

No. 795,324.

PATENTED JULY 25, 1905.

G. B. WILLCOX.
RAKER FOR SALT GRAINERS.
APPLICATION FILED MAY 8, 1905.

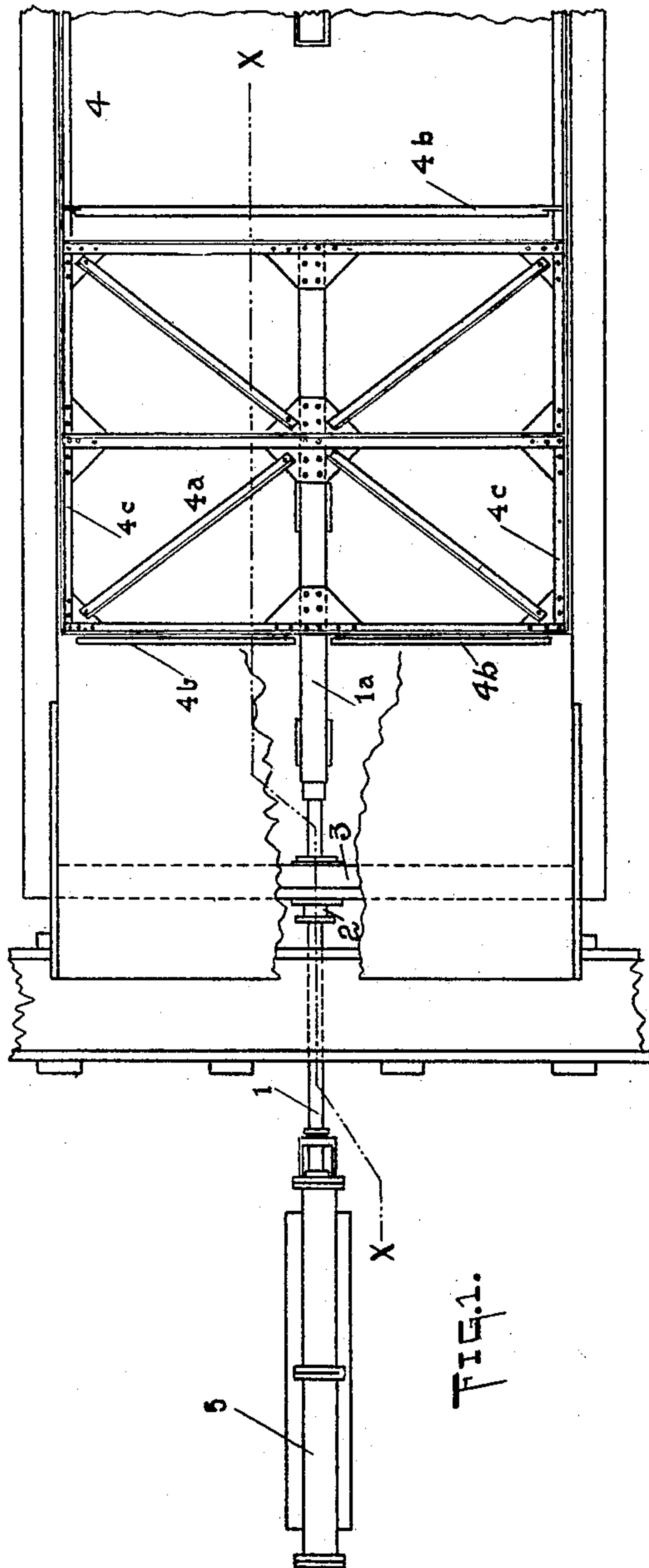


FIG. 1.

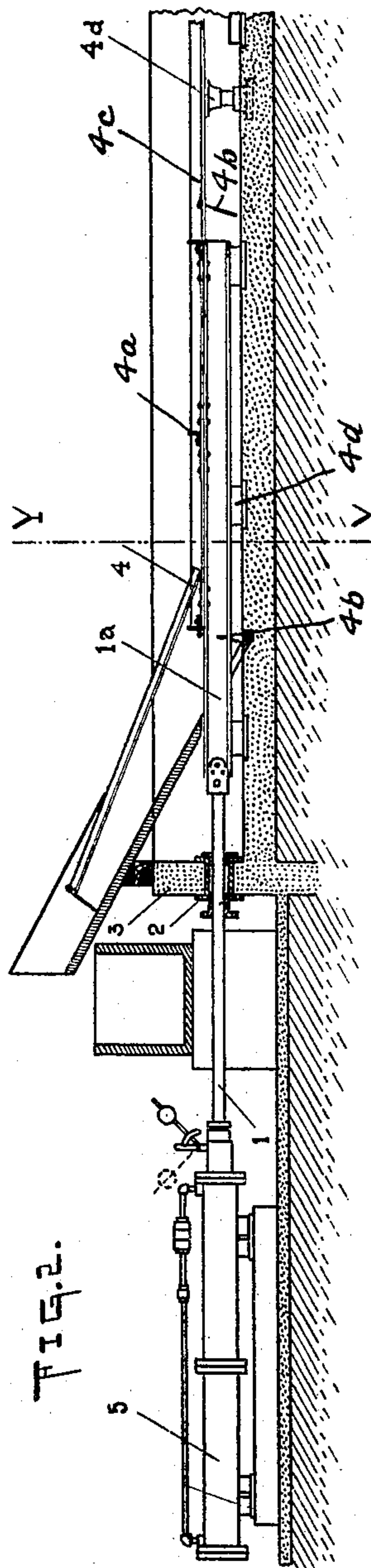


FIG. 2.

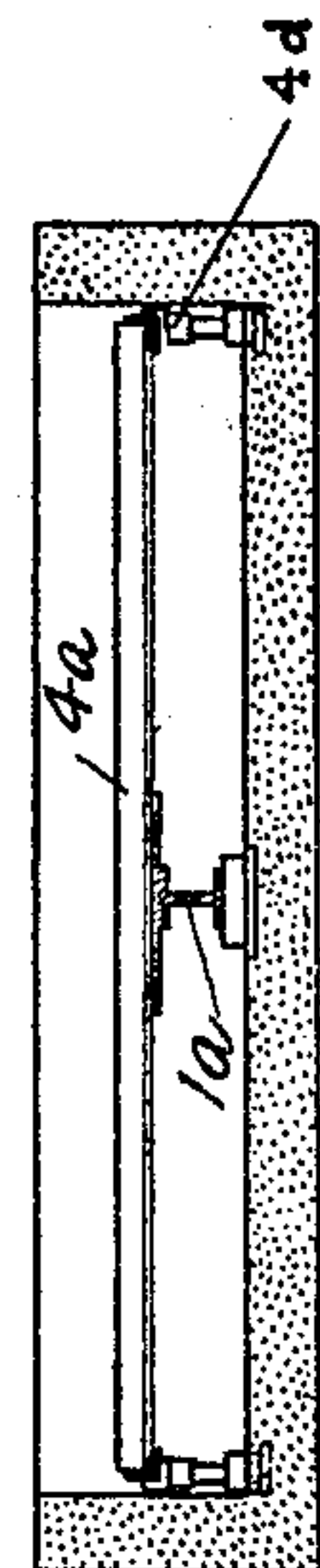


FIG. 3.

WITNESSES:

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RAKER FOR SALT-GRAINERS.

No. 795,324.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed May 8, 1905. Serial No. 259,389.

To all whom it may concern:

Be it known that I, GEORGE B. WILLCOX, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Rakers for Grainers; 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 is an improvement in means for actuating automatic salt-rakers for grainers, and pertains more particularly to means for producing back-and-forth movement in reciprocating salt-rakers.

The improvement is especially adapted for driving rakers of the type now commonly known as the "submerged rigid back bone" construction, meaning the general type of raker employing an inflexible member located within the grainer and extending in proximity to the grainer-bottom, adapted to back-and-forth reciprocating movement, and carrying scraping devices that operate along the grainer-bottom to push the salt toward the end of the grainer on the forward stroke and feather on the back stroke, so that the salt is intermittently moved along the bottom of the grainer and delivered up the incline at its front end with a step-by-step movement. In rakers of this class, wherein all the scraping devices are located close down to the grainer-bottom beneath the grainer-pipes and submerged in brine, it is important that the driving force to move the raker back and forth be applied as nearly as possible in the same horizontal plane with the scraping-blades. When the driving force is thus applied, all vertical components of the driving force are eliminated. Consequently the wear on the rake-supporting guides is reduced to the minimum. Not only is wear reduced, but the liability of binding and breakage is avoided and minimum power is required to operate the machine.

It has been my practice heretofore to apply the driving force in the horizontal plane of the scraping devices, but by means essentially different from the means herein shown. I formerly provided a horizontally-placed longitudinal track or guide over the middle of the grainer and on that guide mounted a trolley or cross-head actuated back and forth by a hydraulic cylinder or other suitable means. The cross-head had a downwardly-

extending arm, the lower forked end of which engaged by side contact a bar or brace located in the horizontal plane of the scraping devices. The brace was rigidly fixed to the raker and received horizontal driving force from its side contact with the arm, but was subjected to no vertical thrust.

The cross-head arrangement above described operates well in practice; but being located above the grainer it is while operating enveloped by corrosive vapors, thick fog, and gases rising from the grainer. Since the power is applied to the cross-head at its upper part and delivered at the lower end of its arm, bending strains are produced in the cross-head and in the track on which the cross-head runs. When located over the grainer, and therefore difficult of access, the driving mechanism generally receives but indifferent attention and frequently has to be repaired. The guide or cross-head track is usually supported on heavy timbers extending across the grainer, and these timbers, together with the cross-head and its operating mechanism, obstruct to a considerable extent the salt-maker's inspection of the liquor surface. In my present invention I overcome all of these objections by providing driving means whereby the actuating force is not only applied more directly and in the same horizontal plane as the scraping devices, but is also applied in such manner that the driving-motor may be conveniently located outside the grainer, easily accessible and protected from the fog and steam.

In my improved arrangement the motive power is so applied as to exert upon the raker perfectly horizontal direct driving effort. This arrangement also dispenses with the cross-head, its guide or track, and all the supporting-beams above referred to, leaving the grainer area unobstructed by any species of rake-driving mechanism. No power is lost by reason of indirect application of the driving force, as heretofore.

My present improvement consists in the devices, combinations, and equivalents thereof illustrated in the accompanying drawings and set forth in the claims.

Figure 1 is a top plan view, broken away in part, showing the direct-stroke device applied to the front end of the raker. Fig. 2 is a sectional elevation of the same, the section being taken on the line *x x* of Fig. 1. Fig. 3 is a section of the grainer on the line *y y* of Fig. 2.

As is clearly shown in the drawings, the device consists in a horizontal driving-rod 1, having back-and-forth-sliding movement in a suitable stuffing-box 2, located in the end 3 of the grainer, the end of the rod within the grainer being connected to the end of the raker 4 by any suitable means and the end of the rod outside the grainer being connected to any suitable motor, as the hydraulic cylinder 5, capable of imparting back-and-forth reciprocating movement to the rod 1 and thence to the raker.

For the purpose of illustration I have shown a single rod 1 passing through the end of the grainer; but, if desired, more than one such rod may be used, said rods being connected by any suitable means to the source of power.

In the particular construction which I have chosen for illustration, 4^a is a trussed frame rigidly fixed to the raker, and 1^a is a longitudinal bar or bars rigidly fixed to the trussed frame and lying substantially in the horizontal plane of the scraping-blades 4^b and of the "backbone" members 4^c, adapted to exert as nearly as possible purely direct horizontal longitudinal thrust upon the raker, thereby eliminating vertical wear-producing thrust upon the raker-supporting guides 4^d and accomplishing this result without the aid of an intermediate cross-head or guide-track, as in the previous construction above referred to. Any equivalent arrangement of truss-frame members or any system of connections between the raker 4 and the rod 1 may be employed without departing from the spirit of my invention.

While I have shown and described my improved driving apparatus applied to the discharge or incline end of a raker, it may be applied to the rear end, if desired.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

1. The combination with a grainer; of a raker located within the grainer in proximity

to the grainer-bottom and adapted to back-and-forth movement; a stuffing-box in the end of the grainer; a rod slidably mounted in the stuffing-box and having its inner end connected to the raker, together with actuating means attached to the outer end of said rod.

2. The combination with a grainer; of a raker located within the grainer in proximity to the grainer-bottom and adapted to back-and-forth reciprocating movement; a stuffing-box in the end of the grainer and located substantially in the horizontal plane of the raker; a rod slidably mounted in said stuffing-box and having its inner end connected to the raker; together with actuating means attached to the outer end of said rod.

3. The combination with a grainer; of a raker located within the grainer in proximity to the grainer-bottom and adapted to back-and-forth reciprocating movement; a trussed frame secured to said raker in the horizontal plane thereof; a stuffing-box in the end of the grainer and located in the horizontal plane of the raker; a rod slidably mounted in said stuffing-box and having its inner end connected to said frame, together with actuating means attached to the outer end of said rod.

4. The combination of a grainer having a raker located within and in proximity to the grainer-bottom and adapted to back-and-forth reciprocating movement; of rake-operating mechanism located outside the grainer in the horizontal plane of the raker; and means connecting said motor and raker whereby the motor is adapted to exert horizontal reciprocating effort against said raker in the horizontal plane thereof.

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

GEORGE B. WILLCOX.

Witnesses

H. F. TIWKC,

A. A. EASTERLY.