Dec. 23, 1941. D. C. DRILL 2,267,194

NOZZLE MEANS

Filed Feb. 14, 1941

Fig. 1.

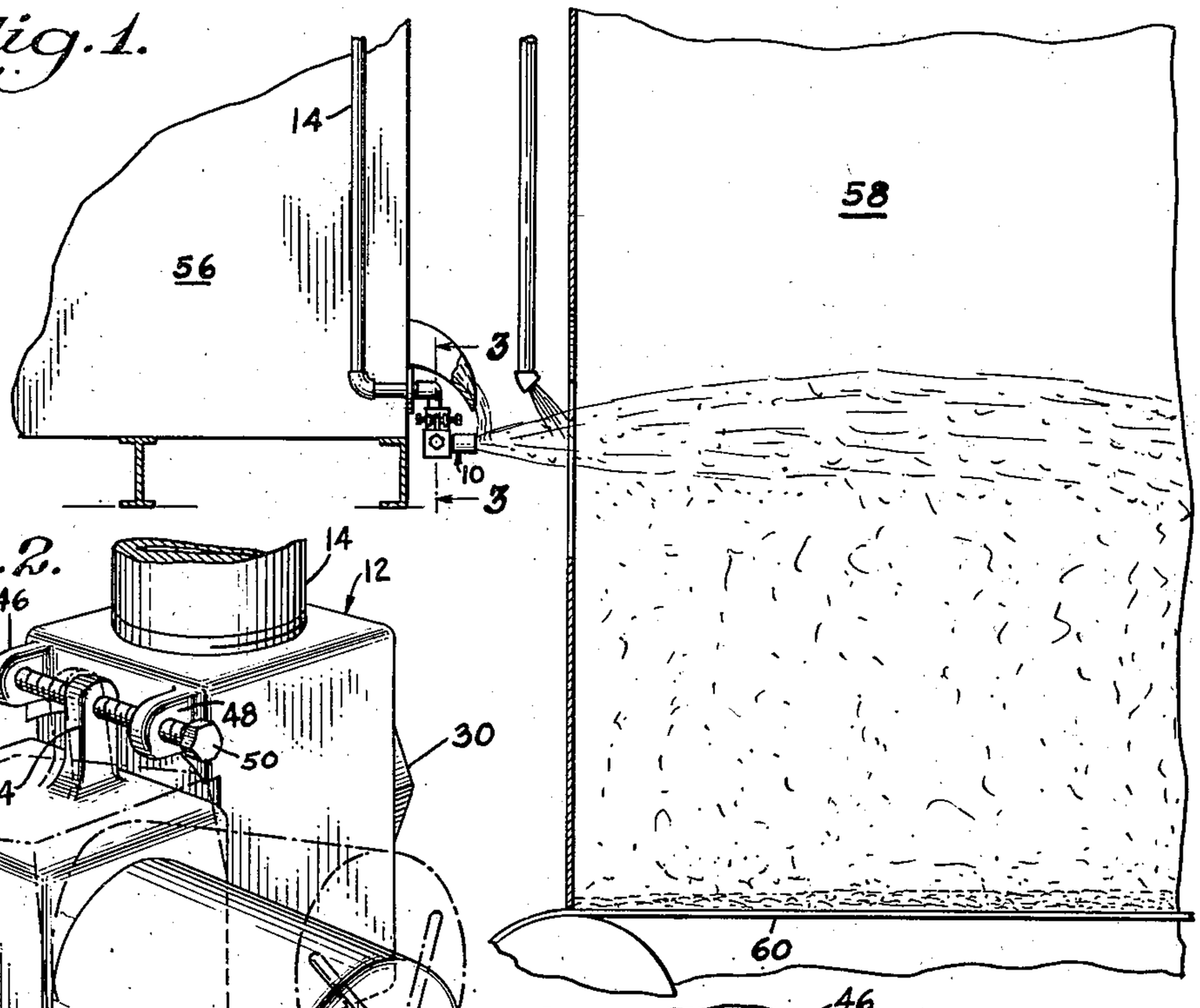


Fig. 2.

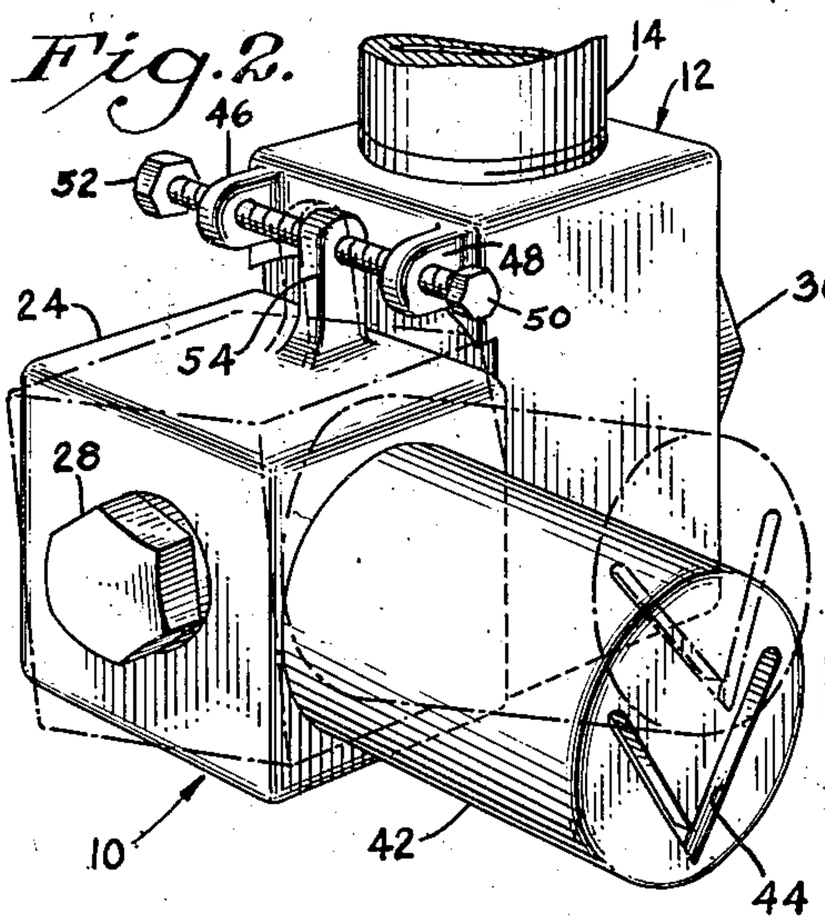


Fig. 4.

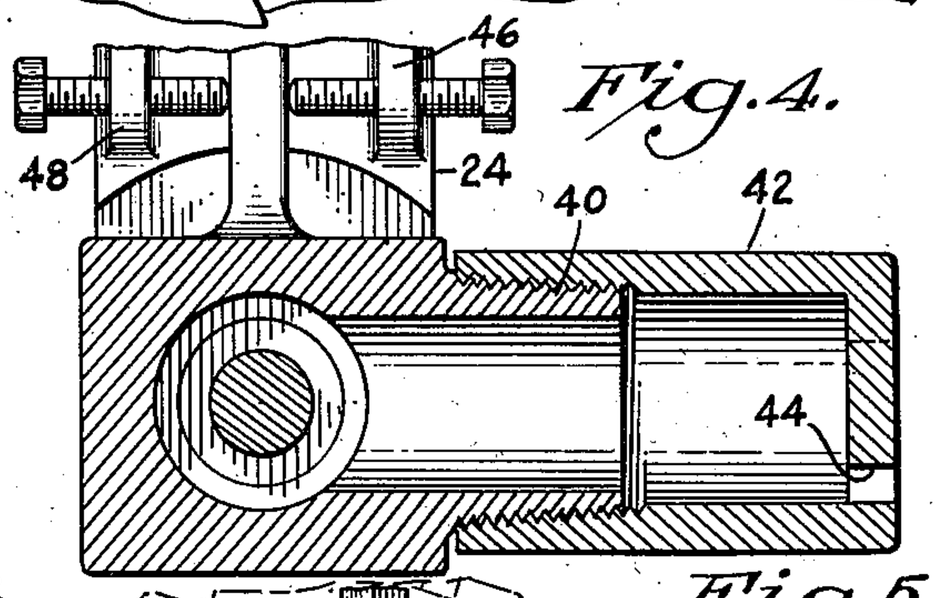


Fig. 3.

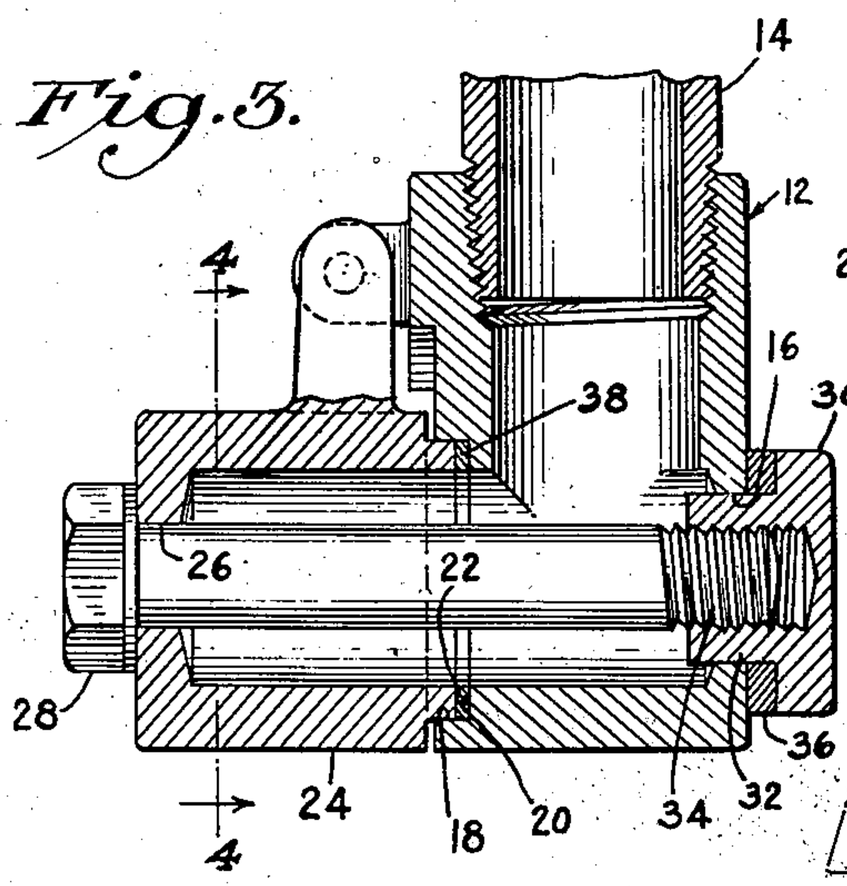
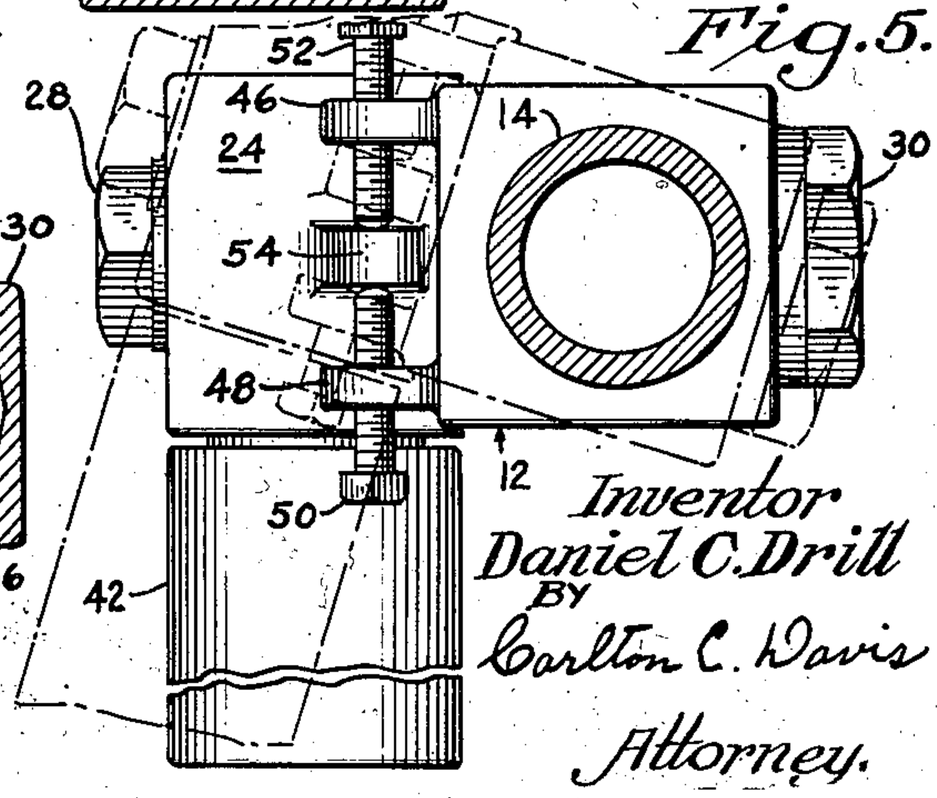


Fig. 5.



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2,267,194

NOZZLE MEANS

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3 Claims. (Cl. 299—73)

My invention relates to an improved nozzle means whereby the direction of the blast of fiber formation in the blowing of mineral wool fibers may be changed while the fibers are being blown from molten lava.

Mineral wool is conventionally manufactured by discharging a stream of molten lava upon a powerful V-shaped blast of steam or air which shreds the molten material into fibers and hurls these fibers into an adjacent blow chamber. The fibers are placed in suspension by the blast and rapidly swirl in the atmosphere of the blow chamber until they at last come to rest on its movable floor or conveyor. This conveyor removes the fibers from the blow chamber in the form of an elongated blanket or mat. The gases constantly whirl to and fro in the blow chamber until they escape through the ventilators provided in the upper portion of the blow chamber and the positions in which the fibers are deposited on the conveyor is determined by the direction and force of the movement of the air and other gases in the blow chamber.

When adhesively treated blankets or batts are being produced a molten or liquid adhesive such as, for instance, rosin or asphalt is sprayed upon one or more blasts of fiber formation preferably just before the fibers enter the blow chamber.

It is the duty of the blowing operator to so direct the blast that the fibers will become evenly deposited on the conveyor. This, however, is no easy task, because the operating conditions rapidly change from time to time and if the direction of the blast is not promptly changed the blanket of wool on the conveyor is much higher in some portions than in others. The blanket is compressed at the end of its travel in the blow chamber by a compacting roller in such a manner that the upper surface of the blanket will be parallel with the base of the conveyor, but unless the fibers have been evenly deposited on the conveyor, different portions of the batt will have different densities and therefore different "K" values. Needless to say, such batts do not provide dependable insulation and are therefore objected to by the trade.

It has been determined by experience when the blast is directed either to the right or to the left, it tends to deposit the majority of the fibers on the side of the conveyor toward which the blast is directed. When the blast is directed upwardly, it tends to cause more of the fibers to become deposited on the outer portions of the conveyor. When the blast is directed downwardly the fibers tend to become deposited on the center of the conveyor. The experienced blowing operator, therefore, has but little difficulty in determining the direction in which the blast should be directed under any given atmospheric condition in the blow chamber. The operator with nozzles of conventional construction, however, is unable to readily shift the nozzle so that it will discharge the blast in the desired direction. Insofar as known to the applicant, the prior art discloses no such nozzle and it is a major object of my invention to provide a nozzle which may be readily shifted during the blowing operation.

It is a further purpose of this invention to provide means whereby the blast may not only be easily raised and lowered but maintained in its adjusted position. As it has been before stated, the atmospheric conditions in the blow chamber vary from time to time due to numerous causes beyond the control of the blowing operator. It is, therefore, a further purpose of this invention to provide a nozzle means that may be repeatedly shifted in position from time to time as may be indicated by the changing operating conditions. A further object is the provision of means and methods especially adapted to be used in the production of adhesively treated batts.

In the drawing:

Figure 1 is a partly elevational and partly sectional view showing my improved nozzle means as it is used in the blowing of mineral wool.

Figure 2 is an enlarged perspective view of the same nozzle means.

Figure 3 is an enlarged section taken along the line 3—3 of Figure 1.

Figure 4 is a section taken along the line 4—4 of Figure 3.

Figure 5 is a top plan view of my nozzle means.

Referring now to Figures 2 to 5 inclusive, I make use of a nozzle means 10 which includes an internally threaded tubular member 12 which is adapted to be connected to any suitable externally threaded steam or air supply pipe 14 in any suitable manner whereby the tubular member may be rotated on the supply pipe as much as 90 degrees without any appreciable escape of steam or air.

The tubular member 12 may be rectangular in cross section and provided with two circular oppositely positioned open portions 16 and 18 which are in alignment with each other. The open portion 18 is preferably provided with a circular reduced portion 20 which abuts against a reduced circular end portion 22 of a second tubular section 24.

The section 24 has an open portion 26 which

is opposite to and in alignment with the reduced portion 22 and is adapted to receive a bolt 28 whereby the two tubular sections may be rotatably clamped together.

This bolt has a nut 30 which is preferably provided with an inwardly extending reduced end portion 32 which is internally recessed and threadedly adapted to receive the threaded end portion 34 of the bolt 28. If desired any suitable packing rings 36 and 38 may be provided to prevent the escape of steam through the open portions 16 and 18.

The tubular section 24 has a nipple or circular tubular extension 40 which is threadedly adapted to receive a nozzle cap 42. This nipple may extend at right angles to the longitudinal axis of the bolt 28. The nozzle cap 42 has a preferably V-shaped slot 44 through which, in operation, a blast of steam or air issues at a high velocity to shred the molten materials into mineral wool fibers.

In operation, the tubular section 24 may be turned with respect to tubular member 12 by any suitable instrument such as for instance a wrench. In order, however, to make certain that the tubular section 24 remains in its desired angular position with respect to the tubular section 12, I preferably provide the tubular member 12 with two spaced apart ears 46 and 48. These ears are internally recessed and are threadedly adapted to receive inwardly extending threaded screw bolts 50 and 52, which serve to adjustably secure an upwardly extending ear 54 on the tubular member 24 in any desired angular position between the ears 46 and 48.

Referring now to Figure 1, in operation, the nozzle means 10 is connected to the air or steam supply pipe 12 in such a position that a stream of lava issuing from any suitable cupola or melting furnace 56 falls upon the preferably V-shaped blast of steam which shreds the lava and directs the combined blast of steam or air and lava into any suitable blow chamber 58 which is preferably, though not necessarily provided with a movable floor or conveyor 60.

From the foregoing description of the various parts of the nozzles, its operation may be readily understood. When it is desired to lower the blast, the screw bolt 50 is retracted and screw bolt 52 advanced. When it is desired to move the nozzle cap 42 to the left or to the right the nozzle cap may be turned to the right or the left as may be desired with a monkey wrench or the like by turning the nozzle on threaded supply pipe 14.

If desired the screw bolts 50 and 52 may be withdrawn and the front of the nozzle may be moved upwardly or downwardly by any suitable wrench.

Having described my invention, I now make the following claims:

1. A mineral wool blow cap of the character described, said blow cap including a rigid tubular fluid inlet section and a rigid tubular fluid outlet section, each of said sections being detachably and pivotally secured substantially at a right angle to each other, said tubular outlet section being provided with an outwardly extending nipple portion including a nozzle member adapted for directing a fluid blast substantially at right angles to the main center line of the tubular outlet section, said blow cap being also provided with a plurality of ears mounted substantially in alignment with each other, at least one of said ears projecting from each of said tubular sections and at least two of said ears projecting from one of said sections on opposite sides of said one of said ears, each of said last mentioned two ears being provided with threaded recessed portions and with a threaded bolt adapted to engage said one of said ears at various positions intermediate of the last mentioned two ears.

2. A mineral wool blow cap of the character described, said blow cap including a rigid tubular fluid inlet section and a rigid tubular fluid outlet section, each of said sections being detachably and pivotally secured substantially at a right angle to each other, said tubular outlet section including a nozzle member adapted for directing a fluid blast substantially at right angles to the main center line of the tubular outlet section, said blow cap being also provided with a plurality of rigid extensions mounted substantially in alignment with each other, at least one of said extensions projecting from each of said tubular sections and at least two of said extensions projecting from one of said sections on opposite sides of said one of said extensions, each of said last mentioned two extensions being provided with threaded recessed portions and with an elongated threaded means adapted to engage said one of said extensions at various positions intermediate of the last mentioned two extensions.

3. A mineral wool blow cap of the character described, said blow cap including a rigid tubular fluid inlet section and a rigid tubular fluid outlet section, each of said sections being detachably and pivotally secured substantially at a right angle to each other, said tubular outlet section being provided with an outwardly extending nipple portion including a nozzle member adapted for directing a fluid blast substantially at right angles to the main center line of the tubular outlet section, said blow cap being also provided with a plurality of rigid extensions mounted substantially in alignment with each other, at least one of said extensions projecting from each of said tubular sections and at least two of said extensions projecting from one of said sections on opposite sides of said one of said extensions, each of said last mentioned two extensions being provided with threaded recessed portions and with an elongated threaded means adapted to engage said one of said extensions at various positions intermediate of the last mentioned two extensions.

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