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MEANS FOR CONVEYING CANS IN EXHAUSTERS, COOKERS, &c.

APPLICATION FILED APR. 18, 1911.

**1,023,087.** **Patented Apr. 9, 1912.**

Fig. 1.

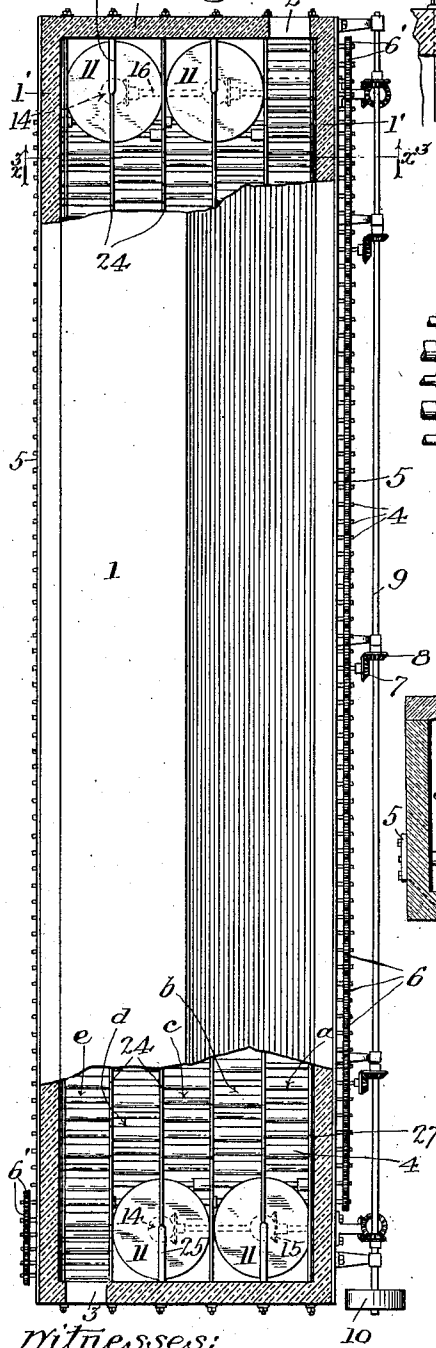



Fig. 2.

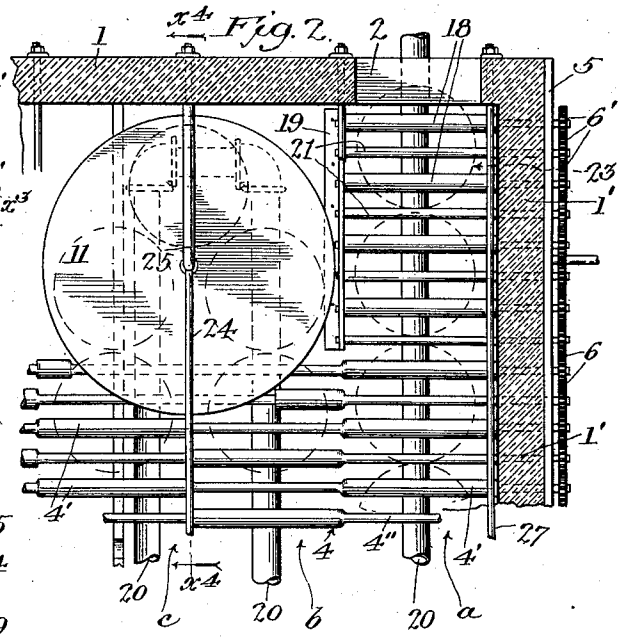



Fig. 3.

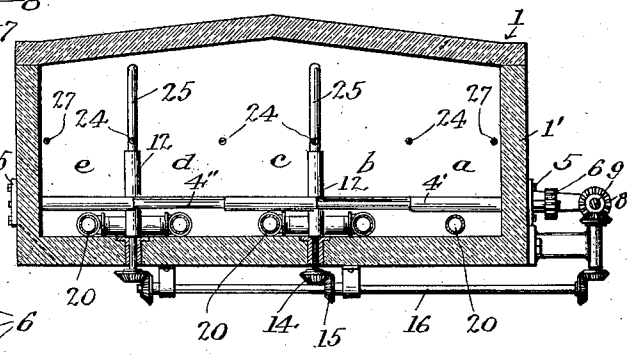
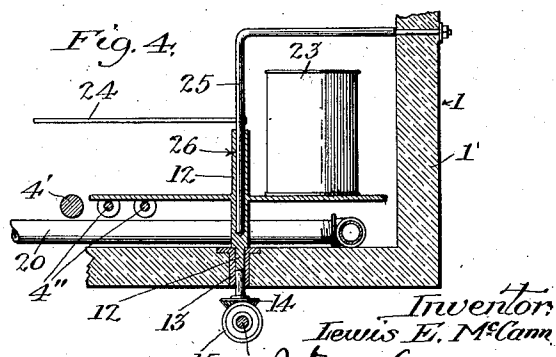



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## MEANS FOR CONVEYING CANS IN EXHAUSTERS, COOKERS, &c.

1,023,087. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed April 18, 1911. Serial No. 621,882.

*To all whom it may concern:*

Be it known that I, LEWIS E. McCANN, a citizen of the United States, residing at Ontario, in the county of San Bernardino and State of California, have invented a new and useful Means for Conveying Cans in Exhausters, Cookers, &c., of which the following is a specification.

This invention relates to means for conveying cans in a zigzag or tortuous path through a receptacle or casing, the object of the invention being to utilize substantially the entire space within the casing and to cause the cans to traverse said space by passing back and forth in a series of parallel runs.

The main object of the invention is to provide simple and effective means for moving the cans in this manner.

Other objects of the invention will appear hereinafter.

The accompanying drawings illustrate the invention, and referring thereto: Figure 1 is a plan of the apparatus, partly broken away to show the interior construction. Fig. 2 is a horizontal section on an enlarged scale of the portion of the apparatus adjacent to the can receiving means. Fig. 3 is a section on line $x^3$—$x^3$ in Fig. 1. Fig. 4 is a vertical section on line $x^4$—$x^4$ in Fig. 2.

1 designates a casing or inclosing means through which the cans are to be passed, said casing being provided with an inlet opening 2 for receiving the cans and an outlet opening 3 for delivery of the cans. The conveying means comprises a plurality or series of shafts 4 journaled in bearings 5 in the side walls 1′ of the casing 1, said shafts extending parallel to one another and transversely in the casing. Each shaft 4 is provided with portions of different diameter, said shaft being, in case of a conveyer having more than two runs, provided with a plurality of larger portions 4′ and a plurality of smaller or reduced portions 4″, said shafts being alternately disposed with relation to the location of their reduced portions so that in any longitudinal line along the casing successive shafts will present alternating reduced and unreduced or larger portions. The larger portions of the shafts form a carrier for supporting the cans, and are arranged in different sections, *a*, *b*, *c*, etc., extending side by side, longitudinally of the casing. The shaft portions which are in the section *a* adjacent to one side of the casing will present, for example, a large portion in the first shaft, a reduced portion in the second shaft, a large portion in the third shaft, and so on. In the next section *b*, the first shaft will present a reduced portion, the second shaft a large portion, and so on, the order being the reverse to what it is in the first section. The third section *c* is similar to the first and reverse to the second, and so on.

Means are provided for driving adjacent shafts in opposite directions, so that in any one section of the series of shafts, the unreduced or larger shaft-portions are moving in the same direction on their upper faces and serve as conveyer elements for conveying the cans continuously forward in a longitudinal direction. The reduced shaft-portions are moving in this section in the opposite direction to the larger shaft-portions, but their motion is not effective in conveying the cans as they are too small to make contact with the bottom of the cans. In the next section *b* of the series of shafts, the larger shaft-portions, being on shafts alternating with those of the unreduced shaft-portions of the first section *a*, are moving on their upper faces in the opposite direction to the motion of the first section forming conveying elements operating to convey the cans in such opposite direction. The several sections *a*, *b*, *c*, etc., act as successive runs of the zigzag conveyer, the effective motion being in opposite directions in successive runs. To drive the said shafts in the manner stated, they may be connected by gears 6, each shaft carrying a gear 6 meshing with the gear 6 at each side thereof, so that a continuous train of gears 6 is provided from end to end of the apparatus, whereby the adjacent shafts are driven in opposite directions. Driving power may be communicated to this train of gears at any desired point or points, for example, by bevel gears 7 on certain of the shafts 4, said bevel gears 7 engaging with bevel gears 8 on a longitudinal shaft 9 provided with any suitable driving means, such as pulley 10.

Means are provided for transferring the cans from the end of each section or run of the conveyer to the adjacent end of the next section or run, said means consisting of

a disk 11 carried by a vertical shaft 12 mounted in a bearing 13 and driven by any suitable means, such as bevel gear 14 on said vertical shaft engaged by a bevel gear 15 on a transverse shaft 16. The disk 11 aforesaid is preferably thin and the adjacent portions of the shafts 4 are reduced or cut away, as indicated, so that the upper faces of said disks may extend flush with the tops of the several shafts 4 and the cans may pass smoothly off of the shafts onto said disks or off of the disks onto the shafts, as the case may be. Guide bars 24 may be provided within the casing extending longitudinally of said casing between the sections *a*, *b*, etc., each guide bar extending from a bracket 25 at the axis of a transfer disk 11 to the farther end of the casing. Said bracket 25 may extend from the end of the casing adjacent to said transfer disk longitudinally of the casing and then downwardly to engage in a socket or bearing 26 in the shaft 12 of said transfer disk. The portion of said bracket extending outwardly from the end of the casing is at a sufficient height above the transfer disk to allow of the passage of the cans thereunder, as shown in Fig. 4, but the bar 24 extending from said bracket to the farther end of the casing is at a lower height so as to extend between the rows of cans on the sections of the conveyer and guide the same in their travel. Outside guide bars 27 are provided extending from end to end of the casing near the side walls of the casing.

To receive the cans at the inlet opening and to deliver the cans at the outlet opening, auxiliary conveying devices may be used comprising a plurality of shafts 18 mounted in bearings 19, said shafts 18 being connected by a train of gears 6′ on said shafts and on intermediate shafts 21 which are of smaller diameter, said train of gears rotating the shafts 18 in the same direction as the larger shaft portions 4′ in the same section or run of the conveyer.

In order to provide the requisite heat for treatment of the cans in their passage through the casing 1, in case the invention is used in connection with an exhauster, cooker or other similar device, heating means, such as steam coils or pipes 20, are provided within the casing, said steam pipes being connected to steam supply means.

The operation is as follows: The cans, indicated in dotted lines at 23 in Fig. 2, are supplied to the inlet opening 2 by any suitable feeding means and pushed onto the receiving conveyer constituted by the shafts 18, the rotation of said shafts causing the cans to be rolled forward onto the first of the shafts 4 in the first run or section *a* thereof. The shafts 4 being rotated by the train of gears 6 aforesaid in opposite directions and the larger portions 4′ of said shafts which are in this first section being all rotated forwardly so that their upper faces move forward in the direction of the arrow in Fig. 1, the cans are carried along on said larger portions 4′, each such larger portion rolling the can along onto the second shaft in advance, skipping the intermediate shaft whose corresponding portion 4″ is of smaller diameter. When the can is moved forward in this manner until it reaches the end of the first run or section *a* of the conveyer, it is pushed by the last shaft 4 onto the transfer disk 11, the rotation of which carries the can around onto the corresponding end of the next run or section *b* of the conveyer. In this second run or section *b* of the conveyer, the larger portions 4′ of the shafts are on those shafts which are rotating rearwardly or in a direction in which their upper faces move rearwardly toward the inlet end of the conveyer, so that the can supported on said larger portions is moved or rolled thereon rearward to the inlet end of the casing where it is taken by the transfer disk at said inlet end and again returned to the forwardly extending run or section *c* and so on until the last run or section is reached, the cans being delivered from the forward or delivery end of said last section to the shafts 18 of the delivery means, which carry the can out through the outlet opening 3. While the cans are being carried through the casing in this manner, the casing is heated by operation of the heating means 20 or in any other suitable manner to perform the exhausting, cooking, or other operation upon the contents of the cans.

An important feature of the operation of the apparatus as above described is that the cans are carried forward by rolling contact with the rollers, so that the can is at all times supported on rolling surfaces and is not subjected to sliding contact with the supporting means, thereby obviating considerable wear and damage to the cans by friction due to the sliding contact.

What I claim is:

1. In combination with a casing, a conveyer therein comprising a plurality of shafts mounted side by side in said casing, each of said shafts having portions of different diameter at different portions of its length, means for driving all of said shafts in such manner that the adjacent shafts are driven in opposite directions, the shafts which are rotating in one direction having their enlarged portions extending in corresponding positions forming a series of conveyer elements arranged longitudinally in the casing, and the shafts which are rotating in the opposite direction having their enlarged portions extending in corresponding positions forming another series of conveyer elements arranged longitudinally of the casing parallel to the first named series.

2. The combination with a casing, of a conveyer means therein comprising a series of shafts journaled side by side in said casing, each of said shafts having an enlarged and a reduced portion, said enlarged and reduced portions alternating in opposite order along the series of shafts forming two series of conveyer elements, and driving means connected to all of said shafts to cause all of the shafts having their larger portions in corresponding positions to rotate in the same direction.

3. In combination with a casing, a series of shafts journaled therein, means for rotating all of said shafts in such manner that adjacent shafts rotate in opposite directions, alternate shafts having enlarged portions arranged in corresponding positions in the casing forming a series of conveyer elements rotating in the same direction, and the intermediate shafts in the series having enlarged portions arranged in corresponding positions to form a series of conveyer elements arranged parallel to the first named series and moving in the opposite direction, and means at the ends of the series of shafts for transferring articles from the delivery end of each series of conveyer elements to the receiving end of the next series of conveyer elements.

4. In combination with a casing, a series of shafts journaled therein, means for rotating all of said shafts in such manner that adjacent shafts rotate in opposite directions, alternate shafts having enlarged portions arranged in corresponding portions in the casing forming a series of conveyer elements rotating in the same direction, and the intermediate shafts in the series having enlarged portions arranged in corresponding positions to form a series of conveyer elements arranged parallel to the first named series and moving in the opposite direction, and means at the ends of the series of shafts for transferring articles from the delivery end of each series to the receiving end of the next series, each of said transferring means comprising a disk mounted to rotate on a vertical axis and extending over adjacent portions of the conveyer shafts, said shafts being cut away to receive said disk and the upper pieces of the said disk being flush with the tops of the enlarged portions of the shafts.

5. A conveyer comprising a series of parallel shafts mounted side by side and provided with larger and smaller portions arranged in sections, the said larger and smaller shaft portions being arranged in alternating order in each section of the series of shafts, and being arranged in reverse order in adjacent sections, and means for rotating said shafts in such manner that all of the shafts having their larger portions in the same sections rotate in the same direction and the intermediate shafts rotate in the opposite direction.

6. A conveyer comprising a series of parallel shafts mounted side by side and provided with larger and smaller portions arranged in sections, the said larger and smaller shaft portions being arranged in alternating order in each section of the series of shafts, and being arranged in reverse order in adjacent sections, and means for rotating said shafts in such manner that all of the shafts having their larger portions in the same section rotate in the same direction and the intermediate shafts rotate in the opposite direction, said means comprising a train of gears on said shafts, the gear on each shaft engaging the gear on each of the adjacent shafts, and means for driving said train of gears.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 13th day of April, 1911.

LEWIS E. McCANN.

In presence of—
F. A. CRANDALL,
FRANK L. A. GRAHAM.