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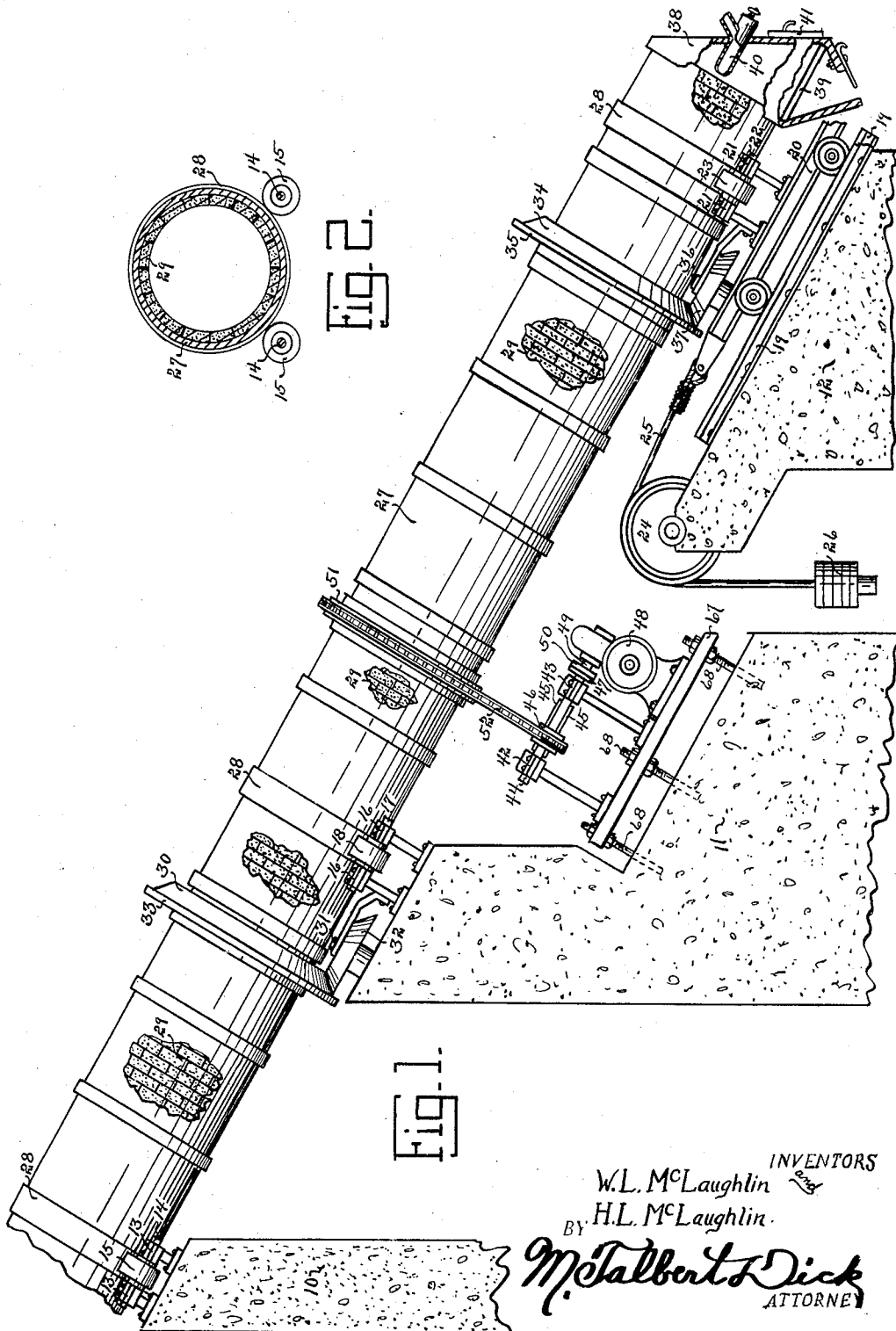
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GARBAGE INCINERATOR

Filed Sept. 3, 1931

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

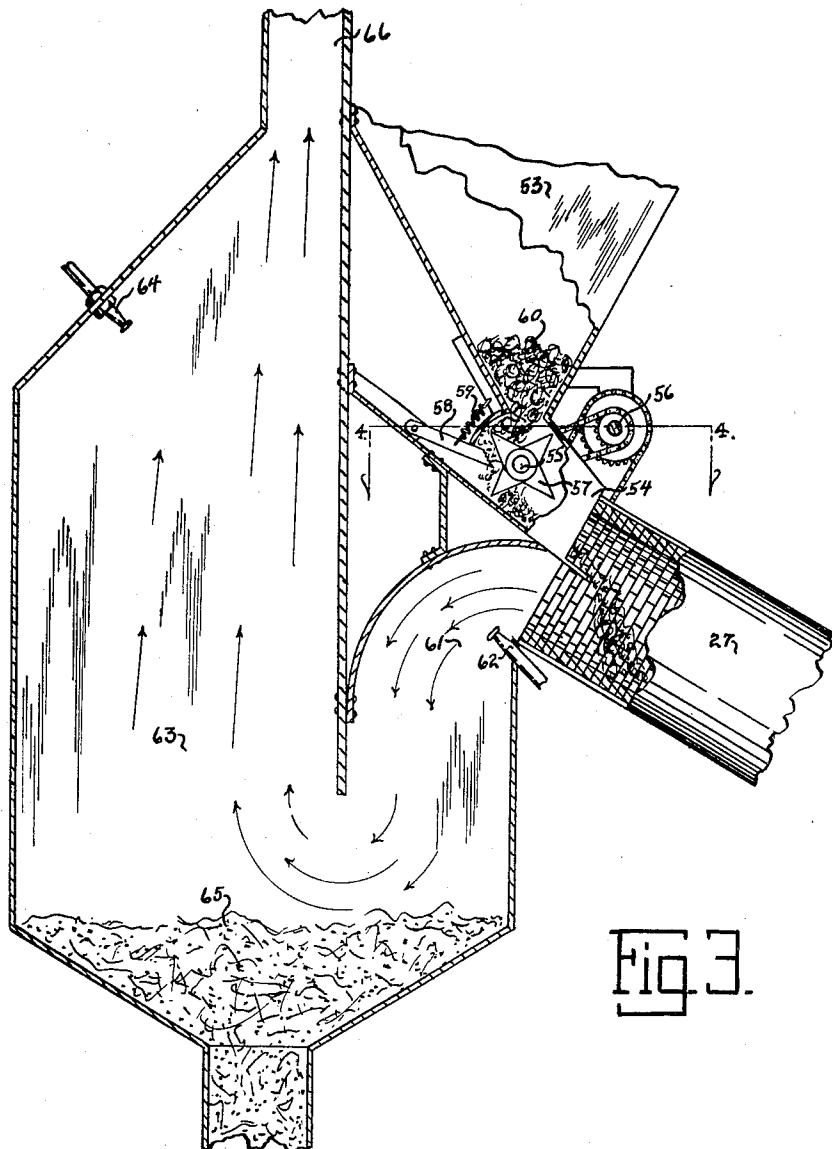


Fig. 3.

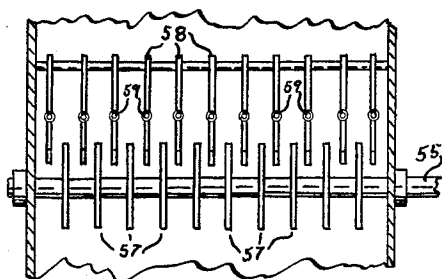


Fig. 4.

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GARBAGE INCINERATOR

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6 Claims. (Cl. 110—14)

The principal object of our invention is to provide an apparatus for the disposing of waste matter such as garbage and the like by dehydration and combustion.

A further object of our invention is to provide a garbage incinerator that is odorless during the garbage burning function.

A still further object of our invention is to provide a garbage incinerator that tears up or otherwise disintegrates the mass of waste before it reaches the cremating zone.

A still further object of this invention is to provide a garbage incinerator that automatically compensates for contraction and expansion due to temperature changes.

A still further object of our invention is to provide a garbage incinerator that is operated with a minimum amount of power.

A still further object of our invention is to provide a garbage incinerator that eliminates any possibility of the fine ash from the incinerated waste from escaping into the surrounding atmosphere.

A still further object of our invention is to provide a garbage incinerator that is economical in manufacture and durable in use.

These and other objects will be apparent to those skilled in the art.

Our invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, in which:

Fig. 1 is a side view of the main portion of our invention installed and ready for use with sections cut away to more fully illustrate its construction.

Fig. 2 is a cross sectional view of the apparatus.

Fig. 3 is a side sectional view of the receiving end and hot gas escape assembly of the device.

Fig. 4 is a top plan view of the masserator and assembly taken on line 4—4 of Fig. 3.

The disposing of garbage is very costly due to the fact that it is subjected to fire in its original wet condition. It is known that garbage consists of about one-third wet paper, one-third vegetable offal, such as leaves, peelings, trimmings, and decayed matter, and the balance is composed of meat scraps, bones, package paper, and the like. This means that approximately seventy percent of ordinary garbage is combustible material and if properly distributed is almost sufficient to dry and incinerate the whole mass. We accomplish our objects by first cutting the waste material into small particles and then continuously and progressively drying the same as it moves toward the cremating zone in the rotatably mounted drying and cremating tube.

As an aid to this end we use a powdered coal

burner which extends into the lower discharge end of the drying and cremating tube.

Referring to the drawings we have used the numerals 10, 11, and 12 to designate three spaced apart supporting base members. These supporting base members progressively increase in height as they extend to the left, as shown in Fig. 1, and have their upper surfaces each extending upwardly and to the left at an angle approximately that of the angle at which they increase in height relative to each other. Mounted on the top of the base 10 are two pairs of spaced apart bearing members which we have designated by the numeral 13. Rotatably mounted in each pair of bearing members 13 is a shaft 14 carrying a roller 15, as shown in Fig. 2. The numeral 16 designates a similar set of two pairs of spaced apart bearing members, but secured to the top of the base 11. Rotatably mounted in each pair of bearing members 16 is a shaft 17 carrying a roller 18. The numeral 19 designates two spaced apart track members mounted on the base 12 and arranged in parallel relation with the shafts 14 and 17. The numeral 20 designates a wheeled vehicle mounted for movement on the tracks 19. The numeral 21 designates two pairs of spaced apart bearing members similar to the bearing members 13 and 16, but rigidly secured on the vehicle 20. Rotatably mounted in each of these bearing members is a shaft 22 carrying a roller 23. It will here be noted that all of the shafts 14, 17, and 22 extend upwardly and to the left and are parallel with each other. It will also be noted that each of the rollers 15, 18, and 23 are positioned between the two bearing members that support them.

The numeral 24 designates a comparatively large pulley wheel rotatably mounted at the upper end of the base 12, as shown in Fig. 1. The numeral 25 designates a cable or like embracing the upper portion of the pulley wheel 24. This cable has one end rigidly secured to the vehicle 20 and its other end rigidly secured to a weight 26 suspended a substantial distance below the pulley wheel 24. The numeral 27 designates our elongated drying and cremating tube rotatably mounted and supported on the three pairs of rollers 15, 18, and 23. The numeral 28 designates peripheral strengthening band tracks embracing the drying and cremating tube at points where the tube would otherwise engage the rollers 15, 18, and 23. The numeral 29 designates a brick or stone lining inside the metallic drying and cremating tube.

We will now describe the method of preventing the downward creeping of the drying and cremating tube while it is rotating. The numeral 30 designates a ring rigidly secured to and embracing the drying and cremating tube some distance from its upper end portion. This ring 30

has a forty-five degree angle face on its periphery. The face of this ring may be considered to face toward the lower end of the tube 27 and outwardly. The numeral 31 designates a shaft rigidly secured to the top of the block 11 and positioned directly below the tube 27. This shaft 31 extends transversely of the longitudinal axes of the shafts 17. The numeral 32 designates a comparatively small wheel rotatably mounted on the shaft 31. This wheel 32 has a forty-five degree angle face on its periphery, which may be considered to face upwardly and outwardly to contact and properly engage the angle face of the ring 30. The numeral 33 designates a peripheral flange integrally formed on the outer marginal edge of the ring 30. This flange extends transversely of the longitudinal axis of the tube 27 and extends below the extreme marginal edge of the wheel 32, as shown in Fig. 1.

By this arrangement, the upper portion of the drying and cremating tube will be prevented from serious downward movement relative to the supports 10, 11, and 12 with a minimum amount of friction. The numeral 34 designates a ring that is an exact duplicate of the ring 30, but which is secured around the tube 27 near the lower end portion of the tube. The peripheral flange on this ring 34 at its extreme marginal edge is designated by the numeral 35. The numeral 36 designates a shaft rigidly secured to the vehicle 20 and positioned directly below the tube 27. This shaft is parallel with the shaft 31 and carries the rotatably mounted wheel 37, which is an exact duplicate of the wheel 32. From the drawings it will be noted that this wheel 37 contacts and engages the ring 34 in the same manner as the wheel 32 engages the ring 30. The peripheral flanges 33 and 35 eliminate any possibility of the rings 30 and 34 with the tube 27 moving downwardly and to the right over the retaining wheels 32 and 37 respectively.

By the wheel 37 and rollers 23 being mounted on the vehicle 20, the lower portion of the drying and cremating tube below the ring 30 may contract and expand with temperature changes and without in any way affecting its continued and successful operation. This, of course, is made possible by the possible movement of the vehicle 20 with the contracting and expanding movements of the tube 27. The weight 26 should be sufficient, however, to slightly more than compensate for the tendency of the tube 27 to creep and move downwardly to the right. This tendency for the tube 27 to creep and move downwardly to the right is due to the fact that it extends upwardly and to the right at an angle from the horizontal.

The numeral 38 designates a capping member loosely embracing the lower right end of the drying and cremating tube. This member 38 has an opening 39 in its bottom for the outlet of the garbage ash. The numeral 40 designates a powdered coal burner extending through the cap 38 and pointing into the lower discharge end of the tube 27. The numeral 41 designates an air gate on the cap 38 for permitting air to enter the tube 27 and promote successful combustion.

We will now describe the apparatus for rotating the drying and cremating tube. The numerals 42 and 43 designate two spaced apart bearing members rigidly secured to the base 11 and positioned below the tube 27. Rotatably mounted in these two bearing members is a shaft 44 having longitudinal splines 45 on its periphery and between the two bearing members 42 and 43. Slid-

ably mounted on this shaft 44 and positioned between the two bearing members 42 and 43 is the comparatively small sprocket gear 46. Although this gear 46 may slide on the shaft 44 it is held from independent rotation relative to the same by the splines 45. The numeral 47 designates a drive plate rigidly secured on one end of the shaft 44. The numeral 48 designates a prime mover mounted on the base 11 and adjacent the bearing member 43. This prime mover has a drive shaft 49 which carries the driving plate 50 for engagement with the driving plate 47. The numeral 51 designates a comparatively large sprocket gear rigidly secured to and embracing the tube 27. This gear 51 is above the shaft 44. The numeral 52 designates an endless sprocket chain embracing the gears 46 and 51. By this construction when the prime mover is rotating the drying and cremating tube 27 will be rotating slowly. By the gear 46 being slidably mounted on the shaft 44, the tube 27 may move in either direction longitudinally by contraction and expansion without seriously affecting the above described driving mechanism.

The numeral 53 designates a hopper for receiving the garbage or waste to be incinerated. This hopper empties into a large conduit 54 which terminates inside the upper portion of the upper receiving end of the drying and cremating tube. Rotatably mounted in the conduit 54 is a shaft 55. The numeral 56 designates a prime mover operatively connected by any suitable means to the shaft 55. Inside the conduit and rigidly secured to the shaft 55 are a plurality of cutting and revolving feeder knives 57. The numeral 58 designates a plurality of retarding fingers pivoted at their upper ends and extending between the paths cut by the feeder knives 57, as shown in Fig. 4. These fingers are yieldingly held in close proximity to the cutting knives 57 by coil springs 59. By this construction the garbage or waste will be cut into fine particles before it reaches the inside of the drying and cremating tube. If the garbage, which we have designated by the numeral 60, possesses any uncuttable or unbreakable matter the fingers 58 will give way by virtue of the springs 59 and let such material pass into the tube.

If the device is operating, the material fed into the entrance end of the tube 27 will slowly work toward the discharge end of the tube by the rotation of the tube. In actual practice, the tube 27 will operate in zones in that its upper end portion will act as a drying zone while the central portion and discharge end portion will act as a cremating zone. The brick or rock lining 29 not only holds the greater percent of the heat inside the tube, but permits the outside of the tube to be comparatively cool, for obvious reasons. The length of the tube 27 and the speed of rotation of the same should be such that by the time the garbage reaches the lower discharge end of the tube it will be reduced to an ash or clinker ash.

The heat from the burner 40 and the heat and smoke from the burning garbage will pass upwardly in the tube 27 and will tend to dry the garbage in the drying zone of the tube. In order that the gases, odors, and fine dust will not escape to the outside atmosphere, we discharge the same from the upper end of the tube 27 into a downwardly extending compartment 61. The numeral 62 designates a liquid spraying device for spraying a liquid into the compartment 61. The numeral 63 designates a comparatively large

upwardly extending compartment communicating at its bottom to the bottom of the compartment 61. The numeral 64 designates a second liquid spraying device for spraying a liquid inside the compartment 63. The liquid from these sprays will neutralize and condense the odors, smoke, and material entering the compartments and cause the same to settle into the receiving hopper 65 communicating with the bottoms of the compartments 63 and 61. Another reason for the settling of the small particles carried by the gases is that due to the increased size of the compartment 63 the speed with which the gases carrying the material passes through the same is much reduced, thereby encouraging the minute particles to fall and settle in the member 65. The numeral 66 designates an ordinary smoke pipe leading from the top of the compartment 63. By this arrangement of parts the air passing out of the pipe 66 will not pollute the outside atmosphere.

From the foregoing, it will readily be seen that we have provided a very desirable and efficient garbage incinerator. In order to tighten the chain 52 to compensate for wear or the like the bearing members 42 and 43 and the prime mover may be adjustably and accurately positioned toward or away from the tube 27. In the drawings we have accomplished this by mounting the bearing members 42 and 43 and the prime mover on a table 67 which is adjustably supported to the supporting member 11 by the threaded rods 68 which have nuts at each side of the table member, as shown in Fig. 1.

Some changes may be made in the construction and arrangement of our improved garbage incinerator without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

We claim:

1. In a device of the class described, a plurality of supporting members, a pair of spaced apart rollers rotatably mounted on each of said supporting members, an elongated tube resting on said rollers, a prime mover for rotating said tube, a supporting member below the lower end portion of said tube, a movable member on said last mentioned supporting member, a means for yieldingly holding said movable member in one direction, a wheel rotatably secured to said movable member, a ring rigidly secured to and embracing said tube for engagement with said wheel, and a fire producing means communicating with the lower end portion of said tube.

2. In a garbage incinerator, a supporting member, an elongated tube, a means for rotatably mounting the upper end portion of said tube on said supporting member, a second supporting member below the lower end portion of said tube and having a height less than the height of the first mentioned supporting member, an inclined track on said last mentioned supporting member, a vehicle on said track, a yielding means for holding said vehicle in one direction, a means for rotatably supporting the lower end portion of said tube on said vehicle, a ring rigidly secured to and embracing said tube, a wheel rotatably mounted on said vehicle and engaging said ring, and a fire producing means communicating with the lower end portion of said tube.

3. In a garbage incinerator, a supporting member, an elongated tube, a means for rotatably

mounting the upper end portion of said tube on said supporting member, a second supporting member below the lower end portion of said tube and having a height less than the height of the first mentioned supporting member, an inclined track on said last mentioned supporting member, a vehicle on said track, a yielding means for holding said vehicle in one direction, a means for rotatably supporting the lower end portion of said tube on said vehicle, a ring rigidly secured to and embracing said tube, a wheel rotatably mounted on said vehicle and engaging said ring, a fire producing means communicating with the lower end portion of said tube, a bearing member secured to one of said supporting members, a shaft rotatably mounted in said bearing member, a prime mover operatively engaging said shaft, a slidably mounted gear on said shaft incapable of independent rotation relative to said shaft, a gear rigidly secured to and embracing said tube, and a means for operatively connecting said two gears to each other.

4. In a garbage incinerator, a supporting member, an elongated tube, a means for rotatably mounting the upper end portion of said tube on said supporting member, a second supporting member below the lower end portion of said tube and having a height less than the height of the first mentioned supporting member, an inclined track on said last mentioned supporting member, a vehicle on said track, a yielding means for holding said vehicle in one direction, a means for rotatably supporting the lower end portion of said tube on said vehicle, a bevel faced ring rigidly secured to and embracing said tube, a bevel faced wheel rotatably mounted on said vehicle and engaging said bevel faced ring, a fire producing means communicating with the lower end portion of said tube, a bearing member secured to one of said supporting members, a shaft rotatably mounted in said bearing member, a prime mover operatively engaging said shaft, a slidably mounted sprocket gear on said shaft incapable of independent rotation relative to said shaft, a sprocket gear rigidly secured to and embracing said tube, and an endless chain embracing both of said sprocket gears.

5. In a device of the class described, a supporting member, an elongated tube, a means for rotatably mounting one end portion of said tube on said supporting member, a supporting member below the other end portion of said tube, a movable member on said last mentioned supporting member, a means for yieldingly holding said movable member in one direction, a means for rotatably supporting the end portion of said tube on said movable member, a stop means on said tube for preventing the independent movement of said movable member in one direction, a prime mover for rotating said tube, and a fire producing means communicating with the inside of said tube.

6. In a device of the class described, a supporting member, an elongated tube, a means for rotatably mounting one end portion of said tube on said supporting member, a second supporting member below the other end portion of said tube, a movable vehicle on said last mentioned supporting member, a means for rotatably mounting the end portion of said tube above said vehicle on said vehicle, a prime mover for rotating said tube, and a fire producing means communicating with the inside of said tube.

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