(No Model.)

J. G. JUSTIN.

SHELL FOR HIGH EXPLOSIVES.

No. 464,569. Patented Dec. 8, 1891.

Fig. 1.

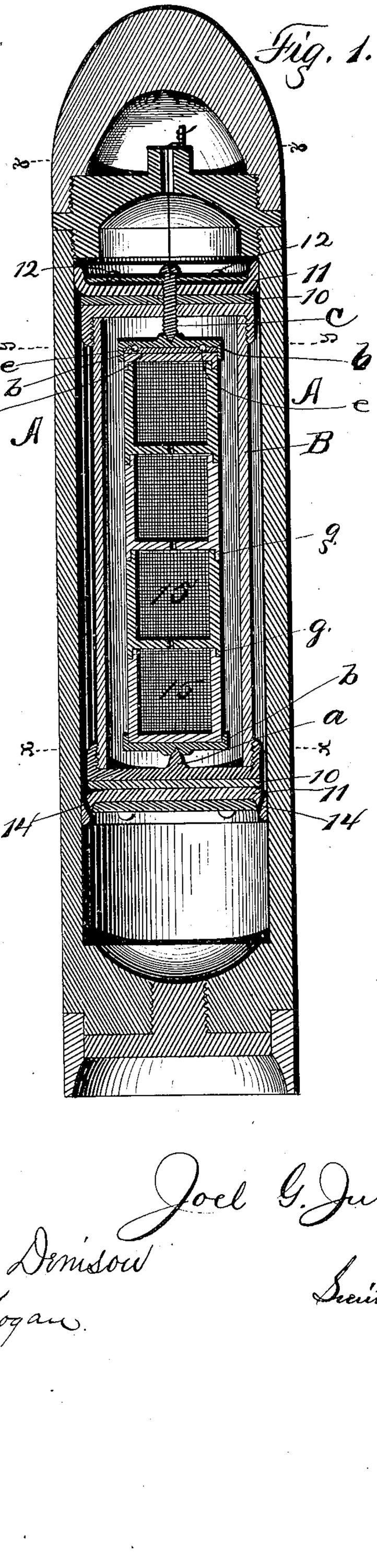


Fig. 2.

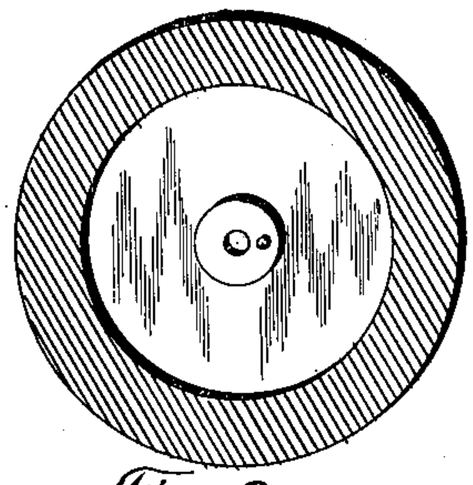


Fig. 5.

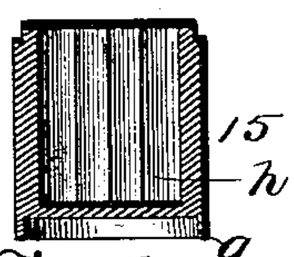


Fig. 6.

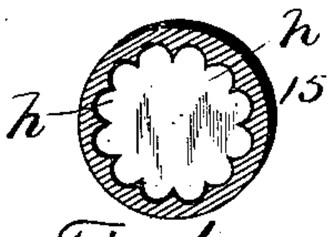


Fig. 7.

Fig. 3

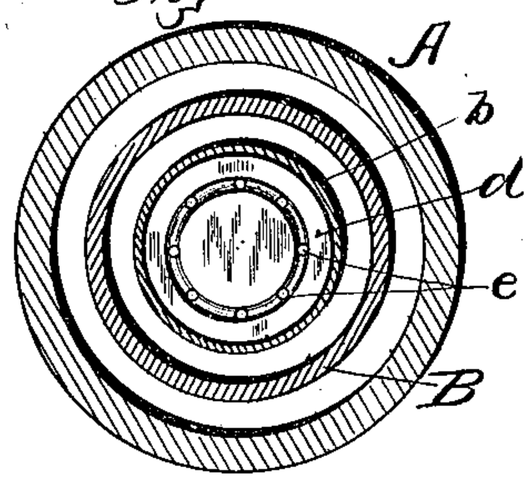
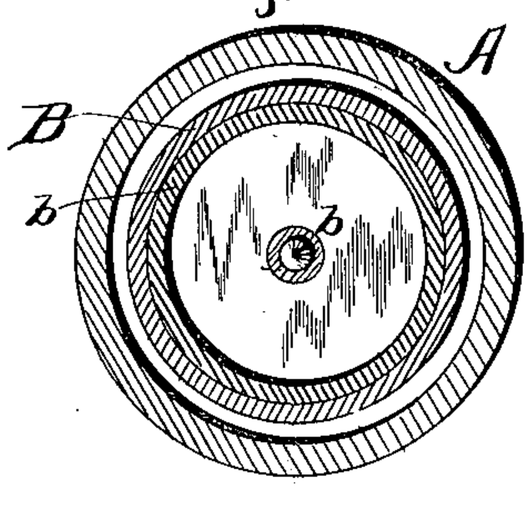


Fig. 4.



WITNESSES:

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Silas J. Hogan.

Joel G. Justin INVENTOR

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Smith & Denison

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UNITED STATES PATENT OFFICE.

JOEL GILBERT JUSTIN, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE JUSTIN PROJECTILE COMPANY, OF JERSEY CITY, NEW JERSEY.

SHELL FOR HIGH EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 464,569, dated December 8, 1891.

Application filed April 16, 1890. Serial No. 348,214. (No model.)

To all whom it may concern:

Be it known that I, JOEL GILBERT JUSTIN, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Shells for High Explosives, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to the construction of shells carrying high explosives which are to be fired from cannon or fire-arms.

My object is to more perfectly protect the dynamite or other high explosive from premature explosion either in the cannon or shortly after leaving it and before striking the target.

My invention consists in the several novel features of construction and operation hereinafter described, and which are specifically set forth in the claim hereunto annexed.

It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section. Fig. 2 is a transverse section on line *z z*. Fig. 3 is a like view on line *y y*. Fig. 4 is a like view on line *x x*. Fig. 5 is a vertical section of the body of one of the wooden boxes detached. Fig. 6 is a transverse section of the same. Fig. 7 is an isometrical view of the bottom of the body.

This invention is an improvement upon the shell for high explosives for which Letters Patent were granted me, dated April 1, 1890, and numbered 424,482, and I therefore limit and confine my specification herein to the construction of the explosive-carrier, which is mounted, suspended, and supported within the outer casing A, substantially as shown and described in said patent.

The carrier B consists of a cylinder the ends of which are closed by heads, and each is provided with a flexible washer 10 and flanged disks 11, secured thereon by screws 12, the flanged disks upon the rear end being provided with ports 14. The rear head is provided upon its inner face with central cone-point *a*, which fits into a seat in the center of the rear face of the box-supporter *b*, which is flanged around its outer face or otherwise adapted to engage with the base of the rear box 15, which holds the explosive. A screw *c* is centrally inserted through the front end of the carrier B and provided with a cone-point, which fits into a seat in the outer face of the front-box supporter *b*, which is also flanged or otherwise adapted to engage with the top of the front box 15 in the same manner as the rear supporter *b*.

In Fig. 1 I show a plate *d* interposed between the supporter *b* and the end of the box and provided with a circular groove, a like groove in the inner face of the supporter and balls *e*, placed in the grooves, creating a ball or roller bearing in conjunction with the cone-point bearing. This roller-bearing can be used on either or both ends, or the cone-point bearing can be used alone, or any other bearing the equivalent of either.

All of the boxes 15, except the rear one, if desired, are constructed with a flanged bottom, rabbeted internally, as at *g*, so as to fit as a cover over the externally-rabbeted top of the box, so that each box acts as a cover for the one behind it, enabling me to fit them closer together, saving valuable space, and also operating to better support and steady each other between the end bearings.

The principle of this improvement is that I support or suspend the boxes upon the front and rear bearings in such a manner that the outer casing A, and also the carrier B, are free to rotate around the boxes, so that none of their rotation or twisting is imparted to the boxes, and I thereby prevent the frictional rubbing or grinding of the particles of explosive against each other and their friction against the inclosing walls, thus lessening the danger of premature explosion from angular rotation.

As a further means for preventing the friction of the particles of dynamite against each other I corrugate or flute the inner surface of the body of the box, as at *h*, either so that the sticks of dynamite will fit into the corrugations or grooves or not, as desired.

It will be observed that the carrier is supported in the casing by the flanged disks and that the explosive-boxes are suspended within the carrier between the bearings and that the tension of these bearings is adjustable, that the body of the carrier stands clear from the inner wall of the casing and does not come

into contact therewith, and, further, that the boxes are suspended clear from the inner wall of the carrier. The function of this suspension of the boxes upon end bearings is to prevent the transmission to them of the rotation or twisting of the outer casing which is imparted to it by the rifling of the cannon.

What I claim as my invention, and desire to secure by Letters Patent, is—

An explosive-carrier supported in an outer casing and having a series of boxes for holding the explosive suspended between the ends of the carrier, as set forth.

In witness whereof I have hereunto set my hand this 12th day of April, 1890.

JOEL GILBERT JUSTIN.

In presence of—
HOWARD P. DENISON,
C. W. SMITH.