

UNITED STATES PATENT OFFICE.

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GAS-CHECK FOR BREECH-LOADING GUNS.

SPECIFICATION forming part of Letters Patent No. 539,733, dated May 21, 1895.

Application filed March 6, 1895. Serial No. 540,733. (No model.)

To all whom it may concern:

Be it known that I, GREGORY GERDOM, a citizen of the United States, residing at Sandy Hook, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Gas-Checks for Breech-Loading Guns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in gas checks for breech loading guns, and it consists of certain improvements in the type of gas check ordinarily known as the De Bange gas check in which a plastic pad made mostly of asbestos is used.

The object of the invention is to produce a gas check which will operate efficiently to close the breech of a breech loading gun against the escape of the gases formed by the explosive, and which will permit the free and easy movement in and out of the breech plug. Prior to my invention certain gas checks have been used for this purpose in which the plastic pad was contained between two metal disks with their lips on their circumference, which were expanded outward against the bore of the gun due to the compressive action of the powder gas on the plastic pad. These lips being bound to the circular disks were only elastic on their edges and the repeated expansion outward of these lips caused them to take a "set" and bind hard against the walls of the gun so that the withdrawal of the breech block after firing was made with the greatest difficulty. This made the diameter of the lips larger than was designed so that they frequently had to be turned down to the required size. Again to facilitate the easy withdrawal of the breech block after firing, the seat on the walls of the gun on which the lips of the metallic disks bear was made conical, the diameter in the rear being larger than the diameter in front. This required that the rear metallic disk be larger in diameter than the front one and that their circumferences should also be made conical. As the limit of expansion of the small lips was very small, the diameter of the disks had to be made very nearly the diameters of the

seats for the lips in order that the lips might expand out to the seat to form a close joint. Certain difficulties in manufacture prevented the accomplishment of the proper fit. Again, if the pads varied in thickness, the clearance between the front disk and the walls of the gun also varied and might be sufficient to permit the gas to pass the front disk and penetrate the pad. It was to remedy these and other defects that the hereinafter described improvements were made.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a central longitudinal section through the powder-chamber of a gun, showing the gas-check in the position it would assume before the gun is fired. Fig. 2 represents a front view of one of the split rings used in the gas-check, and Fig. 3 represents a transverse section of the same. Figs. 4 and 5 represent views similar to Figs. 2 and 3 of another one of these split rings used on the exterior of the plastic pad; and Figs. 6 and 7 represent a similar view of the smaller ring, which is mounted on the spindle of the mushroom-head and prevents the exuding of matter from the plastic pad through the center of the breech-block.

A represents the body of the gun which is provided with a powder chamber A', and the ordinary slotted chamber A² for the interrupted-screw breech block B. The breech block is provided with a cylindrical chamber B' for the enlarged portion C' of the stem, to which the mushroom head C is secured. The shank C² of said stem passes to the rear in the breech block in the well-known way. This enlarged portion C' of the stem is curved outward as at c', and terminates in a cylindrical shoulder c as shown in Fig. 1.

An annular plate or washer D fits against the face of the breech plug B², and fits loosely over the stem C' and also loosely in the powder chamber A'. This washer D has an annular recess terminated by the shoulder d cut in its front face to receive the split ring F, which has a clearance between it and the said shoulder of about two hundredths of an inch, and thus allows the said split ring to be

sprung inward as the breech block is forced forward in the powder chamber. The said ring is made somewhat larger than the interior of the powder chamber, and has to be sprung into position. The small split ring H incloses the stem and prevents the exuding of the materials of the pad into the chamber B'. Forward of the rings F and H and the washer D, is the plastic pad E made of asbestos and tallow as in the De Bange system of gas checks, and covered with canvas e. Outside of this pad, the ring K is put around the inner face of the mushroom head C. This ring K is made somewhat larger than the interior of the powder chamber, and has a clearance of two hundredths of an inch from the shoulder c so that the said ring may be sprung inward as the breech plug is forced forward in the powder chamber. These two rings F and K are split as at f and k and are curved as at f' and k', respectively, as shown most clearly in Figs. 2 and 5.

When the gun is fired the gas acting on the mushroom head forces it backward compressing the plastic pad E and causing it by means of curve c' of the spindle to expand radially against the walls of the gun carrying with it the highly elastic split rings and together with the rings forming a gas tight joint where they bear hard against the seat.

The diameter of the split rings is slightly larger than the diameter of the seat so that they should always be in contact, but in case they were not, their high capability for expanding circumferentially and also radially due to their being split would easily enable them to be expanded for a considerable distance by the plastic pad until they come in contact with their seat.

After the discharge of the gun the various parts assume their normal position and allow the breech block to be opened with the ease with which it was closed before firing.

The rings are highly elastic by reason of their being split, so that they are easily expanded and easily contracted after the pressure which expanded them has been removed. Their being of a larger diameter than their seats, they are always in contact with the said seats, and consequently always protect the edges of the pad, preventing their being destroyed by the gas and also preventing any exudation of the plastic material of which the pad is composed. At the same time being expanded by the great pressure due to the expansion of the plastic material they form with the pad a gas tight joint where they are in contact with the walls of the gun. Another important point is that by splitting the rings they will compress as well as expand. It is thus possible to make them, in their natural state from one one-hundredth to two one-hundredths of an inch larger in diameter than the diameter of the seat, so that when the breech block is forced into the gun they bear against the walls of the gun for some distance before they reach their seat and scrape off any residue or fouling

that may have been left there, leaving a clean smooth surface for them to bear against under pressure, thus better insuring a perfect joint. Again, on account of their being larger in diameter than their seat, and on account of their great expansibility the coning of the gas check seats need not be made to such fine dimensions, thus reducing cost. On account of the rings being split they are capable of being compressed as well as expanded and consequently they do not bear hard against the walls of the gun after the pressure has been removed allowing the breech block to be opened easily. Furthermore, the split rings being of some thickness and being beveled to correspond with the coning of gas check seat have quite a considerable bearing area on the walls of the gun and consequently do not indent it or score it as a thin lip would do when its thin edge is in contact. The split in the rings with the pad forms a gas check in itself so that no gas can pass through the split and get into the pad. These and the various other advantages of the herein described construction would readily suggest themselves to any one skilled in the art.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination in a gun, of a breech block provided with a recess in the face thereof, a movable head projecting in front of said breech block and provided with a stem entering said recess, a washer in front of said breech block and loosely encircling said stem, a small split ring around said stem in front of said washer and closely engaging said stem, a plastic pad included between said washer and said movable head, and two resilient split rings, made of greater diameter than the powder chamber and mounted one at either side of the outer edge of said pad, substantially as and for the purposes described.

2. The combination in a gun, of a breech block provided with a recess in the face thereof, a movable mushroom head C curved on its rear face as at c', and shouldered as at c, and having a stem projecting into said recess of the breech block, a washer in front of said breech block and loosely encircling said stem, a small split ring around said stem in front of said washer and closely engaging said stem, a plastic pad included between said washer and said movable head, a resilient split ring K curved as at k' made of greater diameter than the powder chamber and mounted exterior to said shoulder c and forward of said pad, and a ring curved as at f' mounted in front of said washer and in rear of said pad, substantially as and for the purposes described.

3. The combination in a gun, of a breech block provided with a recess in the face thereof, a movable mushroom head C curved on its rear face as at c', and shouldered as at c, and having a stem projecting into said recess of the breech block, a washer in front of said breech block and loosely encircling said stem

and shouldered as at *d*, a small split ring
around said stem in front of said washer and
closely engaging said stem, a plastic pad in-
cluded between said washer and said movable
5 head, a resilient split ring *K* curved as at *k'*
made of greater diameter than the powder
chamber and mounted exterior to said should-
der *c* and forward of said pad, and a resilient
ring *F* split as at *f* and curved as at *f'*, made
10 of greater diameter than the powder chamber

and mounted exterior to said shoulder *d* and
in rear of said pad, substantially as and for
the purposes described.

In testimony whereof I affix my signature
in presence of two witnesses.

GREGORY GERDOM.

Witnesses:

CARL F. JEANSEN,

GREGORY GERDOM, Jr.