

(No Model.)

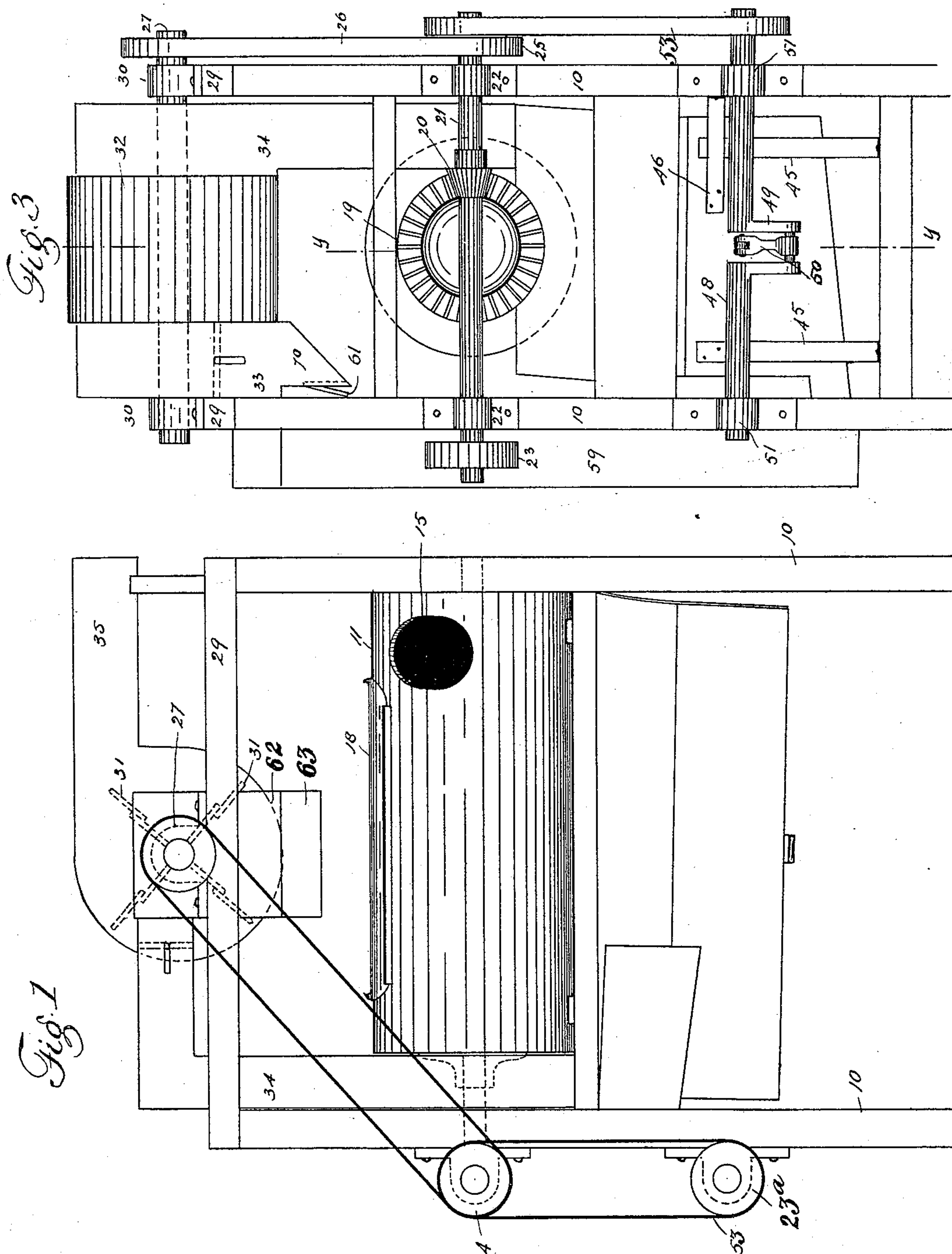
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R. J. BEHRINGER.

MACHINE FOR COOLING, SCOURING, AND CLEANING MALT.

No. 459,777.

Patented Sept. 22, 1891.



WITNESSES:

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Wm. M. Cornell

INVENTOR
Rudolph Behringer
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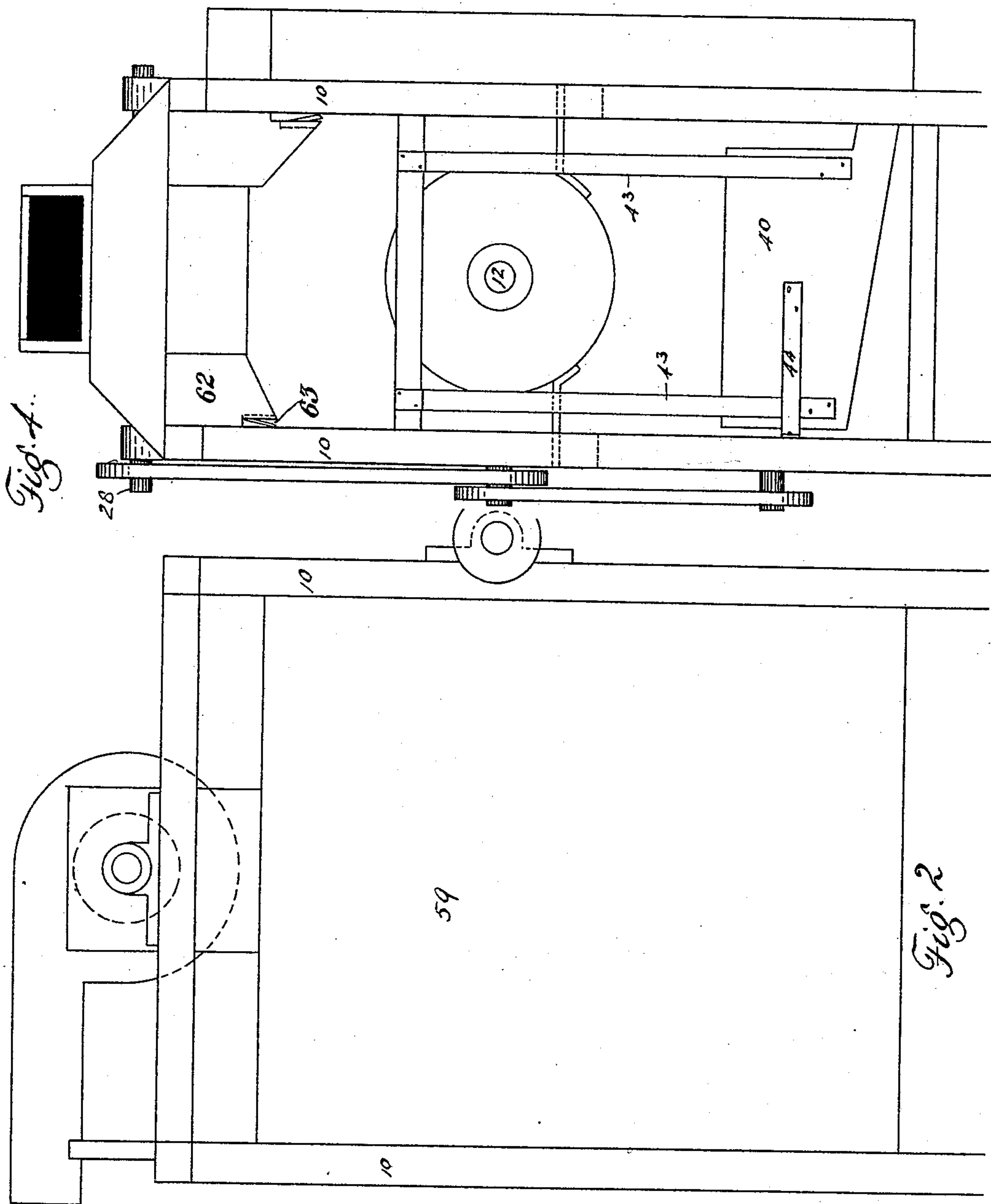
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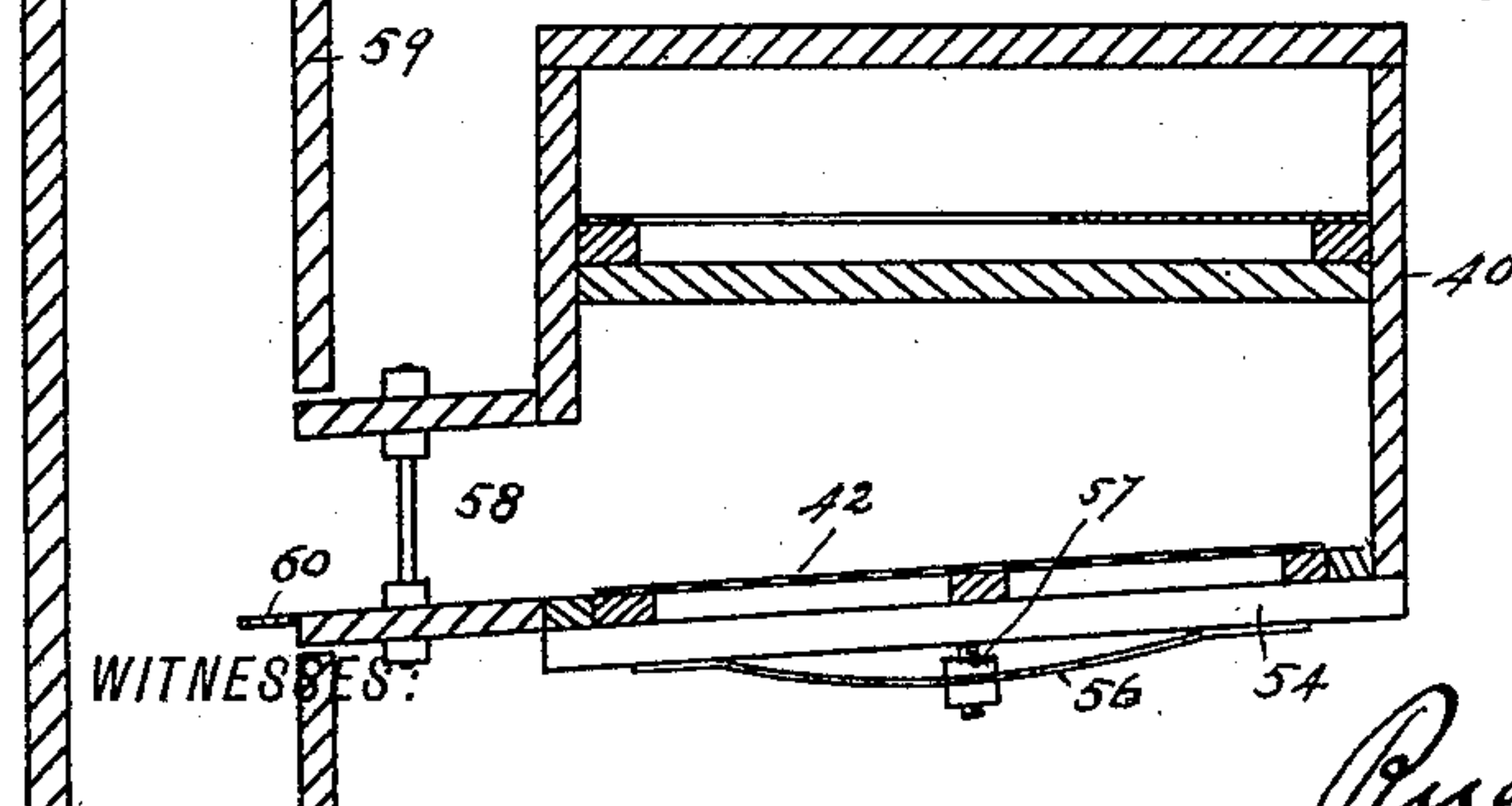
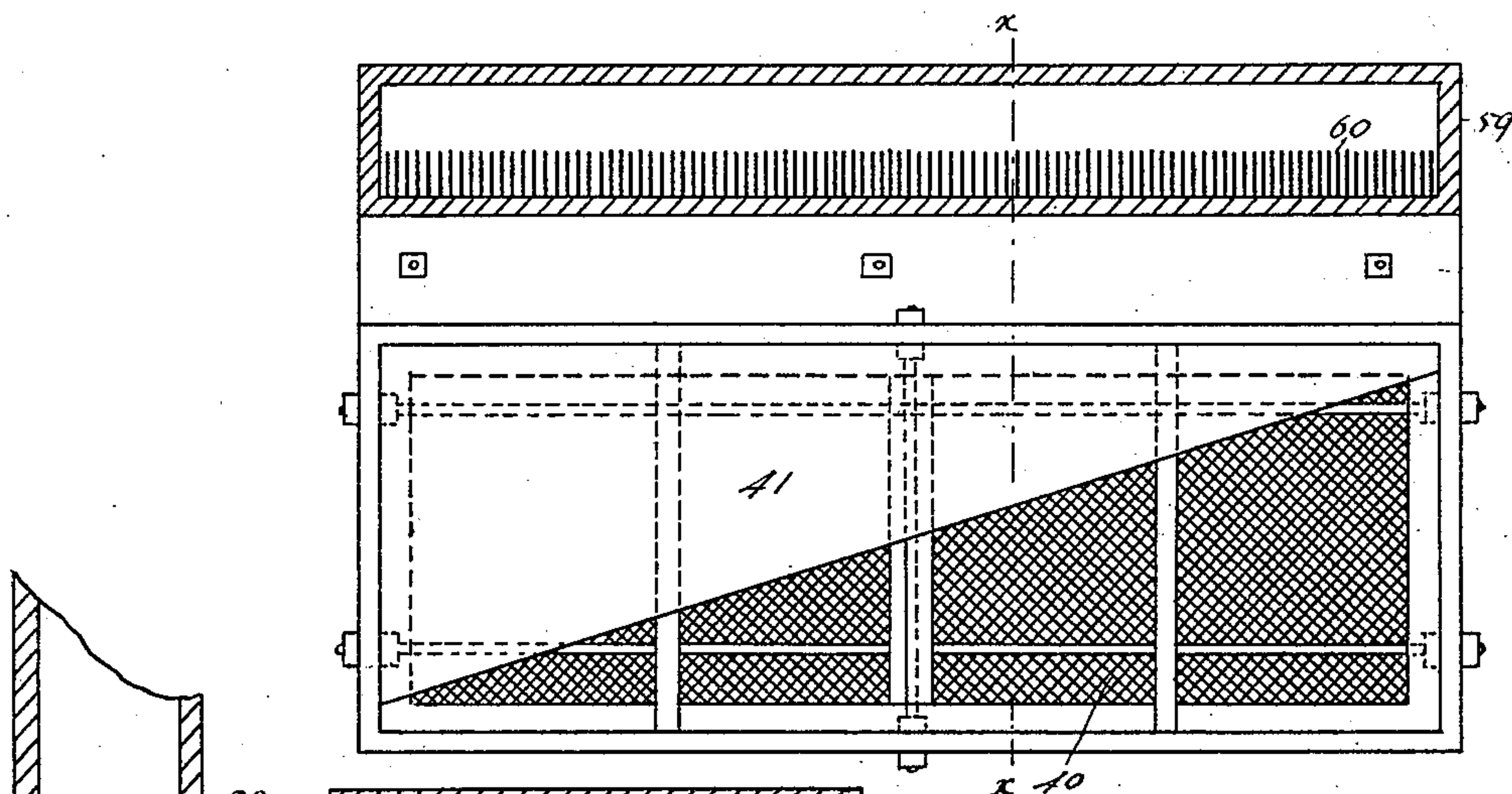
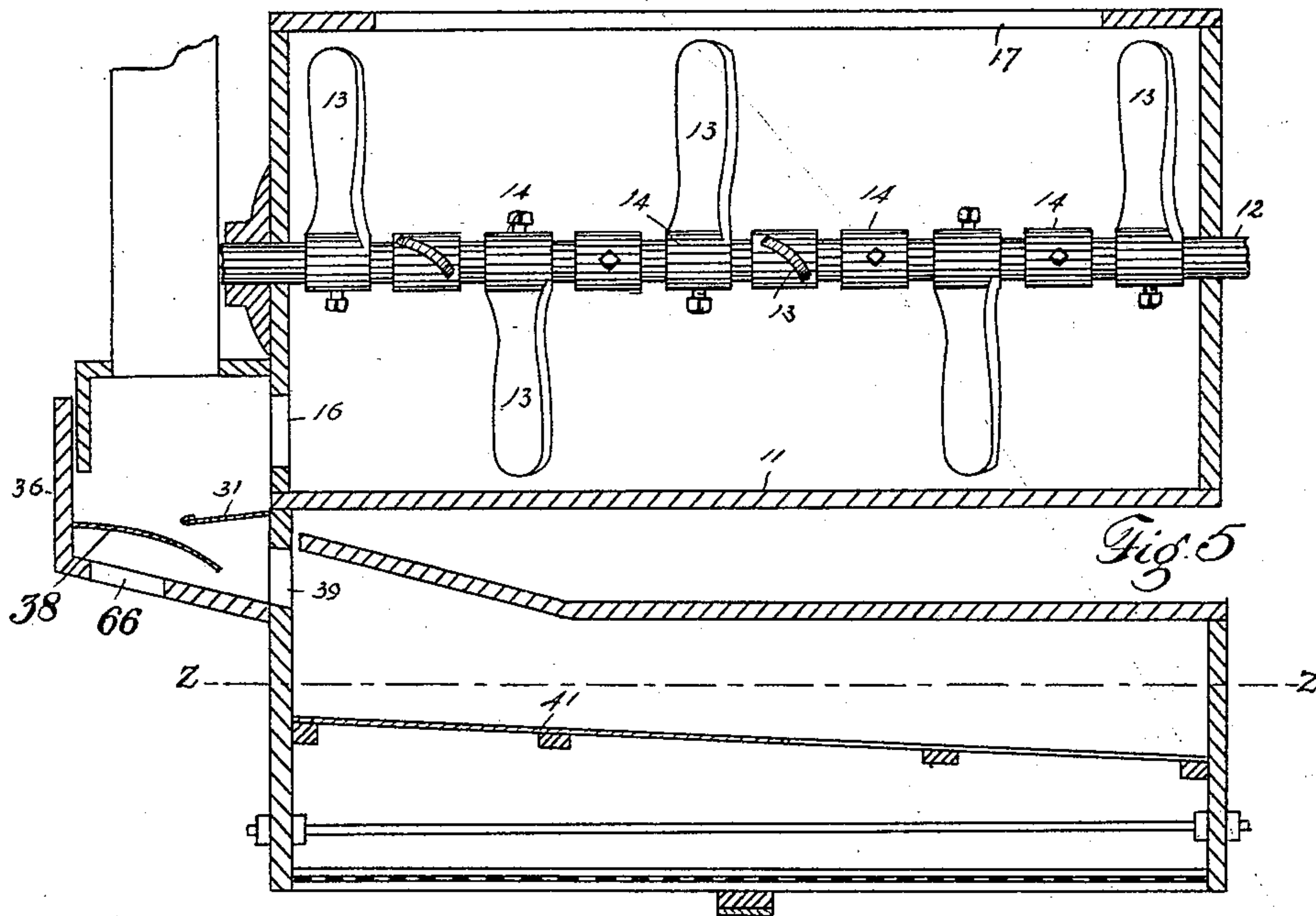
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UNITED STATES PATENT OFFICE.

RUDOLPH J. BEHRINGER, OF DENVER, COLORADO.

MACHINE FOR COOLING, SCOURING, AND CLEANING MALT.

SPECIFICATION forming part of Letters Patent No. 459,777, dated September 22, 1891.

Application filed January 19, 1891. Serial No. 378,338. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH J. BEHRINGER, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Machines for Cooling, Scouring, and Cleaning Malt; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for scouring, cleaning, and cooling malt after it leaves the kiln and preparatory to storing.

It is well known to those familiar with the handling of malt that if it is stored immediately after leaving the kiln or while hot it will continue to dry in the storage-chamber, and thereby diminish its value for brewing purposes. It is also well known that malt when it leaves the kiln is mingled with dirt, sprouts, and foreign substances to a greater or less extent, the sprouts having fallen off of the grain during the process of drying in the kiln. Hence to remove any sprouts which may not have dropped off, as well as to separate foreign substances from the kernels of grain, the malt should first be subjected to a scouring process.

Hence the object of my improved machine is the scouring, cleaning, and cooling of the malt after it leaves the kiln; and to this end the mechanism consists of the features, arrangements, and combinations hereinafter described and claimed.

In the accompanying drawings is illustrated an embodiment of the invention.

In the drawings, Figure 1 is an elevation of one side of the machine; Fig. 2, a similar view of the opposite side. Fig. 3 is an elevation of one end. Fig. 4 an elevation of the opposite end; Fig. 5, a longitudinal vertical section taken through the machine from the top of stationary cylinder downward on the line *y y*, Fig. 3. Fig. 6 is a horizontal section taken on the line *z z*, Fig. 5. Fig. 7 is a vertical section taken on the line *x x*, Fig. 6.

In the views, wherein similar reference characters designate corresponding parts of the mechanisms, let the numerals 10 10, &c., designate the standards suitably connected at the top and bottom and constituting the main frame-work of the machine.

Centrally supported in the frame in any suitable manner is a stationary cylindrical tank 11, through the longitudinal center of which passes the rotating shaft 12, provided with arms 13, rigidly secured to collars 14, surrounding the shaft and adjustable thereon. These arms are of such length as to reach nearly to the shell of the cylinder and are arranged spirally on the shaft, so as to force the material from any point therein toward one end thereof and out of a discharge-opening thereat as shaft 12 revolves.

Tank 11 is provided with an inlet-opening 15 and a discharge-opening 16, the former being located in the upper part of the tank near one extremity and the latter at the opposite extremity close to the bottom. The top is provided with an opening 17, closed by a sliding cover 18. This opening gives access to the interior of the tank when for any reason it may be necessary, as for repairing purposes. Shaft 12 is provided at one extremity with a bevel gear-wheel 19, located outside of the tank and adapted to engage a bevel-pinion 20, rigidly secured to a transverse shaft 21, extending across the end of the machine and journaled in suitable boxes 22 22, secured to two of the standards or posts 10 10 of the frame-work. The extremities of shaft 21 project beyond posts 10 on either side of the machine, these extensions being provided with pulleys.

On one side of the machine a pulley 23 is located, while on the opposite side two pulleys 24 and 25 are located. Power may be applied to the mechanism from any suitable motor by running a belt from the motor to pulley 23. Pulley 25 on the opposite end of the shaft is connected by means of a belt with a pulley 27, made fast to one extremity of a shaft 28, journaled by means of boxes 30 30 in top cross-beams 29 29, connecting the main standards 10. Shaft 27 is provided with fans 31, rotating in a drum 32, provided with air-inlet conduits 33 and 34, one being located

on each side of the drum, which is also provided with a discharge-conduit 35. As the material leaves the tank through opening 16, it passes to a receptacle or box 36 and falls upon an inclined plate 31, and thence to another plate 38, but oppositely inclined, whence it passes to the bottom of the receptacle and through an opening 39 into a suitable receptacle 40, provided with a triangular plate 41, upon which the malt first drops, passing thence to an inclined screen 42, forming the bottom of receptacle 40. This receptacle is supported within the frame-work and beneath the tank 11 by the use of suitable metal straps 43, 44, 45, and 46. These straps are secured to the frame-work of the machine at one extremity and to the ends of the receptacle at the opposite extremity. These straps allow the receptacle a swinging or oscillating movement under the influence of a rotating shaft 48, provided with a double crank 49, connected with one end of the receptacle by a pitman 50. Shaft 48 is supported upon uprights 10 by means of suitable boxes 51, and is provided at one extremity with a pulley connected with a pulley 24 by means of a belt 53. Screen 42 is centrally supported underneath by a transverse bar 54. The object of this bar is to prevent the screen from sagging or bending downward in the center, and to aid it in the performance of this function the transverse bar is provided with a bow-shaped brace 56, having its extremities secured to the bar with a screw 57 passing through its center and bearing upon the bar, but not entering the same. This screw is provided with a nut on each side of the brace, and by the adjustment of these nuts the space between the bar and the spring can be increased or diminished, as may be desired, and the screen thus kept in proper position. Receptacle 40 is provided with an opening or chute 58, through which the material after leaving the screen passes to the bottom of a conduit 59, being momentarily supported in said conduit by the projections 60. Conduit 59 is open at the bottom and covers the entire side of the machine, as shown in Fig. 2, and is connected with conduit 33 at the top and through this mechanism with drum 32. Conduit 33 projects downward a short distance from its connection with conduit 59, so as to form a receptacle 70, provided with a small door 61, hinged at the top and free to open by pressure from above. During the operation of the machine the suction produced by the air-blast will normally maintain the door in the closed position. The object of receptacle 70 is to catch the dirt or foreign particles of matter which might fall thereinto. This accumulation will after some time be such that its gravity will overcome the force of the suction. Then the door 61 will open and the material fall from the machine. Conduit 34, which has been heretofore referred to, leads from receptacle 36 to drum 32, and is pro-

vided with a receptacle 62, having a door 63, hinged and adapted to open by pressure from above. This mechanism has the same function as the similar mechanism located on the opposite side of the machine.

From the foregoing description the operation of my improved machine will be readily understood. Power having been communicated to the machine from any suitable motor, the malt to be treated is fed to the cylindrical tank through opening 15, wherein it is scoured by the action of arms 13 and simultaneously carried toward the opening 16, whence it is discharged to receptacle 36, which is connected with the movable receptacle 40. As soon as the malt passes out of the tank it is acted upon by a current of air created by the suction mechanism located at the top of the machine and connected with receptacle 36. This air-current removes a great deal of the dirt, sprouts, &c., from the malt, which dirt and foreign particles are carried upward by the air-blast and discharged through spout 35, leading from the drum 32. It will be observed that receptacle 36 is provided with an opening 66 in its bottom, which from its location beneath inclined plate 38 is so protected that the material discharged from the tank cannot escape therethrough, yet permits the free air-supply for winnowing the malt. From receptacle 36 the material passes to plate 41, whence under the influence of the shaking mechanism it is spread out and evenly distributed over screen 42, which separates therefrom the finer and heavier particles of dirt, sand, &c., whence it passes to the bottom of the conduit 59, when it is again directly acted upon by the air-current produced by the blast mechanism above. At this point the cleaning of the malt is completed and the dirt is carried upward by the air and out through discharge-spout 35, leading from the drum. It will thus be observed that my improved machine thoroughly scours the malt and separates therefrom all particles of dirt and foreign material, and yet at the same time it does not break or in any manner injure the malt, but leaves it in as good condition as when it receives it, so far as the kernels or berries of the grain are concerned, the malt being discharged from the machine at the bottom of conduit 59 in a perfectly clean condition, being at the same time cooled and fit for storing. It may be carried from the bottom of receptacle 59 to the storage-bin by suitable elevating mechanism not herein shown and forming no part of my machine, whose object is to thoroughly prepare the malt for storing.

It will be observed that my screen 42, located in the bottom of receptacle 40, may be easily removed therefrom by simply removing a few screws, when the screen can be taken out of the receptacle from underneath. This is a very important feature, inasmuch as it may be often necessary or desirable to change

the screen in the machine and replace it by one of finer or coarser mesh, as the exigencies of the case may require.

Having thus described my invention, what I claim is—

1. The combination of a cylinder having revolving blades therein, a reciprocating frame located beneath the said cylinder, a receptacle 36, connecting the said frame and cylinder, a triangular distributing-plate within the said frame, a screen located below the said plate, a fan-casing, a flue connecting the said casing and receptacle, and a flue having an open lower end connected with the said frame 15 and with the said casing, as described.

2. A screener consisting of vibratory frame having a triangular distributing-plate therein and having a screen below the said plate, as described.

3. The combination, with a cylinder, of revolving blades therein, a reciprocating screen located beneath the said cylinder, a receptacle having an apertured bottom, a plate located in the said receptacle above the said 25 aperture, a discharge for the said screen, a suction mechanism, and flues connected with

the receptacle and with the discharge, both of the said flues communicating with the suction mechanism, substantially as described.

4. The combination, with a cylinder having revolving blades therein, of a frame-work carrying the said cylinder, a frame swung from the said frame-work below the said cylinder, a receptacle having an apertured base mounted on the said frame-work and connecting the said cylinder and frame, a plate over the aperture in the base of the said receptacle, an air-flue rising from the top of the receptacle, a triangular distributing-plate contained in the said frame, a screen below the said plate, 40 an uptake communicating with the said frame and into which the said frame projects, and a casing mounted on the said frame-work and connected with the said uptake and air-flue, substantially as described. 45

In testimony whereof I affix my signature in presence of two witnesses.

RUDOLPH J. BEHRINGER.

Witnesses:

FRED. W. FELDWISCH,
AUGUST RISCHE.