Nov. 26, 1946. I. J. OVERMAN 2,411,751

DRIER FOR AGGREGATES AND THE LIKE

Filed July 1, 1943

FIG. 1

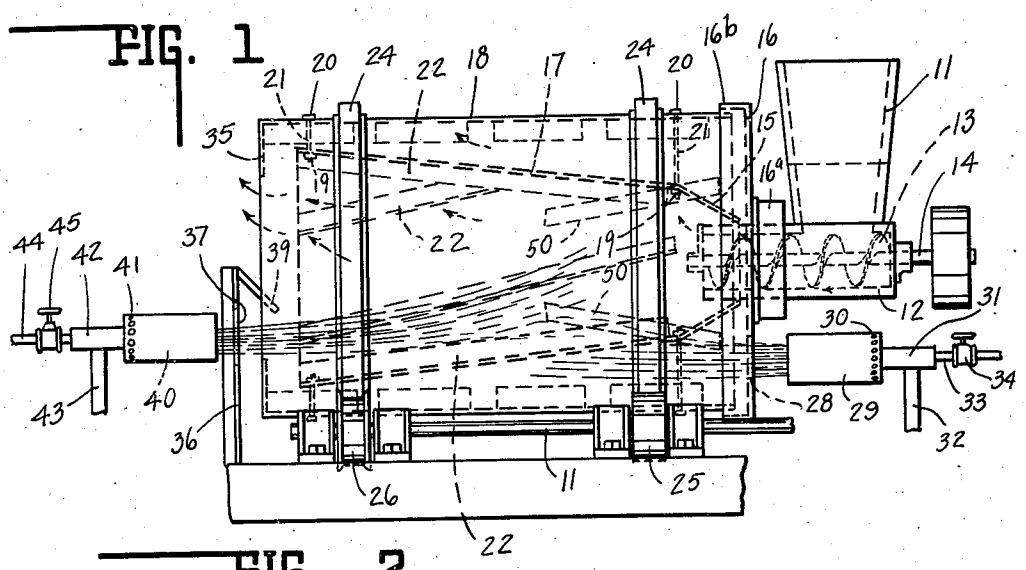
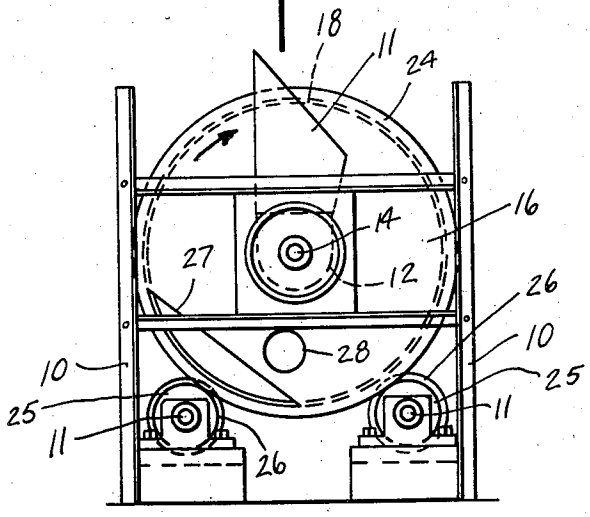


FIG. 2



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DRIER FOR AGGREGATES AND THE LIKE

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18 Claims. (Cl. 263—16)

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This invention relates to driers for aggregates and the like.

This invention is an improvement upon the drier illustrated, described and claimed in Patent No. 2,290,765, dated July 21, 1942. In actual use of this patented structure two serious operating objections were discovered. The first was, if the aggregate was quite moist, the resulting vapor in the intial drying stage did not have free escape but worked back and interfered with the second drying stage. The second was more serious and potentially dangerous. The resulting back pressure, as it were, frequently quenched one of the flames. The combustible mixture then accumulated in the drier until it accidentally ignited from the other flame. The result was an explosion of detonating and potentially devastating character.

The chief object of the present invention is to insure proper drying in both stages and more particularly to insure that one flame will always ignite the combustible mixture from the unlit torch before such mixture can accumulate in the drier to such a degree as to be dangerous.

The chief feature of the present invention consists in first stage venting and inclusion of ignition tubes in the drier.

Other objects and features of the present invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawing and the following specification and claims:

In the drawing

Fig. 1 is side elevation of a drier embodying the invention, the outer housing such as illustrated in said patent, if used, being omitted.

Fig. 2 is an elevational view of the aggregate supply and discharge end of the drier, the housing being omitted.

In the present form of the invention, like the aforesaid patent, the aggregate is supplied to and discharged from the same end of the drier. Differing from said patent, the moisture, burned gases, etc., discharge from the end opposite that last mentioned. This has certain operational advantages.

Herein 10 indicates framework that may be cased to form a housing as aforesaid. It also supports the hopper 11 leading to stationary supply passage 12 in which is mounted aggregate feed screw 13 carried by shaft 14 rotatable by suitable means not shown.

The screw feeds the aggregate in a regulated manner and degree into the rotatable drum structure and into the inner drum thereof. This

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inner drum has a tapered intake throat portion 15. The end wall 16 of the drum structure is stationary. The discharge end of tube 12 projects into the central aperture in the end 16 defined by collar 16a and into the intake end 15 as illustrated.

The inner drum includes a main frusto-conical body portion 17, which is a continuation of intake portion 15. An outer cylindrical drum 18 envelopes the inner drum and its right hand end, see Fig. 1, has a close fit with rim 16b of closure 16. Annular rings 19 and 20 are carried by the inner and outer drums interiorly and exteriorly, respectively, and suitably connected together by bolts, etc., 21. In this manner the inner drum is supported within and by the outer drum with a channel therebetween.

Within the inner drum and secured to the interior thereof and co-extensive with portion 17 thereof are the annularly spaced flights or vanes 22. These are pitched about 15° and six are utilized. These flights are spaced apart to somewhat delay aggregate travel so that aggregate travels longitudinally, both interiorly and exteriorly, notwithstanding the difference in drum diameters, and is substantially at equal rates and equal to the feeding rate of screw 13.

Secured to the interior of the exterior drum 18 are four flights of annularly spaced vanes 23, there being six in each flight and each pitched about 45°. Drum rotation is in the direction of the arrow, see Fig. 2, and the speed is about 10 R. P. M.

The exterior of drum 18 is provided with the bearing bands 24 and these in general are substantially as illustrated in Figs. 1 and 2 of said patent and as so illustrated one set of rollers 25 herein is smooth and the other set 26 is grooved. The power for shafts 11 is omitted for clearness.

The intake end of the drum structure has its stationary end 16 apertured at 27, which aperture is the aggregate outlet of the drum structure. End 16 is also apertured at 28 positioned slightly to the left of the central plane in Fig. 2. Adjacent said aperture 28 is a burner 29 ported at 30 and having nozzle 31 connected by an air line 32 to a source of air pressure and by fuel line 33, including valve 34, to a source of oil or gas under pressure.

This burner directs its flame into the drum structure through aperture 28 and within the annular channel between the inner and outer drums. The other end of the inner drum is open and terminates short of the adjacent end of the outer drum which carries an annular inwardly

directed shield 35 providing a large central opening. Carried by the frame 10 is a stationary plate 36, apertured at 37 and having an inwardly and downwardly directed deflector 39 at its upper edge which is slightly above the drum axis of rotation.

A similar burner 40, ported at 41 and having nozzle 42 connected to a source of air pressure by line 43 and a source of oil or gas under pressure by line 44 including valve 45, directs its flame through opening 37 and into the inner drum near the bottom thereof.

The aggregate is supplied in regulated amount and continuously by screw 13 from hopper 11 to the inner drum at the intake end. It is rotated by the blades 22 in drum rotation and is gradually worked to the left hand end of same, thus discharging to the other drum. Any aggregate discharged outwardly and from the inner drum engages deflector 39 and is returned to the outer drum. Any aggregate that falls down at this end and from the outer drum is also so returned by the baffle. The outer drum vanes, in drum rotation, work the aggregate back to the supply end until it is discharged through outlet 27.

Burner 40 also is off-center and to a greater degree than burner 29 and is at a higher elevation than the latter. The flame from burner 40 passes into the inner drum and passes toward the aggregate intake end thereof. Moisture in the aggregate is vaporized and rises in the drum with the hot products of combustion. The screw feed blocks escape from closure 16, so the aforesaid rises and returns and finally passes out through the central aperture in ring flange 35 and above plate 36 and deflector 39.

The flame from burner 29, entering at 28, passes along the drum structure in the annular channel between the inner and outer drums and finally discharges inwardly at the plate 35 and similarly escapes from the drum structure. The housing, not shown, may include a stack to facilitate such discharge.

The foregoing arrangement, accordingly, prevents the development of moisture excessive back pressure in the drum, since substantially no restrictions are included preventing, or materially retarding continuous flow and escape of vaporized moisture and products of combustion through and from the drum structure.

Reference will again be had to Fig. 1 wherein there is illustrated a plurality of tubes 50, open at opposite ends and projecting through the intake end of the inner drum substantially at the junction between portions 15 and 17 thereof. These tubes, of which two are herein illustrated at 180°, have their lesser divergent ends closest to burner 40 and positioned so that said ends successively register therewith. The greater divergent ends of said tubes are closest to burner 29 and positioned so that said ends successively register therewith.

Thus there is always restricted communication between the inner drum chamber and the outer annular channel. Furthermore, in drum rotation, at least every three seconds (10 R. P. M. times 2), a tube is aligned, as it were, between nozzles 29 and 40. Now if the burner flame, accidentally or intentionally, goes out for either burner, the flame from the other burner will ignite the unlighted combustible mixture, and before a dangerous concentration thereof builds up in the drum. Accordingly, danger of destructive explosions is completely eliminated. These two tubes also provide a pressure equalizing arrangement at the "closed" ends of the inner drum and annular chamber, so that the proper vapor and gaseous flow for the proper discharge thereof will occur.

The temperature of the inner drum chamber is appreciably higher than that in the outer annular chamber. The aggregate when discharged is dry and at about 260° to 300° F. If the collar 18*a* is appreciably larger than screw feed tube 12, hot gases will escape about said tube and heat same and thus preheat the aggregate in the worm tube creating a vapor pressure therein to seal, as it were, the inner drum at the intake end. This accounts for the interior of the inner drum being at a higher temperature than the outer annular chamber.

While the invention has been illustrated and described in great detail in the drawing and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture.

2. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inwardly directed burners are at different elevations and offset laterally of the drum structure vertical central plane.

3. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having

apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inwardly directed burners are at different elevations and offset laterally of the drum structure vertical central plane and inwardly directed flange means on the end of the outer drum opposite the intake end of the drum structure, and spaced longitudinally of the adjacent end of the inner drum and having an inner edge that is at a greater radial distance from the drum rotation axis than the burner adjacent that end of drum structure is spaced from the aforesaid axis for non-interfering flaming by the last mentioned burner of the drum structure central chamber and aggregate transfer from the inner to the outer drum.

4. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inwardly directed burners are at different elevations and offset laterally of the drum structure vertical central plane and inwardly directed flange means on the end of the outer drum opposite the intake end of the drum structure, and spaced longitudinally of the adjacent end of the inner drum and having an inner edge that is at a greater radial distance from the drum rotation axis than the burner adjacent that end of drum structure is spaced from the aforesaid axis for non-interfering flaming by the last mentioned burner of the drum structure central chamber and aggregate transfer from the inner to the outer drum, the second mentioned partial closure at its upper edge having an inwardly and downwardly directed deflector for the purpose set forth and terminating at its lower inner edge above the flame path from said last mentioned burner.

5. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means.

6. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation.

7. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the

end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, the inner drum end of the tube means being distant from said axis substantially the distance from the same that the second mentioned burner is therefrom.

8. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, the outer drum end of the tube means being distant from the said axis slightly less than the distance from the same that the first mentioned burner is therefrom.

9. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, the inner drum end of the tube means

being distant from said axis substantially the distance from the same that the second mentioned burner is therefrom, the outer drum end of the tube means being distant from the said axis slightly less than the distance from the same that the first mentioned burner is therefrom.

10. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure.

11. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the intake end burner being laterally offset to a lesser degree.

12. An aggregate drier comprising in combination a rotatable drum structure including an in-

ner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the inner drum end of the tube means being distant from said axis substantially the distance from the same that the second mentioned burner is therefrom.

13. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the outer drum end of the tube means being distant from the said axis slightly less than the distance from the same that the first mentioned burner is therefrom.

14. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the inner drum end of the tube means being distant from said axis substantially the distance from the same that the second mentioned burner is therefrom, the outer drum end of the tube means being distant from the said axis slightly less than the distance from the same that the first mentioned burner is therefrom.

15. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the intake end burner being laterally offset to a lesser degree, the inner drum end of the tube means being distant from said axis substantially the distance from the same that the second mentioned burner is therefrom.

16. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure

for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the intake end burner being laterally offset to a lesser degree, the outer drum end of the tube means being distant from the said axis slightly less than the distance from the same that the first mentioned burner is therefrom.

17. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means extending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means, the burners being at different elevations, the intake end burner being at a greater distance from the structure axis of rotation, both burners being offset laterally of the central vertical plane of the drum structure, the intake end burner being laterally offset to a lesser degree, the inner drum end of the tube means being distant from said axis substantially the distance from the same that the second mentioned burner is therefrom, the outer drum end of the tube means being distant from the said axis slightly less than the distance from the same that the first mentioned burner is therefrom.

18. An aggregate drier comprising in combination a rotatable drum structure including an inner drum and an outer drum through which aggregate passes in succession, a stationary closure for one end of said drum structure having apertures through which aggregate is supplied to the inner drum, and aggregate is discharged from the outer drum, a burner arranged to flame the interior of the outer drum and through a closure aperture therein, a stationary partial closure at the opposite end of the drum structure, the central inner drum chamber and included outer annular chamber venting therefrom above the latter closure, the inner drum at the said opposite end of the structure terminating short of the adjacent end of the outer drum for aggregate transfer, said latter closure having an aperture therein, and a second burner flaming the interior of the inner drum through the last mentioned aperture, and wherein there is provided a feed screw device for aggregate supply, the axis of which is coincident with the drum structure rotation axis, the screw device adjacent end portion of the inner drum being appreciably tapered and the remainder of the inner drum being of frusto-conical type, the opposite end of the inner drum terminating adjacent but slightly spaced from the outer drum, the latter being substantially cylindrical and longer than the inner drum at the said opposite end thereof and wherein the inner drum is of tapering type with its smallest end constituting the aggregate intake of the structure, and protector tube means exending angularly through the inner drum adjacent the intake end thereof, the end of said tube means closest to the intake end of the structure being at a greater distance from the structure axis of rotation than the opposite end of the said tube means.

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