

F. S. INGOLDSBY.

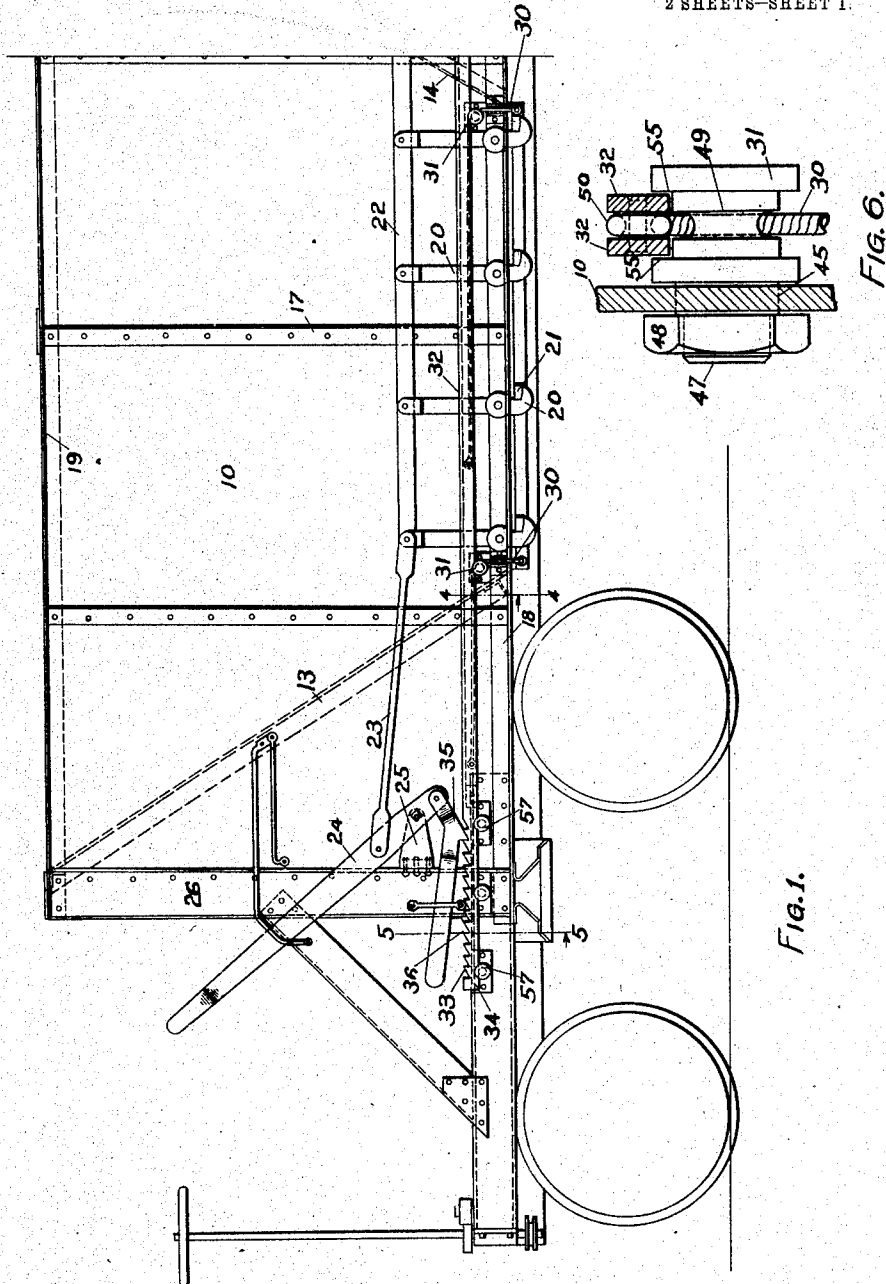
DUMP CAR.

APPLICATION FILED AUG. 24, 1907.

1,013,552.

Patented Jan. 2, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

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2 SHEETS—SHEET 2.

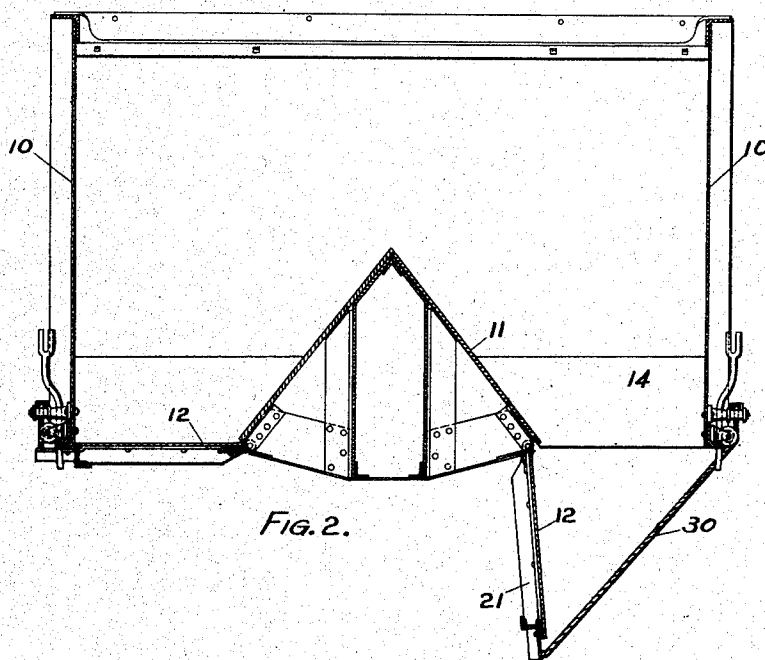


FIG. 2.

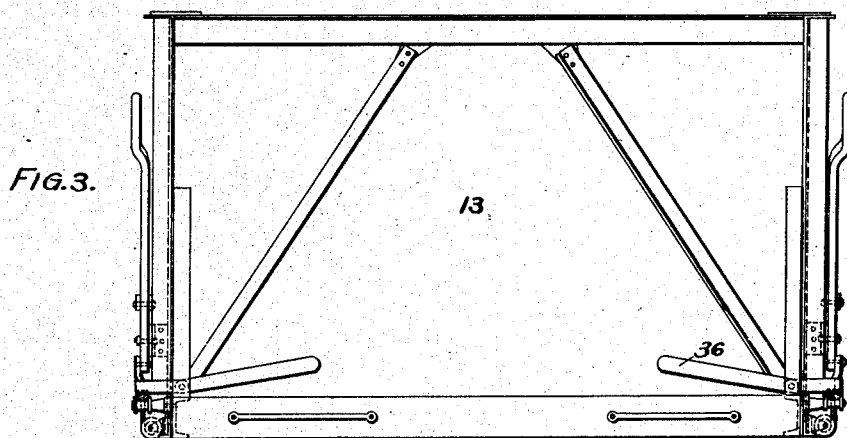


FIG. 3.

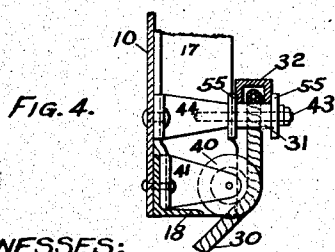


FIG. 4.

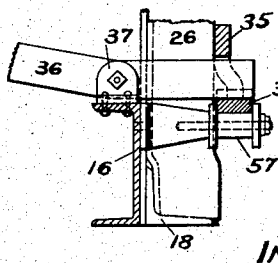


FIG. 5.

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UNITED STATES PATENT OFFICE.

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DUMP-CAR.

1,013,552.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed August 24, 1907. Serial No. 389,939.

To all whom it may concern:

Be it known that I, FRANK S. INGOLDSBY, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a certain new and useful Improvement in Dump-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide very simple and effective mechanism for raising the doors of dump cars.

The invention is well adapted for cars of the Ingoldsby type, wherein there is a longitudinal center member to which are hinged dumping doors which form all or a portion of the load carrying floor of the car and swing downwardly at their outer edges to discharge the load. In such cars it has been customary to support the doors by means of hooks pivoted along the side of the car and engaging floor beams on the under sides of the doors, the upper ends of these hooks being connected with a pivoted operating lever, which is thrown in one direction to cause the hooks to engage and in the opposite direction to release them. I have discovered that this same operating lever may be used to operate a mechanism to raise the doors. Such an arrangement is the subject of the present application.

This invention includes broadly the combination of releasing mechanism, raising mechanism and a common operating member therefor.

It includes moreover the particular embodiment shown in the drawings and herein-after more fully described, though it is to be understood that numerous modifications of this embodiment may be made without departing from my invention.

In the drawings, Figure 1 is a side elevation of substantially half a car embodying my invention; Fig. 2 is a cross section thereof; Fig. 3 is an end view; Figs. 4 and 5 are details, being vertical sections substantially on the correspondingly numbered lines of Fig. 1; Fig. 6 is a detail of a slightly modified form of pulley which may be employed in the raising mechanism.

Referring to the parts by reference numerals, 10 represents the side of a car which is shown as a plate girder, having a lower chord 18, an upper chord 19 and vertical

stiffeners 17; 11 represents the central longitudinal member, which is shown as ridge-shaped, and 12 the dumping doors hinged to the central longitudinal member, and adapted to extend outwardly to the car sides. 13 represents an inclined end floor and 14 a cross beam or a member. The car shown is thus divided into four hoppers, and the load is normally supported by the dumping doors and the inclined walls of these hoppers.

It is to be understood that the present invention is not concerned with the interior of the car, which may be made in hoppers as illustrated, or may be a level bottom car wherein the doors constitute substantially the whole of the bottom, or it may be constructed in other form.

Pivoted to the sides of the car are hooks or levers 20, the lower ends of which are adapted to engage beneath floor beams 21 on the under sides of the doors. The upper ends of these hooks are connected by a horizontal bar 22 which is connected by a link 23 with an operating lever 24. This lever is pivoted at a suitable point, the arrangement shown being by means of a bracket 25 secured to the end strut 26 of the girder side. The pivoting may be made directly to the car side, or in any other manner desired.

It will be seen from the structure described, that, when the lever is in the position shown in Fig. 1 extending in the direction toward the extreme end of the car, the hooks engage beneath the floor beams and support the doors. When the lever is thrown forward the hooks are withdrawn from the floor beams and the doors dropped. This is the usual arrangement in Ingoldsby cars.

To raise the doors I provide the following very simple mechanism: Secured to each door are two or more cables, chains or flexible members indicated by 30. These flexible members pass upwardly over suitable pulleys 31 and then extend horizontally toward the end of the car. These pulleys 31 are so formed as to carry also a longitudinal bar 32, which (as shown in Figs. 1-5) may be in the form of a channel-bar, with its flanges facing downwardly. The upper ends of the flexible members are secured to this channel-bar. Near its end, the longitudinal member carries upwardly facing teeth 33.

These teeth may be made in a solid bar 34 extending within and secured to the channel 32. Pulleys 57, similar to pulleys 31 are provided at close intervals beneath the tooth bar 34, to effectively support it.

In the present invention, the operating lever 24 extends below its pivot 25 and to such extension is pivoted an operating pawl 35. This pawl is adapted to engage the teeth 33. 36 represents a detent pawl extending cross-wise of the car, and adapted to engage the teeth 33. This detent pawl is shown as being pivoted to a bracket 37 secured to the channel beam 16 which constitutes an extension of the side-sill. The pawl 36 rests against the outer face of the vertical strut 26.

Now, with the above described construction, if the doors have been dropped to discharge the load, they may be easily elevated by oscillations of the operating lever 24. The forward movement of the upper end of that lever toward the center of the car, shoves the bar 32 toward the end of the car, drawing upwardly on the cables 30 and elevating the door. At the end of the stroke the gain made is secured by the detent pawl 36, the inner end of which is drawn upward by the operator's foot, so that the pawl-nose engages the teeth 33 and prevents backward movement of the longitudinal bar. As the lever is moved backward, the pawl 35 clicks idly over the teeth 33; then, on the next stroke, the door is further elevated, and so on, by successive oscillations until the door is brought home.

The parts are so proportioned that as the door is going into its home position the lever will be making its final stroke forward, so that the lower ends of the hooks 20 are out of the way of the floor beams, which clear them. Now when the lever returns these hooks to locking position beneath the floor beams, the bevel on the engaging face of the hooks (as shown in Fig. 1) lifts the floor beams slightly and brings the doors snugly into position. This same movement releases the tension on the flexible members which releases the pressure on the detent pawl 36. As soon as the operator removes his foot from beneath this pawl, the superior weight of its inner end swings this end downward which raises the rear end of the pawl 35 extending above the detent pawl, thus freeing the raising mechanism. The parts thus automatically assume position for the next releasing of the doors, as soon as the doors have been raised and locked.

If desired, suitable guide pulleys 40 may be provided for the flexible members 30 to bend against in passing from the pulleys 31 to the doors. In the drawings these pulleys are shown as mounted in suitable brackets 41 riveted to the lower chord 18 on car side.

In Figs. 1-5 I have shown the pulleys 31

as being journaled on bolts 43 mounted in brackets 44 riveted to the car side. This construction may be employed where it is desirable to locate the longitudinal bar 32 outside of the stiffeners 17 or other members of the car. In some forms of car, however, it may be desirable to locate this member closer to the car side, in which case the pulley may be provided with a boss journaling it directly in the car side. This form is illustrated in Fig. 6. In this figure 45 represents the boss of the pulley journaled to the car side 10, the boss having a reduced extension 47, on which screws a nut 48. In this figure there is shown a peripheral groove 49 to receive the cable 30. The longitudinal member is shown as composed of two flat bars 32, the cable riding between them and being formed with an eye 50 extending around a bolt 51, connecting the bars 32. Whether the pulley and longitudinal member take the form shown in Fig. 4 or Fig. 6 depends on the convenience of construction. In either event space is provided for the cable, and flanges 55 are provided by the pulley for guiding the longitudinal member.

Having described my invention, I claim:

1. In a dump car, the combination of a dumping door, mechanism for releasing the door, and mechanism for raising the door operated by successive movements of part of the releasing mechanism.

2. In a dump car, the combination of a dumping door, a pivoted lever for releasing the door, and mechanism for raising the door operated by successive oscillations of said lever.

3. In a dump car, the combination of a dumping door, hooks on the car side adapted to support the door, a member connected with said hooks and adapted to move them to release the door, and raising mechanism for the door operated by movement of said member.

4. In a dump car, the combination of a dumping door, hooks on the car side adapted to support the door, a lever connected with said hooks and adapted to move them to release the door, and raising mechanism for the door operated by oscillations of said lever.

5. In a dump car, the combination of a central longitudinal member and dumping doors hinged thereto and adapted to extend outwardly to the car sides, hooks pivoted on the car sides for supporting said doors, levers for operating said hooks, and raising mechanism operated also by said levers.

6. In a dump car, the combination of a dumping door, a flexible raising member connected therewith, a toothed member connected with said flexible member, supporting means for the door, a member adapted to move the supporting means to

release the door, and means operated by the last mentioned member and adapted to engage such teeth.

7. In a dump car, the combination of a dumping door, a flexible raising member connected therewith, a toothed member connected with said flexible member, supporting means for the door, a lever connected therewith and adapted to move the supporting means to release the door, and a pawl operated by said lever and adapted to engage such teeth.

8. In a dump car, the combination of a dumping door, a flexible member connected thereto, a toothed reciprocating bar, to which the flexible member is connected, a pivoted lever, and a pawl carried thereby and adapted to engage and operate the bar.

9. In a dump car, the combination of a dumping door, a flexible member connected thereto, a toothed reciprocating bar, to which the flexible member is connected, a pivoted lever, a pawl carried thereby and adapted to engage the bar, and releasing mechanism operated by the lever.

10. In a dump car, the combination, with the car side, of a longitudinal bar movable along the side, flexible members carried thereby, pulleys over which said flexible members depend, a dumping door to which said flexible members are connected, and two pawls for moving and retaining said bar.

11. In a dump car, the combination with the car side, of a longitudinal bar movable along the side, flexible members carried thereby, pulleys over which said flexible members depend, a dumping door to which said flexible members are connected, said bar having a toothed portion, driving and holding pawls for moving and retaining said bar, and a pivoted lever connected with said driving pawl.

12. In a dump car, the combination, with the car side, of a longitudinal bar movable along the side, flexible members carried thereby, pulleys over which said flexible members depend, a dumping door to which said flexible members are connected, a pawl for moving said bar, a pivoted lever connected with said pawl, mechanism for sustaining and releasing the door, and a connection between said mechanism and said lever.

13. The combination of a car side, pulleys carried thereby, a stiff longitudinal member riding on said pulleys, flexible members secured to said longitudinal member and depending over the pulleys, a dumping door to which said flexible members are connected, and mechanism for moving said longitudinal member to raise the door.

14. The combination of a car side, pulleys carried thereby, a longitudinal bar riding on said pulleys, flexible members secured

within a recess in said bar and depending over the pulleys, a dumping door to which said flexible members are connected, and mechanism for moving said bar longitudinally to raise the door.

15. The combination of a car side, pulleys carried thereby, a longitudinal bar riding on said pulleys, flexible members secured to said bar and depending from the pulleys, a dumping door to which said flexible members are connected, and a lever and pawl adapted to act on said bar to move it longitudinally to raise the door.

16. In a dump car, the combination with a dumping door and a car side, of pulleys carried by the car side in a substantially horizontal row and provided each with a pair of flanges, a bar riding between said flanges, and flexible members secured to the bar depending from the pulleys and secured at their lower ends to the door.

17. The combination, in a dump car, of a central, longitudinal member, doors hinged thereto adapted to extend outwardly to the car sides, pulleys carried by said sides, flexible members depending over said pulleys and connected at their lower ends to the doors, longitudinal members which ride on said pulleys and to which the upper ends of the flexible members are connected, and mechanism for moving and holding said longitudinal members.

18. The combination, in a dump car, of a central longitudinal member, doors hinged thereto adapted to extend outwardly to the car sides, means on the car sides for sustaining said doors, pulleys carried by said sides, flexible members depending over said pulleys and connected at their lower ends to the doors, longitudinal members which ride on the pulleys and to which the upper ends of the flexible members are connected, and common operating mechanism for moving said longitudinal members and releasing the sustaining means.

19. In a dump car, the combination, with a dumping door, of a flexible member connected therewith, a shiftable bar to which the other end of said member is connected, and a pulley on which said bar rolls and over which the flexible member travels.

20. In a dump car, the combination, with a dumping door, of a flexible member connected therewith, a shiftable bar to which said member is connected, and a pulley on which both the flexible member and bar travel.

21. In a dump car, the combination, with a dumping door, of a flexible member connected therewith, a shiftable bar, to which the other end of said member is connected, and a pulley on which said bar rolls, said bar being in the form of a channel facing downwardly whereby space is provided for the flexible member.

22. In a dump car, the combination, with a dumping door, of a longitudinal raising member, a driving pawl for operating said member, and a detent pawl for holding said member, said driving pawl having a part extending over the detent pawl, whereby the movement of the detent pawl to idle position may move the driving pawl to idle position.
23. In a dump car, the combination with a dumping door of a longitudinal raising member, a driving pawl for operating said member, a detent pawl for holding said member, said driving pawl having a part extending over the detent pawl, whereby the movement of the detent pawl to idle position may move the driving pawl to idle position, said detent pawl being provided with a counterweighted end tending to move it to idle position.
24. In a dump car, the combination of a car side, pulleys carried thereby, a longitudinal member riding on said pulleys, a dumping door, a flexible member connecting the longitudinal member with the dumping door, teeth on the longitudinal member, a pivoted operating lever, a driving pawl carried thereby and adapted to engage said teeth, a detent pawl pivoted crosswise of the car, and adapted to engage teeth on the longitudinal member, said detent pawl extending beneath the driving pawl and extending in the opposite direction in the form of a counterweighted end tending to release both pawls.
25. In a dump car, the combination of door releasing mechanism, door raising mechanism, and common operating mechanism all located at the side of the car.
26. In a dump car, the combination with a dumping door, of a lever pivoted at the side of the car, mechanism operated by said lever for releasing the door, and raising mechanism adapted to be operated by said lever.
27. In a dump car, the combination with a dumping door, of a lever pivoted at the side of the car, mechanism operated by said lever for releasing the door, and mechanism for raising the door, adapted also to be operated by said lever.
28. In a dump car, the combination with a dumping door, of hooks on the car side adapted to support the door, a lever for operating said hooks, mechanism for raising the door operated by said lever, and means whereby such mechanism may bring the door substantially home with the hooks out of engagement, and thereafter the continued movement of said lever may cause said hooks to engage and hold the door before said raising mechanism is released.
29. In a dump car, the combination of a dumping door, a flexible member for raising the same, a stiff member to which the flexible member is secured, and a pulley on which both the flexible member and the stiff member ride.
30. In a dump car, the combination with a dumping door, of pulleys carried by the car side, a longitudinally shiftable stiff member riding on said pulleys, and flexible members secured to the longitudinal member and depending over the pulleys to the door.
31. In a dump car, the combination of a pulley having a main groove and a deeper groove, a stiff member riding in the main groove, and a flexible member carried by the stiff member and occupying the deeper grooves.
32. In a dump car, the combination of a pulley, a stiff member and a flexible member connected together and both riding on the same pulley.
33. In a dump car, the combination with a dumping door, of flexible raising members, and a stiff member to which the raising members are anchored, and pulleys for supporting the raising members and stiff member.
34. In a dump car, the combination with a dumping door, a flexible member connected therewith, a shiftable bar to which the flexible member is connected, and a pulley for supporting said parts.
35. In a dump car, the combination of a dumping door, a plurality of flexible raising members secured thereto, a plurality of pulleys over which the raising members pass, and a single bar riding on a plurality of pulleys and having a plurality of raising members connected to it.
36. In a dump car, the combination of a car side, pulleys carried thereby, a longitudinal bar riding on said pulleys, flexible members secured to said bar and depending from said pulleys, and a dumping door to which said flexible members are connected.
37. In a dump car, the combination of a car side, pulleys carried thereby, a longitudinal bar riding on said pulleys, flexible members secured to said bar and depending from said pulleys, a dumping door to which said flexible members are connected, and mechanism for pulling said bar longitudinally.
38. In a dump car, the combination of a car side, pulleys carried thereby, a longitudinal bar riding on said pulleys, mechanism near one end of the car for moving said bar longitudinally, and flexible members secured to the bottom and adapted to extend parallel therewith and then depend over the pulleys and dumping doors to which said flexible members are secured.
39. In a dump car, a raising mechanism comprising a longitudinally shiftable bar, a flexible member secured thereto, and a pulley on which both the bar and the flexible member ride.
40. In a dump car, the combination of a

dumping door, a flexible member, and a longitudinally shiftable member having two substantially parallel sides between which the flexible member is anchored.

5 41. In a dump car having dumping doors, raising mechanism for said doors comprising a longitudinal shiftable bar, a flexible member secured to the said bar, a pulley having a single groove, the said flexible member and bar being adapted to be supported upon the pulley within the said groove.

15 42. In a dump car having a plurality of dumping doors, raising mechanism for the said doors comprising a flexible member secured to each door, a bar extending longitudinally of the car, pulleys secured upon the said car adjacent each of the doors, each of the said pulleys being provided with a single groove, the flexible member and the bar being supported by the pulley and occupying the said groove.

25 43. In a dump car having a dumping door, the combination with a device for supporting the door, means for operating said device, and a winding mechanism comprising a flexible member secured to the door and a bar longitudinally shiftable with respect to the car, and common operating means for the winding mechanism and the means for operating the door supporting device.

30 44. In a dump car having dumping doors,

of devices carried by the car for supporting the doors when in raised position, means for simultaneously operating the said devices to release the doors, in combination with raising mechanism for the doors comprising flexible members secured to the doors, a longitudinal bar to which said flexible members are secured, and means for simultaneously operating said bar and the means for releasing the supporting devices.

45. In a dump car, the combination of a plurality of door supporting devices carried by the side of the car, means for operating the said devices to release the doors, door raising mechanism comprising a shiftable bar, and flexible connections between said bar and the doors, means for simultaneously operating the door releasing mechanism and the raising means.

46. In a dump car, the combination, with door releasing mechanism, of door raising mechanism comprising a movable bar, a pulley, and a flexible member secured to the said bar and the door and passing across the pulley, and means for simultaneously operating the said bar and the said releasing mechanism.

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

FRANK S. INGOLDSBY.

Witnesses:

F. J. BERSCHBACH,
WM. J. ROWE.