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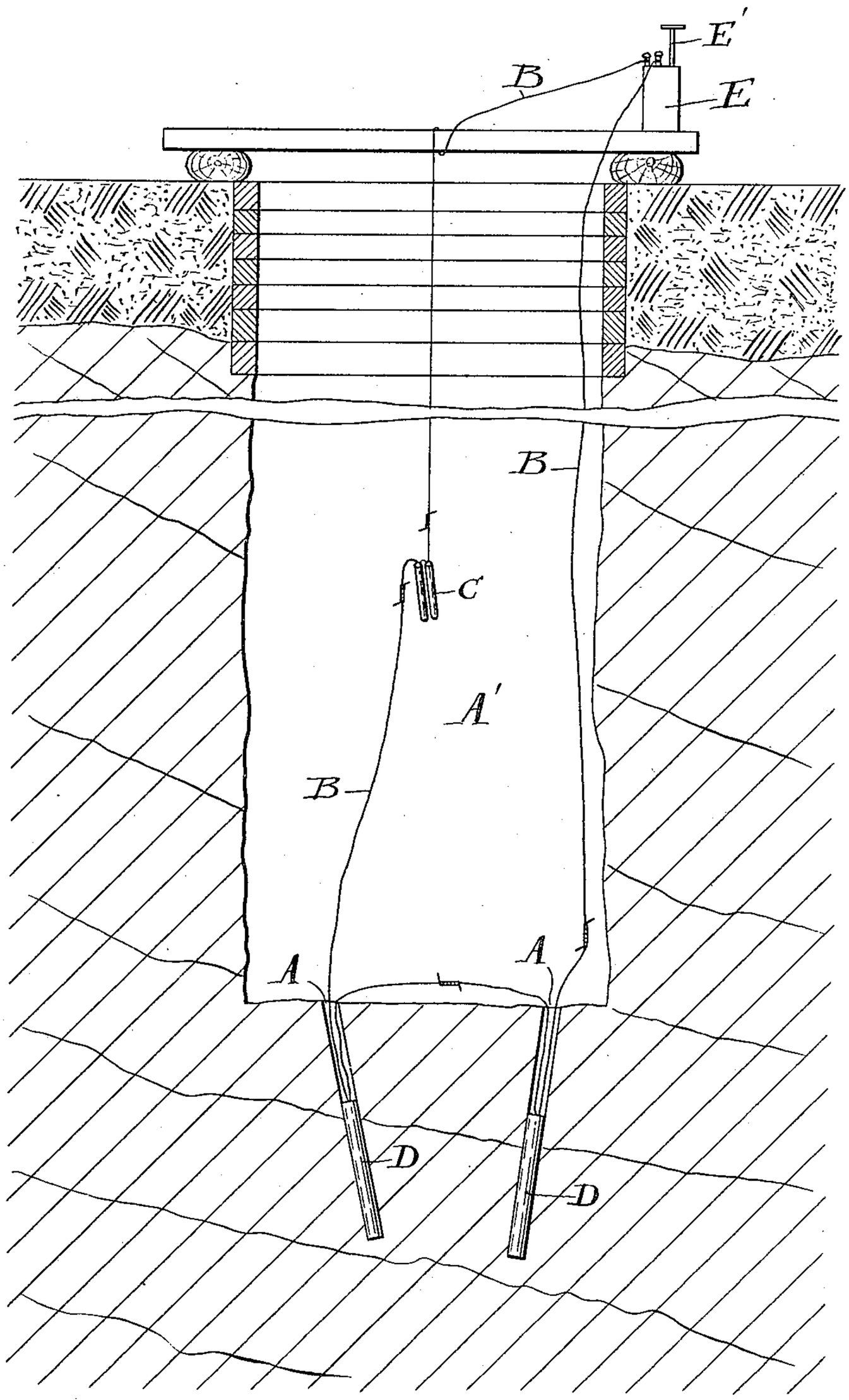
C. O. FRYE.

METHOD OF BLASTING.

APPLICATION FILED MAR. 11, 1904.

NO MODEL.



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No. 770,459. Patented September 20, 1904.

UNITED STATES PATENT OFFICE.

CHARLES OSCAR FRYE, OF JOPLIN, MISSOURI.

METHOD OF BLASTING.

SPECIFICATION forming part of Letters Patent No. 770,459, dated September 20, 1904.

Application filed March 11, 1904. Serial No. 197,629. (No model.)

To all whom it may concern:

Be it known that I, CHARLES OSCAR FRYE, a citizen of the United States, residing at Joplin, county of Jasper, and State of Missouri, have invented a new and useful Improvement in Methods of Blasting, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

In surface-blasting or in shafts, tunnels, cuts, or excavations as at present carried out there is an uplifting or upheaval of flying rock or the material blasted, which is dangerous and often causes great damage. Thus in cases of sinking a shaft it causes damage to any cribbing or lumber, pumps, or surface machinery.

My invention has for its object to confine the force of the explosive used to the place and purpose for which it is used, thereby minimizing the danger and damage to those employed and to the adjoining parts of the work being done and to contiguous property, whether in a shaft, tunnel, cut, excavation, or any other work. I accomplish this result by exploding in proper proximity to the surface to be blasted an explosive, in the case of a shaft, above the bottom of the shaft and at a distance sufficient to have considerable air between the surface of the material to be blasted and the explosive. This charge is exploded simultaneously with the charge embedded in the surface to be broken by blasting or at the time of the upheaval produced by the blasting charge. With this method I am enabled to confine the force of the explosion to the place where it is used and prevent any flying rock or damage therefrom.

In the accompanying drawing I have illustrated the application of my method in a blast at the bottom of the shaft.

A A represent two drill-holes in the bottom of a shaft A′, which have been properly drilled and charged with the powder or other explosive D D.

C represents my compression charge, which is suspended in the shaft A′ above the surface in which the blasting charge is embedded.

B B are the wires leading to the current-generator E, which, as shown, is a battery rendered active by the plunger E′ for igniting the explosives D D, and connected with which wires is the compression charge C.

When the battery is operated, the charge C and explosives D D are simultaneously ignited. The explosion of the charge C drives the compressed air or compresses the air against the surface of the bottom of the shaft, which prevents the upheaval and resultant damage. The charge C is placed in the case illustrated at a sufficient distance above the surface in which the blasting charge is embedded, so as to insure a body of air to be compressed against the surface on the exploding of the compression charge C.

In practice I have found a distance of from ten to twelve feet to give good results, although I do not intend to limit myself to any particular distance; nor do I intend to limit myself to the particular use illustrated of a blast in a shaft, as it is capable of use for other purposes. In fact, my invention consists, broadly, in fixing a compression charge in proper proximity to and with a layer of air between it and the surface in which the blasting charge is embedded.

As shown in the drawing, the firing of the compression charge is simultaneous with that of the blasting charge. I have found, however, in practice that it is often desirable that the firing of the compression charge should follow that of the blasting charge, so that the action of the compression charge shall not be spent before the upheaval produced by the action of the blasting charge occurs. The duration of time of firing the compression charge after the firing of the blasting charge is of course exceedingly short—practically a fraction of a second.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. The hereinbefore-described method of blasting, which consists in exploding a compression charge in proximity to the surface in which the blasting charge is embedded, with a body of air between it and said surface, the explosion of the compression charge taking place at the time of the upheaval produced by the blasting charge.

2. The hereinbefore-described method of blasting, which consists in exploding a compression charge in proximity to the surface in which the blasting charge is embedded, with a body of air between it and said surface, the explosion of the compression charge being simultaneous with the explosion of the blasting charge.

In testimony of which invention I have hereunto set my hand, at Joplin, Missouri, on this 23d day of February, 1904.

CHARLES OSCAR FRYE.

Witnesses:
E. R. JONES,
W. W. HUTTON.