No. 883,848. PATENTED APR. 7, 1908.

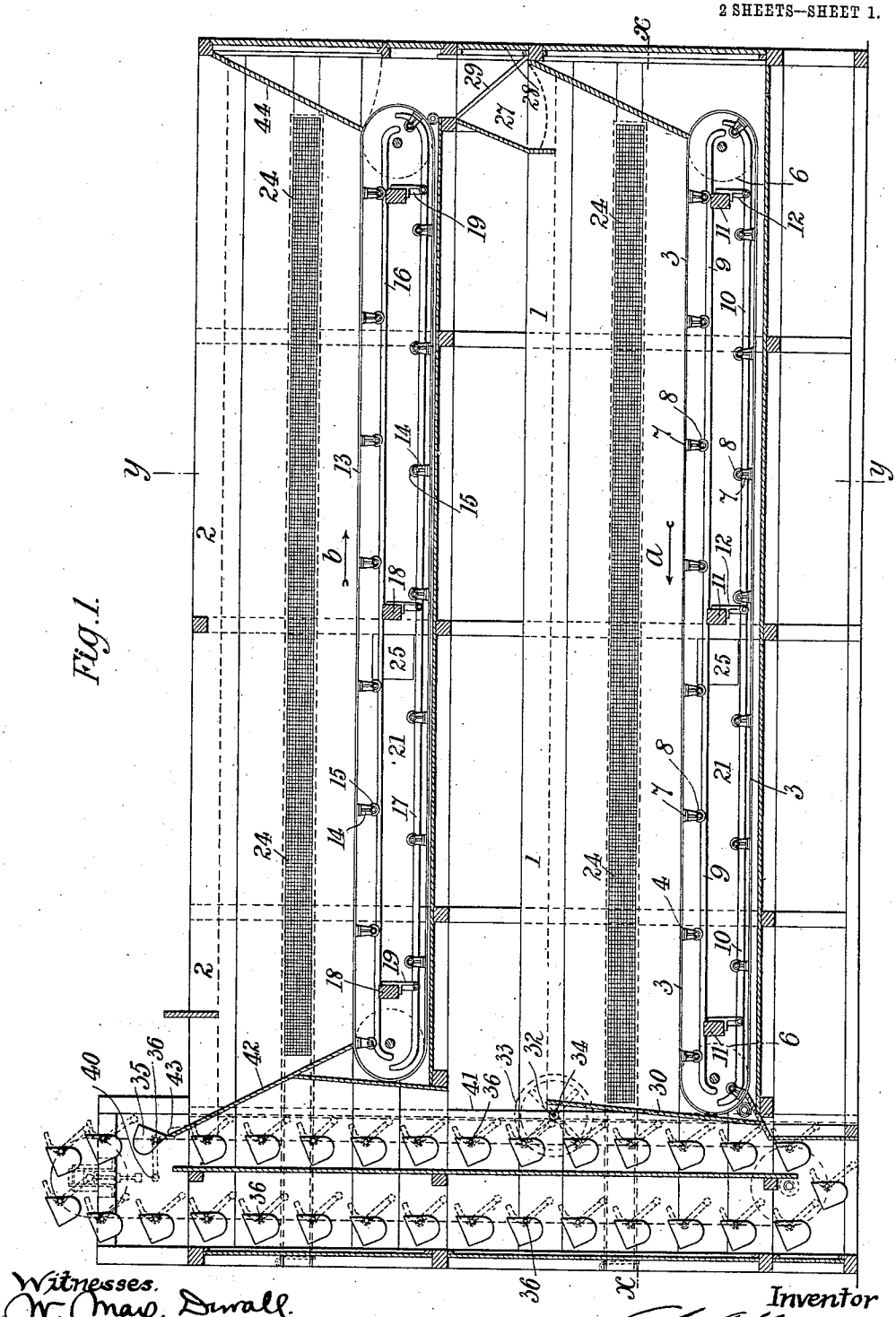
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APPARATUS FOR MALTING.

APPLICATION FILED AUG. 23, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



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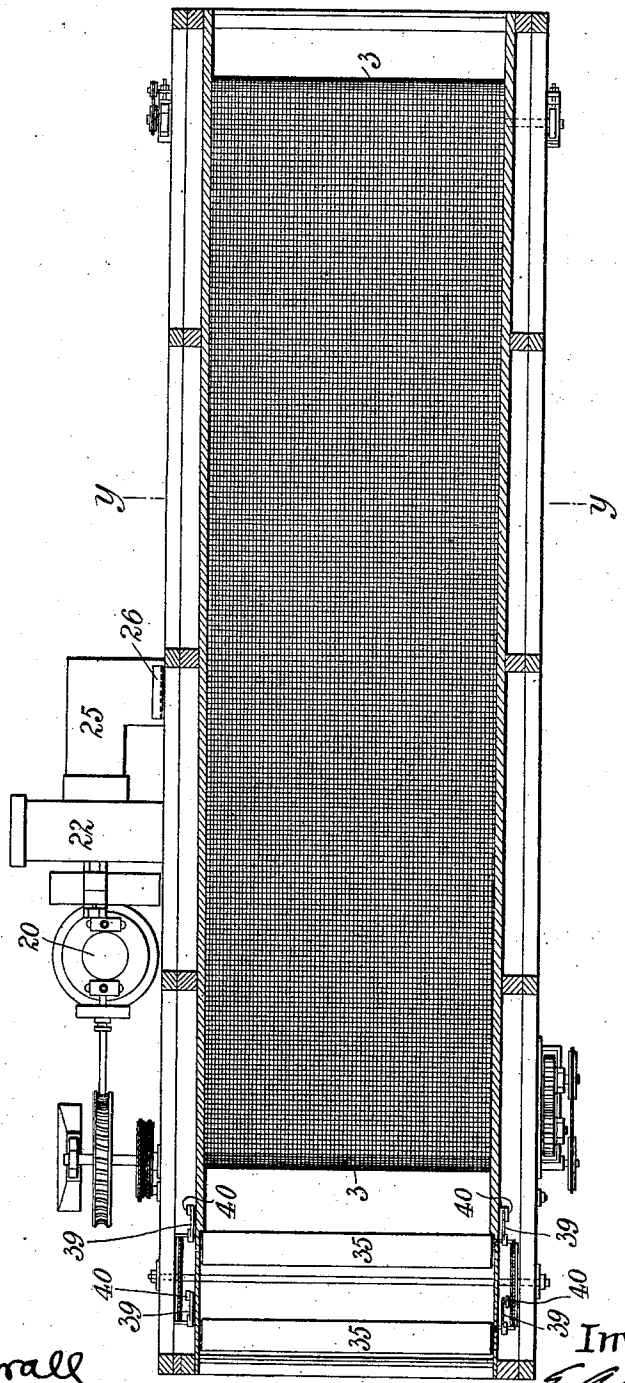
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APPLICATION FILED AUG. 23, 1907.

2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MALTING.

No. 883,848. Specification of Letters Patent. Patented April 7, 1908.

Application filed August 23, 1907. Serial No. 389,922.

To all whom it may concern:

Be it known that I, EDWIN GEORGE ADLAM, a subject of the King of Great Britain and Ireland, residing at Bristol, England, Kingdom of Great Britain and Ireland, have invented certain new and useful Improvements in Machinery or Apparatus for Malting; and I do hereby 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.

This invention relates to methods of malting in which the process is carried out in tanks or containers which are provided with conveyers or bands for agitating and moving the grain; a fan, or the like, being employed for drawing air through the grain.

This invention consists in improvements in machinery or apparatus for malting under systems of the kind above mentioned, as hereinafter set forth.

According to this invention, in its most simple form, the malting apparatus comprises two tiers, consisting of two box-like grain containers communicating with each other, and in each of which is a conveyer band of reticulated woven wire, or the like. The conveyer bands are near the floors or bottoms of the grain containers. Each conveyer travels in opposite directions in a suction chamber which is subjected to the suction action of a fan, or the like.

The grain is charged in to the lower container at one end thereof and is received on the conveyer web therein by which the grain is conveyed to an elevator of special construction situated at the opposite end. By the elevator the grain is carried up and delivered on to the conveyer band in the upper container. When both the upper and lower containers are charged, the grain is kept in a state of rest until such time as it has to be moved in the process. The conveyer bands and elevator having then been put into action the grain is thereby agitated and caused to circulate, the grain on the under conveyer web being carried up by the elevator and discharged on the upper conveyer web, from which the grain thereon is delivered on to the lower web. The elevator is fitted with pivotal buckets provided with cranked arms by means of which and a stop roller pin the buckets are tilted to discharge the grain they bring up on to the conveyer band in the upper grain container. Agitation and turning movement of the grain are carried out at such intervals and for such periods of time as may be needed. The air fan is put into action during such times and at such intervals as is necessary, as is well understood in the process of malting. Finally, when the process is completed the malt is discharged from the apparatus.

In larger apparatus constructed in accordance with my invention the tiers or containers are increased in number in pairs.

Referring to the accompanying drawings, Figure 1 illustrates, in longitudinal section, apparatus for malting, constructed and arranged in accordance with my invention. The apparatus is shown in its simplest form, that is to say, having only two tanks or grain containers. Fig. 2 is a sectional plan, the section being taken on the line x, x, Fig. 1.

The apparatus comprises two box-like open-topped containers 1 and 2. These containers or tanks are wider at the delivery end, tapering from the feeding end. In the lower container 1 is an endless conveyer band 3 constructed according to the usual way of making such bands, that is to say, of reticulated wire, or the like, secured to transverse bars 4 riveted to side chains 5 adapted to run round sprocket wheels 6 which are driven by an engine or motor situated outside. The conveyer band 3 travels in the direction indicated by the arrow *a*. To the inner face of the band 3 are attached brackets 7 which carry rollers 8 which run on the rails 9 and 10. The rails 9 are supported in bearings 11 extending transversely across the container 1. The rails 10 are bolted to hangers 12 which are bolted to the bearers 11. In the upper container 2 is a similar conveyer band 13, constructed like the band 3, and similarly fitted with brackets 14 and with rollers 15 adapted to run on rails 16, and 17 of which the rails 16 are carried on the transverse bearers 18, the rails 17 being bolted to the hangers 19. The band 13 travels in the direction indicated by the arrow *b*, that is to say, reversely to the band 3 in the lower tank or container 1. The band 13 is driven by means of the same engine or motor 20 which drives the band 3.

The conveyers 3 and 13 extend at each side into recesses 21 which are closed on the outside to the air, so that the suction fan does not draw air into the containers 1 and 2 through these recesses 21. The fan draws air in only from the open tops of the tanks

or containers 1 and 2 and through side ducts 23 which are faced internally with woven wire guards 24. The fan is driven by the engine or motor 20. The suction pipe 25 of the fan communicates with both containers 1 and 2 and is fitted with dampers or regulators for governing the communication.

The method of working is as follows. The sluice or shutter 30 being lowered, the grain is charged into the lower container 1 through the opening 27, the panel 28 having been lowered or removed and the hinged door 29 swung open. The grain is received on the web 3 and is thereby conveyed to the special elevator at the opposite end of the container. Access of the grain to the elevator is governed by the sluice 30 which is a partition fitted with racks 31 in which gear pinions 32 by rotating which, through the medium of the hand-wheel 33 and spindle 34, the sluice 30, which is inclined at an angle, is raised and lowered bodily in a vertical plane, so that, in rising, it is moved out of contact with the grain and thus obviates injury thereto in the movement of the sluice. The elevator is, as aforesaid, of special construction, in that the buckets are so hung and operated that they will deliver grain at any desired point in the same vertical plane on the same side at which they are fed. In delivering the grain on to the web 13 they shoot it down at an angle and not directly vertically. To effect this the buckets 35 have at each end trunnions 36 supported in the elevator chains 37, the trunnions being so situated that the buckets 35 always return to a normal position after having been swung out of the said position, as in discharging the grain. Fixed on the trunnions 36 are cranks having arms 38 and 39 carrying anti-friction rollers 40. The rollers 40 run in contact with roller path guides 41. Near the top of the inclined plane 42, over the inner face of which the grain descends from the buckets 35 to the web 13, are pins 43 fitted with rollers. By contact of the arms 38 of the bucket cranks with the stop pins 43 the buckets 35 are partially inverted and thus discharge their contents down the plane 42 to the web 13. By the web 13 the grain is carried along in the container 2 and, the door 44 being closed the grain accumulates in the container 2 until the container is charged to the required depth. The sluice 30, the panel 28, and the doors 29 are next closed. The grain is then left at rest, and the fan 22 is put into action at such intervals and for such periods of time as may be required.

The fan draws air in only through the open tops of the grain containers and through the side ducts 23 which latter are open at one or both ends and are fitted with controlling dampers or slides. When it is required to move and turn the grain, the sluice 30 and the doors 44 and 29 are opened. The webs 3 and 13 and the elevator are put in motion and the grain is thus moved and circulated. This is repeated at such intervals as may be needed as is well understood in the process of malting in tanks or containers.

When the grain has been malted it is taken out at the same place at which it is charged in, or it may be discharged by the elevator at the top thereof. The elevator is capable of being lengthened and extended upwards to deliver at any desired height, the stop pins 43 being removable, similar pins being fixed at a suitable height further up for the discharge. The number of containers may be increased and thus the capacity of the apparatus extended, the various operating and other parts being increased and extended accordingly.

What I claim is:

1. Malting apparatus comprising a series of box-like grain containers, each having screened openings in its sides, an endless conveyer in each container and an elevator arranged vertically and located adjacent to one end of each container, pivotally mounted buckets thereon and means for tripping said buckets to discharge into the upper container, substantially as described.

2. Malting apparatus comprising a vertically arranged series of box-like containers, open at each end and each provided with screened openings in its sides, an endless conveyer in each container, an elevator adjacent to one of the ends of each of said containers, buckets pivotally mounted on said elevator, means for tripping said buckets to discharge into the upper container, and a suction fan arranged to draw air through said containers, substantially as described.

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

EDWIN GEORGE ADLAM.

Witnesses:
SAMUEL HENRY HARRISON,
JOHN ST. AUBYN TRENERRY.