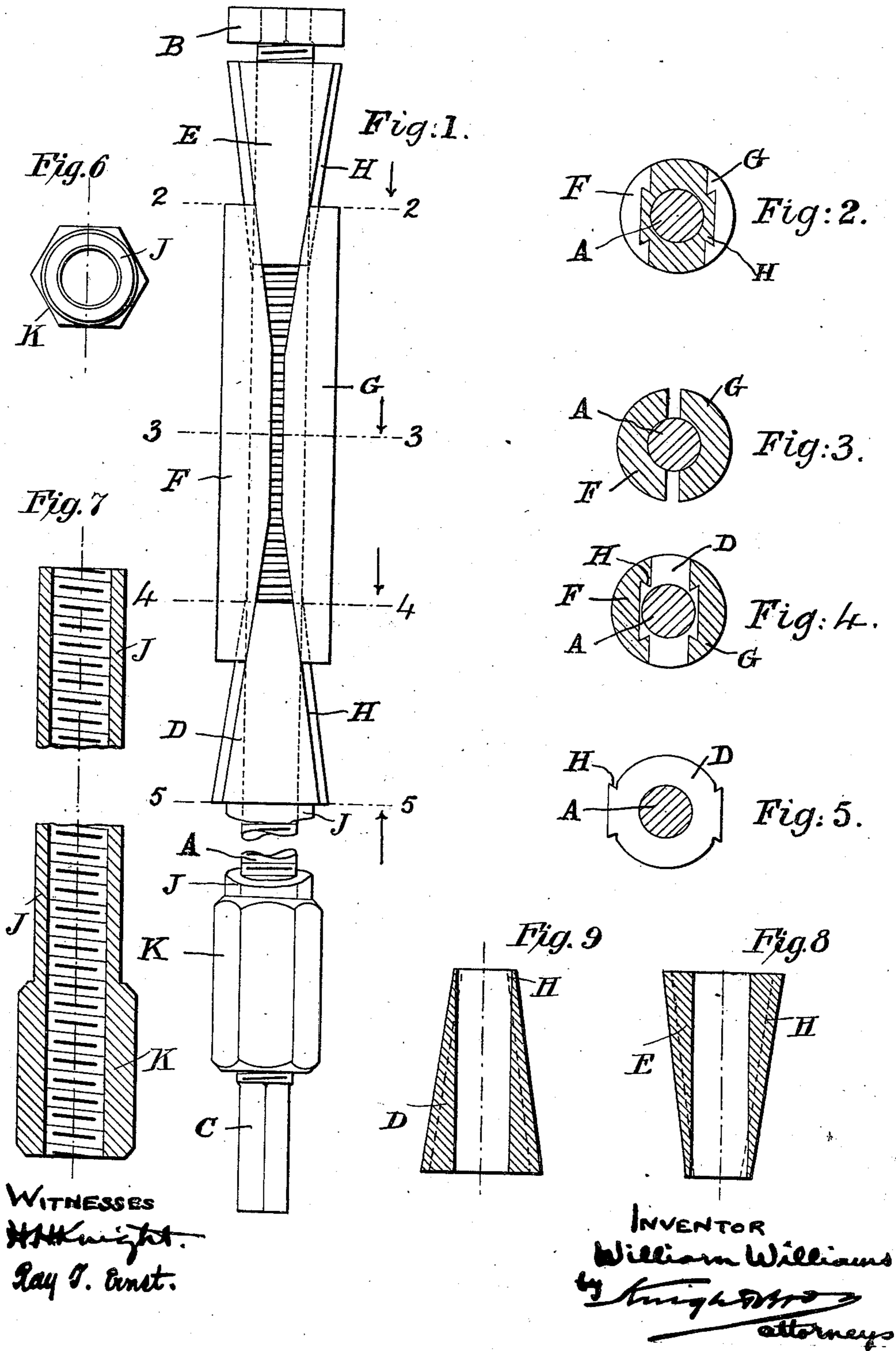


W. WILLIAMS.
BREAKING DOWN APPLIANCE FOR MINERALS.
APPLICATION FILED NOV. 5, 1910.

997,889.

Patented July 11, 1911.



UNITED STATES PATENT OFFICE.

WILLIAM WILLIAMS, OF LLANELLY, ENGLAND.

BREAKING-DOWN APPLIANCE FOR MINERALS.

997,889.

Specification of Letters Patent.

Patented July 11, 1911.

Application filed November 5, 1910. Serial No. 590,872.

To all whom it may concern:

Be it known that I, WILLIAM WILLIAMS, a subject of the King of Great Britain, residing at Llanelly, in the county of Carmarthen, Great Britain, have invented new and useful Improvements in Breaking-Down Appliances for Minerals, of which the following is a specification.

The invention relates to that class of appliance for breaking down coal or other minerals in mines and quarries in which are employed two oppositely pointed wedges, a divided body into the ends of which the points of the wedges enter, and a screw threaded shaft screwing within an internal screw thread in one of said wedges and passing freely through a plain hole in the other wedge.

The object of the present invention is to construct an improved apparatus in which all the parts will remain connected together when the coal or other mineral is broken down, without employing springs or other more or less elastic devices which must rapidly become damaged in use.

I will describe my invention by the aid of the accompanying drawings, in which—

Figure 1 is a side elevation of the improved appliance, and Figs. 2 to 5 are sections drawn respectively on the lines 2—2, 3—3, 4—4, and 5—5 of Fig. 1 looking in the direction of the arrows. Fig. 6 is a plan and Fig. 7 is a central longitudinal section of one of the parts shown separately. Figs. 8 and 9 are central longitudinal sections of the wedges.

A shaft A, screw threaded throughout the greater portion of its length, is provided at one end with a thrust block B, and at the other end with a flat or square part C. Two wedges D, E, are mounted co-axially upon shaft A in such manner that the wedge E, which is screw threaded internally, is capable of being easily screwed up and down on shaft A, while wedge D, which is only plain bored, is capable of being slid freely up and down on shaft A, as has heretofore been proposed.

I employ, as heretofore, two members F, G, preferably semi-cylindrical on their outer sides and each tapered on their inner sides at either end to suit the taper of the wedges D, E, said members being diametrically opposed to each other, but, according to my invention, being held to the wedges D, E, by a suitable arrangement of coacting undercut

parts H, which nevertheless allows of the wedges D, E, to approach to or recede from one another.

The inner diameter of the members F, G, is made of such proportion that when the wedges D, E, have been caused to recede from one another to a predetermined distance, the inner cylindrical surfaces of the members F, G, come in contact with the shaft A and thereby prevent the wedges D, E, from becoming entirely disconnected from the members F, G. I also, according to my invention, employ a sleeve J, which is preferably provided with a hexagonal head K and is screw threaded internally so as to be capable of being screwed up and down on shaft A.

As applied in a coal mine or in like circumstances, the wedge E is screwed back against the thrust block B and the wedge D is pulled back as far from the wedge E as the aforesaid predetermined position of the sleeve J will allow, so as to reduce the members F, G, to their minimum diameter, as will be readily understood. Said apparatus is now inserted into a drill hole (of the kind usually made in coal mines or quarries for the reception of explosives) with the thrust block B against the far end of the said drill hole, and the sleeve J is rotated so as to force the wedges D, E, within and expand the members F, G, until they finally grip the walls of the said bore hole. Shaft A is now rotated clockwise if the screw thread is a right handed one, thereby causing the wedge E to move outward from the thrust block B, and as a consequence the members F, G, are further expanded and the coal or other mineral in the locality is cracked or broken down.

When shaft A is being rotated sleeve J remains stationary; this is due to the end thrust and consequent friction between the wedge D and the end of said sleeve J. By still further rotating shaft A, the coal is pushed outward, due to the thrust which is set up between the thrust block B at the far end of said drill hole and the position where the members F, G, grip the walls of the bore hole as aforesaid.

The flat or square part C and the hexagonal head K may be rotated by any suitable mechanism.

It is at once apparent that by the foregoing construction a very material advantage is obtained as whether the members F, G,

are fully expanded or otherwise they are always securely held to the said wedges D, E, without the aid of springs or other more or less elastic devices, which latter must
5 necessarily become quickly damaged and rendered useless.

What I claim is:—

1. In appliances for breaking down coal and other minerals in mines and quarries,
10 the combination of a screw-threaded shaft, a thrust block on one end of said shaft, two wedges located on said shaft, one internally screw threaded and the other plain bored,
15 two expanding members tapered on their inner sides at either end, and coacting undercut parts on the exterior of the wedges and on the interior of the expanding members, substantially as shown and described.

2. In appliances for breaking down coal
20 and other minerals in mines and quarries,

the combination of a screw-threaded shaft, a thrust block on one end of said shaft, two wedges located on said shaft, one internally screw threaded and the other plain bored,
25 two expanding members tapered on their inner sides at either end, co-acting undercut parts on the exterior of the wedges and on the interior of the expanding members, and an internally screw-threaded sleeve on the opposite end of the screwed shaft to that
30 carrying the thrust block and screwing against the end of the plain bored wedge, substantially as shown and described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WILLIAM WILLIAMS.

Witnesses:

MYDDLETON BRIGGS,
WILLIAM D. SEES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."