

(No Model.)

# E. MOULD.

APPLIANCE FOR BREAKING LOOSE OR SPLITTING ALL KINDS OF MINERALS.

No. 398,742.

Patented Feb. 26, 1889.

FIG. 1

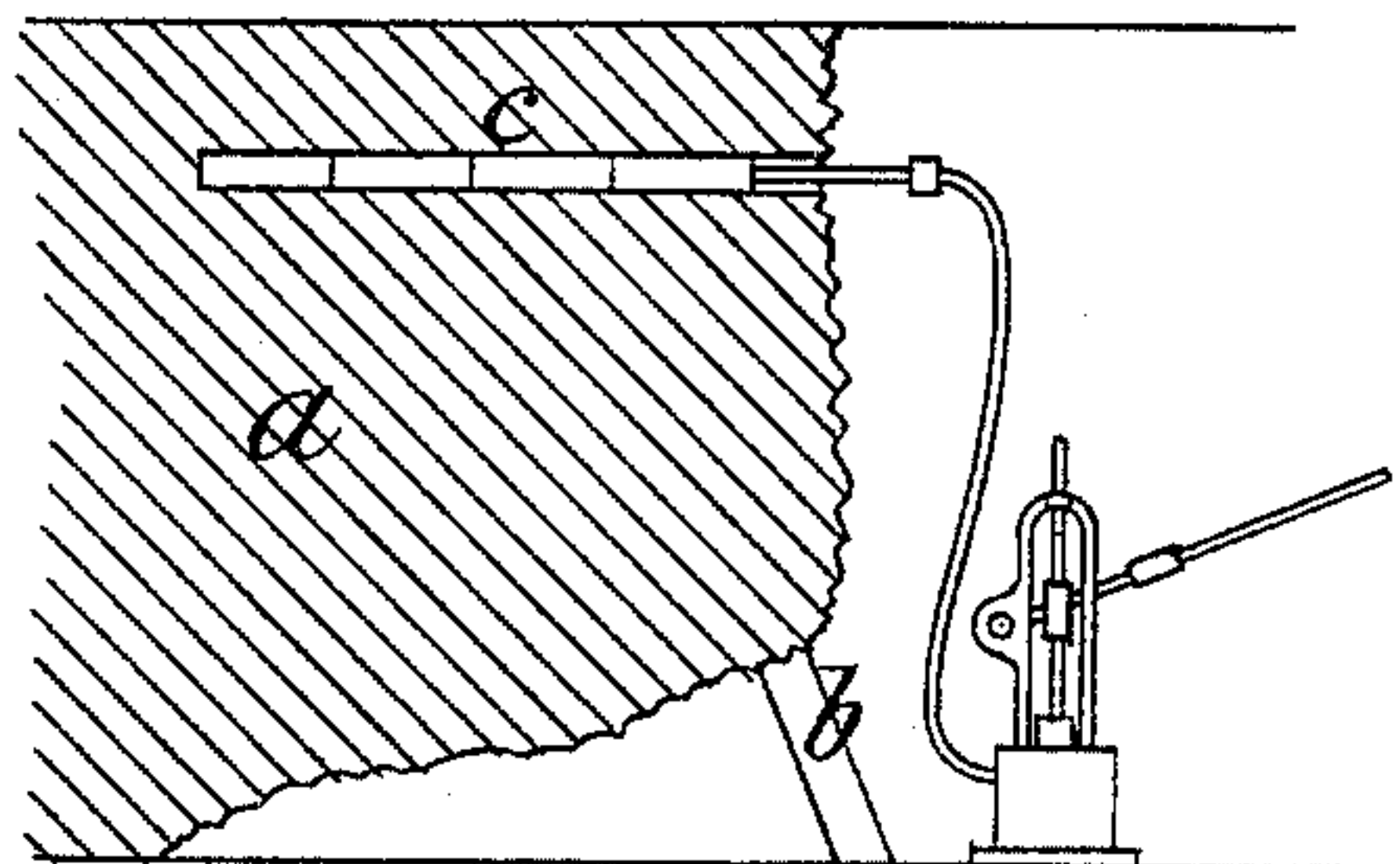


FIG. 2

FIG. 3

FIG. 4

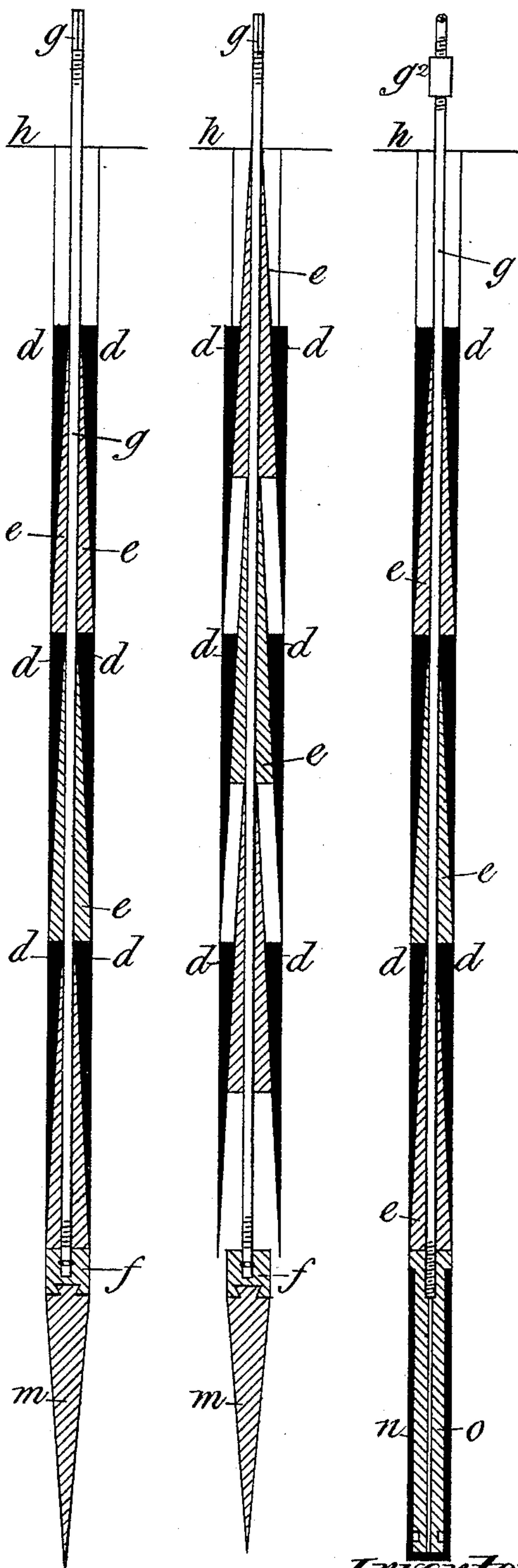


FIG. 6

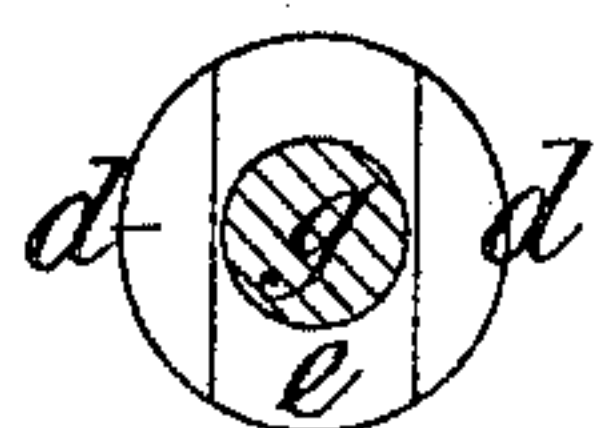


FIG. 9



FIG. 5

FIG. 8

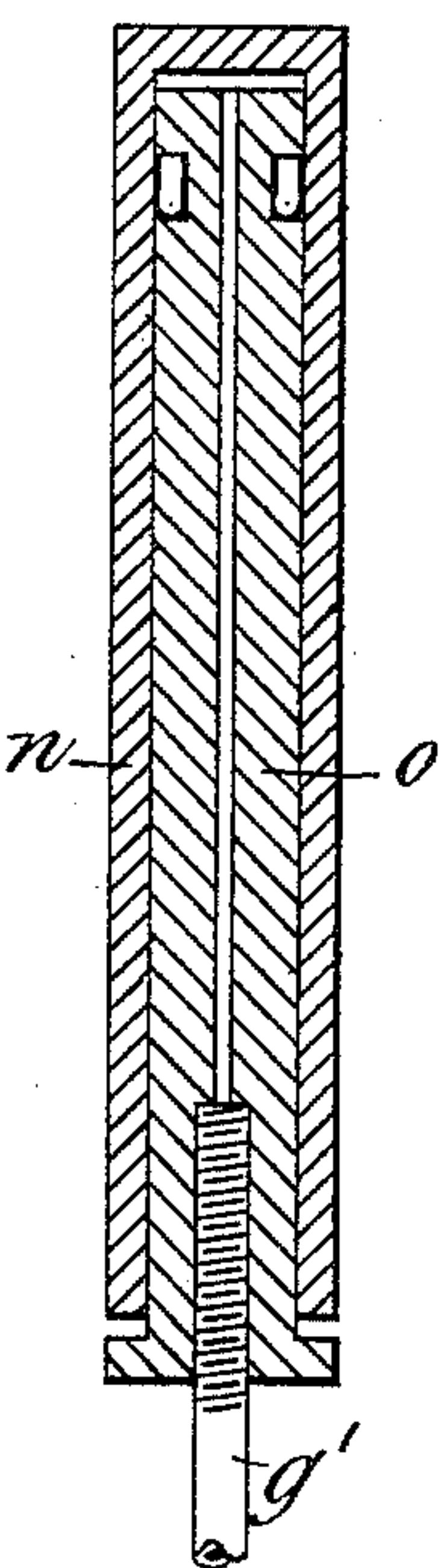
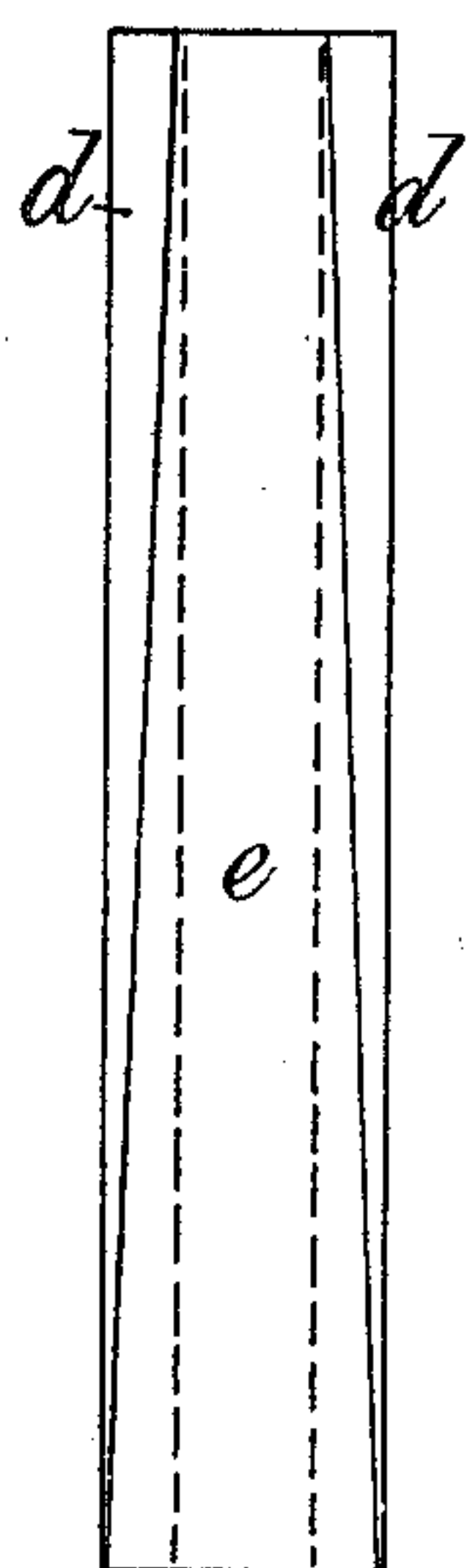
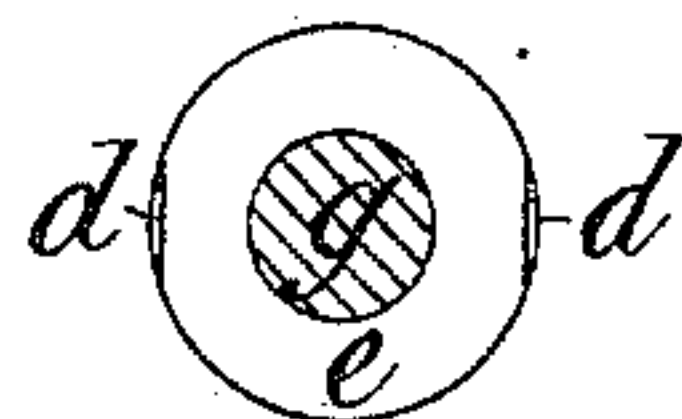


FIG. 7



Witnesses  
*J. A. Rutherford*  
*Robert Smith*

Inventor  
*Enoch Mould*  
By *James L. Norris*



# UNITED STATES PATENT OFFICE.

ENOCH MOULD, OF WHITE BARN, NEAR NEWCASTLE, COUNTY OF STAFFORD, ENGLAND.

APPLIANCE FOR BREAKING LOOSE OR SPLITTING ALL KINDS OF MINERALS.

**SPECIFICATION** forming part of Letters Patent No. 398,742, dated February 26, 1889.

Application filed February 16, 1888. Serial No. 264,309. (No model.) Patented in England July 13, 1886, No. 9,123.

*To all whom it may concern:*

Be it known that I, ENOCH MOULD, certified colliery manager, a subject of the Queen of Great Britain, residing at White Barn, near Newcastle, in the county of Stafford, England, have invented an Improved Appliance for Breaking Loose or Splitting all Kinds of Minerals, (for which I have obtained a patent in Great Britain, No. 9,123, bearing date July 13, 1886,) of which the following is a specification.

This invention relates to certain new and useful improvements in machines for breaking and splitting coal, and particularly to that class of devices in which are employed wedges that are inserted in a hole first bored in the coal and expanded by means of force applied to said wedges in a longitudinal direction; and the object of this invention is to provide such a device wherein the expansive force of the wedges is exerted at several distinct points simultaneously.

To this end my invention consists in the construction and arrangement of parts herein-after fully described and specifically claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a view showing my improved device in position within a vein of coal; Fig. 2, a central longitudinal section of my improved device; Fig. 3, a similar view showing the wedges in their expanded positions; Fig. 4, a similar view showing the device when adapted to be operated by hydraulic power; Fig. 5, an enlarged side elevation of the wedges; Figs. 6 and 7, top and bottom views, respectively, of the wedges shown in Fig. 5; Figs. 8 and 9, enlarged views of the ram shown in Fig. 4.

Referring to the drawings, the letter *d* indicates the expanding wedges, which gradually increase in width from the bottom toward the top, and *e* the central wedges, which gradually diminish in width from the bottom upward. The central wedges, *e*, are centrally bored and screw-threaded, and through them is passed a screw-threaded rod, *g*, which is fitted at its lower end into a block, *f*, so that it may rotate therein, being held in the block by two pins or rivets which enter a groove in

the rod. The central wedges, *e*, are slipped upon the rod *g*, one above the other, and the large end of each of said wedges rests directly upon the small end of the wedge next below it, and the expanding wedges *d d* are disposed about the central wedges, so that the narrow ends of the wedges *d* lie superimposed upon the wide ends of the wedges *e*. When the device above described is inserted in a hole bored in a vein of coal and the rod *g* rotated by means of a spanner, wrench, or other tool, the central wedges, *e*, are caused to rise on the rod *g*, and the wedges *d* are spread or expanded so as to considerably increase the diameter or width of the tool, and thus cause the mass of coal to split, and since there are several series of separate wedges superimposed one upon the other and all expanded simultaneously the coal will not only be broken from the mass contained in the vein, but, owing to the wedges expanding at several different points, will be broken in many different pieces. The arrangement of several separately-acting wedges, as shown, also enables any wedge to give slightly to inequalities in the density of the coal without risk of injury to the apparatus.

In Figs. 4, 8, and 9 I have illustrated one method of operating the device by means of hydraulic power. In this form of construction the device is fitted at its lower end with a cylinder, *n*, and ram *o*. The ram has a hole bored therein from end to end, and the rod *g* is similarly bored and screwed into the plunger *o*, as shown. The outer end of the rod *g* is designed to be connected to a pump, and the pressure of the water drives the ram and the central wedges outward, and thereby expands the wedges, as before.

I am aware that a single pair of concentric wedges operated by a screw-rod has heretofore been proposed for use in splitting coal, and also that wedges have been rigidly connected in series for joint operation to accomplish the same work; but these I do not claim, and my invention differs therefrom in comprising an inner and an outer series of separate oppositely-pointed wedges simultaneously acting at distinct and separate points, whereby the

coal is broken into many pieces at different points without liability of injury to the wedges or their operating mechanism.

Having thus described my invention, what I  
5 claim is—

In mechanism for breaking and splitting coal, the combination, with the screw-threaded rod *g*, of the inner series of separate centrally-bored and internally-threaded wedges, *e*, superimposed one upon another around said rod  
10 and having their points turned outward all in the same direction, and the outer series of expanding wedges, *d*, surrounding the wedges *e*

and having their points turned inward in a direction opposite to that of the inner wedges, 15 *e*, whereby all the outer wedges, *d*, are simultaneously expanded at distinct points by the outward longitudinal movement of said inner wedges, substantially as described.

ENOCH MOULD.

Witnesses:

J. B. SHIRLEY,  
*Basford, Stoke.*

W. A. COWLISHAW,  
*Clerk to Paddock & Sons, Solrs., Hanley.*