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WEIGH BUCKET

Filed Jan. 22, 1938

2 Sheets-Sheet 1

Abstract

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2 Sheets-Sheet 2

Fig. 3.

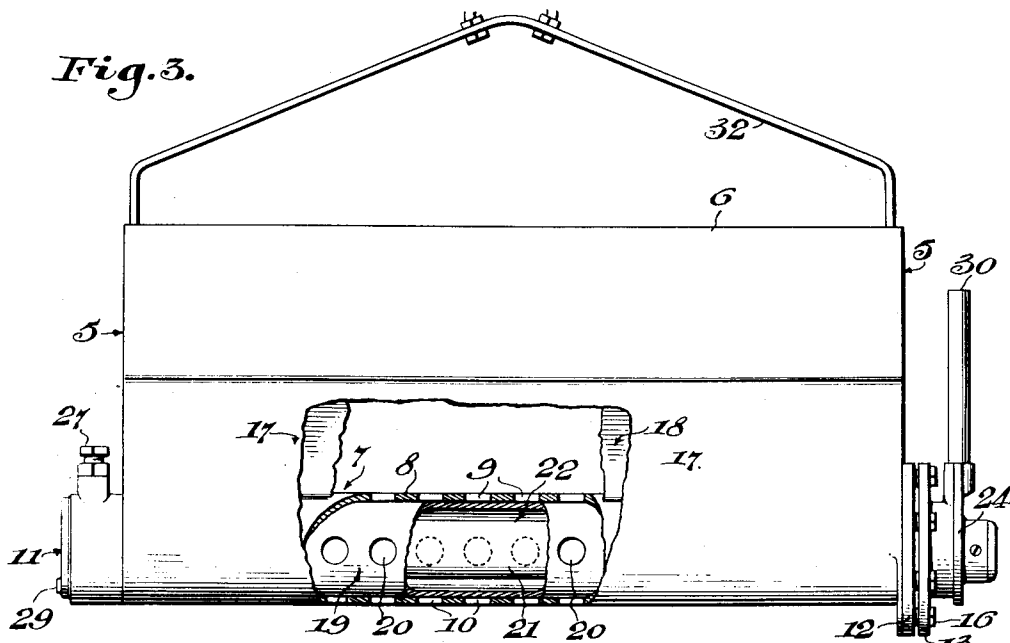


Fig. 4.

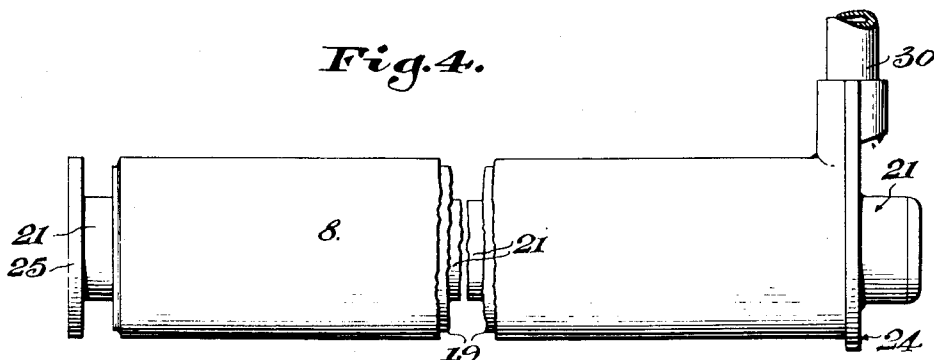
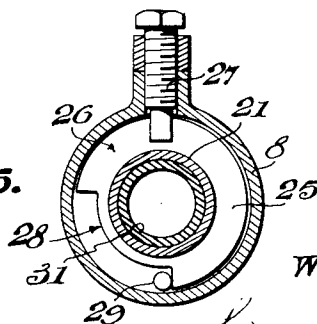


Fig. 5.



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WEIGH BUCKET

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8 Claims. (Cl. 219—44)

The invention relates generally to dispensing
hoppers or buckets and primarily seeks to pro-
vide a simple, economically manufactured unit
of that character in which bitumen or like ma-
terial can be weighed, maintained in the desired
hot, fluid state while being weighed, and then
discharged or dispensed under suitable control
into the aggregate with which it is to be mixed.

In the making up of aggregates for road build-
ing or similar operations, the materials must be
accurately proportioned, and for this purpose
they are weighed. Weighing the bitumen form-
ing a part of the aggregates presents problems
in attaining the desired accuracy, for unless the
bitumen is dispensed in a suitably fluid state
from a weigh bucket maintained at a suitable
elevated temperature, portions of the weighed
bitumen will adhere to the bucket and build up
thereon progressively so as to entirely disrupt
the accuracy of the weighing and dispensing
operation.

The invention therefore has for an object to
provide a novel weigh bucket embodying means
for maintaining a desired elevated temperature
in the bitumen, and a novel rotary valve struc-
ture for controlling the dispensing of hot bitu-
men from the bucket, a removable and replaceable
electrical heating unit being disposed directly
in the valve structure, and the bucket including
heat retaining pockets heated indirectly by said
heating means.

With the above and other objects in view that
will hereinafter appear, the nature of the in-
vention will be more clearly understood by fol-
lowing the description, the appended claims, and
the several views illustrated in the accompany-
ing drawings.

In the drawings:—

Figure 1 is a central vertical cross section.

Figure 2 is a longitudinal section.

Figure 3 is a side elevation, parts being broken
away and in section.

Figure 4 is a side elevation of the rotor per se,
parts being broken away and in section.

Figure 5 is a vertical cross section taken on
the line 5—5 on Figure 2.

Like reference numerals designate correspond-
ing parts throughout the several figures of the
drawings.

My improved weigh bucket or hopper is formed
of end walls 5 and side walls 6 which converge
at their lower ends to form a longitudinal dis-
charge throat 7. The side and end walls may be
fabricated in any suitable manner, as by welding.

A cylindrical shell 8 is secured at the lower end

of the hopper, as indicated in Figure 1 of the
drawings, and forms a valve chamber. The shell
communicates with the discharge throat 7 of the
hopper through a plurality of openings 9, and a
similar set of openings 10 are disposed diametri-
cally opposite the openings 9 and through these
hot bitumen is discharged into the mass of aggre-
gate usually contained within a mixing hopper
beneath the shell 8. The apertures 9 and 10
may be of any desired shape, round or elongated.

One end of the shell 8 is closed by a wall or
cap 11, and at its other end the shell is sur-
rounded by a flange or head 12 opposed by a
clamp plate 13, the members 12 and 13 being
equipped with opposed beveled surfaces 14 en-
gageable at opposite sides with a packing ring
15 so that when the clamp plate 13 is forced
against the plate 12 by the clamping screws 16
the packing ring will be expanded against the
rotary valve soon to be described in a manner
for preventing leakage of hot bitumen from the
end of the shell.

Side plates 17 are welded or otherwise secured
to the shell 8 and hopper sides, as indicated in
Figure 1 of the drawings, so as to provide dead
air spaces 18 at the sides of the shell and bucket.
A cylindrical valve sleeve 19 is rotatably mounted
in the shell 8 and is equipped with two diametri-
cally opposed sets of openings 20 adapted to regis-
ter at times with the shell apertures 9, 10 for per-
mitting and controlling the dispensing of hot
bitumen from the hopper or bucket. A heater
sleeve 21 is mounted in spaced relation within
and axially of the valve sleeve 19 so as to provide
an annular chamber 22 within the valve sleeve
and surrounding the heater sleeve. One end of
the annular chamber 22 is closed by a wall por-
tion 23 and the other end by a wall portion 24, and
it will be observed by reference to Figure 2 of
the drawings that the heater sleeve 21 extends
beyond both of the wall portions 23 and 24. It
will be obvious that bitumen flowing from the
bucket or hopper must pass through the regis-
tering apertures 9, 20, thence through the an-
nular space 22 surrounding the heater sleeve 21
and out through registering apertures 20, 10.

At its end adjacent the shell closure 11, the
heater sleeve is closed by an end wall 25 which
is larger in diameter than the heater sleeve and
adjacent to but spaced from the shell end wall 23
so as to provide an annular chamber 26 for re-
ceiving a limiting screw 27 carried by the shell 8
and serving to prevent longitudinal movement of
the valve and heater sleeves 19, 21 which move
as a unit. The wall 25 also includes an arcuate

clearance or notch 28 defined by limiting stops engageable with a pin 29 projecting inwardly from the shell cap 11. The notch or clearance 28 preferably extends around 90° of the periphery of the wall 25 so that when the limiting pin 29 engages one stop wall it will stop rotation of the valve sleeve with the apertures 9, 20 and 20, 10 in registry, whereas when the pin engages the other of the stop wall the apertures 20 will be 90° out of registry with the diametrically disposed apertures 9, 10. A handle member 30 may be secured in any approved manner to the end of the valve sleeve 19 which extends beyond the packing 15 so that the desired rotary movement may be imparted to the valve sleeve.

A suitable electrical heating element generally designated 31 is removably and replaceably mounted in the heater sleeve 21 for the purpose of directly heating the bitumen flowing over and around the sleeve 21 within the valve and for indirectly heating the bitumen in the hopper and the air in the dead air spaces 12 at the sides of the hopper and the shell 8. This heating unit comprises a suitable form of electric resistance heater capable of maintaining a temperature of between 250° F. and 375° F. It has been found that the bitumen must be heated to a temperature of at least 250° F., but to heat it to a temperature exceeding 375° F. would result in an undesirable overheating tending to distill the affluent constituents of the bitumen. A heating unit capable of generating temperatures of 400° F. or less has been found suitable for attaining and maintaining the desired bitumen temperatures.

If desired, a similar electrical heating unit, generally designated 33, may be disposed longitudinally in each air space 13 for directly heating the air in said spaces and aiding in maintaining the desired elevated temperature in the bitumen contained in the bucket.

In use the hopper or bucket may be supported upon any suitable scale by means of the bail 32.

It will be obvious that the shape of the hopper, the bitumen dispensing apertures, and the details of construction and arrangement of the valve movement effecting and limiting devices may be variously changed without departing from the scope of the invention as defined in the appended claims.

I claim:

1. A hot bitumen dispensing weigh bucket comprising a hopper body having a discharge throat, a rotary valve for controlling flow of bitumen from said throat, and an electrical heating unit mounted directly in and movable with the valve and removable and replaceable without dismounting the valve or removal of bitumen from the hopper body.

2. A hot bitumen dispensing weigh bucket comprising a hopper body having a discharge throat, a rotary valve for controlling flow of bitumen from said throat, means forming dead air spaces at the sides of the body, and an electrical heating unit mounted directly in said valve for directly heating the bitumen flowing through the valve and for indirectly heating the air in the air spaces and the bitumen within the body, said heating unit being movable with the valve and removable and replaceable without dismounting the valve or removal of bitumen from the hopper body.

3. A hot bitumen dispensing weigh bucket comprising a hopper body having a discharge throat and a cylindrical valve chamber, said valve chamber having diametrically opposed apertures

therein respectively communicating between the throat and the chamber and between the chamber and bitumen discharge receiving means, a rotary sleeve valve rotatably mounted in the chamber and having diametrically opposed apertures therein adapted to be brought into registry with the chamber apertures to permit controlled outflowing of hot bitumen, and an electrical resistance heating unit disposed axially within the sleeve and about which the outflowing bitumen must flow.

4. A hot bitumen dispensing weigh bucket comprising a hopper body having a discharge throat and a cylindrical valve chamber, said valve chamber having diametrically opposed apertures therein respectively communicating between the throat and the chamber and between the chamber and bitumen discharge receiving means, a rotary sleeve valve rotatably mounted in the chamber and having diametrically opposed apertures therein adapted to be brought into registry with the chamber apertures to permit controlled outflowing of hot bitumen, an electrical resistance heating unit disposed axially within the sleeve and about which the outflowing bitumen must flow, means for imparting rotary movement to the valve, means for preventing longitudinal movement of the valve, and means for limiting rotary movement of the valve between positions in which the valve and chamber apertures do and do not register.

5. A hot bitumen dispensing weigh bucket comprising a hopper body having a longitudinal discharge throat, a cylindrical shell forming a valve chamber and having two diametrically opposed sets of apertures one set communicating between the chamber and the throat and the other set constituting discharge apertures, a valve sleeve snugly fitting and rotatable within the shell and having apertures therein for registering with the shell apertures, a cylindrical heater sleeve axially disposed in spaced relation within the valve sleeve, and an electrical resistance heating unit removably and replaceably mounted in said heater sleeve.

6. A hot bitumen dispensing weigh bucket comprising a hopper body having a longitudinal discharge throat, a cylindrical shell forming a valve chamber and having two diametrically opposed sets of apertures one set communicating between the chamber and the throat and the other set constituting discharge apertures, a valve sleeve snugly fitting and rotatable within the shell and having apertures therein for registering with the shell apertures, a cylindrical heater sleeve axially disposed in spaced relation within the valve sleeve, an electrical resistance heating unit removably and replaceably mounted in said heater sleeve, said heater sleeve being projected beyond each end of and movable with said valve sleeve, means for closing the annular space between the valve and heater sleeves at each end, and means engageable with said valve and heater sleeves for preventing longitudinal movement and for limiting rotational movement of said sleeves.

7. A hot bitumen dispensing weigh bucket comprising a hopper body having a longitudinal discharge throat, a cylindrical shell forming a valve chamber and having two diametrically opposed sets of apertures one set communicating between the chamber and the throat and the other set constituting discharge apertures, a valve sleeve snugly fitting and rotatable within the shell and having apertures therein for registering with the shell apertures, a cylindrical heater sleeve axially

disposed in spaced relation within the valve sleeve, a heating unit removably mounted in said heater sleeve, a closure cap closing one end of said shell and a packing gland carried by the other end of said shell and engaging said valve sleeve, said heater sleeve being projected beyond each end of and movable with said valve sleeve, wall members closing the respective ends of the annular space between the valve and heater sleeves, a closure cap for the heater sleeve disposed adjacent and in spaced relation to one said wall member and having an arcuate clearance therein defined at the ends by stop walls, a stop pin carried by the shell closure cap and engageable with the stop walls for limiting rotary movement of the valve sleeve, and a pin carried by the shell

and engageable in the space between the heater sleeve cap and the adjacent wall member for preventing longitudinal movement of said valve sleeve.

8. A hot bitumen dispensing weigh bucket comprising a hopper body having a discharge throat, a rotary valve for controlling flow of bitumen from said throat, means forming dead air spaces at the sides of the body, an electrical heating unit removably and replaceably mounted directly in and movable with said valve for directly heating the bitumen flowing through the valve, and an electrical heating unit mounted in each said air space.

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