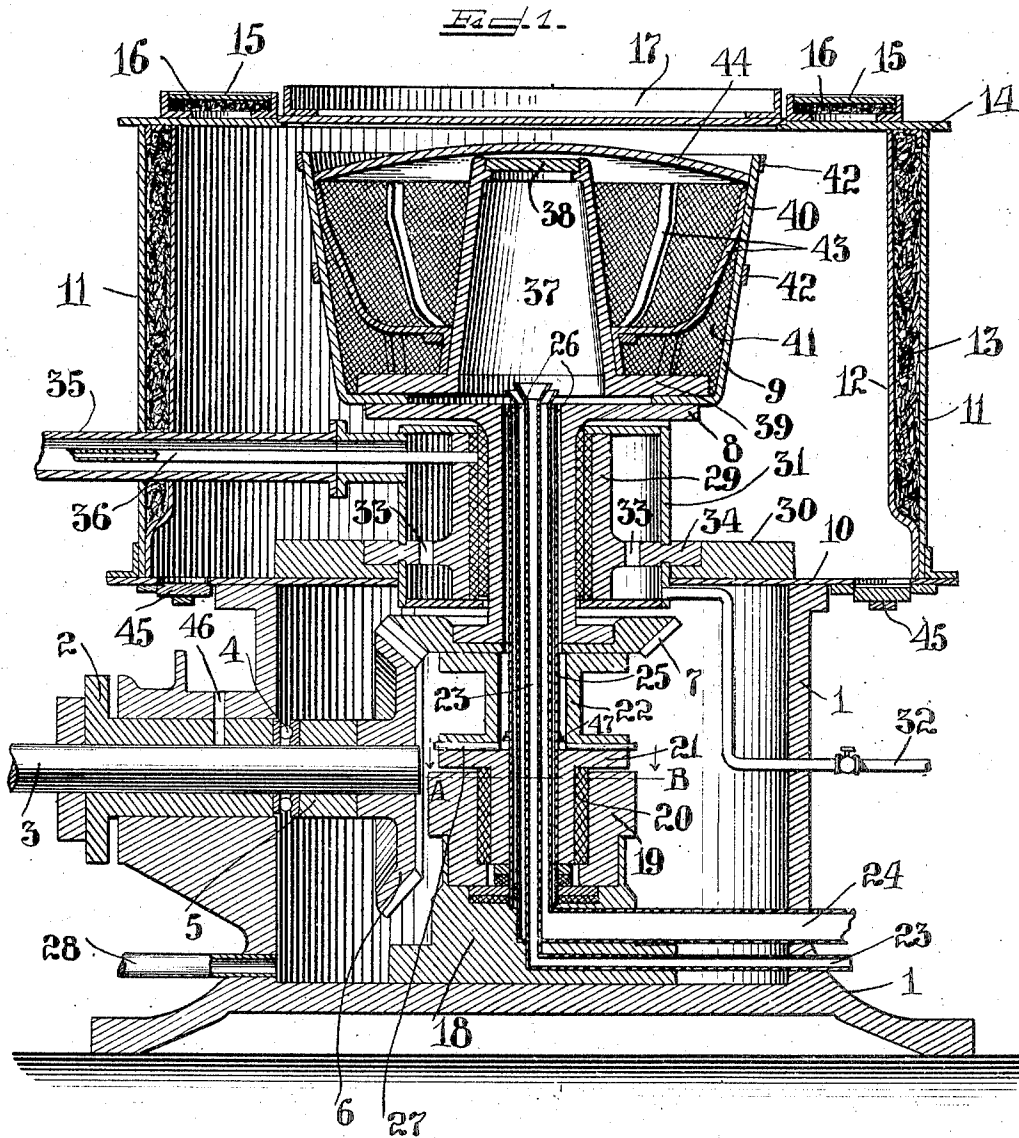


E. C. HIGGINS.
 APPARATUS FOR EXTRACTING TIN FROM TIN SCRAPS.
 APPLICATION FILED NOV. 17, 1908.

965,580.

Patented July 26, 1910.

2 SHEETS—SHEET 1.



Attest:
[Signature]
 C. S. Ashley

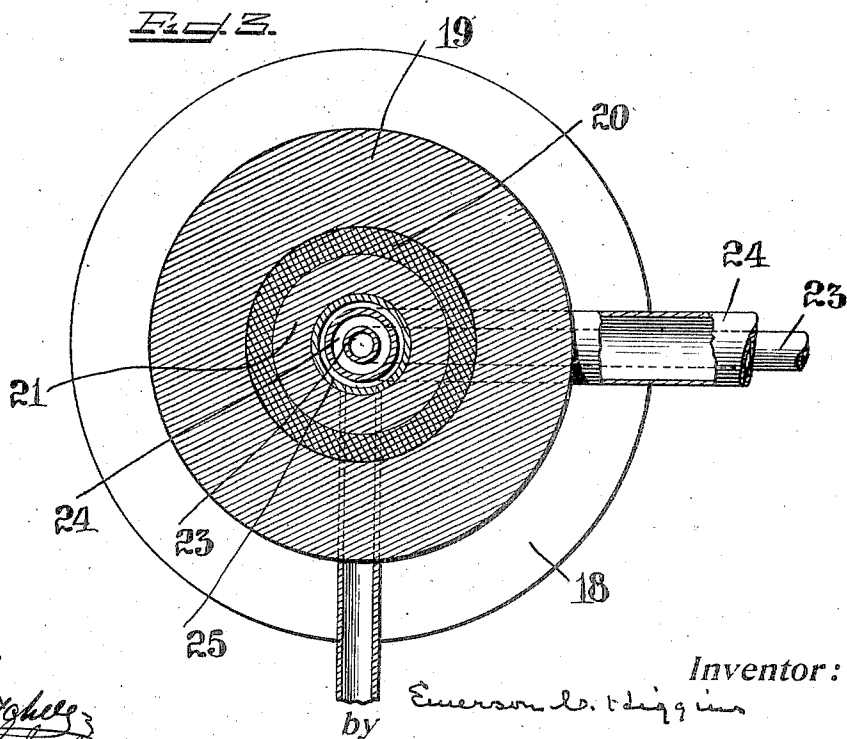
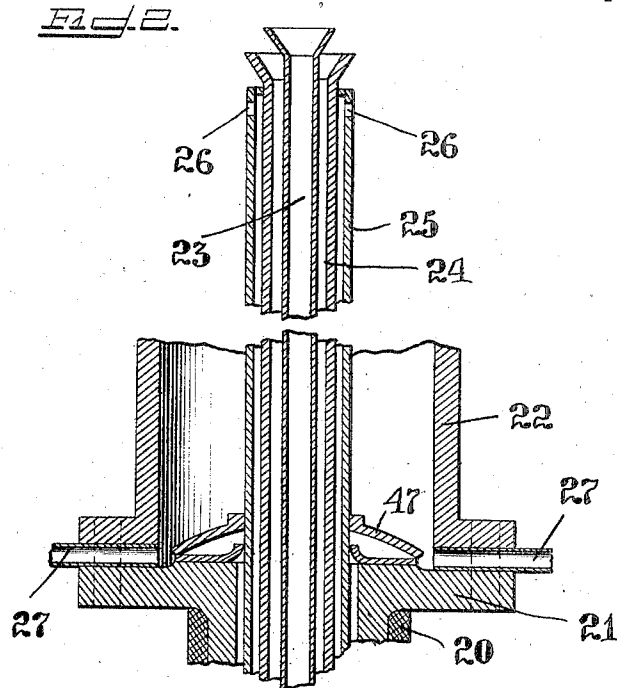
by Emerson C. Higgins Inventor:
 Lawrence E. Martin
 his Atty

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Attest:
W. S. Mitchell
C. S. Ashley

Inventor:
 Emerson C. Higgins
 by *Arthur C. Mason* Atty

UNITED STATES PATENT OFFICE.

EMERSON CORSON HIGGINS, OF BAYONNE, NEW JERSEY, ASSIGNOR OF ONE-HALF TO
ALFRED D. BRITTON, TRUSTEE, OF BROOKLYN, NEW YORK.

APPARATUS FOR EXTRACTING TIN FROM TIN SCRAPS.

965,580.

Specification of Letters Patent.

Patented July 26, 1910.

Application filed November 17, 1908. Serial No. 463,008.

To all whom it may concern:

Be it known that I, EMERSON C. HIGGINS, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Extracting Tin from Tin Scraps, of which the following is a specification.

This invention relates to an improved apparatus for extracting tin from tin scraps, such as old tin cans for example, and has for its object a simple and economical means for accomplishing the result.

In the following is described, in connection with the accompanying drawings, one embodiment of the invention.

In said drawings Figure 1 is a vertical sectional elevation of one form of apparatus illustrating the invention; Fig. 2 is an enlarged vertical sectional view of a detail of construction partly broken away; and Fig. 3 is a sectional view along the line A—B of Fig. 1 looking in the direction of the arrows.

Similar numerals of reference indicate similar parts throughout the several views.

1 represents a base or standard of any suitable material, preferably cast iron, having air openings (not shown) in its sides and provided with a bearing 2 for shaft 3.

4 is a ball bearing interposed between bearing 2 and collar 5. Shaft 3 is adapted to be driven by any suitable means (not shown). Gear wheel 6 is mounted on shaft 3 and is adapted to engage gear wheel 7 keyed to bearing 8 which supports basket 9.

10 is a plate or table resting on the top of standard 1 and adapted to support a receptacle 11, preferably circular in form.

Within receptacle 11 and concentric therewith is a wall 12 so spaced from receptacle 11 as to leave an air space 13 between the two. A cover 14 is adapted to rest on receptacle 11 and cover the top of the same.

15 is a false top adapted to leave an air space 16 between cover 14 and the atmosphere. Air spaces 13 and 16 may be packed with some non-conducting material such as asbestos to confine as much heat as possible within the apparatus.

17 is a cover adapted to close a central aperture in cover 14 whereby access may be had to basket 9.

Bearing 8, carrying gear 7 is supported from beneath by a suitable thrust bearing resting on casting 18 fastened to the bottom of base or standard 1.

19 is a casting resting on casting 18 and adapted to support a suitable bronze bearing 20. The thrust bearing comprises a flanged collar 21 fastened to a neck piece 22 which in turn is fastened to gear 7. The thrust bearing is provided with the usual protective bearings to overcome friction. Bearing 8, gear 7 and the thrust bearing are centrally apertured to permit the passage of pipes 23, 24 and 25 which are respectively adapted to convey air, fuel and water into the apparatus. Pipe 23 is preferably flared at the top in order to throw the flame outward. The air, fuel and water may be supplied under pressure from any suitable containers (not shown).

Pipe 25 is closed at the top and near the top is provided with openings 26 to permit the water to be forced out and against the inner face of bearing 8. The space between bearing 8 and pipe 25 is closed at the top, the water running out into the interior of base 1, through pipes 27 between neck 22 and collar 21. Pipe 28 conducts this waste water or other liquid from the interior of base 1 to any suitable point. Bearing 8 turns in a suitable friction bearing 29 supported from ring 30 on plate 10. Friction bearing 29 is surrounded by a water jacket 31 to which water is supplied under pressure from any suitable source through a pipe 32. Openings 33 permit the water to circulate through the water jacket on both sides the support 34 for bearing 29.

35 is the discharge pipe for water jacket 31. Pipe 36 is adapted to convey oil from any suitable supply to bearing 29 and preferably passes through pipe 35 in order that the oil in pipe 36 may be kept cool by the water in pipe 35.

Basket 9 is provided with a centrally arranged combustion chamber 37, preferably in the form of a truncated cone as shown. The combustion chamber 37 is closed at the top by a suitable cover 38 and is preferably imperforate. Combustion chamber 37 is preferably flanged at the bottom as at 39, ribs 40 of basket 9 being clamped between flange 39 and bearing 8. A space 41 is thus

left between bearing 8 and flange 39 which is adapted to protect bearing 8 from the heat. Ribs 40 are surrounded by and support a suitable wire mesh 41 preferably held in place by reinforcing strips 42.

Ribs 43, preferably the same in number as ribs 40, are adapted to form a false bottom on which rests the bundles of tin scraps from which the tin is to be removed. A cover 44 closes the top of basket 9.

45 is an opening through which the tin may be discharged from receptacle 11.

46 is an oil hole for supplying oil to bearing 2.

47 is a protecting flange fastened to pipe 25 in order to deflect the water through holes 27 and to prevent it from escaping down into the lower bearings.

The operation of the apparatus is as follows: The covers 17, 38 and 44 being removed, the bundle of tin scraps is thrown into basket 9, resting on the false bottom formed by ribs 43. The air and the fuel supply, preferably gas under pressure, is then admitted to the combustion chamber through pipes 23 and 24 respectively, and the water for cooling the bearings is turned on. The fuel is then ignited and the covers replaced. The products of combustion escape from the combustion chamber as by leakage. Power is then applied to shaft 3, causing the basket 9 to be rapidly rotated through the means disclosed. The speed of rotation is preferably 650 revolutions per minute. The walls of the combustion chamber become heated sufficiently to radiate heat in the basket at a temperature sufficient to melt the tin, although the flame does not contact with the tin and hence cannot oxidize the same. The space between the false bottom formed by ribs 43 and the bottom of basket 9 permits the radiated heat to easily pass up through the tin from beneath as well as through the upwardly extending walls of the combustion chamber. The melted tin is thrown off the scraps and out of basket 9 through wire mesh 41 and against wall 12 by centrifugal force. The tin is permitted to cool and may from time to time be removed through openings 45.

It is obvious that the details of construction may be considerably varied without departing from the spirit of the invention and I do not restrict myself to the specific means shown.

What I claim and desire to secure by Letters Patent is:

1. In an apparatus of the character described, a rotatable basket, ribs forming a false bottom therein, a bearing for said basket, a gear on said bearing and means for driving said gear.

2. In an apparatus of the character described, a rotatable basket, a bearing there-

for, a water jacket around a portion of said bearing, a gear on said bearing and means for driving said gear.

3. In an apparatus of the character described, a rotatable basket, a bearing therefor, a water jacket around a portion of said bearing, a discharge pipe for said water jacket, means for conveying oil to said bearing through said discharge pipe, a gear on said bearing and means for driving said gear.

4. In an apparatus of the character described, a double walled receptacle, non-heat conducting material between said walls and a rotatably supported basket within said receptacle.

5. In an apparatus of the character described, a rotatably supported basket, a centrally apertured bearing therefor, a plurality of concentric pipes within said bearing, means permitting water to flow from one of said pipes around the inside of said bearing and means for discharging said water.

6. In an apparatus of the character described, a rotatably supported basket, a bearing therefor, means for admitting water within said bearing and means moving with said bearing for discharging the water therefrom.

7. In an apparatus of the character described, a rotatably supported basket, a centrally arranged combustion chamber within said basket, a centrally apertured bearing for said basket and concentrically arranged pipes in said bearing, one of said pipes being adapted to conduct fuel and another of said pipes being adapted to convey air to said combustion chamber and both of said pipes flaring outwardly at the top.

8. In an apparatus of the character described, a rotatably supported basket, a centrally arranged closed combustion chamber within said basket, means for supplying fuel to said combustion chamber and means for directing the flame against the walls of said combustion chamber.

9. In an apparatus of the character described, a rotatably supported basket, a cover therefor, a centrally arranged combustion chamber in said basket, a cover therefor and a false bottom within said basket, the space between the basket proper and the false bottom forming a heat radiating chamber.

10. In an apparatus of the character described, a rotatably supported basket, a centrally apertured bearing therefor, means for supplying water to the inside of said bearing, means for discharging the water from said bearing and means for deflecting the water into said last named means.

11. In an apparatus of the character described, a horizontally rotatable basket, a vertical bearing therefor, an imperforate

walled combustion chamber within said basket, a gear on said vertical bearing and means for driving said gear.

5 12. In an apparatus of the character described, a rotatably supported basket, a bearing therefor, a water jacket around said bearing and means for supplying water to the inside of said bearing.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses. 10

EMERSON CORSON HIGGINS.

Witnesses:

K. G. LE ARD,
E. P. LA GAY.