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PATENTED OCT. 31, 1905.

J. C. WILSON.
SWITCH TONGUE THROWING MECHANISM.

APPLICATION FILED APR. 14, 1905.

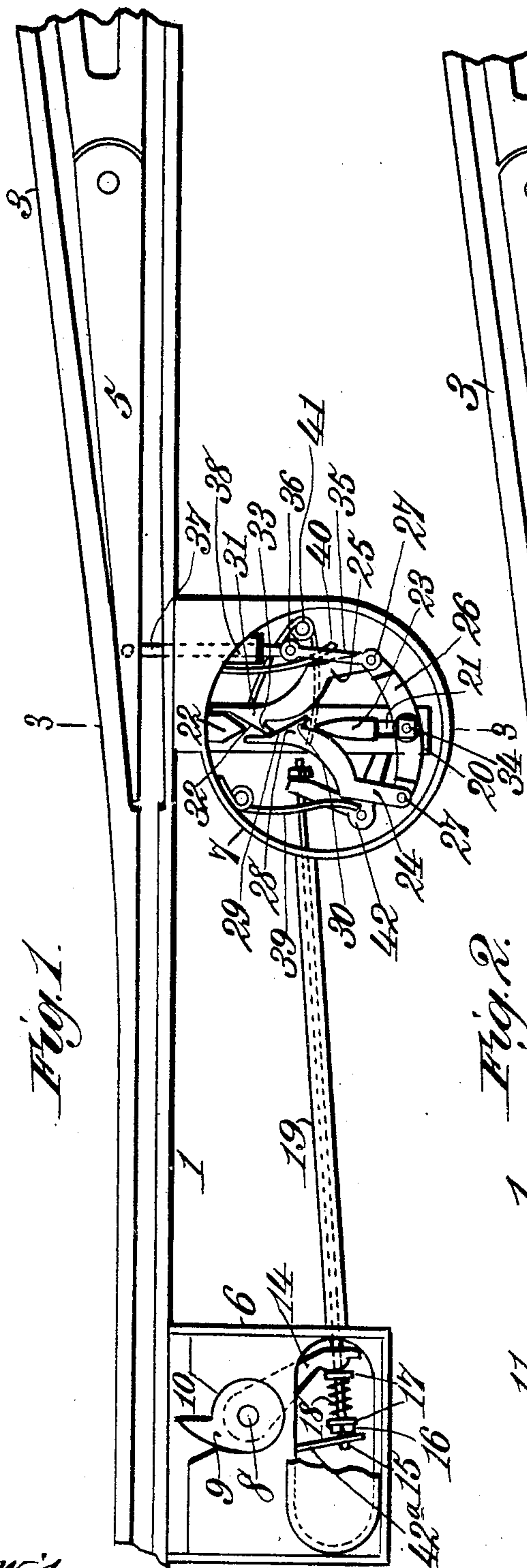


Fig. 1.

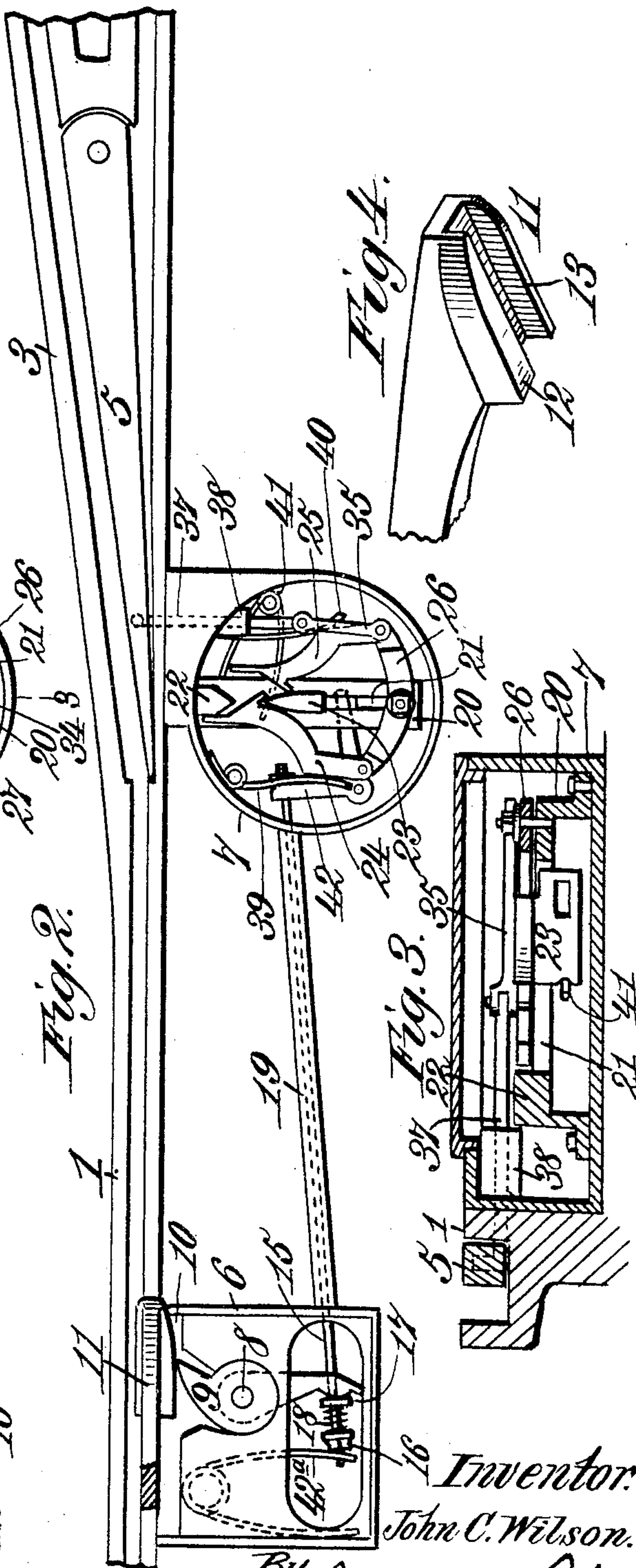


Fig. 2.

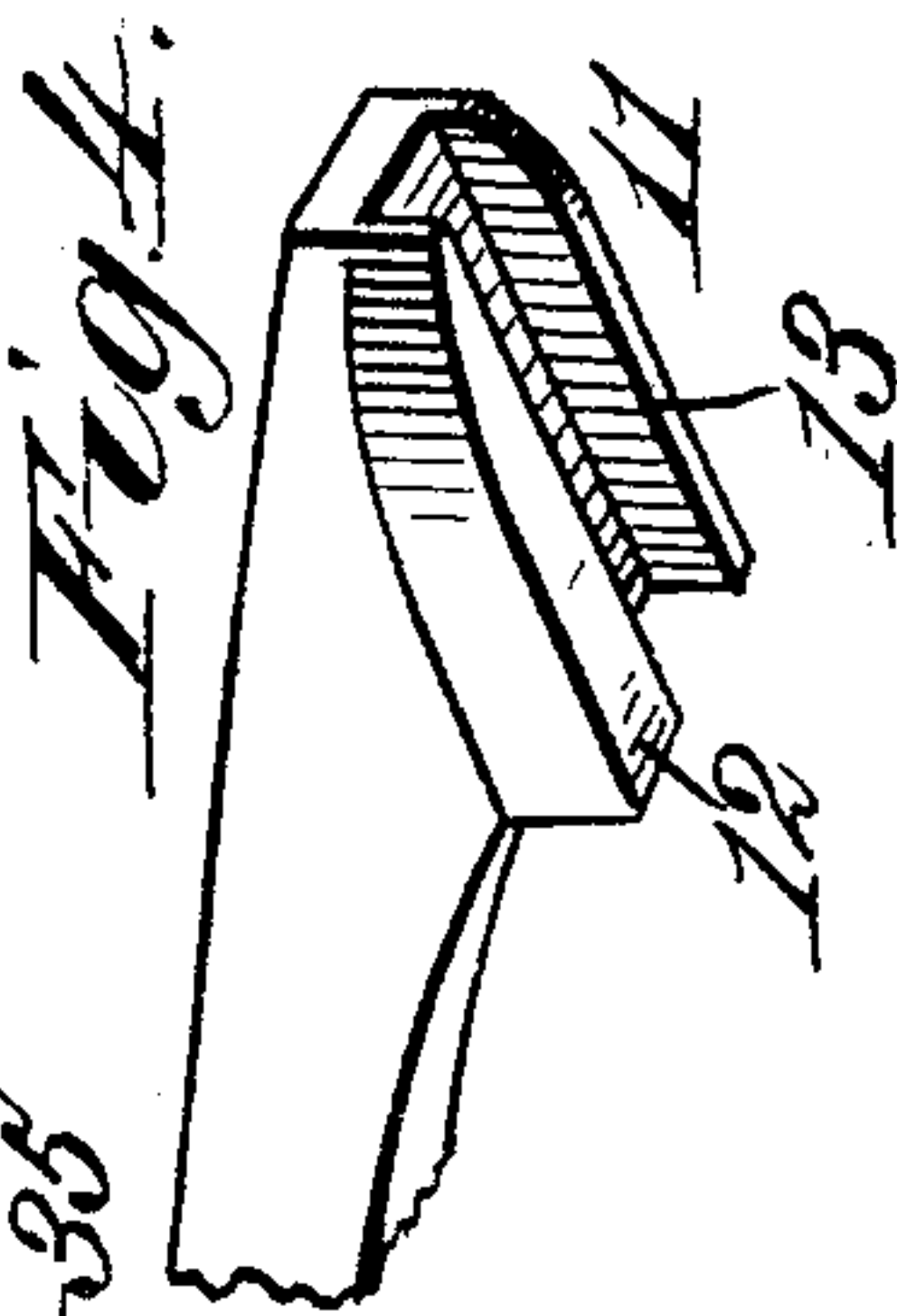


Fig. 3.

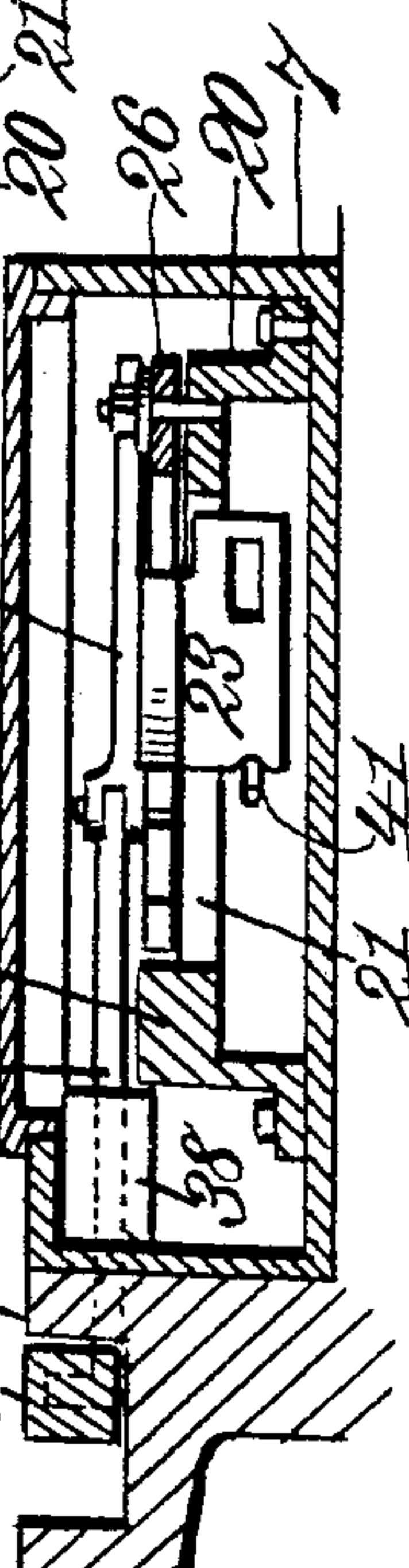


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SWITCH-TONGUE-THROWING MECHANISM.

No. 803,382.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed April 14, 1905. Serial No. 255,649.

To all whom it may concern:

Be it known that I, JOHN C. WILSON, a citizen of the United States, residing at Nespelem, in the county of Okanogan and State of Washington, have invented new and useful Improvements in Switch-Tongue-Throwing Mechanism, of which the following is a specification.

This invention relates to switch-tongue-throwing mechanisms; and the object thereof is to provide a mechanism of such class embodying various novel features hereinafter more specifically described, said mechanism being adapted and designed for throwing switch-tongues on railways, more particularly street-railways; and to this end the invention consists of the construction, combination, and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, which form a part of this specification, and wherein like reference characters denote corresponding parts throughout the several views, and in which—

Figure 1 is a plan of a switch-tongue-throwing mechanism constructed in accordance with this invention and arranged in operative relation with respect to the track-rails and switch-tongue. Fig. 2 is a like view showing a plow adapted to be carried by the car and in engagement with the trip when throwing the switch-tongue. Fig. 3 is a section on line 3 3, Fig. 1; and Fig. 4 is a detail of the plow.

Referring to the drawings by reference characters, 1 denotes one of the track-rails of the main line, 3 denotes one of the track-rails of the branch line, and 5 denotes the switch-tongue.

A switch-tongue-throwing mechanism constructed in accordance with this invention embodies two casings provided with suitable covers and indicated by the reference characters 6 7. The casing 6 is arranged at one side of the track-rail 1 at a point removed from the switch-tongue 5, and the casing 7 is arranged at one side of the track-rail 1 in close proximity to the switch-tongue 5. The casing 6 carries a vertically-extending shaft 8, having upon its upper end a trip-dog 9, which extends across a channel 10, formed in the top of the casing and arranged in the path of the plow 11, which is carried by the car. The trip-dog 9 is seated within a cut-away portion

formed in the top of the casing 6, so that the upper face of said dog 9 will be flush with the upper face of the casing 6. That portion of the dog 9 which is engaged by the plow 11 during the travel thereof is rounded off, which facilitates the passage of the plow, at the same time causes the actuation of the dog 9 by the plow. The plow 11 is provided with the drop-flanges 12 13, so that the plow will straddle the top of the track-rail 1 during its passage through the channel 10 and its engagement with the dog 9. Suitable mechanism is carried by the car within reach of the motorman, so as to lower and raise the plow when occasion so requires. The drop-flange 12 of the plow is formed in a wedge-shaped manner, which materially assists in actuating the dog 9 during the passage of the plow. Upon the lower end of the shaft 8 a crank-arm 14 is attached. Said arm is arranged within the casing 6 and extends at an inclination and has its free end formed with an opening through which extends one end of an operating element 15—for example, an elongated rod—although any other suitable means for the same purpose as the element can be employed. That end of the rod 15 which extends through and projects from the apertured end of the crank-arm 14 carries a nut 16 and a pair of washers 17, between which and arranged upon the rod 15 is a compression-spring 18. The rod 15 extends through an elongated conduit 19, which is connected at one end with the casing 6 and at its other end to the casing 7. The rod 15, as before stated, extends through the crank-arm 14 within the casing 6, and said rod 15 also extends within the casing 7 for a purpose to be hereinafter referred to.

Within the casing 7 is arranged the throwing mechanism for the switch-tongue, and said mechanism is so constructed as to throw, when operated, the switch-tongue in alternate directions. For example, if the car be traveling upon the main track and the trip-dog is actuated the throwing mechanism shifts the switch-tongue in one direction. If another car should come along and the trip-dog is actuated, the throwing mechanism will shift the switch-tongue in an opposite direction. The throwing mechanism for the switch-tongue consists of a support 20, having an elongated slot 21 therein and further provided at that end in proximity to the switch-tongue 5 with a beveled tooth 22. Extending upwardly through the slot 21 and reciprocating therein is a chamfered throwing-arm 23, which is

adapted to alternately engage a pair of pulling-arms, (indicated by the reference characters 24 and 25.) Each of the pulling-arms 24 and 25 is pivoted at one end to the ends of a shifting-lever 26, as at 27, and the free ends of the said pulling-arms 24 and 25 are arranged within the path of the arm 23 and are each provided with a protuberance, a beveled portion, and a tooth. The protuberance of the pulling-arm 24 is indicated by the reference character 28, the beveled portion by the reference character 29, and the tooth by the reference character 30, and the protuberance of the pulling-arm 25 is indicated by the reference character 31, the beveled portion by the reference character 32, and the tooth by the reference character 33. The pulling-arms have a portion of their length curvilinear, so as to project over and upon the support 20 in the path of the throwing-arm. When one of the pulling-arms is shifted by the throwing-arm 23, the beveled portion of said pulling-arm is adapted to engage the tooth of the other of said pulling-arms for shifting the said last-mentioned pulling-arm out of the path of the first-mentioned pulling-arm, so that said latter pulling-arm can be shifted by the throwing-arm. The beveled tooth 22 acts as a stop for that pulling-arm which is being shifted. The lever 26 is pivoted to the support 20, as at 34, and said lever 26 is shifted through the medium of either one of the pulling-arms 24 and 25 when operated through the medium of the throwing-arm 23. Pivoted to one end of the lever 26 is a link 35, which in turn is pivoted, as at 36, to a shifting-bar 37, which passes through a stuffing-box 38 and is connected to the switch-tongue 5. Fastened at one end to the wall of the casing 7 and having its free end bearing against the arm 24 is a spring 39, whose function is to normally retain the arm 24 in the path of the throwing-arm 23, and 40 denotes a spring bearing against the arm 25 for the same purpose as the spring 39 in connection with the arm 24. 41 denotes an expanding spring connected to the pulling-arm 23 for automatically returning said arm 23 to its inoperative position. 42 denotes a bell-crank lever having one of its arms connected to the pulling-arm 23 and its other arm connected to the rod 15. A spring 42" within the casing 7, which engages one end of the rod 15, returns the said rod 15, trip-dog, and the bell-crank lever to normal position and associates with the action of the spring 41.

The function of the spring 18 is to relieve the strain on the mechanism should any obstruction get between the tongue 5 and the rail, so that the tongue could not be moved. The spring 18 will allow the plow to pass through and the trip-dog to turn without breaking any part of the mechanism, which would be the case if the spring 18 was not employed.

The manner in which the entire mechanism

operates is as follows: It will be assumed that the car is traveling upon the main line and the switch-tongue 5 is to be shifted so as to switch the car upon the branch line, the mechanism within the casing 7 will be in the following position: The arm 24 immediately in advance of the arm 23 and arranged partly at the rear of the free end of the arm 25, the lever 26 having that end thereof to which the arm 25 is pivoted extending toward the switch-tongue, the plow engaging the trip-dog 9 will shift the same, which will cause the actuation of the bell-crank lever 42, causing the pulling-arm 23 to be moved toward the tooth 22. During this movement of the arm 23 the same will engage the tooth 30 of the arm 24, consequently carrying said arm 24 therewith, shifting the lever 26, and withdrawing the shifting-bar 37 into the casing 7, said bar 37 carrying the switch-tongue therewith, and consequently shifting it against the track-rail 1, thereby setting the switch proper for the car to travel upon the branch line. When this movement has been had and the plow has passed by the trip-dog 9, the action of the spring 18 and spring 41 will cause the rod 15 to assume its normal position as well as the bell-crank lever 42 and pulling-arm 23. During the return of the pulling-arm 23 the arm 24, owing to the action of the spring 40, will be caused to move upon the support 20 immediately in advance of the arm 23, so that if said arm 23 was actuated it would engage the tooth 33 of the arm 25 and shift it, causing thereby the operation of the lever 26 and the projecting forwardly of the bar 37, thereby shifting or throwing the switch-tongue 5 in an opposite direction to that just referred to.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A switch-tongue-throwing mechanism comprising a pair of pulling-arms, each provided with a beveled portion and a tooth, the beveled portion of one arm adapted to shift the other arm out of the path of the first-mentioned arm, means for suitably connecting said arms with the switch-tongue, and means for operating the said arm, causing thereby the shifting of the switch-tongue in alternate directions.

2. A switch-tongue-throwing mechanism comprising a pair of pulling-arms, each provided with a beveled portion and a tooth, the beveled portion of one arm adapted to shift the other arm out of the path of the first-mentioned arm, means for suitably connecting said arms with the switch-tongue, a reciprocating throwing-arm adapted to alternately engage the teeth of the said arms for operating the said arms, thereby throwing the switch-tongue in alternate directions, and means for operating the said throwing-arm.

3. A switch-tongue-throwing mechanism comprising a pair of pulling-arms, each pro-

vided with a beveled portion and a tooth, the beveled portion of one arm adapted to shift the other arm out of the path of the first-mentioned arm, means for suitably connecting
 5 said arms with the switch-tongue, a reciprocating throwing-arm adapted to alternately engage the teeth of the said arms for operating the said arms, thereby throwing the switch-tongue in alternate directions, and a
 10 trip-dog suitably connected with said throwing-arm and adapted when actuated to reciprocate said arm in one direction.

4. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms connected
 15 with the switch-tongue and adapted when operated to shift the switch-tongue in alternate directions, one of said arms arranged in the path of the other of said arms, and means for operating one of said pulling-arms, thereby
 20 moving the same out of the path of the unoperated arm and causing the operated arm to be moved in the path of the unoperated arm.

5. A switch-tongue-throwing mechanism comprising a shifting-lever, means connected
 25 with one end of said lever and with the switch-tongue for throwing the latter when the lever is operated, a pair of pulling-arms connected to the ends of said lever, one of said arms arranged in the path of the other of said arms,
 30 and means for operating one of said arms, thereby shifting said lever and causing the operated arm to be moved in the path of the unoperated arm.

6. A switch-tongue-throwing mechanism,
 35 comprising a reciprocating throwing-arm, a pair of toothed pulling-arms arranged in the path of said throwing-arm and adapted to be engaged and alternately operated thereby, a switch-tongue suitably connected with said
 40 pulling-arms and adapted to be operated in alternate directions thereby, and means connected with the throwing-arm for operating it.

7. A switch-tongue-throwing mechanism, comprising a reciprocating throwing-arm, a
 45 pair of toothed pulling-arms arranged in the path of said throwing-arm and adapted to be engaged and alternately operated thereby, a switch-tongue suitably connected with said pulling-arms and adapted to be operated in
 50 alternate directions thereby, a bell-crank lever connected with said throwing-arm for operating it, and means connected with the bell-crank lever for operating it.

8. A switch-tongue-throwing mechanism,
 55 comprising a reciprocating throwing-arm, a pair of toothed pulling-arms arranged in the path of said throwing-arm and adapted to be alternately operated thereby, one of said pulling-arms arranged in advance of the other of said
 60 pulling-arms, means for moving one of said pulling-arms to a position rearwardly of the other of said pulling-arms, means connected with said pulling-arms and with the switch-tongue for shifting the latter in alternate di-
 65 rections when said pulling-arms are operated,

means connected with said throwing-arm for operating it in one direction, and means for returning said pulling-arm to its operative position.

9. A switch-tongue-throwing mechanism, 70 comprising a reciprocating throwing-arm, a pair of toothed pulling-arms arranged in the path of said throwing-arm and adapted to be alternately operated thereby, one of said pull-
 75 ing-arms arranged in advance of the other of said pulling-arms, means for moving one of said pulling-arms to a position rearwardly of the other of said pulling-arms, means con-
 80 nected with said pulling-arms and with the switch-tongue for shifting the latter in alter-
 85 nate directions when said pulling-arms are operated, a bell-crank lever connected with said throwing-arm and adapted when oper-
 90 ated to operate the said throwing-arm, means for operating the bell-crank lever, and means
 95 for returning the bell-crank lever and throw-
 100 ing-arm to their inoperative positions.

10. A switch-tongue-throwing mechanism, comprising a pair of toothed pulling-arms,
 90 one arranged in advance of the other and adapted to be alternately operated, connec-
 95 tions between said pulling-arms and the switch-tongue for throwing the switch-tongue in alternate directions when the said pulling-
 100 arms are operated, means for alternately op-
 105 erating said pulling-arms, a bell-crank lever connected with said operating means for the
 110 arms, operating means for said bell-crank lever, and a trip mechanism connected with
 115 said operating means for the lever for actu-
 120 ating it.

11. A switch-tongue-throwing mechanism, comprising a support having an elongated slot
 105 and further provided at one end with a stop, a reciprocating pulling-arm extending up-
 110 wardly through said slot and operating to-
 115 ward and away from said stop, a pair of toothed pulling-arms extending upon said support and arranged one in advance of the
 120 other and adapted to be engaged and alter-
 125 nately operated by said throwing-arm, a shifting-lever pivoted to said pulling-arms and adapted to be actuated thereby, means
 130 connected with the shifting-lever and with the switch-tongue for throwing the switch-
 135 tongue in alternate directions when said lever is operated by said arms, a bell-crank lever
 140 connected with said throwing-arm for oper-
 145 ating it, actuating means for said bell-crank lever, and a trip mechanism for operating
 150 said actuating means.

12. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, one ar-
 125 ranged in advance of the other, means for operating one of said arms, causing thereby
 130 the shifting of the other of said arms out of the path of the operated arm, means for mov-
 135 ing the unoperated arm to the rear of the op-
 140 erated arm, connections between the pulling-
 145 arms and the switch-tongue for shifting it, 130

and a trip mechanism connected with said means for operating it.

13. A switch-tongue-throwing mechanism, comprising a pair of curvilinear pulling-arms, each provided with a tooth, one of said arms arranged in advance of the other, means for moving one of said arms to the rear of the other of said arms, a reciprocatory throwing-arm adapted to engage with the said toothed arms for alternately operating them, connections between the pulling-arms and the switch-tongue for throwing the latter when the pulling-arms are operated, and a trip mechanism actuated from a moving car for operating said throwing-arm.

14. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, each provided with a tooth, a reciprocatory throwing-arm adapted to alternately engage said pulling-arms for operating them, a shifting-lever pivotally connected with the said pulling-arms, a shifting-bar connected with said shifting-lever and with the switch-tongue for throwing the latter when said lever is operated, means for returning said arms to their inoperative position, a bell-crank connected to said throwing-arm for operating it, a rod connected with said bell-crank for actuating it, a crank-arm connected with said rod for operating it, a shaft secured to the crank-arm, and a trip-dog connected to the shaft and adapted when actuated to rotate the shaft, thereby moving the crank-arm and operating the rod.

15. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, one arranged in advance of the other, means for operating one of said arms, causing thereby the shifting of the other of said arms out of the path of the operated arm, means for moving the unoperated arm to the rear of the operated arm, connections between the pulling-arms and the switch-tongue for shifting it when one of the said arms is operated, and operating mechanism for said means.

16. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, one arranged in advance of the other, one of said arms provided with means adapted to engage the other of said arms for moving the first-mentioned arm out of the path of the other of the arms when one of the arms is operated, means for operating one of said arms, means for moving the unoperated arm to the rear of the operated arm, connections between the pulling-arms and the switch-tongue for shifting it when one of the said arms is operated, and operating mechanism for said means.

17. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, one arranged in advance of the other, one of said arms provided with means adapted to engage the other of said arms for moving the first-mentioned arm out of the path of the other of the arms when one of the arms is operated,

means for operating one of said arms, means for moving the unoperated arm to the rear of the operated arm, connections between the pulling-arms and the switch-tongue for shifting it when one of the said arms is operated, and operating mechanism for said means, combined with a plow carried by the car and adapted to engage and actuate said operating mechanism.

18. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, one arranged in advance of the other, one of said arms provided with means adapted to engage the other of said arms for moving the first-mentioned arm out of the path of the other of the arms when one of the arms is operated, means for operating one of said arms, means for moving the unoperated arm to the rear of the operated arm, connections between the pulling-arms and the switch-tongue for shifting it when one of the said arms is operated, and operating mechanism for said means, combined with a plow carried by the car and adapted to straddle one of the track-rails to engage and actuate said operating mechanism.

19. A switch-tongue-throwing mechanism, comprising a pair of alternately-operating pulling-arms, a reciprocatory block adapted to alternately operate said arms, connections between the arms and the switch-tongue for shifting the tongue when one of said arms is operated, a lever mechanism connected with said reciprocatory arm for operating it in one direction, means for automatically returning said reciprocatory arm to its normal position, and a trip mechanism connected with said lever mechanism and adapted when operated to actuate the lever mechanism.

20. A switch-tongue-throwing mechanism comprising a pair of pulling-arms, one arranged in advance of the other, one of said arms provided with means adapted to engage the other of said arms for moving the first-mentioned arm out of the path of the other of the arms when one of the arms is operated, means for operating one of said arms, means for moving the unoperated arm to the rear of the operated arm, connections between the pulling-arms and the switch-tongue for shifting it when one of the said arms is operated, operating mechanism for said means, and means for relieving certain parts of the mechanism to prevent the breakage thereof when the switch-tongue is blocked.

21. A switch-tongue-throwing mechanism, comprising a pair of pulling-arms, each provided with a protuberance, a beveled portion and a tooth, said pulling-arms suitably connected with the switch-tongue, combined with means for operating said arms, causing thereby the throwing of the switch-tongue in opposite directions, and means to relieve the strain upon said arms should the switch-tongue be obstructed.

22. A switch-tongue-throwing mechanism,

comprising a pair of pulling-arms connected with the switch-tongue and adapted when operated to shift the switch-tongue in alternate directions, one of said arms arranged in the path of the other of said arms, and means for operating one of said pulling-arms, thereby moving the same out of the path of the unoperated arm and causing the operated arm to be moved in the path of the unoperated arm, combined with means for relieving the strain upon said pulling-arms when the switch-tongue is obstructed.

23. A switch-tongue-throwing mechanism, comprising a reciprocating throwing-arm, a pair of toothed pulling-arms arranged in the path of said throwing-arm and adapted to be

engaged and alternately operated thereby, a switch-tongue suitably connected with said pulling-arms and adapted to be operated in alternate directions thereby, and means connected with the throwing-arm for operating it, combined with means for relieving the strain upon said arms and said operating means if the switch-tongue is obstructed.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN C. WILSON.

Witnesses:

HENRY M. STEELE,
E. K. JACOBS.