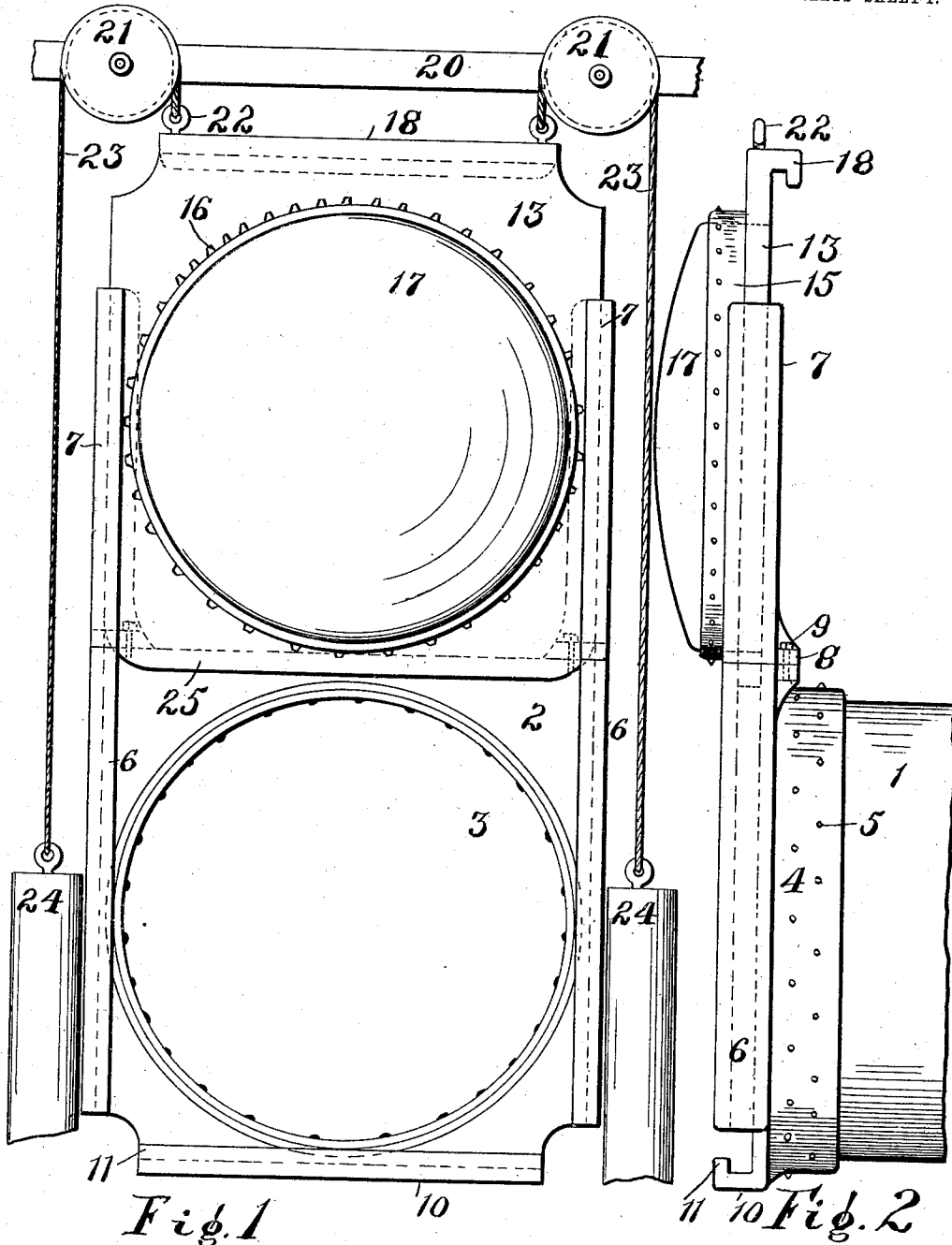


J. K. WILLIAMS.
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 APPLICATION FILED JUNE 23, 1910.

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Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.



Witnesses:
 Glenora Fox
 Mabel Ryan.

Inventor
 John K. Williams
 by C. E. Humphrey,
 Atty.

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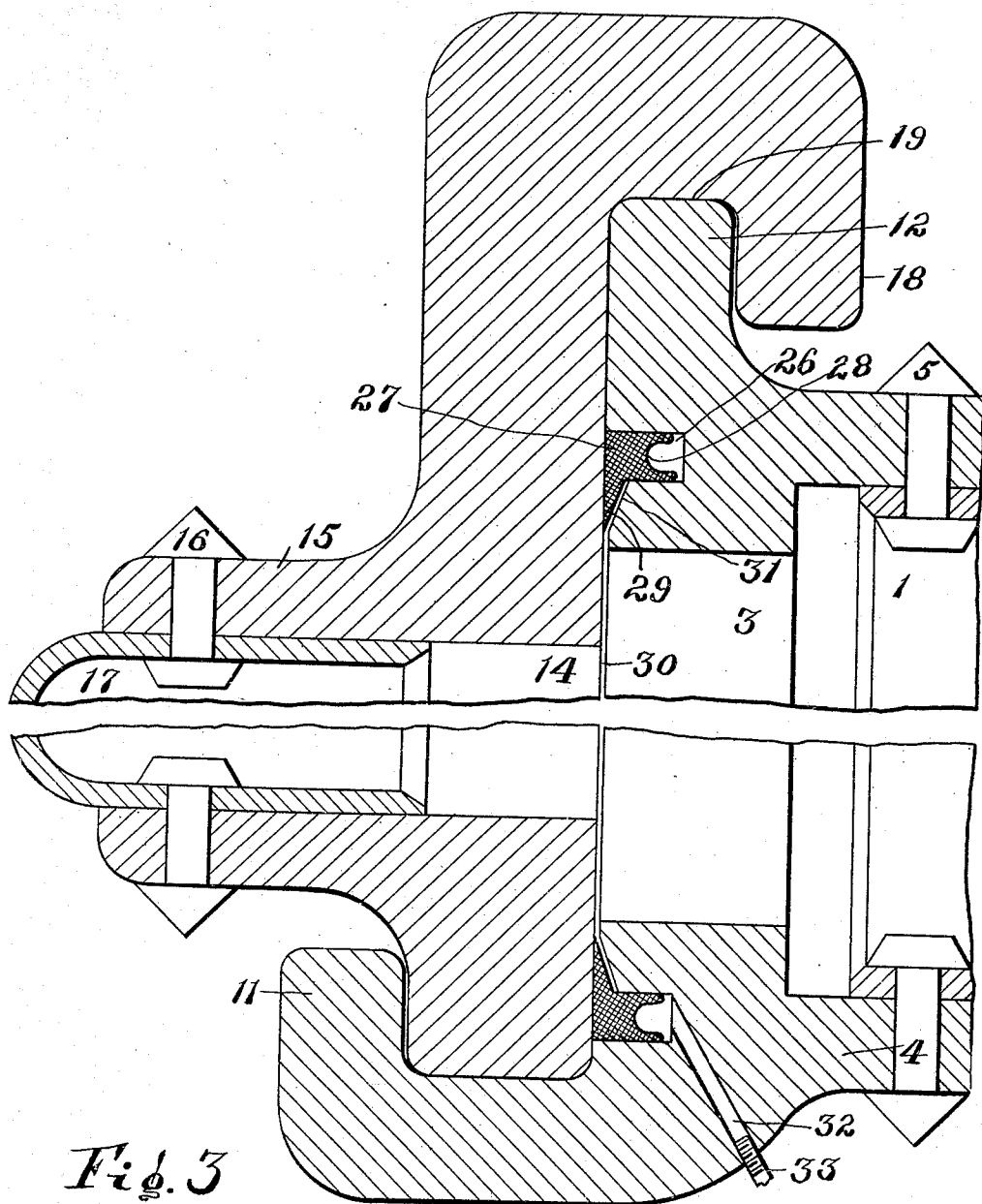


Fig. 3

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN K. WILLIAMS, OF AKRON, OHIO, ASSIGNOR OF ONE-HALF TO THE WILLIAMS
FOUNDRY AND MACHINE COMPANY, A CORPORATION OF OHIO.

QUICK-OPENING DOOR FOR VULCANIZERS.

976,969.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed June 23, 1910. Serial No. 568,581.

To all whom it may concern:

Be it known that I, JOHN K. WILLIAMS, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful improvements in Quick-Opening Doors for Vulcanizers, of which the following is a specification.

This invention relates to quick-opening doors for vulcanizers and the object thereof is to provide a door constituting a closure member for the open end of a vulcanizer or analogous receptacle, so constructed that it may be shifted from a closed or operative position to an open or inoperative position, or vice versa easily and quickly in order to save time and labor. Heretofore doors of this class have been secured to the body of the vulcanizer by various means, all of which require the expenditure of a considerable amount of time in effecting a perfect closure of the open end of the vulcanizer, and as these closure members and the vulcanizer are heated intensely hot, great care is necessary in handling them to prevent injury to the operatives.

A further object of the invention is to provide means to permit the shifting of the door from its inoperative or open position to its closed or operative position accurately, with a minimum expenditure of manual labor, said means embodying guides capable of permitting movement of the door radially with respect to the longitudinal axis of the vulcanizer body and so arranged that when the cover is moved to its operative or closed position it will always accurately register with the opening in the end of the vulcanizer body.

A still further object of the invention is to provide a packing element for forming a fluid-tight joint between the inner face of the closure member and the opening to the vulcanizer body for hermetically sealing the latter, said packing element arranged to be brought into operative relation for sealing the joint between the closure member and the vulcanizer body and held there by the pressure of the agent used for vulcanizing the articles within the body of the vulcanizer.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be here-

inafter specifically described and illustrated in the accompanying drawings which form a part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings, in which similar reference numerals indicate like parts in the different figures: Figure 1 is a view in elevation of the front end of a vulcanizer showing the closure member therefor in its inoperative position. Fig. 2 is a view in side elevation of the device shown in Fig. 1 looking from the right thereof; and, Fig. 3 is an enlarged, vertical, central, sectional view of the device shown in Fig. 1 with the closure member for the vulcanizer in its closed position with portions thereof broken away.

Referring to the drawings in detail, the reference numeral 1 denotes the body portion of a vulcanizer, which is preferably cylindrical and of a length sufficient to accommodate the articles to be vulcanized therein. The rear end of the vulcanizer (not shown) is closed and the front end which is shown in the drawings is open. Mounted on the open end of the vulcanizer is a member embodying a body portion 2 provided with a central opening 3 and from the rear of which extends an annular flange 4 arranged to telescope the open end of the vulcanizer body 1 and secured in position thereon through the medium of rivets 5. On each side of the body portion 2 is an upright 6 provided with a groove, said grooves being parallel with and opposed to each other and constituting ways for a purpose to be later described. Mounted on each of the uprights 6 is an extension 7 the inner opposing faces of which are provided with grooves registering with the grooves in the uprights 6 on which they are mounted and forming extensions thereof. The upper ends of uprights 6 and the lower ends of extensions 7 are provided with laterally-extending apertured lugs 8 arranged in registering relation with each other when the device is set up and united together through the medium of holdfast devices 9 positioned in the apertures in said lugs. The lower part of the body portion 2 is provided with a forwardly-projecting horizon-

tally-extending lip 10 formed with a flange 11 arranged parallel with the face of said body portion, the space between the flange 11 and the front face of the body portion 2 constituting a groove in alinement with the grooves in the uprights 6, for a purpose to be later described. The upper portion of the body portion 2 is formed to constitute a transverse upwardly-extending ridge 12.

Shiftably-mounted in the grooves in the uprights 6 and extensions 7 is a door 13 in the central portion of which is an opening 14 surrounded by an integral forwardly-projecting flange 15 to the inner face of which is secured by holdfast devices 16 a convexly-formed cap 17 the size and shape of which approximates the opening 3 in the body portion 2. The upper portion of the door 13 is bent rearwardly and downwardly to form a lip 18 which latter extends from the rear face of the door to form a transversely-extending groove or channel 19. Mounted above the door 13 on some support such as beam 20 are a pair of grooved sheaves 21. Secured in the upper face of the lip 18 are a pair of eye-bolts 22 or their equivalents, to each of which is secured a rope or cord 23, each passing over and seating in the groove in one of the sheaves 21 and each provided at its lower end with a counterweight 24, the combined weight of the counterweights 24 substantially counterbalancing the weight of the door 13 so as to permit vertical shifting of the latter in the grooves in the uprights 6 and extensions 7 with little or no manual effort on the part of the operator. The door 13, when shifted to its upper position, as shown in Fig. 1, leaves the opening 3 in the body portion 2 entirely unobstructed to permit ready access to the interior of the vulcanizer 1 and when lowered to its closed or operative position effectually seals the opening 3 and constitutes a closure device therefor, and when in this latter position, the lower end 25 of the door 13 will be received in the groove in the lip 10 formed by the flange 11 at the lower end of the body portion 2, and the rearwardly-turned lip 18 formed at the upper portion of the door 13 will interlock with the upwardly-projecting flange 12 formed at the upper part of the body portion 2 so that both the upper and lower ends of the door 13 are held against movement, and as the side edges are seated in the grooves in the uprights 6 and extensions 7, movement of the door under the pressure of fluid employed in the body portion 1 for the purpose of vulcanization is thereby prevented.

In order to form a hermetically-tight joint between the rear face of the door 13 and the front face of the body portion 2, one of these abutting faces, preferably the body portion 2, is provided with an annular groove

26, in which is mounted a packing element 27 having in its rear face an annular U-shaped groove 28, and the outer or projecting portion of the packing element, that is to say the portion which engages the rear face of the door 13 is provided with an inwardly-projecting wedge-shaped integral flange 29. The part of the body portion 2 positioned within the annular groove 26 is cut away to provide a circular space 30 and the portion immediately within the groove 26 is beveled at 31 to provide an annular space to receive the flange 29 of the packing element 27. Connecting with the annular groove 26 is a duct 32 in the outer end of which is secured a fluid-conducting pipe 33.

The operation of the device is somewhat as follows: The door 13 is shifted to its open or inoperative position, as shown in Fig. 1, and the articles to be vulcanized are conveyed through the opening 3 into the body portion 1 of the vulcanizer. The door 13 is then shifted to its operative or closed position by hand which is easily accomplished due to the fact that the weight thereof is counterbalanced by the weights 24. Then a fluid such as air, water or steam is introduced through the duct 32 and pipe 33 into the groove 26, the pressure of which against the walls of the U-shaped groove 28 will drive the packing element outwardly into contact with the rear face of the door 13 and constitute a temporary fluid-tight closure member for the opening 3, after which a vulcanizing agent such as live steam is introduced to the interior of the vulcanizer body to cause vulcanization of any article contained therein. The vulcanizing agent will pass into the space 30 and engage the inner face of the wedge-shaped flange 29 of the packing element, in doing which it presses this wedge-shaped portion outwardly to cause it to form in connection with the rear face of the door 13 a hermetically-tight joint which will be maintained as long as the pressure of the vulcanizing agent is employed in the vulcanizer. When it is desired to open the vulcanizer the pressure of the vulcanizing agent is withdrawn and the door raised to its open or inoperative position by hand, leaving the opening 3 unobstructed for the removal of the vulcanized articles.

I claim—

1. The combination with a receptacle for containing a fluid under pressure and a radially-shiftable closure member therefor, one of which is provided with an annular groove in the face thereof which opposes the other member, of a packing ring mounted in said groove and provided with an inwardly-extending wedge-shaped integral flange arranged to be forced against the cooperating member by the fluid under pressure contained in said receptacle.

2. The combination with a receptacle for containing a fluid under pressure and a radially-shiftable closure member therefor, one of which is provided with an annular groove in the face thereof which opposes the other member, of a packing ring mounted in said groove and provided in its rear face with a groove or channel and a duct communicating with said groove in the rear of said packing ring for forcing the latter outwardly into snug engagement with the cooperating member.

3. The combination with a receptacle for containing a fluid under pressure and a radially-shiftable closure member therefor, one of which is provided with an annular groove in the face thereof which opposes the other member, of a packing ring mounted in said groove and provided with an inwardly-extending wedge-shaped integral flange at its outer portion and having in its inner or rear face a circumferentially-extending groove or channel and a duct communicating with said annular groove in the rear of said packing ring to admit a fluid under pressure for forcing said packing ring into snug engagement with the cooperating member for forming a fluid-tight joint.

4. The combination with a receptacle for containing a fluid under pressure and a radially-shiftable closure member therefor, one of which is provided with an annular groove in the face thereof which opposes the other member, a portion of the groove-bearing

member being cut away within said groove to provide a space between said member and the complementary member, of a packing ring mounted in said groove and provided with an inwardly-extending wedge-shaped integral flange positioned in said space to permit the fluid in said receptacle to engage the rear face of said wedge-shaped flange for forcing it into snug engagement with said complementary member for forming a fluid-tight joint therewith.

5. The combination with a receptacle for containing a fluid under pressure and a radially-shiftable closure member therefor, guiding means for said closure member, said receptacle provided in the end thereof which opposes the closure member with an annular groove, of a packing ring mounted in said groove and provided with an inwardly-extending wedge-shaped integral flange at its outer portion and a duct communicating with said annular groove in the rear of said packing ring to admit a fluid under pressure for forcing said packing ring into snug engagement with the closure member for forming a fluid-tight joint.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN K. WILLIAMS.

Witnesses:

C. E. HUMPHREY,
GLENARA FOX.