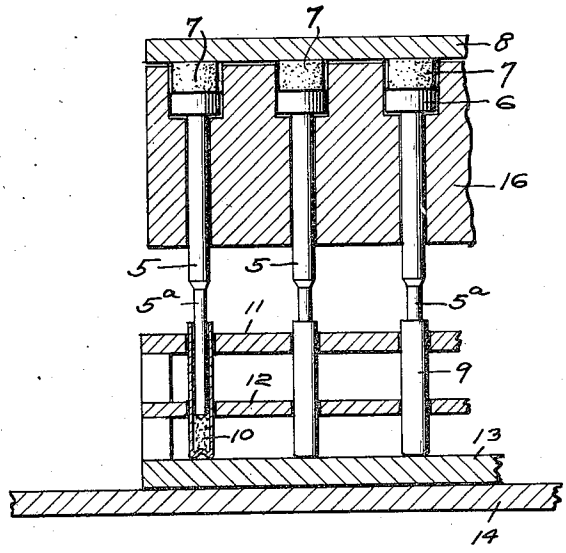
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B. GROTTA

DEVICE FOR INSURING UNIFORM PRESSURE UPON EXPLOSIVE CHARGES

Filed April 11, 1925



Inventor

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UNITED STATES PATENT OFFICE.

BENNETT GROTTA, OF TAMAQUA, PENNSYLVANIA, ASSIGNOR TO ATLAS POWDER COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

DEVICE FOR INSURING UNIFORM PRESSURE UPON EXPLOSIVE CHARGES.

Application filed April 11, 1925. Serial No. 22,430.

To all whom it may concern:

Be it known that BENNETT GROTTA, a citizen of the United States, residing at Tamaqua, in the county of Schuylkill and State of Pennsylvania, has invented certain new and useful Improvements in Devices for Insuring Uniform Pressure upon Explosive Charges, of which the following is a specification.

My invention relates to an improvement in equipment commonly used for the manufacture of detonators and other articles which are similarly assembled and it has for its primary object, the provision of improved means for insuring uniform pressure upon the explosive charges of such detonators.

In the manufacture of detonators it is customary to deposit the explosive charge used, into a large number of detonator shells or metal casings, in a single operation, and then remove the rack containing the charged shells to a press where pressure is applied simultaneously to all of the charges by means of numerous metal punches, one of which enters the open end of each shell. These punches are mounted in a common press head and, with equal length punches, all charges are thus compressed to a uniform height.

It is a well known fact that by any of the methods which may be employed commercially an exactly uniform weight of charge cannot be deposited into the detonator shells. This is due to the fact that the charges are measured out by first filling a series of holes of the approximate cubical content desired, with the explosive used and then permitting this charge to fall into the shells. Variations in density of the explosive as well as variations in its flowing properties render it impossible to deliver charges of exactly uniform weight. As a consequence, with the usual methods of pressing, the underweight charges are under-pressed while the over weight charges are over-pressed.

The over-pressed charges may result in distorted and bulged detonator shells and there is also the possibility of rendering the charge non-explosive by over-compressing, as for example, "dead-pressed" fulminate charges. On the other hand, under-pressed charges are conducive to even greater ills. The explosive charge not being firmly pressed into a common mass tends to loosen and subsequently fall out of the open end of the detonator shell. The presence of loose explosives in the metal containers in which detonators are usually packed constitute a hazard in itself. Furthermore the possibility of detonators, from which part or all of the explosive charge has been lost, being used for initiating of other explosives, may result in the well known dangerous and costly misfires.

In copending and allowed application, Serial No. 754,353, filed on the sixth day of December, 1924, there is disclosed a structure wherein the shells are supported by some resilient material, such as rubber, which, in turn is supported by a solid backing, with the object of equalizing the pressure so that all of the charges will be uniformly compressed.

According to the present invention means are provided for rendering the punches themselves, variable, to a limited degree, for the purpose of equalizing the compression of the charges.

In the accompanying drawing, the figure is a view partly in elevation and partly in section of a construction wherein the heads of the plungers bear against elastic and resilient discs. The reference character 5 designates the punch portions of the structure which according to the present invention, are provided with heads 6. These heads bear against discs of rubber or some other elastic and resilient material, which discs are in turn backed up by a cap plate 8. The elastic and resilient discs 7 are somewhat smaller in diameter than the punch heads 6, in order to allow for expansion. The lower portions of the plungers are reduced at 5^a to enter the shells 9, in which explosive charges, indicated at 10 are compressed. These shells are supported in a rack which comprises the plates 11, 12, and a bottom plate 13; 14 indicates a table or other suitable support.

It is to be understood that the rack comprised by the plates 11, 12 and 13 forms no part of the present invention since it is not new to employ a rack for a plurality of

shells, in the manufacture of devices of this nature. The invention resides more particularly in providing the discs 7 of elastic and resilient material. The body portion of the plungers, indicated at 5, are mounted for vertical movement with respect to the press-head 16, which may be of any desired kind, thickness or weight and may carry any desired number of plungers.

With the above described arrangement it is apparent that, as pressure is applied to a plurality of charges, those plungers which enter over-charged shells will be the first to recede against the elastic backing 7 while the plungers which enter normally charged shells will be the next in order to recede and those in under-charged shells will recede but little if at all. By properly regulating the thickness of the elastic and resilient discs 7, it is possible to compensate for a much greater variation in size of explosive charge than is ever encountered in practice.

While I have suggested the use of rubber for the elastic and resilient discs 7, it should be understood that any material which will accomplish the same purpose is within the scope of my invention.

Having described my invention, what I claim is:

1. In a charge pressing machine of the character described, the combination with a press head, of a plunger movable with respect thereto, and a resilient backing means for said plunger.

2. In a charge pressing machine of the character described, the combination with a press head, of a plunger movable with respect thereto, and a yielding backing means for said plunger.

3. The combination with a movable press head, of a plurality of punches mounted therein, and an individual yieldable backing for each of said plungers.

4. A device of the character described comprising a movable press head, a plunger or plurality of plungers mounted for movement with respect thereto, and elastic discs of rubber or similar material upon which each plunger bears, and a rigid backing for same.

In testimony whereof he affixes his signature.

BENNETT GROTTA.