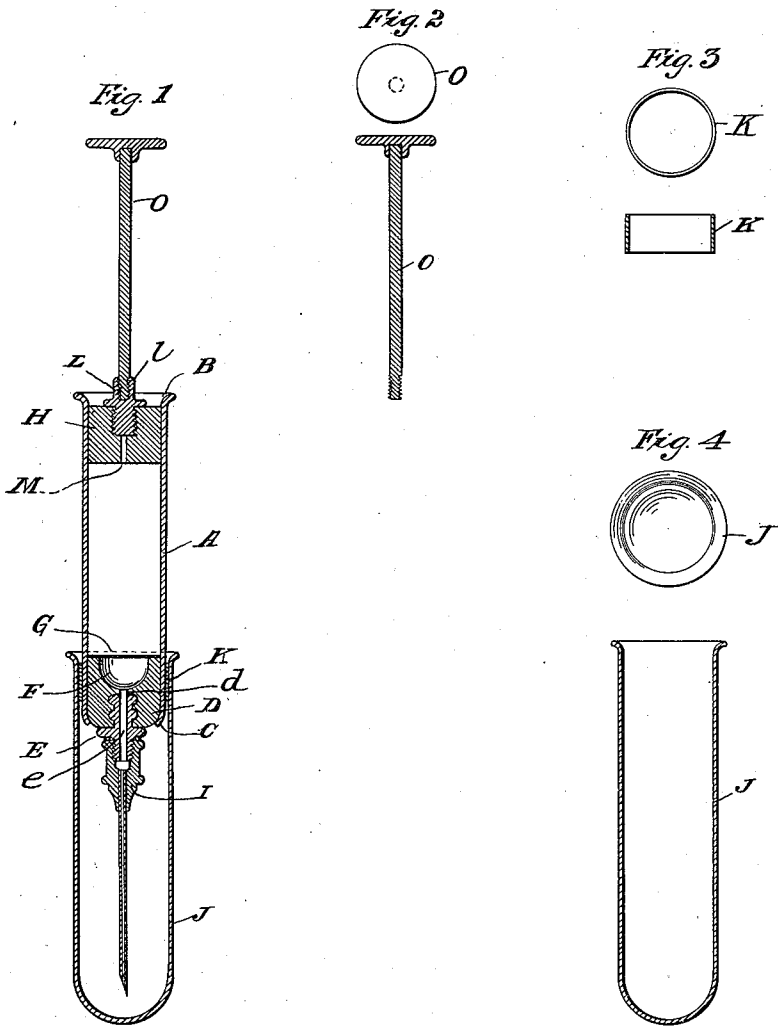


M. E. REED.
 DEVICE FOR STORING AND ADMINISTERING SERUMS.
 APPLICATION FILED DEC. 3, 1914.

1,179,561.

Patented Apr. 18, 1916.



Witnesses:

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UNITED STATES PATENT OFFICE.

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DEVICE FOR STORING AND ADMINISTERING SERUMS.

1,179,561.

Specification of Letters Patent. Patented Apr. 18, 1916.

Application filed December 3, 1914. Serial No. 875,344.

To all whom it may concern:

Be it known that I, MARY E. REED, of
Dorchester, in the county of Suffolk and
State of Massachusetts, have invented cer-
tain new and useful Improvements in De-
vices for Storing and Administering Serums,
of which the following is a specification.

This invention relates to devices for stor-
ing and administering serums or the like.
It is customary and extremely essential that
such serums be preserved in suitable recep-
tacles and properly sealed therein after the
receptacles have been carefully sterilized in
order to insure the prevention of contami-
nation. Such serums are generally admin-
istered subcutaneously or hypodermically
and by means of suitable needles designed
and constructed for such a purpose. It is
likewise equally important that the needles
employed in administering the serums be
carefully sterilized and both the serums or
other substances contained in the device and
the needle be retained out of contact with
the air during the time of storage and ship-
ping of the device. Furthermore said needle
must never be handled after it has been
sterilized.

The object of the invention is to provide
a device adapted to contain serums and the
like and to be hermetically sealed to pre-
vent contamination by contact with the air
or with germs carried by the air. The de-
vice is also supplied with a suitable admin-
istering needle which after being sterilized
is completely inclosed by a suitable protec-
tor, and the end of said protector sealed to
prevent the admission of air to the interior
thereof.

Another object of the invention is to pro-
vide a closure for the serum receptacle,
which closure is adapted to be ruptured by
the application of pressure to the serum con-
tained in said receptacle, whereupon said
serum may be discharged therefrom through
the needle attached thereto without necessi-
tating the handling of the needle.

The invention consists in the combina-
tion and arrangement of parts whereby the
above objects and certain other objects here-
inafter appearing may be attained, as set
forth in the following specification and par-
ticularly pointed out in the claims.

Referring to the drawings: Figure 1 is a
longitudinal section, partly in elevation
through a device embodying my invention. 55
Fig. 2 illustrates in plan and in vertical sec-
tion the piston rod. Fig. 3 illustrates in
detail two views of the elastic band which is
provided to secure the protector for inclos-
ing the needle of the device to the barrel. 60
Fig. 4 represents two views of the protector
illustrated in Fig. 1.

Like numerals refer to like parts through-
out the several views of the drawings.

In the drawings, A is the barrel of the 55
device within which the serum or like sub-
stances is stored, said barrel being prefer-
ably open at opposite ends. One end of the
barrel A is turned outwardly to form an an-
nular rim B, while the opposite end of said 70
barrel is slightly contracted or turned in to
form a bead C. A stopper D constructed of
rubber or other suitable material is arranged
within said barrel against the bead C by
means of which said stopper is prevented 75
from being forced outwardly by any pres-
sure which may be applied against said
stopper from the opposite end.

A coupling E is attached to the outer end
of the stopper D either by being molded into 80
said rubber stopper or by screw-threads,
preferably the former. The stopper D is
provided with a passage *d* extending there-
through, which passage aligns with the pas-
sage *e* in the coupling E. Said passage *d* 85
also communicates with a recess or cham-
ber F arranged adjacent the upper part of
said stopper.

A destructible diaphragm G is arranged
at the inner end of the stopper D and con- 90
stitutes a closure for the recess F and pas-
sages *d* and *e*. The diaphragm G is prefer-
ably in the form of a very thin flat disk
and is constructed of rubber or other ma-
terial suitable to temporarily seal the end 95
of said barrel containing said stopper. The
diaphragm G is of such a nature that it will
be susceptible to rupture upon the applica-
tion of pressure to the serum contained with-
in said barrel, permitting said serum to pass 100
or be discharged from said barrel through
the passages *d* and *e*. Means have been pro-
vided for applying pressure to the serum
within said barrel, said means preferably

consisting of a piston H constructed of rubber or other suitable material which is normally positioned adjacent the end of said barrel A opposite to that containing said stopper D. After carefully sterilizing the barrel A the serum, or substance to be contained therein, is inserted through the end adjacent to the flaring rim B from which end the stopper D is also inserted. The piston H is then inserted in said barrel to the position shown in Fig. 1. During this insertion of said piston it will be evident that the diaphragm G will be ruptured by the sudden compression of air within said barrel, unless a suitable vent is provided in said piston. For this purpose an air vent passage M has been provided extending through said piston and after said piston has been suitably located, said vent is adapted to be closed and sealed by a coupling L having screwthreaded engagement with said piston. The outer end of the coupling L has a screw-threaded socket adapted to receive the end of a piston rod O having an enlarged outer end by means of which said piston may be reciprocated within the barrel A. The piston rod O is detached from said coupling L when the device is not in use in order that it may occupy less space. The outer end of the coupling E is screwthreaded in order that an instrument of any desired design, such as a hypodermic needle I may be attached, said instrument having threads to correspond with the threads of said coupling.

As previously stated it is essential that the needle by which the serum is to be administered should be kept from contact with the air after the same has been sterilized, said sterilizing process taking place previous to the filling of the barrel with serum. Therefore to prevent handling of said needle, a protector J has been provided which is adapted to fit the free end of the barrel entirely closing said needle. An elastic band K of rubber or any other suitable material is placed upon the end of said barrel previous to the fitting thereon of said protector, and to absolutely seal the joint between said protector and said barrel, any of the well-known sealing substances may be added thereto.

To operate the device hereinbefore specifically described the piston rod O is inserted in the coupling L and the needle inserted beneath the cuticle where the application is to be made, the protector J having previously been removed from the barrel A without touching the needle. Pressure is then applied to the piston H through the piston rod O sufficient to rupture the diaphragm G. After said diaphragm has been ruptured the serum will have an uninterrupted course through the stopper D and the needle I and will be discharged at the end of said needle.

Having thus described my invention what I claim and desire by Letters Patent to secure is:

1. A device of the class described having, in combination, a container for fluids, a stopper detachably arranged adjacent to one end of said container, said stopper having a passage extending therethrough, a destructible closure attached to said stopper and adapted to normally close said passage, and means constructed and arranged to apply pressure to said fluid within said container to rupture said closure.

2. A device of the class described having, in combination, a barrel adapted to contain serum or the like, a stopper arranged in said barrel, said stopper having a passage extending therethrough, an intumed rim on said barrel adapted to engage said stopper and retain the same therein, a destructible diaphragm adapted to normally close said passage, said diaphragm being constructed and arranged to be ruptured by the application of pressure to said serum, and means constructed and arranged to apply pressure to said serum.

3. A device of the class described having, in combination, a barrel adapted to contain liquid, a stopper arranged adjacent to one end of said barrel, said stopper having a passage extending therethrough, a destructible diaphragm attached to said stopper and adapted to normally close said passage, and means constructed and arranged to apply pressure to said liquid to rupture said diaphragm, whereby said liquid may be discharged from said barrel.

4. A device of the class described having, in combination, a barrel adapted to contain fluid, a destructible closure for one end of said barrel adapted to be ruptured by the application of pressure to the fluid within said barrel, a piston arranged in said barrel, said piston being adapted to be moved toward said closure to apply pressure to said fluid, said piston having an air vent extending therethrough adapted to relieve the pressure on said fluid during the insertion of said piston into said barrel, and means adapted to close said air vent.

5. A device of the class described having, in combination, a barrel adapted to contain fluid or the like, a destructible closure for one end of said barrel adapted to be ruptured by the compression of the fluid within said barrel, a piston arranged in said barrel adjacent the opposite end thereof from said closure, said piston being adapted to be moved toward said closure to apply pressure to said fluid, said piston having an air vent extending therethrough adapted to relieve the pressure on said fluid during the insertion of said piston into said barrel, a coupling having screw-threaded engagement

with said piston and constituting a closure
for said vent, said coupling having a screw-
threaded socket adjacent the outer end there-
of, and a piston rod adapted to be attached
5 to said coupling within said socket to oper-
ate said piston to move said piston and ap-
ply pressure to said fluid.

In testimony whereof I have affixed my
signature, in presence of two witnesses.

MARY E. REED.

Witnesses:

ALICE E. MULLEN,
CATHERINE E. MAHONEY.