

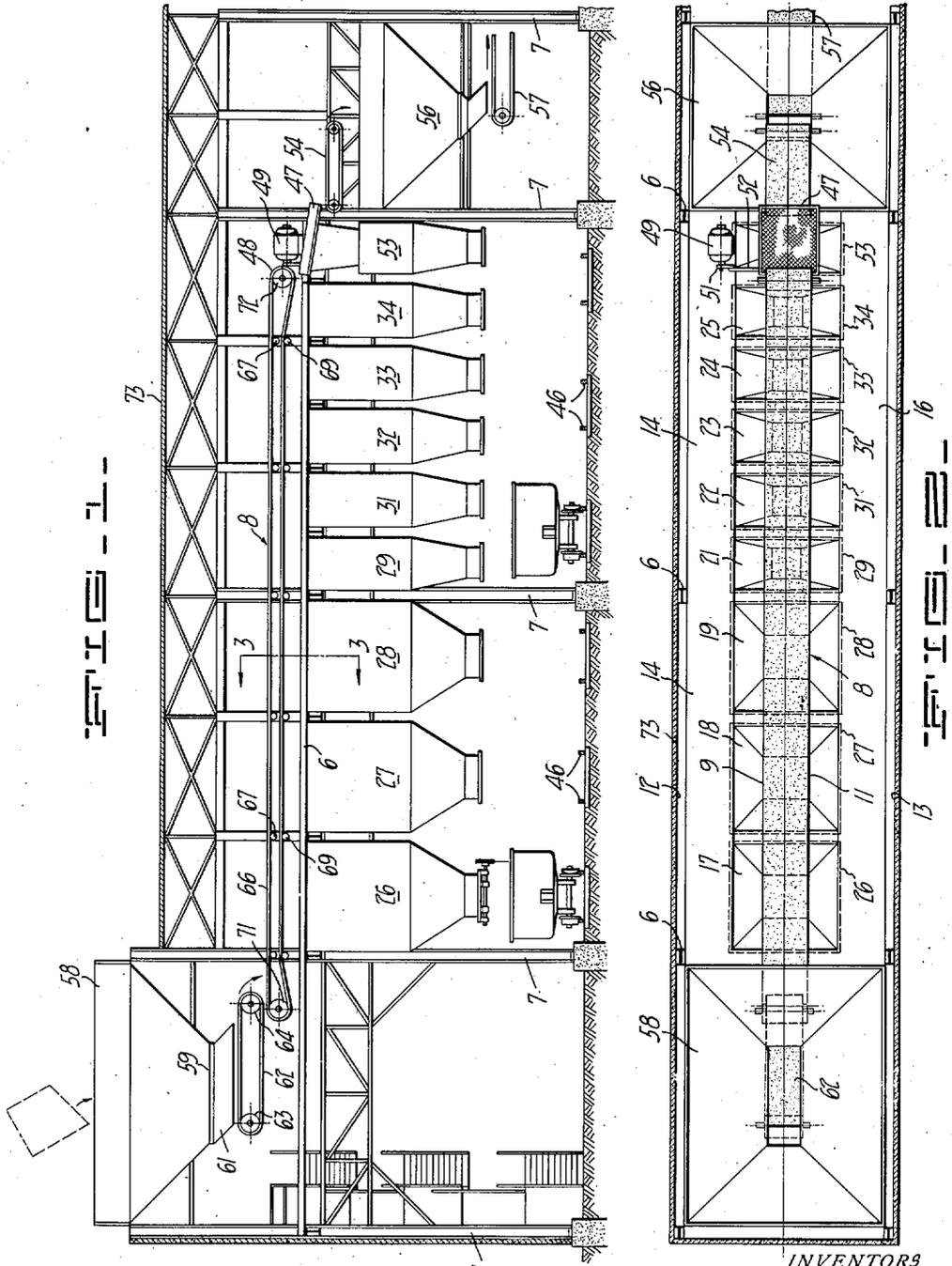
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GARBAGE DISPOSAL PLANT SORTING APPARATUS

Filed Sept. 17, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

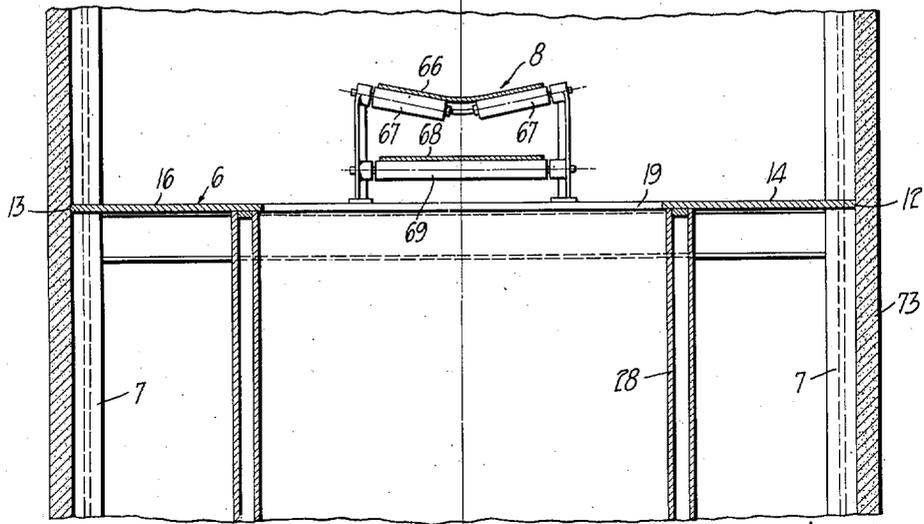


FIG. 3.

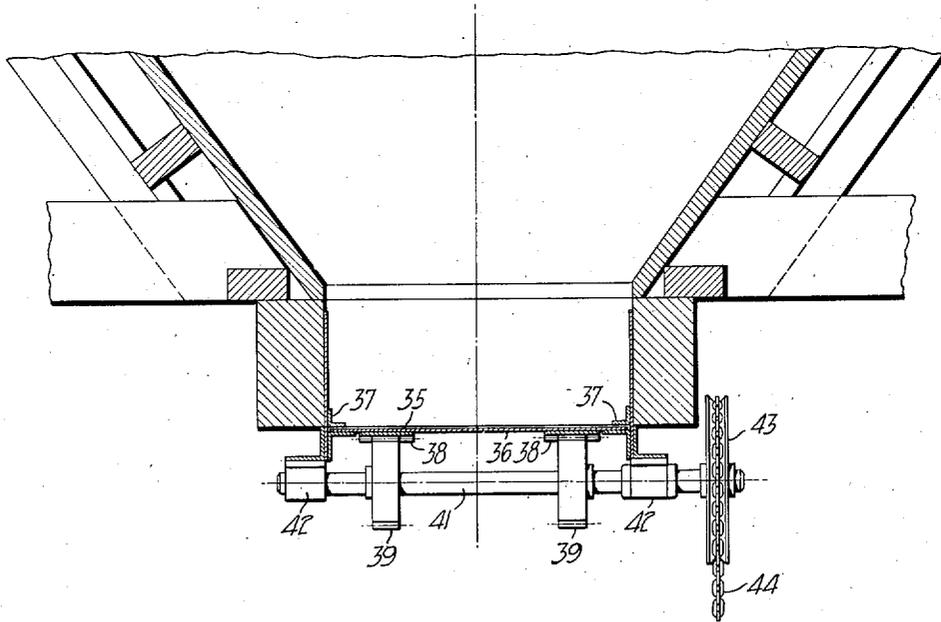


FIG. 4.

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GARBAGE DISPOSAL PLANT SORTING APPARATUS

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1 Claim. (Cl. 209—2)

The invention relates to methods and apparatus for disposing of garbage, particularly on a large scale basis such as garbage disposal systems and plants for cities, communities and the like.

In practically all garbage gathered by scavengers for disposal there is a certain content of marketable material, such as cardboard, paper, tin cans, rags, bones, glass, metal and the like. In garbage disposal systems some attempt is usually made to salvage these materials prior to disposal of the garbage by whatever disposal process is used, such as incineration or dumping. The removal of such materials provides two main advantages in that first, such removal is a revenue procedure and secondly, the material removed is to a large extent non-combustible and the removal of such material prior to incineration saves a substantial amount of fuel and affords a substantial reduction of incinerator residue.

In accordance with the above, it has been the practice heretofore in many instances to pile the garbage in relatively small lots at the disposal plant and have workmen pick out from the garbage so piled whatever marketable or non-combustible materials are to be removed from the garbage. This segregating procedure is very inefficient inasmuch as it requires much loss movement in picking over the garbage and in collecting the segregated materials in appropriate quantities for shipping. The procedure also is unsanitary, as the garbage is left in piles for some time and considerable spoilation is apt to result. This latter condition not only produces offensive and obnoxious odors but attracts great swarms of flies and other insects, which may carry contagious germs to the surrounding community. The accumulation of garbage also carries with it the danger of possible spontaneous combustion.

In accordance with the present invention, and as a principal object thereof, the garbage when received at the disposal plant is almost immediately set into movement and continues to move through a sorting apparatus for the removal of marketable and non-combustible materials, whereby large quantities of garbage may be efficiently and rapidly handled without possibility of accumulation of garbage and attendant disadvantages above noted.

Another object of the invention is to provide an apparatus of the character above which may be used in a roomy, well lighted and well ventilated building and operated under sanitary conditions in compliance with rigid regulations of

the health of the workers and the general welfare of the community.

A further object of the invention is to provide an apparatus of the character above in which the marketable materials removed from the garbage are deposited in bins where the same are immediately accessible for loading directly from the bins into trucks or railway cars or the like.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claim.

Referring to said drawings:

Figure 1 is a side elevation of a garbage disposal plant sorting apparatus constructed in accordance with the present invention.

Figure 2 is a plan view of the apparatus illustrated in Figure 1.

Figure 3 is a fragmentary vertical cross sectional view of a part of the apparatus and is taken substantially upon the plane of line 3—3 of Figure 1.

Figure 4 is an enlarged fragmentary cross sectional view of one of the discharge gates used in the present apparatus.

The apparatus of the present invention and as illustrated in the accompanying drawings consists of an elongated platform 6 which is supported in elevated position by suitable means, such as a plurality of vertical columns 7. Mounted over the upper surface of the platform is an elongated conveyor 8, here shown in the form of an endless belt and which is positioned substantially centrally of the platform and in substantially parallel relation thereto for the majority of the length of the platform. The transverse dimension of the conveyor 8 is less than that of the platform, so as to provide between the side edges 9 and 11 of the belt and the adjacent longitudinal side edges 12 and 13 of the platform, a pair of walkways 14 and 16. Provided in the platform 6 and exposed to the upper surface thereof at opposite sides of the conveyor 8 are a plurality of longitudinally spaced openings 17, 18, 19, 21, 22, 23, 24 and 25, which are adapted for receipt of various materials removed from the conveyor. The removal of material from the conveyor into the openings is readily

effected by attendants positioned along the walkways 14 and 16, provided with suitable devices for engaging and removing cans, paper, cardboard and the like. A plurality of bins 26, 27, 28, 29, 31, 32, 33 and 34, are mounted under the platform in registration with the openings for receiving the materials removed from the conveyor. Preferably, separate bins are used for different materials to be removed such as cardboard, paper, tin cans, rags, bones, glass and scrap metal and the like, so that each attendant may be assigned to removing particular materials from the conveyor. This arrangement also conveniently segregates the various materials so that no further sorting is necessary of the materials removed from the conveyor.

Each of the bins is provided with a discharge opening 35 (see Fig. 6) at the lower end thereof which is normally closed by a gate 36. The gate is removably secured to the bottom of the bin and as here shown, the gate 36 is slidably carried by guides 37 on the bin for movement to and from a closed position across the lower discharge end 35 of the bins. Means for so displacing the gates here include a pair of racks 38 on the underside of the gates which are engaged by pinions 39 carried by a shaft 41 rigidly supported at the underside of the bins by bearings 42. Any suitable means may be used for rotating the shaft and causing a corresponding displacement of the gate and as here shown, we mount on the shaft a sprocket 43 which is rotated by means of a chain 44 extending below the bin for manual manipulation.

In accordance with the present arrangement, the elevation of the platform 6 and the size and arrangement of the bins is such that the lower ends of the bins will be positioned at a substantial elevation over the ground so as to enable direct loading from the bins into trucks or railway cars or the like. As here shown, a plurality of sets of railway tracks 46 are mounted under the bins and extend transversely with respect to the platform so that a plurality of railway cars may be positioned under the bins for loading of marketable materials from the bins directly to the cars.

As a further feature of the construction, we position a shaking screen 47 at the discharge end 48 of the conveyor for receipt of garbage from the conveyor. This screen is appropriately oscillated as by means of a motor 49, crank 51 and link 52 connected to the screen and serves to segregate from the garbage dirt, ashes, and other fine products contained in the garbage and which for the most part are not combustible and interfere with the proper incineration of the remainder of the garbage. The loose ashes and dust and the like, if not removed by the screen, will for the most part blow out of the furnace with the gases of combustion and unless some provision is made for removing these products from the flue gases, the same will blow out through the stack and deposit on the adjacent property. A bin 53 is supported under the screen 47 for collecting the material removed by the screen. From the screen 47 the garbage is ready for disposal and may be passed directly to a furnace or the like. As here shown, the garbage is received from the screen 47 onto a conveyor 54 which deposits the same into a bin or hopper 56, from where the garbage passes by way of a conveyor 57 to the part of the plant effecting the disposal of the garbage.

The garbage is usually received at the plant from trucks or the like which collect the garbage

from the homes in the community and the garbage is thus deposited in intermittent lots into a receiving container or hopper 58. This hopper as illustrated in Figure 1, is preferably positioned adjacent the end of the platform 6 and may be loaded either directly from the trucks or other cars delivering the garbage to the plant or the same may be loaded by suitable auxiliary conveyor or elevator or hoist means. Since the elevation of the top of the receiving hopper 58 is considerable and in a large size plant, approximately fifty to sixty feet over the ground, it is usually desirable to carry the garbage from the ground level to the receiving hopper by means of a skip-hoist or the like.

The garbage is removed from the hopper 58 through the lower discharge end 59 into a spreader box 61 and thence onto a short conveyor 62 for delivery onto the receiving end of conveyor 8. The spreader box 61 functions to level out the garbage on the conveyor 62 so that a substantially uniform and constant rate of flow of garbage from the hopper and onto the sorting conveyor 8 is produced. The conveyor 62, similar to the conveyor 8, is preferably formed as an endless belt and is supported adjacent the opposite ends of the spreader box 61 on rollers 63 and 64. The upper side 66 of the endless belt 8 is preferably supported in a slidably concave shape so as to better retain the garbage on the belt and this shape of the belt may be maintained by the use of a plurality of inclined rollers 67 (see Figure 3) supporting the top side 66 of the belt. The lower or return side 68 of the belt may be supported on a plurality of longitudinally spaced transversely extending rollers 69. The belt may be supported and driven at its opposite longitudinal ends by rollers 71 and 72.

The entire apparatus is preferably used in a suitable building 73 which may completely enclose the apparatus so as to protect the workmen from inclement and other severe weather throughout the year, and to prevent the access of flies and other insects to the garbage. At the same time, the building is well ventilated and lighted for healthful working conditions of the attendants.

It will now be understood that the garbage, although received in intermittent lots at the disposal plant, is almost immediately after receipt set in motion and continues to move through the sorting apparatus without possibility of accumulation of the garbage at any point in the sorting apparatus. In this manner, the garbage is rapidly and efficiently handled during the removal of marketable and non-combustible materials, and further the marketable materials when deposited in the bins are made immediately available for shipment without further segregation and with minimum handling.

We claim:

In a garbage disposal plant adapted to receive garbage containing non-combustible and marketable materials, a sorting apparatus for removing said materials to facilitate disposal of the remainder of the garbage by incineration and comprising, an elongated platform, a conveyor extending longitudinally of said platform and having a width less than that of said platform to define between the side edge of said conveyor and a longitudinal side edge of said platform a walkway, said platform being provided with a plurality of openings in said walkway adjacent said conveyor to receive said materials deposited therein from said conveyor, a garbage receiving

bin adjacent one end of said platform, a second conveyor for conveying garbage from said storage bin to said first conveyor, a plurality of storage bins mounted under said platform in registration with said openings, a shaker screen mounted at the delivery end of said conveyor and adapted to receive garbage therefrom, a bin mounted under and in registration with said shaker screen,

another bin mounted adjacent said shaker screen for receipt of garbage rejected by said screen, and a third conveyor for conveying the garbage from said last named bin to a disposal incinerator or the like.

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