

R. H. STALEY.

RAMMER.

APPLICATION FILED MAR. 27, 1909.

1,044,589.

Patented Nov. 19, 1912.

3 SHEETS-SHEET 1.

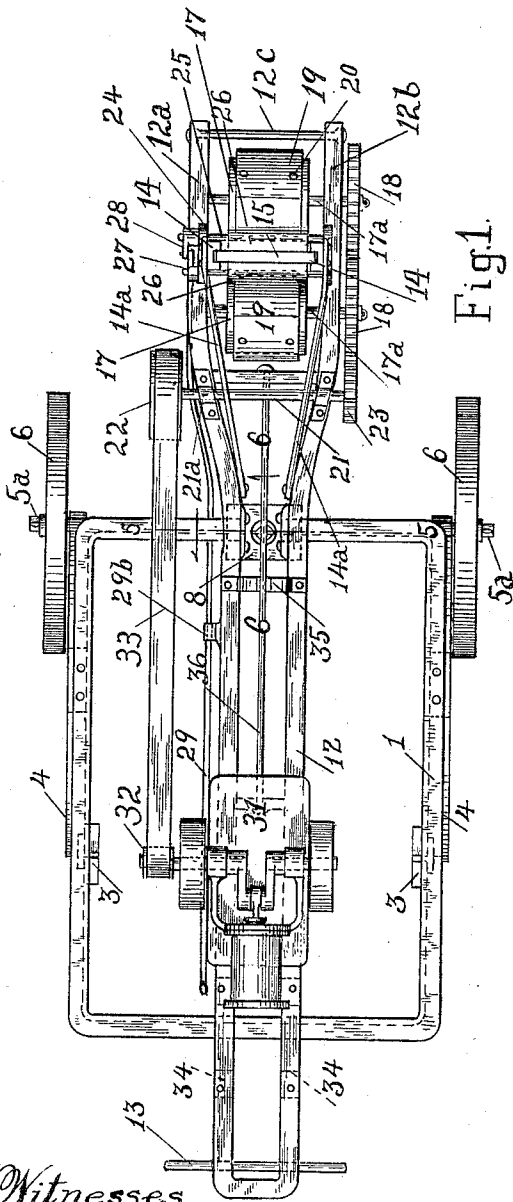


Fig. 1.

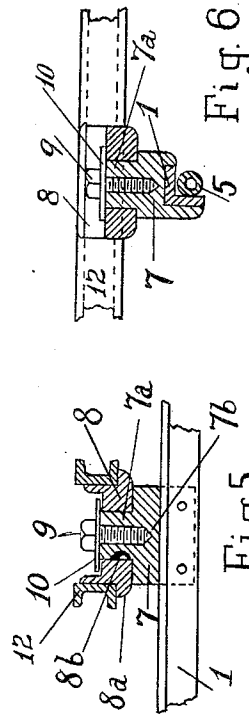


Fig. 5

Fig. 6

Witnesses.
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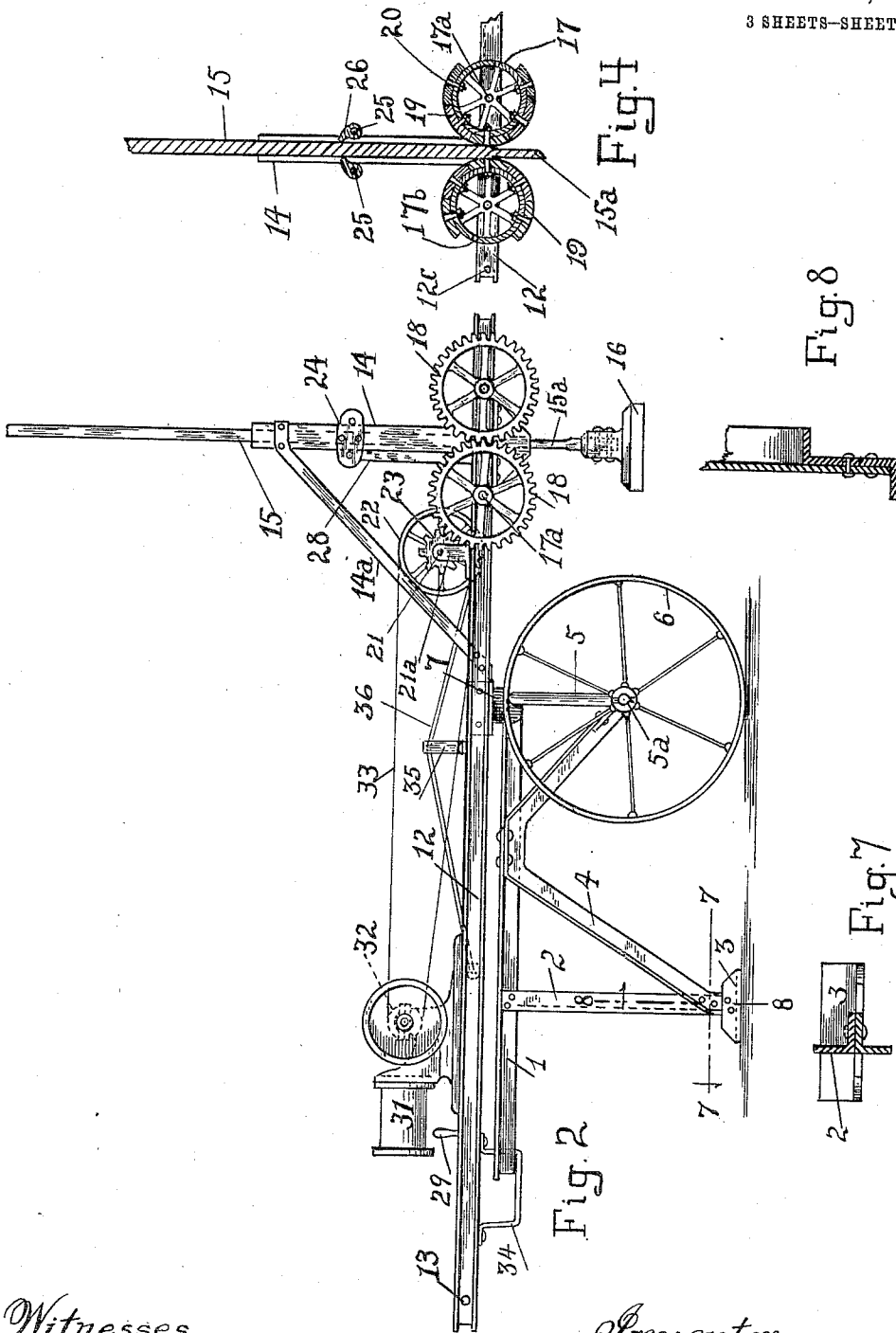
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3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

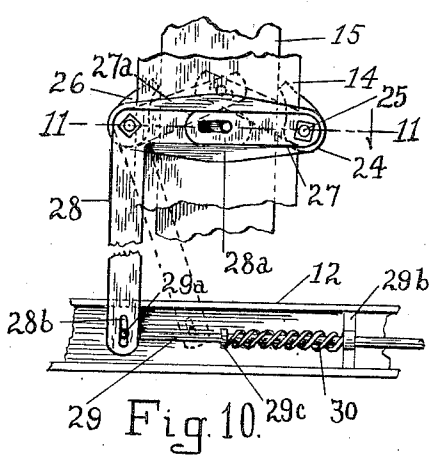


Fig. 10.

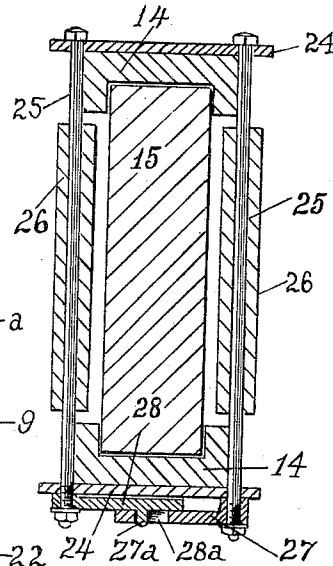


Fig. 11.

Fig. 3.

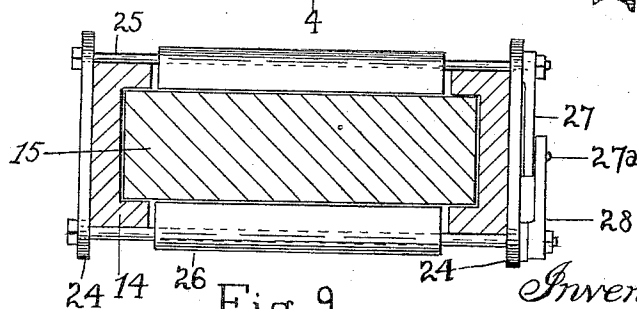
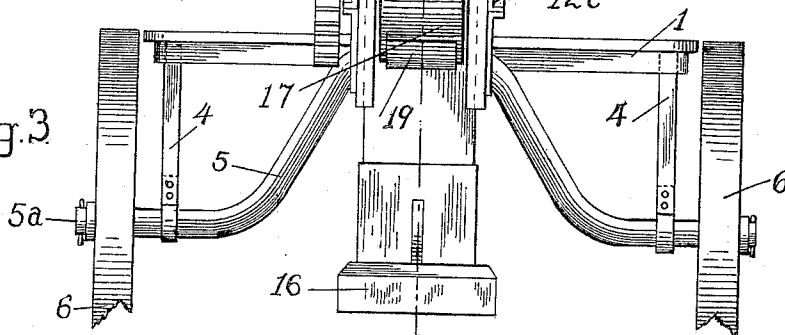


Fig. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

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RAMMER.

1,044,589.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed March 27, 1909. Serial No. 486,265.

To all whom it may concern:

Be it known that I, RALEIGH H. STALEY, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a new and useful Rammer, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

This invention relates to machines of the class used for tamping concrete, sand, dirt, or the like, in the foundation or upon the surface of floors, roads or walks; to tamp concrete in the foundation trenches of buildings; or to tamp dirt, sand, etc., while it is being shoveled back into trenches excavated for sewers, water mains, gas mains and service pipes.

More specific purposes of the invention are to provide instrumentalities enumerated below and effective for the purposes stated, viz: a propellable vehicle of improved construction supporting a sweep and connected parts; a sweep mounted to oscillate horizontally on the vehicle and supporting the operating mechanisms and having a wide scope of movement; means for connecting the sweep with the vehicle so that the sweep may be easily oscillated above the wheels of the vehicle; a vertically slidable plunger mounted on the sweep and equipped with a rammer block; means for guiding the sliding movement of the plunger; automatically acting means for raising the plunger to a predetermined height and then releasing it to permit it to fall by gravity; changeable means for controlling the extent of the upward movement of the plunger; latches effective to support the plunger in its raised position when the machine is not in use; means for releasing the latches supporting the plunger; and other minor features of construction.

With these ends in view, my invention consists in the new and useful features of construction and combinations of parts shown in the annexed drawings to which reference is hereby made, and hereinafter particularly described and finally recited in the claims.

In the drawings, similar reference numerals and characters designate like parts in the several views.

Figures 1, 2, and 3, are respectively a top plan, a side elevation, and an end elevation

of the complete machine. Fig. 4 is an enlarged partial vertical section on the line 4. 4. of Fig. 3, and shows the rollers in section and the cam plates in position on the rollers. Fig. 5 is an enlarged transverse section on the line 5. 5. of Fig. 1 and shows in detail, the swivel connection of the sweep with the main frame; Fig. 6 is an enlarged vertical section on the line 6. 6. of Fig. 1; Fig. 7 is an enlarged transverse section through one leg and the brace connected therewith, on the line 7. 7. of Fig. 2; Fig. 8 is an enlarged vertical section on the line 8. 8. of Fig. 2; Fig. 9 is an enlarged horizontal section just above the latches on the line 9. 9. of Fig. 3; Fig. 10 is an enlarged side elevation of the latch-operating mechanism, and Fig. 11 is a transverse section through the latch-operating mechanism on the line 11. 11. of Fig. 10.

The main frame 1, consists of a single angle bar bent in the form of a rectangle substantially as shown. Vertical legs 2, are fixed on the main frame and have at their lower ends feet 3 riveted on the legs. An arched axle 5, is securely fixed on the frame 1 and has spindles 5^a on which the wheels 6 turn. Wheels 6, fitting and turning on the spindles 5^a, support the main frame. Braces 4 fixed on the frame 1, are firmly connected with the legs 2 and the arched axle 5, and give rigidity to the structure. A saddle 7 is fixed on the frame 1 and has an integral vertical spindle 7^a provided with a central female screw 7^b.

The sweep block 8 has ledges 8^a supporting the sweep and has a central hole 8^b within which the spindle 7^a of the saddle fits so that the sweep block will turn freely on the spindle. A screw bolt 9 screws into the central hole in the spindle 7^a, and a washer 10 between the upper end of the spindle 7^a and the head of the screw 9 projects beyond the spindle 7^a and over the upper surface of the block 8 to keep the block in position and permit it to turn freely on the spindle.

The sweep 12 is made of channel bar, bent in the form of an elongated letter U, and has at its forward end members 12^a and 12^b firmly connected by a bolt 12^c. A handle 13 on the sweep 12 facilitates handling of the sweep. Parallel, vertical channel bars 14, are fixed on the members 12^a and 12^b respectively, and serve to guide the plunger. Braces 14^a connect the upper part of the bars

14 with the sweep 12. The plunger 15 slides in the guides 14, and the lower part 15^a of the plunger, is of reduced thickness in order to prevent excessive lifting of the plunger.

5 When the plunger is being raised by the revolving segment plates acting on the sides of the plunger, the segment plates 19 of the rotating cylinders 17 will act to raise the plunger while they run in contact with the
10 sides of the plunger, but when the plunger is raised to the predetermined height and its reduced part 15^a comes between the segment plates, the reduced thickness of the plunger being less than the distance between the
15 plates, they will cease to act, and therefore cannot lift the plunger higher than it should go. A ram 16 is fixed on the lower end of the plunger 15.

Parallel cylinders 17 of suitable dimensions, are respectively fixed on shafts 17^a which are mounted to turn in suitable bearings on the side members of the sweep 12. Intermeshing cog wheels 18, are fixed on the shafts 17^a respectively. A plurality of segment
20 plates 19 are connected with each of the cylinders 17 by bolts 20 fitting in suitably disposed holes 17^b, extending through the wall of the cylinder and so arranged that by removing the nuts on the bolts 20,
25 and withdrawing the bolts, the segment plates may be removed from the cylinder. Each of the cylinders 17 is equipped with a plurality of segment plates 19 in order that the height to which the plunger may be
30 raised, may be determined by the number of segment plates in situation on the cylinders. If it be desired to raise the plunger to a medium height, a suitable number of segment
35 plates will occupy a proportional part of the circumference of the cylinder; and if it be desired to increase the height to which the plunger is to be raised, additional segment plates will be placed upon the circumference of the cylinders respectively; and
40 conversely, if it be desired to diminish the height to which the plunger is to be raised, one or more segment plates will be removed in order that the surface of the segment plates mounted on the cylinders and running
45 in contact with the sides of the plunger, will raise the plunger to the desired height.

A shaft 21 is mounted to turn in suitable supports 21^a on the side pieces of the sweep.
55 A pulley 22 fixed on the shaft 21, carries a belt transmitting the power from the motor. A pinion 23 fixed on the shaft 21 meshes with and drives one of the cog wheels 18.

Plates 24 fixed on the guides 14, support
60 shafts 25 turning in suitable bearings on the plates. Dogs 26 fixed on the shafts 25 respectively have their upper edges in contact with the sides of the plunger 15, and are so arranged that the dogs will permit upward
65 sliding of the plunger 15 and will gravitate

and press against the sides of the plunger, to prevent downward movement of the plunger.

An arm 27, (Figs. 10 and 11,) is fixed on one of the shafts 25 and has a lengthwise slot 28^a. A bell-crank lever 28 is secured on the other shaft 25 and has near the outer end of one member a lateral pin 27^a fitting in the slot 28^a, and has near the end of the other member a slot 28^b accommodating a
70 laterally extending pin 29^a on the rod 29. The rod 29 slides in guides 29^b on the sweep 12, and extends rearwardly along the sweep, within easy reach of the operator. A collar 29^c is fixed on the shaft 29. A spring 30
75 surrounds the rod 29 and normally acts to move the rod to hold the lever 28 in such position that the points of the dogs 26 will contact with the sides of the plunger 15 and hold the plunger in its raised position when the machine is not in use. When the machine is in use, the rod 29 will be pulled
80 rearward, thereby pulling the vertical member of the lever 28 to the right and causing the arm 27 and the horizontal member of the lever 28 to assume the position indicated by dotted lines in Fig. 10, and thereby move the points of the dogs 26 away from the sides of the plunger 15, so that the plunger may move freely upward or downward between
85 the dogs.

A motor 31, of any approved construction, is mounted on the sweep 12 and is equipped with a pulley 32. A belt 33 runs on the pulleys 32 and 22, and drives the
90 shaft 21; and the pinion 23 on the shaft 21 drives the gears 18 actuating the cylinders 17.

The cylinders 17 rotate in such direction that the segment plates 19, acting on the plunger 15, will raise it and when the circumferences of the segment plates turn out of engagement with the plunger, it will fall by gravity between those parts of the cylinders 17 which are without segment plates; and upon the falling of the plunger the ram 16 will act upon the material underlying the ram.
95

The handle 13 may be used to oscillate the sweep to make the ram effective in different
100 positions, according to the conditions of its use.

On the under side of each side member of the sweep 12 is a loop 34. The loops 34 extend under the front cross piece of the frame 1, and both ends of the loops are secured to the side members of the sweep 12, so that the loops will not interfere with the oscillation of the sweep, but will engage with the under side of the front cross piece of the frame 1, to prevent tipping of the sweep.
105

An arch 35 is fixed in a vertical position and extends transversely across the central part of the sweep, and supports a truss-rod 36 which has its ends securely connected
110 130

with the sweep. The truss rod 36 prevents sagging of the sweep.

When the motor is running and in operation the dogs 26 will be withdrawn from the plunger, so as not to interfere with its free movement.

In transporting the machine from place to place, the plunger will be raised and the dogs 26 will engage with, and support the plunger so that the ram will be a suitable distance above the ground and will not interfere with the transportation of the machine.

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

1. In a machine of the class described, the combination of a vertically slidable plunger, of reduced thickness for part of its length, parallel revoluble cylinders spaced to permit free downward movement of said plunger between said cylinders during part of each rotation thereof and having detachable members forming surfaces adapted to engage with and lift said plunger, to an extent determined by the reduced part of said plunger, and means adapted to support said plunger in its raised position.

2. In a machine of the class described, the combination of parallel revoluble cylinders spaced to permit downward movement of a plunger between said cylinders, a plurality of segment plates detachably connected with said cylinders respectively, each cylinder having an equal number of similar segment plates adapted to engage with and lift a vertically slidable plunger, and a vertically slidable plunger adapted to be engaged and lifted by the cooperating segment plates of said cylinders, to an extent determined by the number of segment plates in use on said cylinders.

3. In a machine of the class described, the combination of a supporting structure, parallel vertical guides fixed on said structure, a plunger slidable in said guides, oscillative shafts mounted on said guides, dogs fixed on said shafts and gravitating to engage the sides of said plunger, an arm connected with one of said shafts, a bell-crank lever connected with the other of said shafts and operatively connected with said arm, a slidable rod connected with said bell-crank lever, and a spring acting to slide said rod to normally keep said dogs in contact with said plunger.

4. In a machine of the class described, the combination of a main frame, a saddle fixed on the main frame and having a vertical spindle, a sweep block mounted on said saddle and adapted to turn on the spindle thereof and having ledges adapted to support the members of a sweep, a sweep secured to said sweep block and supported on the ledges thereof, a washer on said spindle, a securing device securing said washer so as to prevent

vertical displacement of and permit free rotation of the sweep block on said spindle.

5. In a machine of the class described, the combination of a main frame, a sweep oscillative on the main frame, parallel guides fixed in a vertical position on said sweep, a plunger slidable in said guides, a first rotatable cylinder and a second rotatable cylinder co-acting to raise said plunger during part of each revolution of said cylinders and adapted to permit the descent of said plunger during part of each revolution of said cylinders, intermeshing cog wheels connected with said cylinders respectively, a revoluble shaft mounted on said sweep, a pinion fixed on said shaft and meshing with and driving one of said cog wheels, a pulley fixed on said shaft, a motor mounted on said sweep and provided with a pulley, and a belt running on the pulley of said motor and on the pulley on said shaft, and actuating the mechanism as set forth.

6. In an apparatus of the class described, the combination of a main frame and supporting wheels; a sweep oscillative on said main frame; a motor and appurtenances weighting one end of said sweep; a gravitating plunger equipped with a ram and means for raising and releasing said plunger and weighting the other end of said sweep; an arch centrally transverse to said sweep; and a truss rod supported on said arch and having its ends respectively secured near the ends of said sweep and serving to prevent sagging of the sweep.

7. In a machine of the character described, the combination of parallel revoluble cylinders, having non-lifting surfaces occupying a part of the circumference of said cylinders respectively and spaced to permit free vertical movement of a plunger between the non-lifting surfaces of said cylinders, and removable segment shaped lifting tread surfaces occupying a part of the circumference of said cylinders respectively and adapted to engage with and lift a plunger, and a slidable plunger adapted to be engaged by the lifting surfaces of said cylinders to lift said plunger.

8. In a machine of the character described, the combination of parallel revoluble cylinders, having non-lifting surfaces occupying a part of the circumference of said cylinders respectively and spaced to permit free vertical movement of a plunger between the non-lifting surfaces of said cylinders, segment shaped plates one for each cylinder secured to the latter and adapted to engage with and lift a plunger, a slidable plunger adapted to be engaged by the lifting surfaces of said cylinders to lift said plunger, and a laterally movable support for the plunger.

9. In a machine of the class described, the combination of a plunger parallel revoluble

cylinders spaced to permit downward movement of a plunger between said cylinders, and a segment plate connected with each of said cylinders respectively, the segment plates adapted to engage with and lift the vertically slidable plunger and the surface of the cylinders between the ends of the segment plates forming non-lifting surfaces to release the plunger.

10 10. In a machine of the character described, the combination of a main frame, a sweep oscillative on the main frame, parallel guides fixed in a vertical position on said sweep, a plunger slidable in said guides, and a motor for operating the plunger positioned upon the opposite end of the sweep and constituting a counter balance therefor.

11. In an apparatus of the character described, the combination of a main frame, an elongated sweep pivoted intermediate its ends to the end of the main frame and projecting a considerable distance therebeyond whereby it is horizontally oscillative on the main frame, a plunger slidable in guides on the projecting free end of the sweep and equipped with a ram, means for alternately raising and releasing said plunger to permit the plunger to gravitate, and means for preventing vertical tipping movement of the sweep, said means including a motor drive positioned upon the opposite end of the sweep.

12. In an apparatus of the character described, the combination of a main frame and supporting wheels, an elongated sweep pivoted intermediate its ends on said main frame adjacent the end thereof and at a point in substantial alinement with the axis of the supporting wheels, the free end of the sweep projecting a considerable distance beyond said end of the main frame, a motor and appurtenances weighting one end of said sweep, a gravitating plunger equipped with a ram at the free end of the sweep, and means for raising and releasing said plunger and weighting the other end of said sweep.

13. In an apparatus of the character described, the combination of a main frame and supporting wheels, a sweep oscillative on said main frame, a motor and appurtenances supported on and weighting one end of said sweep, a gravitating plunger equipped with a ram, means for raising and releasing said plunger and weighting the other end of said sweep, and bracing instrumentalities intermediate the ends of the sweep for preventing sagging thereof.

14. In a machine of the character described, the combination of a main frame, an elongated sweep pivoted intermediate its ends for horizontal swinging movement directly on the main frame, vertical guides on

the sweep to one side of said pivot, a vertically slidable plunger and ram movable in said guides, and means for preventing tilting movement of said sweep, said means including weighting instrumentalities positioned on the sweep to the opposite side of said pivot.

15. In a machine of the character described, the combination of a carrying frame, a vertically movable plunger mounted on the frame and carrying a ram, means for raising the plunger including oppositely disposed cylinders having on their periphery segment plates engaging opposite surfaces of the ram, the terminals of the plates being separated to form non-lifting surfaces on the periphery of the cylinders, and gear mechanism for imparting rotary movement to the cylinders.

16. In a machine of the character described, the combination of a frame, a plunger mounted on the frame for vertical sliding movement, means for imparting sliding movement to the plunger comprising cylinders one upon opposite sides of the plunger and detachable segment plates on the cylinders.

17. In a machine of the character described, a frame, a laterally movable sweep mounted on the frame, a plunger having a ram mounted on the sweep, and a motor mounted directly on the sweep for operating the ram, the motor being positioned adjacent one end of the sweep and the plunger adjacent the opposite end thereof whereby they balance one another.

18. In a machine of the character described, the combination of a main frame, an elongated sweep mounted for horizontal movement on the frame, elongated vertical guides on the sweep, a plunger carrying a ram slidable in said guides and power drive mechanism mounted upon for movement with the sweep for operating the plunger, the motor being positioned adjacent one end of the sweep and the plunger adjacent the opposite end thereof whereby they balance one another.

19. In a machine of the character described, the combination of a main frame, of a horizontally extending sweep pivoted to the frame for lateral swinging movement, a ram carried by the sweep, and power drive mechanism on the sweep for operating the ram, the motor and ram being positioned at opposite sides of said pivot.

In witness whereof I have hereunto signed my name at Springfield, Illinois, this 20th day of Jan., 1909.

RALEIGH H. STALEY.

Witnesses:

KATHRYN NELSON,
ELEN S. TUCKER.