To all whom it may concern:

Be it known that we, JAMES ROSS and ALEXANDER WOODCOCK MACKENZIE, subjects of the King of Great Britain, residing at Edinburgh, Scotland, have invented certain new and useful Improvements in Bungs, Stoppers, or the Like for Casks or other Storage-Receptacles; and we 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.

Our invention relates to bungs, stoppers, or the like for casks and other storage-receptacles and which are more especially applicable for casks and the like employed for storing ale, beer, or other liquids which generate or give off gases or vapors or from which receptacles the contents are required to be drawn in greater or less quantities from time to time.

The object of our invention is to provide a bung, stopper, or the like which shall permit the gases or vapors generated in such casks or receptacles to pass off and escape automatically whenever the internal pressure increases and reaches the point at which such escape is desired and is necessary and in some cases shall also permit the necessary quantity of air to enter the cask or receptacle to allow the contents to be drawn off, as required from time to time. Brewers, beer-retailers, consumers, and others will thereby be saved a great deal of trouble, the ordinary spikes or vent-peg will be rendered unnecessary, the quality of the beer, for example, will be improved, and evils arising from the bursting of the casks or the "flattening" of the beer will be avoided.

Our invention consists of an ordinary circular bung, shive, stopper, or the like made of wood or other suitable material having a recess or cavity in its under side from which a small hole communicates with the upper side of the said bung. The larger inner end of the wall of the recess or cavity is shoudered down to receive a disk or diaphragm, of india-rubber or other similar material, which is preferably first fitted and fixed into a rim or frame, of brass or other suitable metal or material, which rim or frame is closed upon the outer edge of the india-rubber, for example, so as to hold it firm. This rim or frame containing the india-rubber is fitted tightly into the hole in the under side of the bung and rests against the shoulder above mentioned. The india-rubber or other elastic material when fitted into the rim or frame is punctured with any suitable number of fine needle-holes. When the bung so constructed is employed to stop or close the bung-hole of a cask containing, for example, beer or other fermenting or effervescent liquor, the increasing internal pressure arising from the accumulation of gases given off by the liquor has the effect of expanding the india-rubber and causing it to assume a more or less spherical shape, and the punctures therein are thereby caused to open and allow the excess of gases to escape, thus reducing the internal pressure to its normal or desired point. The india-rubber then assumes its more or less flat or disk-like form and the punctures are caused to close again by the resilient nature of the rubber, thereby effectually excluding the outside air. In cases where a greater pressure of internal gases is desired before any escape takes place this result will be readily obtained by using a thicker or stronger sheet of india-rubber. A bung or stopper of this description also readily admits of liquid being drawn off from the cask, as the outside air necessary to fill the void caused by the withdrawal of the liquid will be admitted through the punctures of the india-rubber by the pressure of the atmosphere, causing the india-rubber to expand and take a spherical shape in a downward direction.

In the accompanying drawings, Fig. 1 is a transverse section of a bung, shive, or stopper constructed in accordance with our invention. Fig. 2 is an edge view. Figs. 3 and 4 are under and upper face views, respectively, and Fig. 5 is a section of a vent-peg or spile with our invention applied thereto. Similar letters of reference relate to like parts in all the figures. a is an ordinary circular bung, shive, or stopper. b is the recess or cavity in its under side, terminating, as shown by full lines, etc.
in the concave surface \( c \) or in a flat or otherwise shaped surface and communicating with the upper side of the bung or stopper \( a \) by the small hole \( d \).

\( e \) is the india-rubber or other elastic disk or diaphragm mounted in the brass or other rim or frame \( f \), which latter is forced tightly into the hole in the under side of the bung or shive and against the shoulder \( g \), so as to form an air-tight joint therewith. The punctures in the disk or diaphragm \( e \) are not shown, as they would be ordinarily invisible unless the disk or diaphragm were distended to a considerable degree. The dotted lines \( i \) and \( j \) in Fig. 1 indicate, respectively, the approximate positions assumed by the disk \( e \) when allowing the escape of excess of gases from the cask and when allowing air to enter the cask to occupy the void caused by the withdrawal of liquid therefrom. The recess or cavity \( b \) with its concave or other surface \( e \), the small hole \( d \), and the shoulder \( g \) are preferably formed at one operation with a specially-shaped tool when making the bung, shive, or stopper.

Fig. 5 shows a hollow spile or vent-peg with our punctured disk or diaphragm \( e \) applied thereto, the said disk or diaphragm being free to assume its curved form either down into the recess \( b \) to admit atmospheric air into the receptacle through the hole \( h \) or upward to allow excess of gas or vapor to escape from the receptacle into the atmosphere through the hole \( d \). The spile or vent-peg may be made of wood, brass, or other metal.

We claim—

1. In a bung, shive, stopper, or the like adapted to be inserted wholly from the outside into the bung-hole or other similar hole in the cask, an elastic disk \( e \) having in it a number of fine needle-holes, said disk being supported only round its edge by an inclosing rim \( f \), its center part being left free, to move outwardly by the pressure of the gas within to allow escape of same and to move inwardly at times for the inlet of air, substantially as described.

2. In a bung, shive, stopper, or the like made in one piece of material \( a \) and adapted to be inserted wholly from the outside into the bung-hole or other similar hole in the cask, a recess or cavity \( b \), an elastic punctured disk \( e \), and an inclosing rim \( f \) for holding the said disk by its edge while leaving the center thereof free to assume a more or less spherical shape outwardly or inwardly whereby the gas may escape from the cask and at times the air may pass into the same, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

JAMES ROSS.
ALEXANDER WOODOCK MACKENZIE.

Witnesses:

SAMUEL DOW MACMILLAN,
ROBERT HUTCHISON HENDERSON.