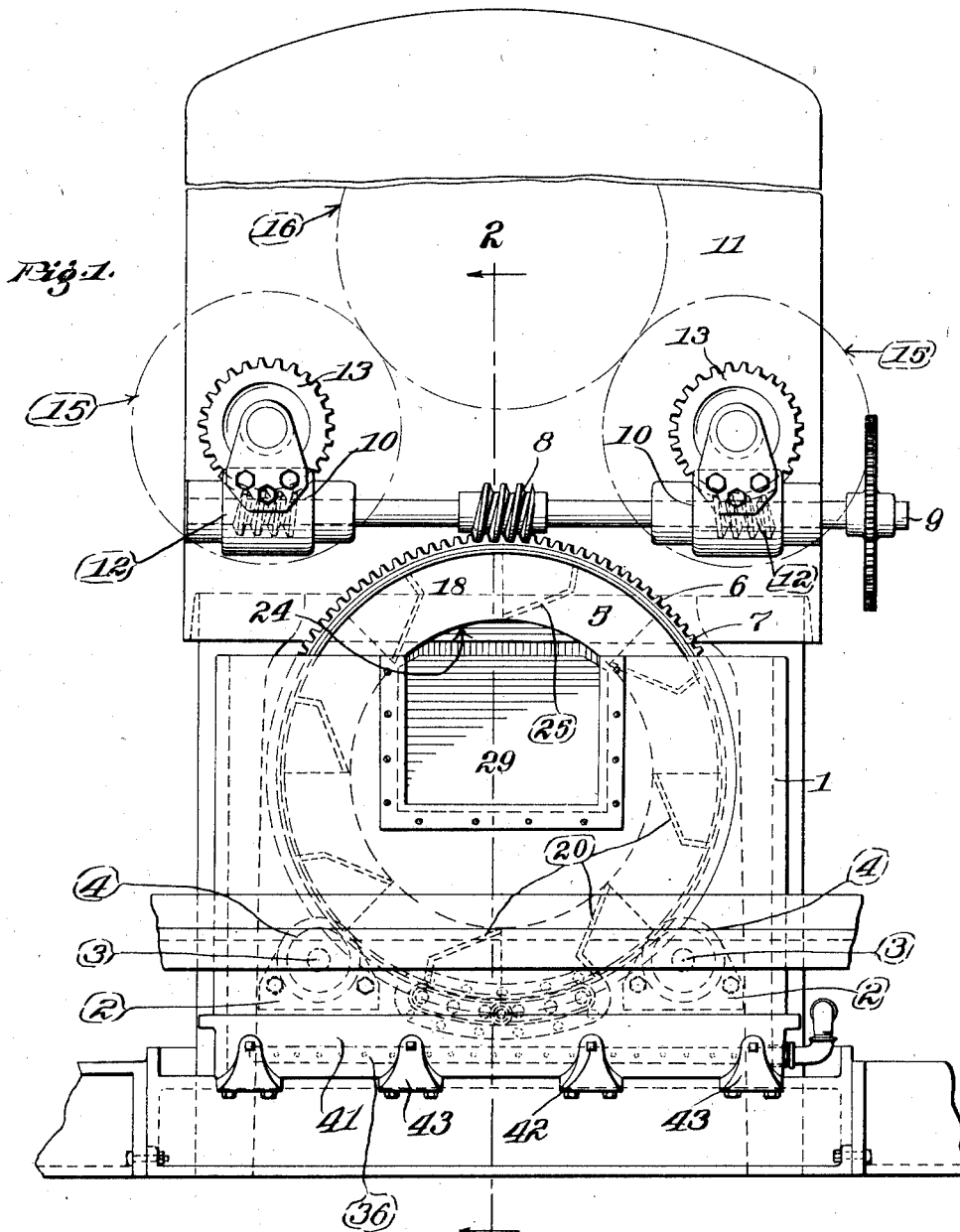


O. SCHLAUPITZ.
 QUENCHING MACHINE.
 APPLICATION FILED JAN. 2, 1920.

1,385,402.

Patented July 26, 1921.

2 SHEETS—SHEET 1.



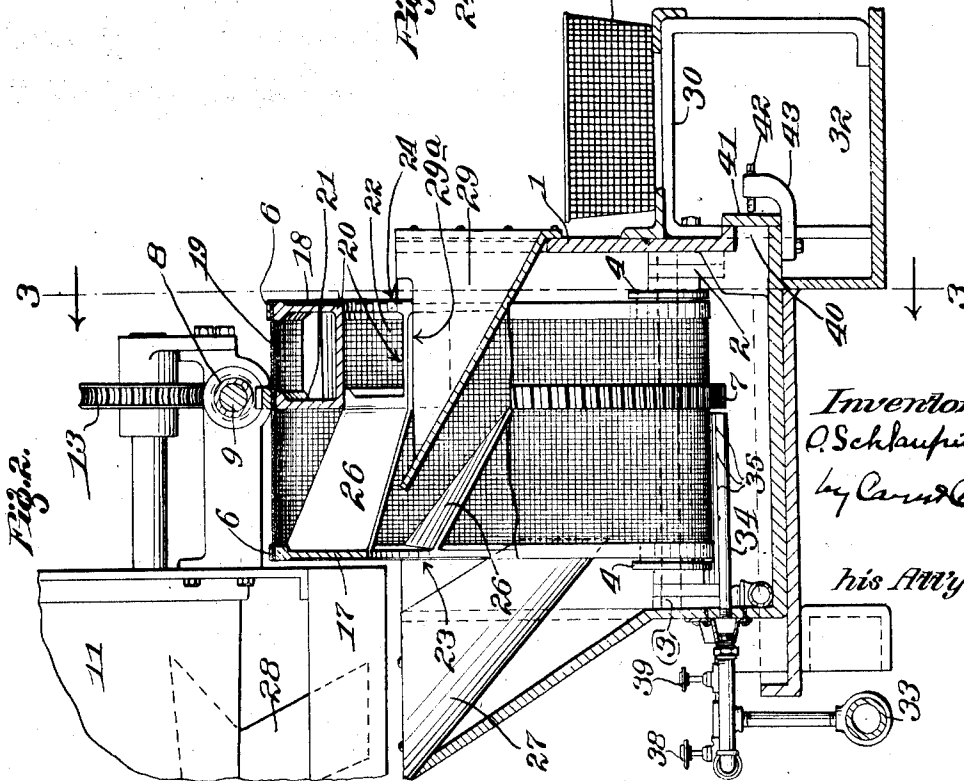
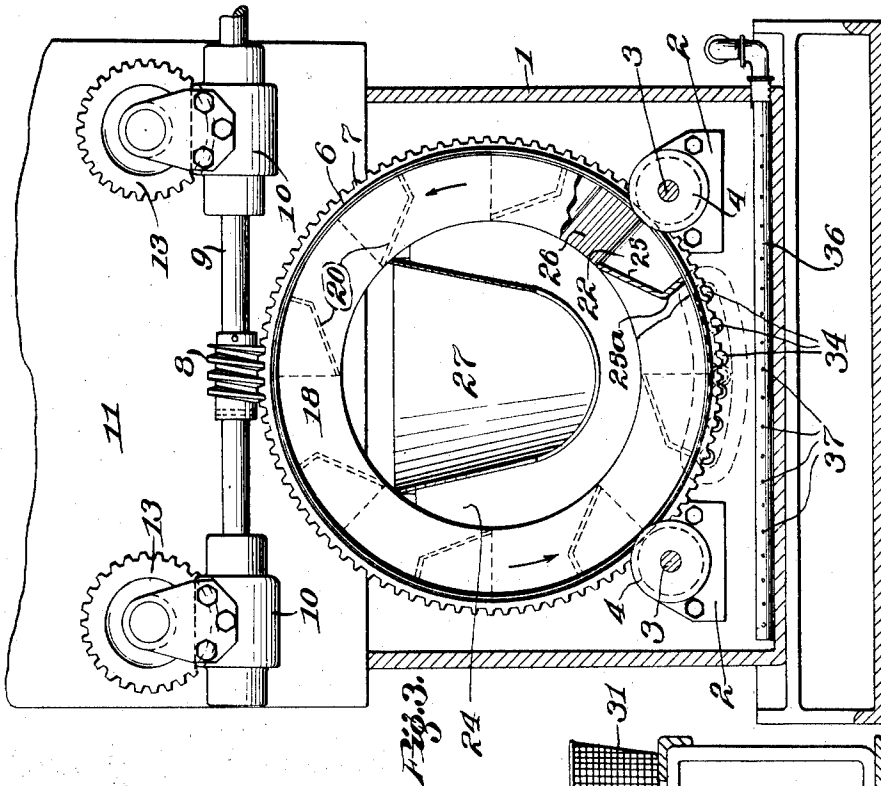
Inventor
 Oswald Schlaupitz,
 by Cant & Co.,
 his Attys.

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Inventor
O. Schlaupitz
by *Carroll*
his Att'ys.

UNITED STATES PATENT OFFICE.

OSWALD SCHLAUPITZ, OF CANTON, OHIO, ASSIGNOR TO THE TIMKEN ROLLER BEARING COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

QUENCHING-MACHINE.

1,385,402.

Specification of Letters Patent.

Patented July 26, 1921.

Application filed January 2, 1920. Serial No. 349,128.

To all whom it may concern:

Be it known that I, OSWALD SCHLAUPITZ, a citizen of the United States, and a resident of the city of Canton, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Quenching-Machines, of which the following is a specification.

My invention relates to quenching machines and has for its principal object to provide for the automatic charging, quenching and discharging of the work while the machine is in continuous operation. It consists in the combination and arrangements of parts hereinafter described and claimed.

In the accompanying drawing wherein like reference numerals refer to like parts wherever they occur,

Figure 1 is an end elevation of a machine embodying my invention;

Fig. 2 is a longitudinal sectional view taken on the line 2—2 in Fig. 1, the lower portion of the drum being shown in side elevation; and

Fig. 3 is a cross-section on the line 3—3 in Fig. 2.

My device comprises a tank or shell 1 that is open at the top. Mounted on the inner lower portions of two opposite walls of the tank are brackets or hangers 2 adapted to support a pair of parallel horizontal shafts or arbors 3. Mounted on each of these shafts, near the respective ends thereof, are rollers or disks 4 which constitute rolling supports for a cylindrical drum 5. This drum is located inside of the casing or tank 1 and is provided with circular track ways 6 that rest upon and coöperate with the supporting rollers. The drum is provided on its outer surface with a worm-gear ring 7, which meshes with a worm 8 on a horizontal shaft 9 that is supported directly above the drum in brackets or hangers 10 provided therefor, preferably on the back of an annealing furnace 11. The worm shaft 9 is operatively connected to any suitable source of power and transmits rotary motion to the drum 5 and to the furnace 11 by means of the worm 12, the worm wheels 13, and the rollers or disks 14, which constitute rolling supports for a cylindrical drum or retort 16.

The drum is preferably made in the form of a casting comprising annular front and rear end members 17 and 18; and it also comprises a cylindrical covering of wire

cloth or open wire metal 19 supported on said end members and clamped thereon by means of the track rings 6.

A series of channel shaped pockets or buckets 20 is formed on the inner face of the rear end member 18 of the drum near the peripheral edge thereof. These channel shaped pockets, which are also covered by the wire cloth covering 19, have web portions or bottom walls which extend forwardly toward the front end member 17 parallel with the axis of the drum. The buckets 20 have spaced parallel side walls disposed at right angles to the longitudinal axis of the drum. The rear end member 18 forms one of the side walls of the buckets 20 and the other side wall is formed by a flange 21 which projects outwardly from the web portions of the pockets, its outer edge terminating flush with the peripheral edge of the drum. The pockets are of greater depth at one end than at the other end and their deeper ends, which are as deep as the width of the metal between the end members 17 and 18 and their respective central openings 22 and 24, are provided with openings 23 which face the direction in which the drum rotates. The web portions of the buckets 20 are inclined outwardly, as at 25, from the open ends or mouths 22 of the pockets toward the outer edge of the drum and terminate in end walls 25^a, which are disposed radially with relation to the axis of the drum and terminate flush with the edge thereof.

A series of vanes or web plates 26 is located at the outer edge of the drum. These vanes extend from the inner side walls 21 of the buckets 20 adjacent to the openings or mouths 22 thereof, to the front end member 17. The vanes 26 are disposed radially with respect to the drum 5 and are of a width corresponding to the depth of the buckets 20. Both the inner and outer edges of the vanes extend parallel with the longitudinal axis of the drum, their inner edges terminating flush with the bottoms of the buckets and the openings in the end members 17 and 18. The outer edges of the vanes terminate flush with the outer edges of the pockets and end members and in contact with the wire cloth covering 19 of the drum. The vanes extend in an oblique manner with relation to the longitudinal axis of the drum from the mouths of the buckets to the front end 17

of the drum 5, the obliquity being such that on the upward moving side of the drum the vanes slope down from the front end of the drum to the mouths of the pockets at the delivery end of the drum.

The front or receiving end of the casing 1 is provided with an inclined feed chute 27 that extends through the opening 23 in the receiving end of the drum whereby it is adapted to deliver the work into the lower portion of the drum. The upper end of this chute 27 is preferably located below and in operative relation to the discharge chute 28 of the hardening furnace 11. This arrangement permits the discharge chute 28 to dump its contents directly into the feed chute 27 of the quenching apparatus.

The rear or delivery end of the tank 1 has a large opening in the top portion thereof; on the inside of said end is a delivery and overflow chute 29. This delivery chute comprises an inclined portion or skid way and upwardly extending side walls and extends inwardly through the central opening 24 of the rear end member 18 of the drum in position to receive the contents of the pockets 20 thereof when the pockets reach their uppermost positions and dump their contents. A flange on the front of the chute 29 affords a convenient means of bolting or riveting the chute to the delivery end of the tank.

The rear end of the tank 1 is provided with a bracket or other suitable support 30 for wire baskets 31 adapted to receive the work directly from the delivery chute 29. Preferably the support is itself made in the form of a trough or receptacle 32 for carrying away the waste quenching fluid. This trough is connected with the sewer or a cooling system.

The lowermost portion of the tank is adapted to receive the quenching fluid, which normally stands on a level with the upper edges 29^a of the side walls of the delivery chute 29, the surplus fluid overflowing into said chute and thence down the inclined bottom thereof into the receptacle 32. The quenching fluid is preferably supplied by a main supply pipe 33 which has a series of horizontal branches 34 disposed immediately below the drum and substantially parallel with the axis thereof. These pipes 34 are provided with a number of jet openings 35 in their upper surfaces designed to deliver sprays or jets of quenching liquid through the openings of the drum on to the work therein. The supply pipe 33 has another branch pipe 36 which extends along the bottom of the tank at right angles to the longitudinal axis of the drum 5. The pipe 36, which is located at the forward end of the tank, is also provided with a number of jet openings 37 in its side wall to deliver fluid for flushing and removing deposits through

an opening 40 in the lower portion of the tank. The respective branch pipes 34 and 36 are provided with valves 38 and 39 whereby jets of quenching fluid can be delivered from the pipes 34 and 36 separately or simultaneously, as is desired.

The opening 40 is located at the rear end of the tank and is normally closed by means of a plate 41. This plate is held in position by means of a series of stud screws 42 threaded into upwardly extending vertical legs of a series of angle brackets 43 whose horizontal legs are bolted or otherwise secured to the bottom of the tank.

The operation of the device is as follows: 80 The worm shaft 9 is in continuous rotation and its connection with the worm-gear 7 on the drum 5 causes continuous rotation of the drum on its supporting rollers 4. The quenching liquid also is in continuous circulation. When the contents of the hardening furnace are dumped on to the feed chute 27, they pass through the opening 23 in the charging end of the drum and drop into the lower portion thereof. There they come in contact with the quenching fluid into which they are dipped and by which they are sprayed, whereupon they are engaged by the vanes 26 and lifted out of the quenching liquid on the upward moving side of the drum. These vanes, which on the upward moving side of the drum slope downwardly from the receiving end of the drum to the mouths of the buckets, cause the articles supported thereon to slide down the inclined vanes and to be trapped in the pockets or buckets 20. The articles are then carried by the pockets to the upper portion of the drum to a position over the delivery chute 29. In this position, the bottom walls or web portions of the buckets slope downwardly toward the delivery chute and upon reaching a slope greater than the angle of repose of the articles thereon, the articles are caused to slide out of the buckets onto the delivery chute whence they fall into the basket or receptacle provided therefor. Aside from the great economy incident to its operation being automatic, my device provides for uniformity in the treatment of the work and for the rapid handling thereof.

Obviously, the construction herein described may be varied and the axis of the rotatable drum may be inclined from the horizontal without departing from the invention. Therefore, I do not wish to be limited to the precise construction shown.

What I claim is:

1. A quenching machine comprising a drum rotatable upon a horizontal axis, said drum being adapted to receive a quenching fluid in its lower portion and having openings in its opposite ends for receiving and discharging articles, a receiving device projecting into the discharge opening of said

drum, said drum having a series of pockets located adjacent to said receiving device, said pockets having openings facing the direction of rotation through which said articles are received into said pockets and are discharged therefrom into said receiving device, the interior surface of said drum having a series of radially spaced plates extending from the receiving end thereof to the openings in said pockets and adapted to engage the articles to lift the same from the bottom of said drum, said plates being arranged to slope downwardly from the receiving end of the drum to the openings in the pockets on the upward moving side of the drum whereby the articles supported thereon are caused to slide off said plates into said pockets.

2. A quenching machine comprising an openwork shell mounted for rotation upon a substantially horizontal axis and having openings in its opposite ends for receiving and discharging articles, the discharging end of said shell having a series of pockets formed on its inner face, said pockets having openings facing the direction of rotation through which said articles are received into the pockets and are discharged therefrom, said shell having a series of radially spaced plates projecting inwardly from its interior surface and extending lengthwise thereof from the receiving end to the openings in said pockets, said plates being adapted to engage the articles to lift the same from the bottom of said shell, said plates being disposed obliquely with respect to the axis of the shell whereby on the upward moving side of said shell they slope downwardly toward the pockets and cause the articles supported thereon to slide into said pockets.

3. A quenching machine comprising an openwork shell mounted for rotation upon a substantially horizontal axis and having openings in its opposite ends for receiving and discharging articles, the discharging end of said shell having a series of pockets formed on its inner face, said pockets having openings facing the direction of rotation through which said articles are received into the pockets and are discharged therefrom, said shell having a series of radially spaced plates projecting inwardly from its interior surface and extending lengthwise thereof from the receiving end to the openings in said pockets, said plates being adapted to engage the articles to lift the same from the bottom of said shell, said plates being disposed obliquely with respect to the axis of the shell whereby on the upward moving side of said shell they slope downwardly toward the pockets and cause the articles supported thereon to slide into said pockets, and means for delivering jets of quenching liquid into the interior of said

shell through the openings in the wall thereof.

4. A quenching machine comprising a drum mounted for rotation upon a horizontal axis, said drum comprising annular end members and an openwork shell portion, one of said annular end members having a series of pockets formed on its inner face opening into the interior of the drum, said pockets having openings facing the direction of rotation through which the articles are received into said pockets and are discharged therefrom, said drum having a series of radially disposed plates projecting inwardly from its openwork shell portion and extending lengthwise of the drum from the opposite end member to the openings in said pockets, said plates being adapted to engage the articles to lift the same from the bottom of said drum, said plates being arranged at an angle with relation to the longitudinal axis of said drum, whereby they slope downward toward the openings in said pockets when in their elevated positions and cause the articles supported thereon to slide into said pockets.

5. A quenching machine comprising an open tank having supporting rollers on the inside thereof, a drum in said tank, said drum being mounted on said rollers for rotation on a horizontal axis and comprising annular end members and an openwork cylindrical shell portion, said drum being provided with a worm-gear ring for rotating the same and having pockets formed in one of said annular end members, said pockets being inclined so as to slope toward the axis of the drum in an elevated position, said pockets opening into the interior of said drum in the direction of its rotation, said drum having a series of radially spaced plates projecting inwardly from its openwork shell portion and extending from the other end member to the openings in said pockets, said plates being adapted to engage the articles to lift them from the bottom of said drum, said plates being arranged obliquely with relation to the longitudinal axis of the drum, the obliquity being such that on the upward moving side of the drum the plates slope downwardly toward the openings in said pockets and cause the articles supported thereon to slide into said pockets.

6. A quenching machine comprising an open tank having supporting rollers on the inside thereof, a drum located in said tank and rotatably supported on a horizontal axis on the rollers thereof, said drum comprising annular end members and a cylindrical covering of open wire metal supported on said end members, said tank being provided at one end with a receiving device communicating with the interior of the drum through the opening in one of said annular end members and being provided

at its opposite end with a delivery device communicating with the interior of the drum through the opening in the other of said end members, said last mentioned end member
5 having pockets formed therein opening into the interior of the drum in the direction of its rotation, said pockets being arranged at an angle so as to slope downwardly toward the delivery chute of said tank in their elevated positions, said drum having radially
10 spaced plates extending lengthwise of said drum from said first mentioned end member to the openings of said pockets whereby articles delivered to the lower portion of said drum are engaged by said plates and
15 lifted from the bottom of said drum, said plates being arranged obliquely with respect to the longitudinal axis of the drum, the obliquity being such that the articles supported
20 on said plates are fed toward the openings in said pockets and dumped into said pockets while being lifted by said plates.

7. A rotary retort furnace having a discharge opening and a means for rotating the same in combination with a quenching machine comprising a rotatable drum adapted to be driven by said retort rotating means, said drum having an opening at one end communicating with the discharge opening
25 of said retort and having a discharge opening in its opposite end, the discharge end of said drum having a series of annularly spaced pockets provided with openings facing its direction of rotation and communicating with the interior thereof, the bottoms of said pockets being inclined from their openings toward the outer edge of the drum so as in their uppermost positions to
30 slope downwardly toward the axis of the drum, said drum having a series of radially spaced plates extending from the receiving end of said drum to the openings of said pockets and adapted to lift articles from the bottom of said drum, which plates are arranged at an angle with respect to the longitudinal axis of the drum so as to slope
35 downwardly toward the openings of said pockets on the upward moving side of the drum and cause the articles supported thereon to slide into said pockets.

8. A quenching machine comprising a drum mounted for rotation upon a horizontal axis and having openings in its opposite

ends for receiving and discharging articles, said drum having a series of pockets adjacent to its discharge end, said pockets having openings facing the direction of rotation through which the articles are received into the pockets and are discharged therefrom, said drum having a series of radially spaced
55 plates projecting inwardly from its interior surface and extending lengthwise thereof from the receiving end to the openings in said pockets, said plates being adapted to engage the articles to lift the same from the bottoms of said drum, said plates being
60 disposed obliquely with respect to the axis of the drum, the obliquity being such that the articles while being lifted are fed toward the openings in said pockets and dumped into said pockets.

9. A quenching machine comprising an open tank and a drum mounted therein for rotation upon a substantially horizontal axis, said drum comprising an openwork shell
75 having openings for receiving and discharging articles, said tank being provided at one end with an inclined feed chute whose lower end opens into the receiving end of said drum, and being provided at its opposite end with a delivery chute whose upper end opens into the delivery end of said drum below the top of said tank, said drum having a series of pockets formed in its delivery end opening into the interior of said
80 drum, said drum having a series of radially spaced plates projecting inwardly from its openwork shell portion and extending from the receiving end of said drum to the openings in said pockets, whereby they are adapted to lift the articles from the bottom of said drum, said plates being disposed obliquely with respect to the axis of the drum, the obliquity being such that the articles being
85 lifted by said plates are fed toward said pockets and dumped thereinto, and means opening into said tank below said drum for delivering jets of quenching liquid into the interior of said drum through the openwork shell thereof, said means constituting the
90 fluid supply for said tank and said delivery chute constituting an overflow therefor.

Signed at Canton, Ohio, this 29th day of December, 1919.

OSWALD SCHLAUPITZ.