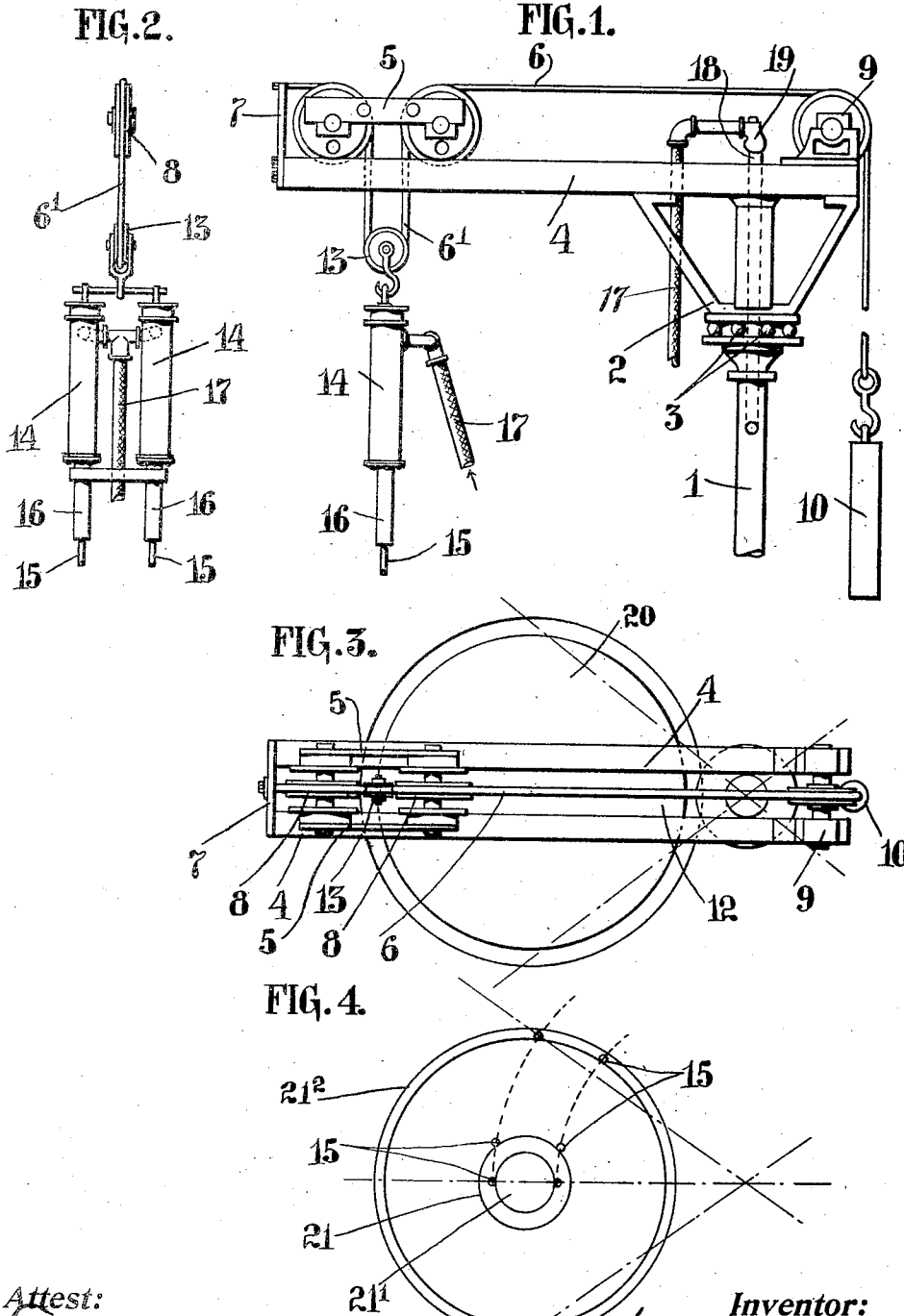


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MOLD RAMMING APPARATUS.
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UNITED STATES PATENT OFFICE.

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MOLD-RAMMING APPARATUS.

No. 931,199.

Specification of Letters Patent.

Patented Aug. 17, 1909.

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To all whom it may concern:

Be it known that I, HENRY HENDERSON, a citizen of the United States of America, residing in the borough of Manhattan, city, county, and State of New York, have invented a certain Improved Mold-Ramming Apparatus, of which the following is a specification.

This invention resembles in some respects that disclosed in my Patent No. 876,054, dated January 7th, 1908, and comprises a new organization of apparatus adapted for either stationary or revolving flasks.

In the accompanying drawing, Figure 1 is a side elevation; Fig. 2, a partial end view; Fig. 3, a plan; and Fig. 4, a diagrammatic plan indicating flasks of different diameter.

The apparatus comprises a standard 1, having a swiveling head 2 turning upon bearing balls 3 arranged in a circular raceway. The head carries a horizontal platform 4, equipped with tracks upon which run the wheels of a truck 5. A cable 6 attached at one end to an upright 7 at the end of the horizontal platform passes over pulleys 8, 8, placed centrally on the two axles of the truck, and then extends over a pulley 9 at the other end of the swiveling platform, and is provided with a counterweight 10. A loop 6' of the cable extends down between the axles of the truck and through the open longitudinal space 12 between the tracks upon which the truck runs and passes over a sheave 13 from which is suspended one or more double acting power cylinders 14 adapted to be driven by compressed air or other source of power. The particular character of the motor is not controlling, since, of course, it may vary and may be driven by any power adapted to it. The motor drives a rammer shaft 15 which is attached to its piston rod and is reciprocated within a protecting and guiding sleeve 16, attached to the lower end of the cylinder.

A plurality of power devices may be suspended by the sheave 13. The drawing shows two, each actuating a rammer shaft, arranged side by side.

The truck is balanced by the counterweight 10, so that very slight strain exerted by the operator, who may grasp the cylinder 14 or guide sleeve 16, will cause the truck to run in or out on the platform to vary the radius of the support 13 with reference to the axis of the swiveling head. Similarly

the platform and swiveling head are balanced, and the head so mounted preferably by means of the ball bearing 3 as to be readily turned about its axis of rotation by like strain exerted in the same way by the operator.

Power may be supplied to the power device or devices in any suitable way, depending upon the character of the motor, since, obviously, the latter might be electrical, and may be also a rotary motor instead of a reciprocating one.

In the particular construction shown, there is a flexible hose 17, connecting at one end with the power cylinder, or cylinders, and at the end with a vertical pipe 18, extending up through the standard 1 and through the swiveling head 2 coincident with its axis. The upper end of pipe 18 and the end of the hose 17, may be connected by a swiveling joint 19. The air supply pipe 18 may enter the standard 1 at any appropriate point, and the operation of the motor be controlled by means of a valve in the main air supply pipe arranged in convenient location, or controlling valves may be placed upon the cylinders when the apparatus is so designed that the cylinders will be within convenient reach of the operator. By downward draft upon the cylinder 14, the latter will descend readily, since it is counterbalanced by the weight 10; and, reversely, if the cylinder be forced upwardly, the counterweight will take up the slack and the cylinder remain suspended at any point. In any position of the cylinder, it is feasible, by lateral strain thereon, to cause the truck to travel on the platform, and by a like lateral strain at an angle thereto, the platform, may be swung around its axis of rotation.

As shown by the diagrammatic top plan view Fig. 3, the ramming devices may be adjusted to ram a stationary flask 20. In such case the wheels of the truck may be blocked. If the flask is stationary, the permissible universal movement of the ramming devices enables the operator to ram all parts of it. In the diagrammatic view Fig. 4 is intended to indicate flasks of different diameter. With a small flask, such as indicated at 21', the two rammer shafts, where two are employed, may work upon diametrically opposite sides of the pattern. In larger flasks, such as indicated at 21'', where the diameter is sufficiently

great, they will work on the same side of the flask in the small arc within which they are included.

I claim:

- 5 1. Mold ramming apparatus comprising a vertical standard, a horizontal platform carried thereby and swiveling about a vertical axis, a truck traveling radially to said axis upon said platform, and a counterbalanced-cable passing around pulleys on the truck and around a pulley suspended by it, combined with a power device suspended from the last named pulley and rammer shaft actuated by the power device.
- 15 2. Mold ramming apparatus comprising the combination of a vertical standard, a swiveled head carrying a horizontal platform, a truck running on the platform radially to the axis of the swiveling head, a cable passing around pulleys on the truck and around a pulley suspended in a loop of the cable, a power cylinder and rammer shaft actuated thereby suspended from the suspended pulley, and a counterbalance
- 25 weight applied to the cable to balance both the truck and the suspended power device and rammer shaft.
3. Mold ramming apparatus comprising the combination of a vertical standard, a head swiveling horizontally thereon, a horizontal platform guided by the head, a truck running thereon, a power device and rammer shaft suspended from the truck, a flexible tube for supplying fluid under pressure connected at one end to the power device, a fluid supply pipe coincident with the axis of the swiveling head and a swiveling connection between it and the other end of the flexible tube.
- 40 4. Mold ramming apparatus comprising a vertically adjustable power-actuated ramming device, a support from which it is suspended adapted to be freely moved in a horizontal straight line and in a circular arc
- 45 bisected by the straight line by strains applied through the point of suspension of the power actuated ramming device and means whereby the power device may be maintained at substantially the same level as its
- 50 support is moved back and forth.
5. Mold ramming apparatus comprising a vertically adjustable counterbalanced power-

actuated ramming device, a support from which it is flexibly suspended adapted to be freely moved in a horizontal straight line and in a circular arc bisected by the straight line by strains applied to the ramming device and means whereby the power device may be maintained at substantially the same level as its support is moved back and forth.

6. Mold ramming apparatus comprising the combination of a support mounted to move easily in a horizontal straight line with substantially the same freedom in either direction and also to move in a horizontal arc with substantially the same freedom in either direction, a power device flexibly suspended from said support and a rammer shaft suspended from the power device and reciprocated thereby, whereby the support may, by strains applied through the point of suspension of the power device, be moved both in said horizontal straight line and in said horizontal arc.

7. Mold ramming apparatus comprising the combination of a support mounted to move easily in a horizontal straight line with substantially the same freedom in either direction and also to move in a horizontal arc with substantially the same freedom in either direction, a power device flexibly suspended from said support and a rammer shaft suspended from the power device and reciprocated thereby, and means whereby the power device may be maintained at substantially the same level as its support is moved back and forth.

8. Mold ramming apparatus comprising the combination of a support mounted to move easily in a horizontal straight line with substantially the same freedom in either direction, a power device flexibly suspended from said support and a rammer shaft suspended from the power device and reciprocated thereby, and means whereby the suspended power device may be maintained at substantially the same level as its support is moved back and forth.

In testimony whereof, I have hereunto subscribed my name.

HENRY HENDERSON.

Witnesses:

W. ST. G. KENT,
Wm. S. Cox.