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1,717,620

SAFETY PLUG

Filed June 23, 1927

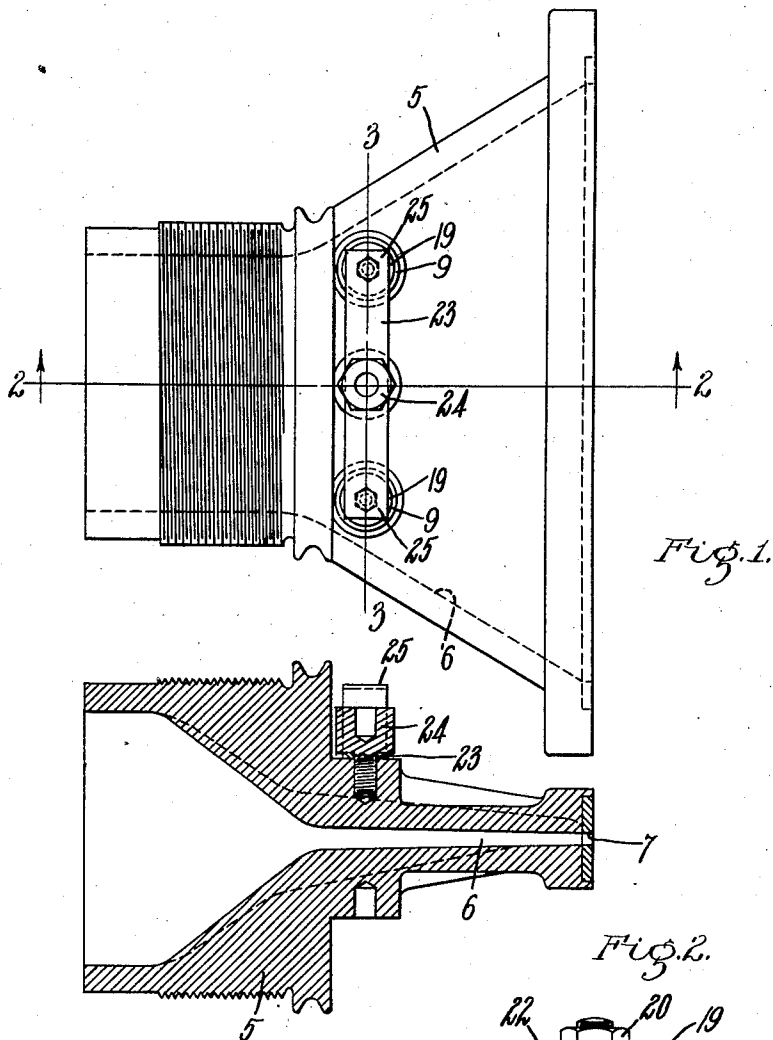


Fig. 1.

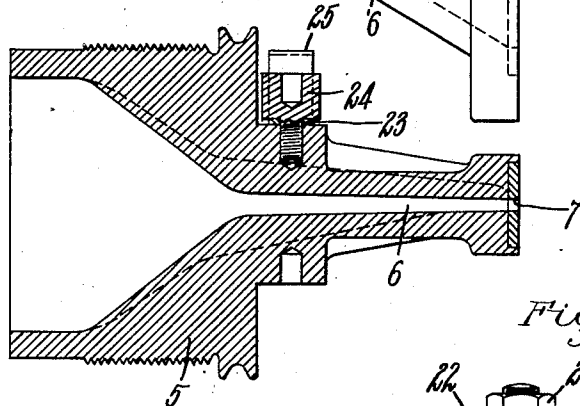


Fig. 2.

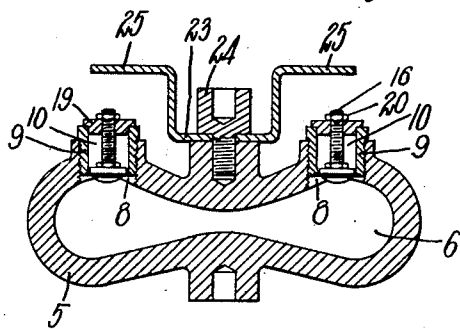


Fig. 3.

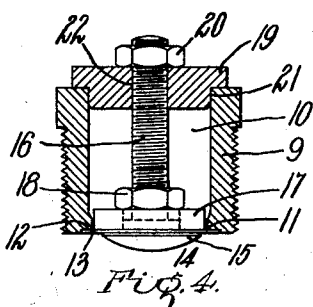


Fig. 4.

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SAFETY PLUG.

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This invention relates to a safety plug for rubber extruding machines and has for its object to provide a device for automatically relieving the pressure within the discharge head of an extruding machine if for any reason said pressure becomes excessive.

In rubber extruding machines the tubing head is generally provided with a narrow discharge orifice, and as the material employed is of such a character that it may become cured within the head, it is a frequent occurrence for the discharge orifice to become clogged thereby causing the pressure within the head to become greater than the machine or head can stand, the result being that the head will burst, or other parts of the machine, familiar to those skilled in the art, may be damaged to such an extent that expensive repairs or replacements are necessary.

It is the object, therefore, of this invention to provide a simple and practical device which may be inserted within the discharge head of the machine in a position to be exposed to the pressure of the material therein, said device embodying therein a member preferably constructed as a disc, plate, diaphragm, or equivalent construction, capable of withstanding pressure up to a predetermined limit and adapted to collapse with a shearing action when said pressure is reached, whereupon said material will be discharged from the head and the pressure within the head relieved before damage can be done.

The invention consists in a safety plug as set forth in the following specification and particularly as pointed out in the claims thereof.

Referring to the drawings:—

Figure 1 represents a plan view of a discharge head for a rubber extruding machine, a pair of safety plugs embodying my invention being illustrated mounted therein.

Fig. 2 is a vertical longitudinal sectional elevation taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional elevation taken on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged sectional elevation of the safety plug.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 represents a discharge head of a rubber extruding machine, said head being of a type well known to those skilled in the art, and provided with a tapered

main discharge passage 6 terminating in a narrow discharge orifice 7. The discharge head 5 is also provided with two auxiliary discharge passages 8, said passages being located midway between the opposite ends of the head and extending transversely thereof from the opposite side portions of the main discharge passage 6 out of said head.

Each auxiliary passage 8 has a sleeve 9 detachably mounted therein, said sleeve having screw-threaded engagement with the head 5. The sleeve 9 has a discharge opening 10 extending entirely therethrough, and located adjacent to the inner extremity of the sleeve and extending entirely around the opening 10 is an annular shearing edge 11. A recess 12 is provided in the end of the sleeve 9 adjacent to the shearing edge 11, and a diaphragm 13 is located in said recess.

The diaphragm 13 is constructed of a suitable relatively thin disc of metal and has a definite shearing strength in order that it may burst whenever the pressure thereon reaches a predetermined limit.

Rigidly secured to the diaphragm 13 is a shearing member 14 embodying therein a head 15 and shank 16, said head being located upon one side of the diaphragm 13, while a collar 17 is also located upon the shearing member 14 upon the opposite side of the diaphragm 13 from the head 15. The diaphragm 13 is clamped tightly between the head 15 and collar 17 by a nut 18 which has screw-threaded engagement with the shank 16. The diaphragm 13 is clamped securely in the recess 12 by a collar 19 and nut 20, said collar engaging the opposite extremity of the sleeve 9 from that engaged by the diaphragm 13, and said collar furthermore acts to position the shearing member 14 within the sleeve 9. The collar 19 is shouldered at 21, said shouldered portion projecting into the opening 10 of the sleeve 9. The shank 16 of the shearing member 14 extends loosely through a hole 22 provided in the collar 19.

To protect the attendant of the extruding machine from injury whenever the plug of this invention functions, a plate 23 is attached to the discharge head 5 by a clamp screw 24 at a point intermediate the two auxiliary discharge passages 8, said plate being provided with oppositely extending wing portions 25 which project over said auxiliary discharge passages and act to deflect and

retard the various parts of the plug and the material whenever they are discharged through said passages.

The general operation of the device hereinbefore specifically described is as follows:— During the normal operation of the device, the plastic rubber composition is forced through the main discharge passage 6 of the head 5, being extruded from said head at the discharge orifice 7 in a wide thin stream. At such times the material passes over the diaphragm 13 and head 15 of the shearing member 14 and there is not sufficient pressure thereon to in any way affect said parts. If, however, for any reason the narrow discharge orifice 7 becomes clogged, as would happen if some of the material should become cured therein, and the pressure of the material within said head should become so excessive as to endanger the working parts of the machine, the pressure of the material upon the head 15 of the shearing member 14 co-operating with the shearing edge 11 of the sleeve 9 will cause the diaphragm 13 to collapse outwardly thereby allowing the material to pass through the opening 10 in the sleeve 9, said material at the same time forcing the shearing member 14 and parts mounted thereon outwardly from the head.

As there is considerable pressure behind the discharged parts and the material, whenever the device functions as described, the plate 23 is provided for the purpose of retarding and deflecting said material and parts and thereby preventing injury to persons who might be in the path of the discharged parts.

I claim:—

1. A safety device of the character described having, in combination, a discharge head provided with a main discharge passage extending therethrough and with an auxiliary discharge passage leading from said main passage out of said head, a sleeve detachably mounted in the auxiliary passage, a diaphragm secured by the sleeve in the auxiliary passage, and a shearing member fast to the diaphragm and exposed to the pressure of material within the main passage, said member co-operating with said sleeve to shear the diaphragm when the pressure of the material reaches a predetermined limit.

2. A safety device of the character described having, in combination, a discharge head provided with a main discharge passage extending therethrough and with an auxiliary discharge passage leading from said main passage out of said head, a sleeve detachably mounted in said auxiliary passage, a diaphragm, a shearing member fast to the diaphragm and exposed to the pressure of material within said main passage, and means to clamp the diaphragm to said sleeve, said shearing member co-operating with the sleeve to shear the diaphragm when

the pressure of the material reaches a predetermined limit.

3. A safety device of the character described having, in combination, a discharge head provided with a main discharge passage extending therethrough and with an auxiliary passage leading from said main passage out of said head, a sleeve detachably mounted in the auxiliary passage, a diaphragm, a shearing member fast to the diaphragm and exposed to the pressure of material within the main passage, and means to position the shearing member at the upper end thereof and clamp the diaphragm to said sleeve, the shearing member co-operating with the sleeve to shear the diaphragm when the pressure of the material reaches a predetermined limit.

4. A safety device of the character described having, in combination, a discharge head provided with a main discharge passage extending therethrough and with an auxiliary discharge passage leading from said main passage out of said head, a sleeve detachably mounted in the auxiliary passage, and provided with a shearing edge thereon, a diaphragm secured by said sleeve in the auxiliary passage, and a shearing member fast to the diaphragm and exposed to the pressure of material within the main passage, said member co-operating with the shearing edge to shear the diaphragm when the pressure of the material reaches a predetermined limit.

5. A safety device of the character described having, in combination, a discharge head provided with a main passage extending therethrough and with an auxiliary discharge passage leading from said main passage out of said head, a sleeve detachably mounted in the auxiliary passage and provided with a discharge opening extending therethrough having a shearing edge extending therearound, a diaphragm, a shearing member fast to the diaphragm and exposed to the pressure of material within the main passage, and means to position the shearing member at the upper end thereof and clamp the diaphragm to the sleeve, said member co-operating with the shearing edge to shear the diaphragm when the pressure of the material reaches a predetermined limit.

6. A safety device of the character described having, in combination, a discharge head provided with a main discharge passage extending therethrough and with a plurality of auxiliary discharge passages leading from said main passage out of said head, a sleeve mounted in each of the auxiliary passages, a diaphragm secured by each sleeve in each auxiliary passage, and a shearing member fast to each diaphragm and exposed to the pressure of material within the main passage, said member co-operating with the sleeve to shear the diaphragm when the pres-

sure of the material reaches a predetermined limit.

7. A safety device of the character described having, in combination, a discharge head provided with a main passage extending therethrough and with an auxiliary discharge passage leading from said main passage out of said head, a sleeve detachably mounted in the auxiliary passage and provided with a discharge opening extending therethrough having a shearing edge extending therearound, a diaphragm, a shearing member fast to the diaphragm and exposed

to the pressure of material within the main passage, means to position the shearing member at the outer end thereof and clamp the diaphragm to the sleeve, said member cooperating with the shearing edge to shear the diaphragm when the pressure of the material reaches a predetermined limit, and a plate adapted to retard and deflect the parts and material discharged from the auxiliary passage. 15 20

In testimony whereof I have hereunto set my hand.

SHERWOOD PAGE.