C. SMITH.

PUMPING APPARATUS.

APPLICATION FILED AUG. 30, 1913.

1,126,109.

Patented Jan. 26, 1915.

2 SHEETS—SHEET 1.

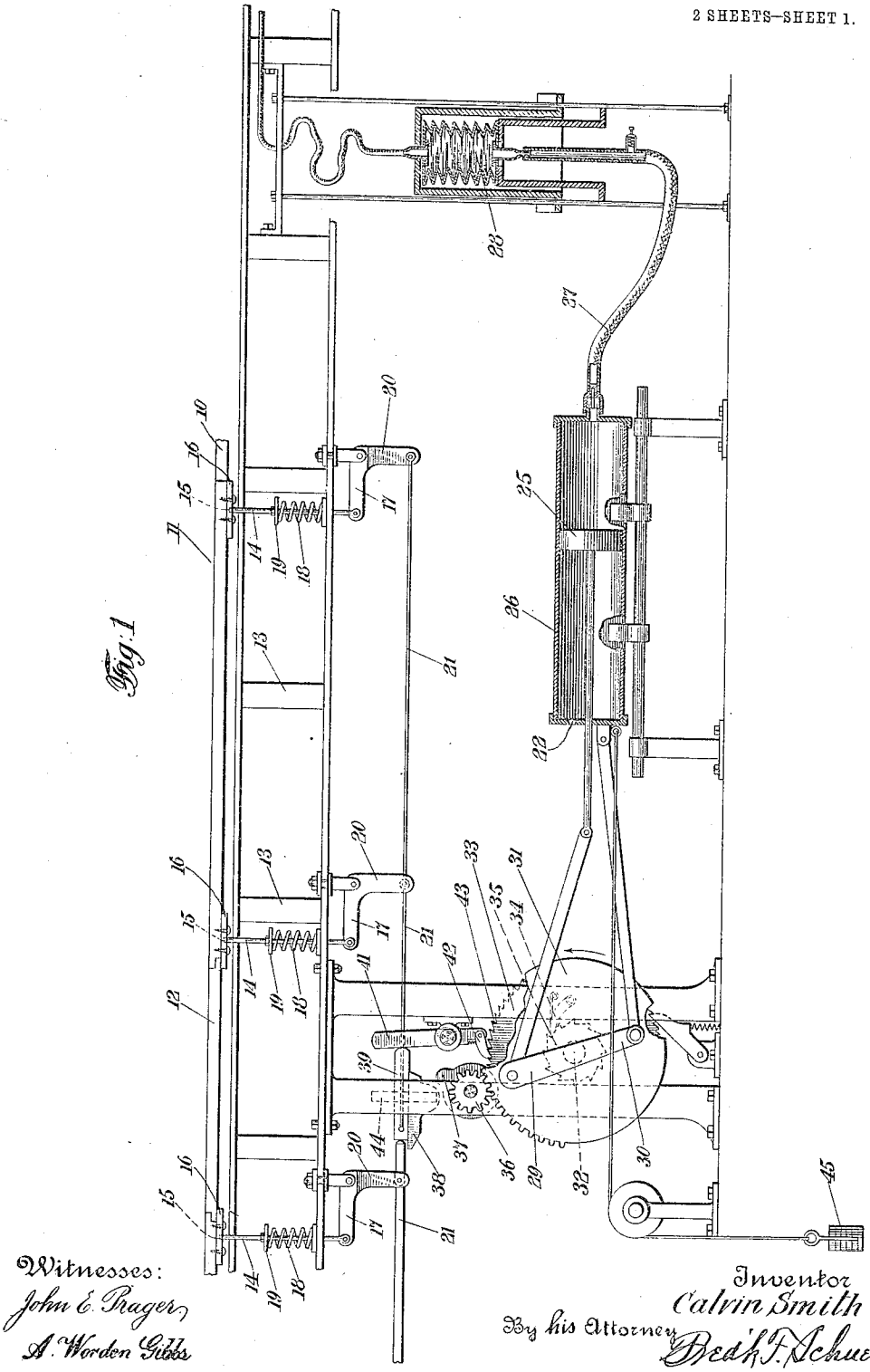


Fig. 1

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A. Worden Gibbs

Inventor
Calvin Smith
By his Attorney
Fred'k F. Schuetz

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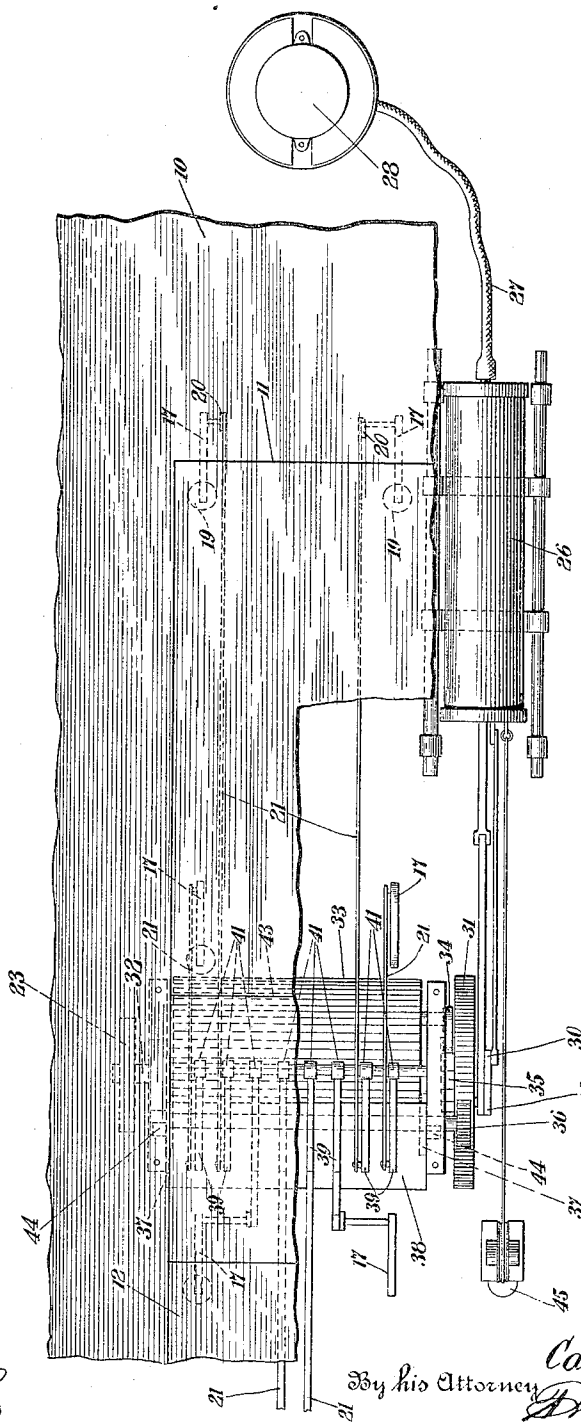


Fig. 2

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CALVIN SMITH, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO SAMUEL KAMM, OF NEWARK, NEW JERSEY.

PUMPING APPARATUS.

1,126,109. Specification of Letters Patent. Patented Jan. 26, 1915.

Application filed August 30, 1913. Serial No. 787,404.

To all whom it may concern:

Be it known that I, CALVIN SMITH, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Pumping Apparatus, of which the following is a specification.

The invention relates to pumping apparatus adapted to be operated by a pedestrian or a vehicle and the like passing over a suitably constructed platform which at the same time affords a flexible tread.

It has for its object to so arrange and construct the apparatus that fluid may be delivered to and stored in a suitable reservoir under the desired pressure; and, with the type of pump employed for this purpose, to provide means whereby energy may be accumulated during the inactive stroke of the pump for use during the active period.

The nature of the invention will be best understood when described in connection with the accompanying drawings, in which—

Figure 1 illustrates the apparatus in elevation and part section. Fig. 2 is a plan thereof with a portion of the flooring removed.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, 10 designates a floor in which a platform 11 has been inserted flush therewith, and which is composed of a plurality of hingedly connected sections 12 adapted to be slightly depressed when a pedestrian, vehicle or the like passes thereover. The various sections of the platform overlap at the ends and are alternately long and short proportionately to the usual length of step, so that with each step a section will be depressed. The said platform sections are supported from the floor beams 13 through rods 14 of which the upper end of each fits within a socket 15 of a plate 16 attached to the under side of the said sections. The other end of each of these rods is connected to a bell-crank arm 17 and which bell-cranks are hung from the floor beams 13. A spring 18 is interposed between the said floor support 13 and a washer 19 fixedly secured to the rods, whereby the said sections of the platform are normally maintained in level position, and when depressed under the action of a weight passing thereover are returned as soon as the said weight is removed.

To the other arms 20 of the various bell-cranks are connected rods 21 which transmit the oscillation of the bell-cranks to the pump operating mechanism, as will hereinafter be set forth. The pump shown is of the reciprocatory type, single acting and in which both the piston 25 and cylinder 26 are movable, the said cylinder being connected through a flexible connection 27 with a suitable storage reservoir 28 adapted to maintain the fluid, in the example shown—air, and received through a port 22 of the cylinder, under the desired pressure developed by the pump. To simultaneously reciprocate the said piston and cylinder, two cranks 29 and 30 and 180° apart are attached to a crank wheel 31 mounted on a shaft 32 carrying a drum 33. The said drum is adapted to rotate the said wheel 31 through a pawl 34 and ratchet 35, whereby the said crank wheel may have an advance motion independent of the said drum for the purpose hereinafter set forth. The crank wheel 31, moreover, is provided over a portion of its periphery with gear teeth adapted to engage a pinion 36 operating two cams 37, one on each side of the drum, to raise a tappet member bed 38. The engagement of said pinion and crank wheel occurs only at the period when the greatest effort is required to rotate said wheel, viz:—mid-way of the inactive stroke of the piston and cylinder. The said tappet member bed 38 carries a plurality of tappets 39 which are pivotally connected to the various rods 21 of the bell-cranks upon one side of the drum; and upon the other side of the drum, the ends of the rods 21 are adapted to contact with the end face of the corresponding tappet members, whereby when any of these sections are depressed as aforesaid the said tappet members are oscillated accordingly and their free ends are adapted to engage with and correspondingly oscillate the upper arms of pawl levers 41. The lower arm of each of these levers is provided with a pawl 42 engaging ratchet teeth 43 extending longitudinally along the periphery of said drum; and the said drum is thus advanced step by step as the sections 12 are depressed. If desired, power may be taken from, for example, a gear wheel 23

fixed to the shaft 32. The said tappet members, furthermore, are vertically movable with bed 38 in guides 44 so that when the same is raised by the cams 37, the said members will engage their corresponding pawl levers 41 at a higher point and consequently provide for a stronger force to rotate the said drum. The cylinder 26, moreover, is placed under a constant tension, for example, by means of a weight 45 which will be raised during the non-active stroke of the pump and energy will thereby be accumulated to be suddenly restored, and employed to quickly effect the compression stroke under a uniform pressure, as the cranks move past the dead center position, the pawl and ratchet drive 34, 35 of the said wheel permitting of a quick advance thereof independently of the drum. In employing a double crank as herein set forth a long stroke of the pump is obtainable with a comparatively short crank.

I claim:—

1. The combination with a suitable pump; of a flexible platform comprising a plurality of sections hingedly connected together and provided with sockets at their under faces, rods fitting said sockets, springs engaging said rods to normally hold the said sections in level position, and bell-crank levers to one arm of each of which said rods are respectively connected; means to actuate said pump as the sections are depressed; and means connecting said pump actuating means with the other arm of said bell-crank levers.

2. The combination with a suitable pump; of a flexible platform comprising a plurality of alternately long and short sections hingedly connected together and provided with sockets at their under faces, rods fitting said sockets, springs engaging said rods to normally hold the said sections in level position and bell-crank levers to one arm of each of which said rods are respectively connected; means to actuate said pump as the sections are depressed; and means connecting said pump actuating means with the other arm of said bell-crank levers.

3. The combination with a suitable pump; of a flexible platform; resilient means supporting the same; a drum provided with ratchet teeth and adapted to actuate said pump; pawls engaging the ratchet teeth of said drum to advance the same as the said platform is depressed and means intermediate of said platform and pawls to actuate the latter for advancing the drum.

4. The combination with a single acting pump including a reciprocatory cylinder, and a reciprocatory piston mounted therein; a crank connection to said cylinder, and a crank connection to said piston; of a flexible platform comprising a plurality of hinged sections, spring pressed rods supporting said sections, bell-crank levers actuated by said rods, tappet members reciprocated by said bell-crank levers; a drum provided with ratchet teeth, and pawls engaging the same and actuated by said tappet members; and means connecting said cranks with said drum.

5. The combination with a suitable pump; of a flexible platform; resilient means supporting the same; a drum provided with ratchet teeth; pawls engaging said teeth and means intermediate of said platform and pawls to actuate the latter for advancing the drum; lever arms carrying the pawls; means to temporarily increase the effective leverage of said arms; and suitable mechanism connecting said drum with said pump.

6. In a single-acting pump including a reciprocatory cylinder, and a reciprocatory piston mounted therein; a crank wheel, a crank connection therefrom to said cylinder, and a crank connection therefrom to said piston; a weight adapted to be raised and lowered by the travel of said cylinder; a driven member, and means to rotate the same; and means connecting said driven member to said crank wheel to permit the latter to advance independently of the former.

7. The combination with a single acting pump including a reciprocatory cylinder, and a reciprocatory piston mounted therein; a crank wheel, a crank connection therefrom to said cylinder, and a crank connection therefrom to said piston; and a weight adapted to be raised and lowered by the travel of said cylinder; of a flexible platform comprising a plurality of hinged sections, spring pressed rods supporting said sections, bell-crank levers actuated by said rods, tappet members reciprocated by said bell-crank levers; a drum provided with ratchet teeth, and pawls engaging the same and actuated by said tappet members; and a pawl and ratchet connection between said drum and crank wheel.

8. The combination with a single-acting pump including a reciprocatory cylinder, and a reciprocatory piston mounted therein; a crank wheel provided for a portion of its circumference with suitable gear teeth; a crank connection therefrom to said cylinder, and a crank connection therefrom to said piston; and a weight adapted to be raised and lowered by the travel of said cylinder; of a flexible platform comprising a plurality of hinged sections, spring pressed rods supporting said sections, bell-crank levers actuated by said rods, tappet members reciprocated by said bell-crank levers; an adjustable carrier for said tappet members; cams adapted to engage the same to adjust the height of said tappet members; a pinion controlling said cams and adapted to mesh with the teeth of said crank wheel; a drum

provided with ratchet teeth; pawls engaging said teeth, and lever arms carrying said pawls and adapted to be engaged by said tappet members; and a pawl and ratchet connected between said drum and said crank wheel.

Signed at New York, in the county of New York, and State of New York, this 28th day of August, A. D. 1913.

CALVIN SMITH.

Witnesses:
FREDK. F. SCHUETZ,
LAURA E. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."