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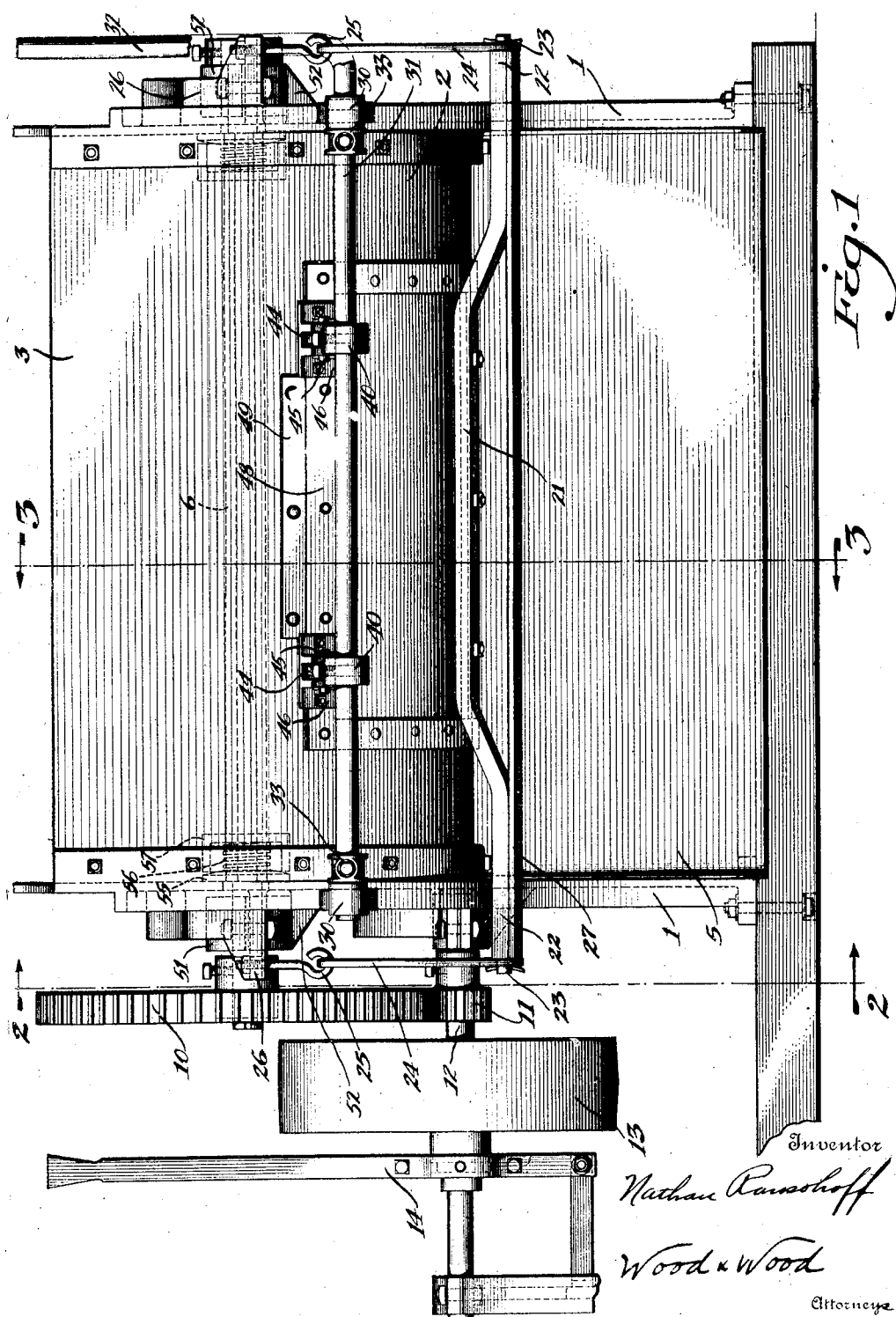
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MIXING MACHINE

Filed March 27, 1925

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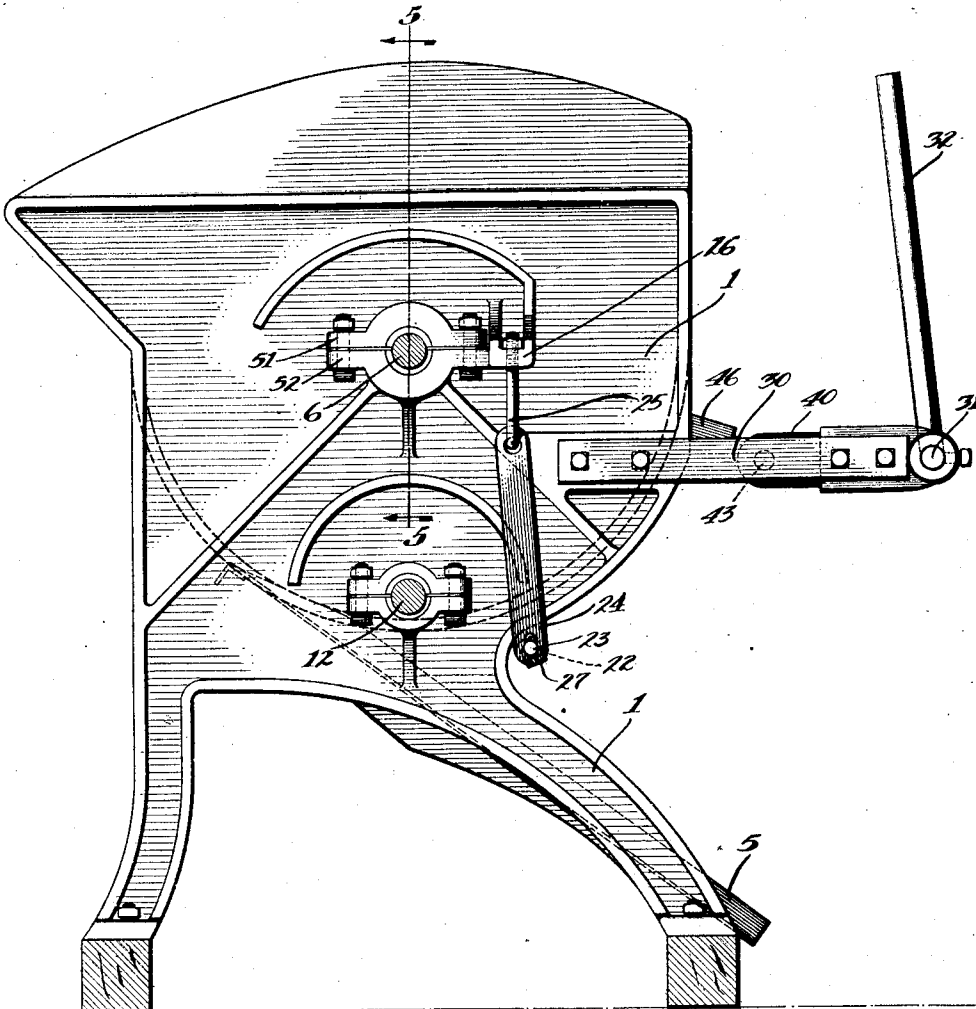


Fig. 2

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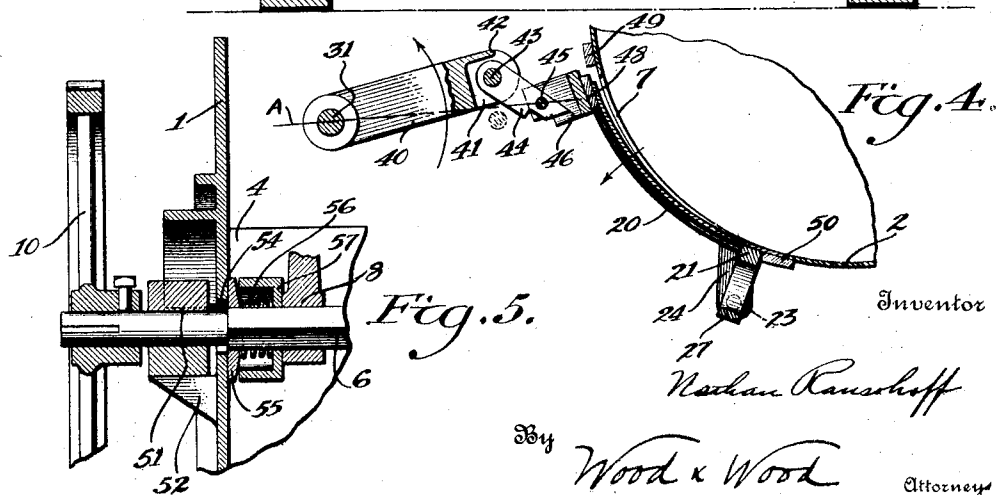
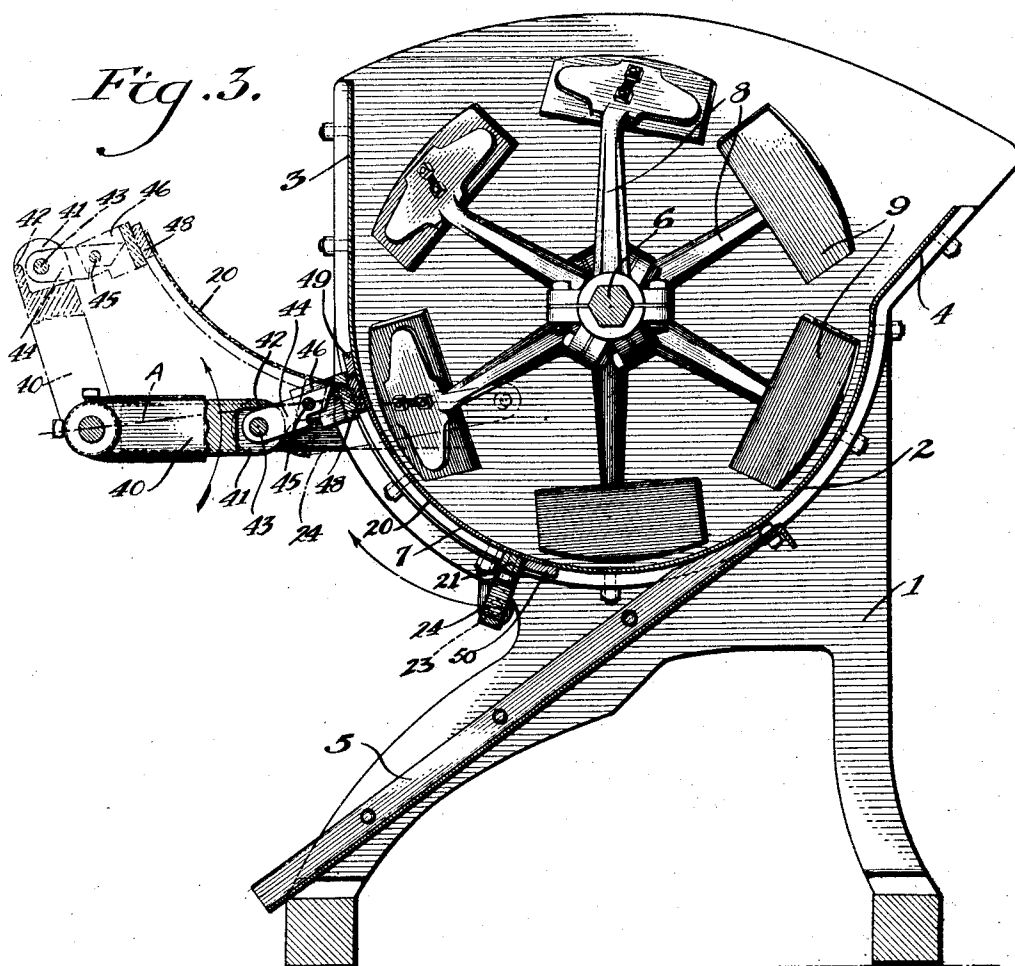
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UNITED STATES PATENT OFFICE.

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MIXING MACHINE.

Application filed March 27, 1925. Serial No. 18,860.

The invention relates to improvements in mixing machines, of a type wherein the batch is placed in an open receptacle and agitated by a rotary mixer of paddle-like configuration.

An object of the invention is to provide a mixing machine wherein the mix is discharged from the side and a portion of the bottom of the receptacle.

Another object is to provide a closure or discharge door sealingly fitted within the discharge opening, and to further provide means whereby the door can be bodily moved to a nonobstructing position to allow free discharge of the material through the opening.

Another object is to provide means for guiding the door to, and placing the same in the discharge opening, for sealingly closing the opening, and to further provide means for positively locking the door thus positioned against accidental displacement.

Another object is to provide a journal or bearing for a mixer shaft located at the outside of the mixing chamber, and to further provide improved means for closing the opening in the end walls of the receptacle through which the mixing shaft loosely extends.

Another object is to provide lever and toggle means for raising and positioning the discharge door in unobstructing position which may be operated with a small expenditure of force, and which remains in self-sustained position after being thus nonobstructedly disposed.

Other objects and certain advantages will appear in the description of the drawings forming a part of this application, and in said drawings:

Figure 1 is an elevation at the discharge side of the mixer showing the discharge door closed.

Figure 2 is a sectional end view on line 2—2 of Figure 1 with the parts positioned in correspondence to Figure 1.

Figure 3 is a vertical section through the mixer with the discharge door closed taken on line 3—3 of Figure 1, and showing in dot-and-dash lines, the fully withdrawn position of the door and door-operating mechanism.

Figure 4 is a fragmentary cross-section similar to Figure 3, illustrating the position of the door, and door opening and locking device, during the first stage of the door opening operation, in which the upper edge

of the door is drawn preliminarily outwardly and disengaged from the opening.

Figure 5 is a fragmentary vertical longitudinal section on line 5—5 of Figure 2, showing the manner of journaling the mixing shaft at the outside of the receptacle, and illustrating the means for sealing the end wall openings through which the shaft passes.

The mixer includes a receptacle, suitably supported by end castings 1. The receptacle is formed of sheet metal and has a substantially semi-cylindrical bottom 2, as a main mixing chamber; one vertical side 3 as a tangential extension of one side of the bottom; and an outwardly upwardly inclined side 4, as a non-tangential extension of the opposite side, forming with the ends 1, a guide or chute leading to the mixing chamber. The ends 1 and the metal sheet forming the receptacle are secured together by bolts. A trough or chute 5 leads downwardly and forwardly to the discharge side of the mixer to receive and guide the mixed batch as the same is discharged through the opening 7. This opening extends longitudinally of the mixing chamber, and also from a point substantially at the lowermost portion of the bottom, upwardly to the vertical side 3, and this allows a discharge of the batch from the bottom and side of the mixing chamber.

Within the receptacle longitudinally thereof is journaled a mixer shaft 6, the bearings of which are attached to the outer sides of the ends 1. The axis of the shaft coincides with that of the cylindrical bottom. In this instance the shaft is of hexagonal cross section, and has attached thereto a series of radially disposed longitudinally spaced mixer arms 8, each having at its outer extremity a plate or paddle 9, angularly related both to the rotative axis of the mixer shaft and to one another, in a manner to obtain a mixing action, by alternate translation of the batch in opposite directions, when the shaft is rotated. The mixing action forms no part of this invention and therefore any suitable mixing element can be used.

The mixer shaft has a spur gear 10 keyed thereto, which meshes with a pinion 11, keyed to a transmission shaft 12, held in suitable bearings, and having a drive pulley 13 thereon, adapted to be clutched to the shaft or unclutched therefrom by a suitable hand operated clutch 14.

In order to obtain a side and bottom dis-

charge of the mix and further to obtain a free or unobstructed discharge, a closure or door is provided for the discharge opening which can be easily bodily raised to a point
5 above the opening and which will be maintained in raised position without further effort on the part of the operator.

The door indicated at 20, is preferably formed also of sheet metal, and is curved,
10 and of the proper dimensions to snugly fit within the opening 7, as a cylindrical segment of the bottom of the mixer. The door is marginally re-enforced to give sufficient rigidity, and has attached longitudinally of
15 its bottom edge, by bolts, a pivot bar 21, bent outwardly from the door at points adjacent the opposite ends thereof; and the ends 22 of the bar extended beyond the end frames 1, and provided with trunnions 23, which extend
20 through the lower ends of links 24, the upper ends of which are pivotally attached to the eyes of eye-bolts 25, attached to and extending vertically downwardly from brackets 26 in turn attached to the outer
25 faces of the end irons 1. A reinforcing strip 27 connects the ends 22 of the bar 21, and thus a trussed frame is provided to which the door is attached and by which it is pivoted to the swinging links 24. The door is
30 thus pivotally and swingingly attached to the mixer frame and is adapted to be bodily swung away from the discharge opening 7.

The door is adapted to be released from the opening 7, and raised to an unobstructed
35 position by the following described mechanism, positions of which also act to prevent endwise motion of the door after release, and assure registration between door and opening, when the door is again brought to closing
40 position.

Attached to the outer sides of and extending horizontally outwardly from the end frames 1 at the discharge side of the device, are bearing brackets or arms 30. Rotatably
45 mounted in the bearing openings at the outer ends of these arms and extending parallel with the longitudinal axis of the machine, is a door operating shaft 31, having an operating handle 32, which is of sufficient weight
50 to sustain the door in opened and raised position when the lever has assumed a corresponding outwardly, horizontally disposed position. Set collars 33 prevent endwise motion of the shaft and permit adjustment of
55 the shaft, to obtain proper registration of the door and opening after assembly.

The door and shaft 31 are connected by pairs of toggles, one member of each pair being connected to the door adjacent respective
60 opposite ends. Both locking toggle devices are identical, so that the detail description will be in the singular.

The toggle device comprises two members, an arm 40 fixed to the shaft, and disposed
65 horizontally when the door is closed, and

bifurcated vertically as at 41. The top of the slot 41 is closed by a web which acts as a stop 42 for limiting the downward movement of the toggles. Pivoted as at 43 within
70 the slot is one end of the second arm or link 44, the opposite end of which is pivoted at its opposite end as at 45, between the arms of a bracket 46, which in turn is attached to re-enforcing and stop strip 48 attached longitudinally along the upper edge of the door,
75 for limiting inward movement of the door in its opening. A companion strip 49 re-enforces the casing wall adjacent the opening. Strip 50 is attached to and projects beyond the lower edge of the door, re-enforcing
80 that edge, and overlapping and engaging the under side of the bottom of the receptacle, and the bar 21, abuts the strip 50. Strips 48, 50 therefore assist in properly disposing the door within the opening flush with the casing.
85 ing.

When the door is in closed and locked position, see Figure 3, the central pivot 43 of the toggles is below a line A passing through the other two pivots 31, 45, and the upper edge
90 of the short link element 44, is engaged with the web 42, which acts as a stop or abutment for positively holding the toggle members in gravity-locked position, against accidental
95 displacement.

During the first portion of the manually obtained rotative motion of the main toggle or lever 40, see Figure 4, the lock is broken by the passage of the pivot 43 across the line
100 A, and thus a preliminary door-releasing motion is given to the upper portion of the door which is disengaged from the discharge opening preparatory to the subsequent outward swing of the lower end of the door about its
105 link pivot, upon continued motion of the main toggle lever.

Thus bodily movement of the door is obtained upwardly and outwardly to bring its lower edge substantially above the upper
110 edge of the discharge opening, permitting free discharge throughout the entire area of the opening.

It will be noted that upon continued rotation of the main toggle in anti-clockwise direction, see dot-and-dash lines of Figure 3,
115 the bottom is drawn upwardly and outwardly to a more horizontal position with its lower edges disposed adjacent or above the discharge opening. The door is thus by a simple rotative movement of the main toggle
120 adapted to be first pulled outwardly at its upper end, and thus released from the opening, and then swung outwardly at its lower end and bodily raised to the non-interfering position, at which position it is self-sustained.
125

A reverse movement of the operating lever 32 first lowers the door, and places its lower edge within the discharge opening, after which the door swings about its trunnion
130 pivots 23, the upper edge approaches, enters

and sealingly engages within the opening, and then the toggles again assume their locking position shown in Figure 3.

The bearings 51 of the mixer shaft, see Figure 5, are supported upon brackets 52, at the outer sides of the end frames 1, by which expedient they are not exposed to corrosive actions of the batch. The shaft 6 loosely traverses openings in the ends 1, and these openings are sealed by washers 55, each slidably disposed upon the shaft, and pressed against the end by a coil spring 56 surrounding the shaft and interposed between the washer 55, and a second cup-like washer 57 which in turn abuts an endmost arm 8, and surrounds and protects the spring. Thus, the opening in each end 1 is closed by a yieldable plate or washer and overflow from the mixing chamber to the bearing 50, substantially prevented.

Having described my invention, I claim:

1. In a mixing machine, a casing having a discharge opening at its lower side, a closure for said opening having a seating engagement therein, a pair of links hingedly suspendingly supported from opposite sides of said casing and pivotally connecting with said closure adapting the closure to be swung from said links for seating or unseating the closure, a rock shaft journaled on said casing, and sets of toggles, each comprising a pair of pivotally connected links having an end of one of the links fixed to the rock shaft and an end of the second link pivotally connected to said closure at an end of the closure opposite the connection of said pair of links, whereby upon actuating said rock shaft the toggles will swing said closure upon said pair of links for seating or unseating and bodily moving said closure with said pair of links to or from a position beyond the opening.

2. In a mixing machine, a casing having a discharge opening at its lower side, a closure for said opening having a seating engagement therein, a pair of links hingedly suspendingly supported from opposite sides of said casing and pivotally connecting with said closure adapting the closure to be swung from said links for seating or unseating the closure, a rock shaft journaled on said casing, and sets of toggles, each comprising a pair of pivotally connected links having an end of one of the links fixed to the rock shaft and an end of the second link pivotally connected to said closure at an

end of the closure opposite the connection of said pair of links, said toggles being arranged relative to said links for locking the mechanism in either closure open or closed position, and whereby upon actuating said rock shaft the toggles will swing said closure upon said pair of links for seating or unseating and bodily moving said closure with said pair of links to or from a position beyond the opening.

3. A device of the class described, comprising, a casing having a curved bottom, a discharge opening at one side of the curved bottom, a closure door for the opening of the same dimension as the opening, a pair of links, one of said links pivotally secured at each end of said casing and pivotally connected to the respective lower ends of the closure door, a pair of toggle levers having one outer end pivotally journaled in the casing in the same general plane with the upper edge of the discharge opening and the other toggle end pivotally attached to the door upper edge, said arrangement of support links and toggle levers adapted to dispose the closure door within the opening flush with the wall of the casing, and means for actuating said toggle levers to raise the door above the opening.

4. A device of the class described, comprising, a casing having a curved bottom, a discharge opening at one side of the curved bottom, a closure door for the opening of the same curvature as the bottom and of the same dimension as the opening, a pair of links, one of said links pivotally secured at each end of said casing and pivotally connected to the respective lower ends of the closure door, a pair of toggle levers having one outer end pivotally journaled in the casing in the same general plane with the upper edge of the discharge opening and the other toggle end pivotally attached to the door upper edge, said arrangement of support links and toggle levers disposing the closure door within the opening flush with the wall of the casing, an overhanging portion formed around the door edge and engageable with the outer margin of the discharge opening to seal the closure, and a lever connected with the outer toggle pivot for swinging the toggles and raising the door above the opening.

In witness whereof, I hereunto subscribe my name.

NATHAN RANSOHOFF.