

(No Model.)

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PORTABLE ELECTRIC PUMP.

No. 507,946.

Patented Oct. 31, 1893.

Fig. 1.

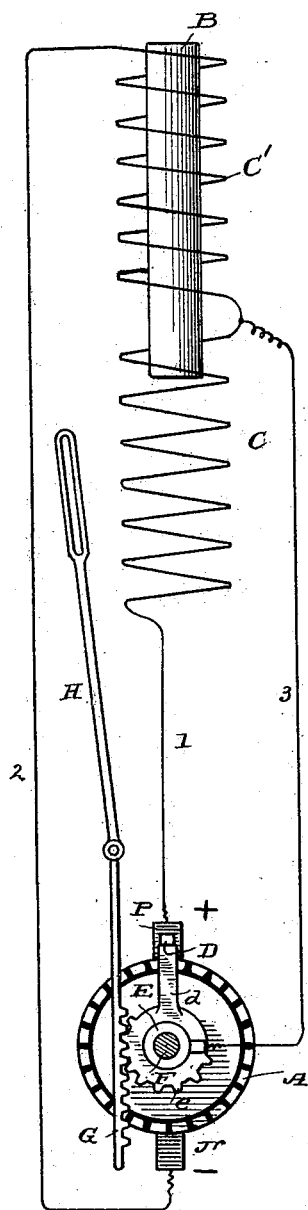


Fig. 2.

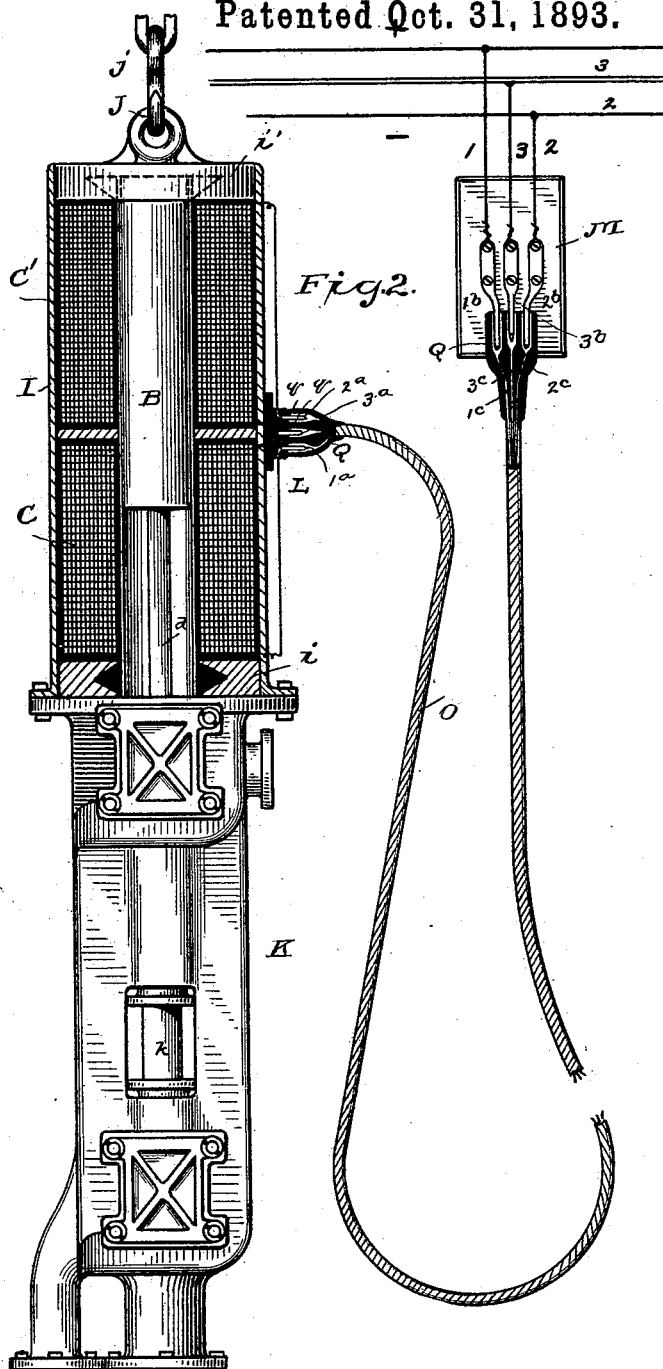
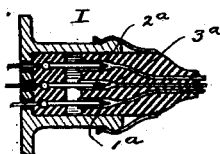


Fig. 3.



Witnesses

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PORTABLE ELECTRIC PUMP.

SPECIFICATION forming part of Letters Patent No. 507,946, dated October 31, 1893.

Application filed February 26, 1891. Serial No. 382,875. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DE-
POELE, a citizen of the United States, resid-
ing at Lynn, in the county of Essex and State
of Massachusetts, have invented certain new
and useful Improvements in Portable Elec-
tric Pumps, of which the following is a descrip-
tion, reference being had to the accompanying
drawings, and to the letters and figures of
reference marked thereon.

My invention relates to improvements in
reciprocating electric engines, of the type in
which a current of rising and falling charac-
ter is alternately supplied from a distant
source to two sets of motor coils within which
the magnetic piston is reciprocated by the
movements of the field of force therein.

The invention is, in the present instance,
applied to the combination with an electric
reciprocating engine of a pumping apparatus
attached to the engine, and connected directly
to the piston of the engine, and the object of
the invention is comprised in the combination
of a reciprocating electro magnetic engine
with a pumping apparatus constructed and
arranged so that the whole forms an integral
machine which can be raised or lowered as
in sinking a shaft where it is often necessary
to withdraw the pump when explosives are
being used. Furthermore, in the operation
of the pump, it is desired that the actuating
current be shifted as rapidly as possible from
one set of coils to the other in order that the
full power may be applied to the piston dur-
ing the greatest length of time.

In a contemporaneous application I have
shown, described, and claimed, an automatic
pumping engine in which the current will re-
main in one set of motor coils until the pis-
ton has completed its travel, the apparatus
therefore being independent of the source of
current. In the present instance, however,
the shifting of the current in the motor coils
is accomplished entirely by devices at the gen-
erator or source and the machine is therefore
in synchronism with the generator, the result
being, of course, that where more or less cur-
rent is required for the satisfactory perform-
ance of the work, the same would have to be
provided for at the station.

The invention also comprises various de-
tails of construction and arrangement, as will
appear.

In the accompanying drawings—Figure 1
is a diagrammatic view, showing the relative
arrangement of the circuits. Fig. 2 is a view
in elevation partly in diagram, showing an
electro magnetic reciprocating pumping en-
gine embodying the invention. Fig. 3, is an
enlarged detail of the connection box.

In the drawings, Fig. 1, A, represents the
sectional commutator of a continuous current
machine, which may be either a generator or
a counter electro motive force device in a con-
tinuous current circuit. P, N, are the posi-
tive and negative main commutator brushes
thereof; D, is a third and rotatably mounted
commutator brush adapted to be moved about
the commutator. The brush D, is mounted,
for example, in an arm *d*, carried by a sleeve
E, rotatably mounted upon and suitably in-
sulated from the armature shaft F. Gear
teeth *e*, are provided upon the sleeve E, and
a rack bar G, is in mesh with the teeth *e*. A
pitman or connecting rod H, is connected with
the rack bar G, through which rotary or ra-
dial movement may be imparted to the arm
d, and the auxiliary commutator brush D,
carried thereby. In the present instance it
is desired that the brush D, be moved rapidly
or even spasmodically from a position in front
of or near to one of the main commutator
brushes, to a like position with respect to the
other main brush, and this movement may be
secured in different ways, as for example,
those set forth in my prior patent, No. 435,261,
dated August 26, 1890.

The electric engine comprises motor coils
C, C', through which a magnetic plunger B,
is adapted to be reciprocated by their alter-
nate action thereon. As indicated in the
drawings, the outer terminal of coil C, is con-
nected to the main positive commutator brush
P, by conductor 1, the outer terminal of coil
C', to the main negative commutator brush
N, by conductor 2, and the inner terminals of
said coils to the moving brush D, by conduc-
tor 3.

As seen in Fig. 2, the coils C, C', are con-
tained within an exterior iron envelope com-

posed of a shell I, and iron heads i, i' . The upper head i , is provided with a hook J, and chain j , by which it can be suspended in operative position. To the lower head i' , is attached a pump K, which may be of any desired type or construction the piston k , of said pump being connected directly with the piston rod d , extending from the plunger B.

It will be understood that in speaking of coils C, C', and the three circuit wires 1, 2, 3, it is to be understood that I may use any combination of coils that can be operated by the three-wire system described, said coils being thereby energized to act alternately upon the piston, that is to say, that in connection with this invention I consider the arrangement set forth in my application, Serial No. 376,610, filed January 3, 1891, as the equivalent of the construction herein shown and described, or that it may be substituted therefor without departing from the invention.

Upon some convenient part of the exterior envelope of the engine, which, of course, is to be completely water-proof, I place a water-proof insulated terminal box or block L, which is provided with contacts $1^a, 2^a, 3^a$. The main conductors 1, 2, 3, are led from the generator or source of defined current, and at a point convenient to the work to be accomplished by the pumping engine, I provide a switch board M, which has three insulated terminals $1^b, 2^b, 3^b$, which should correspond in size, shape and arrangement to the terminals carried by the engine. Current is led from the switch board to the engine, through conductors $1^c, 2^c, 3^c$, which are thoroughly insulated and combine together in the form of a water-proof flexible cable O. The cable O, besides having a covering of the best insulating material, should also be covered with some durable substance, as canvas, and this exterior covering should also be protected by wire armor or equivalent means, which will prevent mechanical injury. A cable so constructed might safely pass through water without danger of mechanical injury and loss of current.

The cable O, is provided at its extremities with cup-shaped terminal sockets Q, Q, one of which fits tightly upon the contact block L, of the engine, making a perfectly water-tight joint. The terminals contained within the socket Q, should be in the form of spring fingers q, q , which will, when in position, tightly clasp the terminals $1^a, 2^a, 3^a$. While it is not essential that a water-proof joint be made with the terminals at the switch board M, it is desirable; and I prefer, therefore, to provide the cable O, with similar devices at each end in order to permit its ends to be used interchangeably, and also as giving added security against leakage.

Any desirable form of manual switch may be provided for opening the circuit between the main conductors and the switch board M, if desired, but the simplest means of accom-

plishing this end would be to detach the cable socket from the switch board terminals. It will be observed that the terminals 3^a , and 3^b , of the intermediate conductor, are made shorter than those of the main conductors. This is very important in practice as I find that by breaking the circuit of the intermediate conductor first, I can at any time, remove the cable at either end by simply detaching the terminal socket or sockets without the production of a dangerous or destructive arc which will always be the case unless the circuit of the intermediate conductor be first broken.

Various changes and modifications may be made in the hereinbefore described apparatus without departing from the invention.

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

1. An electric pumping engine system comprising a reciprocating electric engine having an exterior water-proof metallic casing, said casing provided with an insulated water-proof terminal box, a reciprocating pump, also inclosed within a metallic casing, the casings of the engine and pump being fitted and joined together to form one integral apparatus, a piston rod extending from the moving part of the electric engine and joined to the piston rod of the pump, a protected insulated cable formed of conductors corresponding in number with those of the electric engine, said conductors terminating in a detachable water-proof socket, adapted to fit the terminal box of the engine, and connections from the other end of the cable to a suitable supply circuit.

2. An electric pumping engine system comprising a reciprocating electric engine having an exterior water-proof metallic casing, said casing provided with an insulated water-proof terminal box, a reciprocating pump, also inclosed within a metallic casing, the casings of the engine and pump being fitted and joined together to form one integral apparatus, a piston rod extending from the moving part of the electric engine and joined to the piston rod of the pump, an insulated protected cable provided with detachable water proof terminal sockets at each end, said sockets adapted to fit the terminal box on the electric engine, and a switch board located near the engine and connected to a suitable supply circuit and having insulated terminals adapted to connect with the other end of the cable.

3. An electric engine having motor coils actuated by currents supplied through main conductors, in combination with an intermediate conductor of different length, and detachable circuit connections, whereby the circuit of the intermediate conductor is ruptured before opening the circuit of the main conductors.

4. The combination with a reciprocating electric engine, of a supply circuit compris-

ing multiple conductors said conductors including main conductors of substantially equal length, and an intermediate conductor or conductors of a different length whereby
5 on opening the circuit of all the conductors the circuit of the intermediate conductor is ruptured first.

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

CHARLES J. VAN DEPOELE.

Witnesses:

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FRANKLAND JANNUS.