(No Model.)

L. HINES.

SYRINGE.

No. 583,374. Patented May 25, 1897.

Fig. 1.

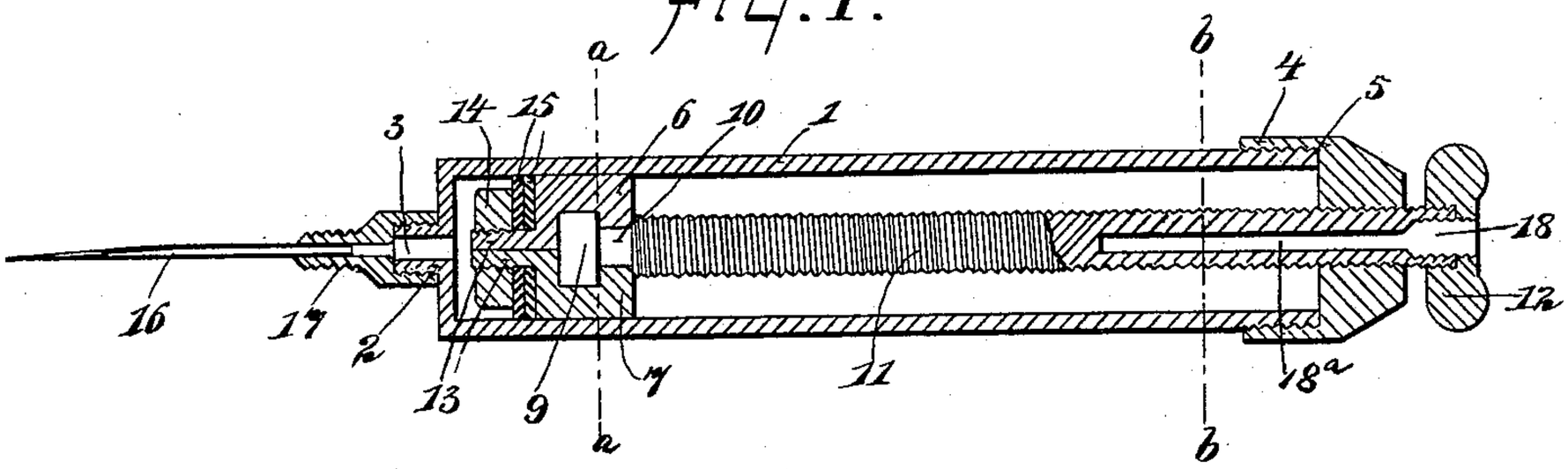

Fig. 2.

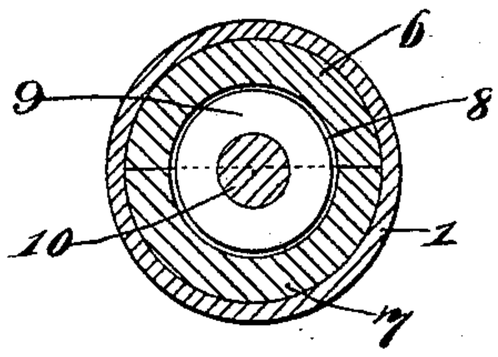

Fig. 3.

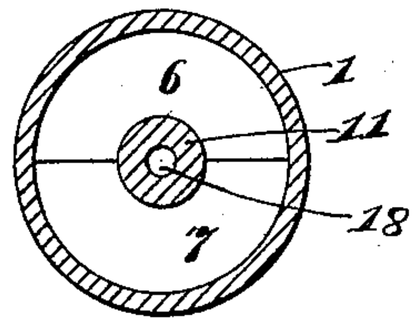

Fig. 4.

WITNESSES:

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SYRINGE.

SPECIFICATION forming part of Letters Patent No. 583,374, dated May 25, 1897.

Application filed May 25, 1896. Serial No. 592,937. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL HINES, of Springer, in the county of Colfax and Territory of New Mexico, have invented a new and useful Improvement in Hypodermic Syringes, of which the following is a full, clear, and exact description.

The object of my invention is to so construct a hypodermic syringe that while the piston will operate the plunger of the syringe said piston may be turned independently of the plunger, and whereby also the piston will have such guided movement in the syringe that the amount of liquid to be expelled therefrom may be controlled with absolute certainty.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal vertical section through a syringe constructed in accordance with my invention. Fig. 2 is a transverse section on the line *a a* of Fig. 1. Fig. 3 is a transverse section on the line *b b* of Fig. 1, and Fig. 4 is a section through a cap which is placed over the needle, receiving end of the syringe when the syringe is not in use.

In carrying out the invention the barrel 1 may be made of any desired material or shape, and at its outer end a nipple 2 is formed having an exterior thread, and the opening 3 in the nipple is in direct communication with the interior of the barrel. At the opposite or outer end of the barrel a head 4 is secured, ordinarily by screwing the said head upon an exterior thread 5, made on the barrel. The plunger is made, preferably, in two sections 6 and 7, as shown in Fig. 2, and at the inner end of the said plunger an undercut recess 8 is formed, comprising an inner circular member and a member of less diameter, and also circular, which extends from the inner member to and through the inner face of the said plunger, whereby in cross-section the recess is substantially inverted-T shape.

A circular enlargement 9, formed at the outer end of a piston 11, is held to turn loosely in the enlarged member of the plunger-recess 8, and the said piston is provided with a surface 10, adjacent to its enlargement or head, of such diameter as to turn freely in the reduced or shank portion of the aforesaid plunger-recess 8. The piston extends from the plunger out through the head 4 of the barrel, and from a point close to the plunger to its outer end the aforesaid piston is enlarged in diameter and exteriorly threaded, the opening in the head of the barrel being correspondingly threaded.

A finger-nut 12 is screwed or otherwise secured on the outer end of the piston, enabling the piston to be readily turned and to cause the plunger to be moved inward or outward in the barrel, although the piston will have a movement independent of the plunger. At the central portion of the outer end of the plunger each section is provided with a semicircular extension exteriorly threaded. These extensions are brought close together, and a lock-nut 14 is screwed upon the threaded surfaces of both, and between the said lock-nut 14 and the outer face of the plunger one or more washers 15 are introduced and securely held, engaging with the inner face of the barrel, as shown in Fig. 1. The needle 16 is of the usual type and is secured in a holder 17, which holder is enlarged at its inner end and reduced at its outer end, the reduced portion being exteriorly threaded and the enlarged portion having a threaded recess whereby the holder of the needle may be secured upon the nipple of the said barrel.

In the outer end of the piston a threaded recess 18 is formed of sufficient diameter to receive the exteriorly-threaded reduced outer end of the needle-holder, and the finger-nut is provided with an opening, also threaded and corresponding in diameter to that of the recess 18, while a preferably smooth bore 18^a is made longitudinally in the piston, communicating directly with the recess 18, and when the needle is not in use it is introduced into the said bore 18^a of the piston and its holder screwed in the threaded recess 18, and when the needle is detached from the outlet end of the syringe and placed at its handle end, as

just described, a cap 19 is screwed upon the nipple 2, effectually preventing the escape of liquid from the barrel.

The syringe is especially adapted for injecting local anesthetics in extracting teeth and for minor operations in surgery.

Among the advantages claimed for the syringe may be mentioned the following: That in injecting solutions under the gum and around the roots of teeth the fluid can be forced to the place desired, no matter how much resistance may be offered by the tissues, since by the power obtained by screwing the piston by the thumb and forefinger a pressure of several pounds may be readily exerted. The surface of the mucous membrane may be first anestheticized by applying the solution with a little cotton. The point of the needle is then introduced slightly and a drop of liquid is injected by turning the piston slightly with one hand, the needle may then be forced a little farther in the surface and another drop of liquid injected, and so the operation may be continued, making the introduction of the needle itself painless. The same operation may be carried out in injecting local anesthetics in lancing abscesses, felons, and in removing foreign bodies, &c. Another advantage is that in the use of the old syringe, where liquid is forced out by pushing on the handle of the piston, it often requires so much force to start the plunger, owing to friction and the resistance of the tissues, that when the plunger does start much more solution is injected than is wanted, often endangering the life of the patient, and the majority of the accidents caused by the use of cocaine may be traced to this inability to regulate the quantity injected. This objection to the use of the hypodermic syringe is overcome by my improvement. By its use not more than one-tenth of the quantity of solution would need to be used, and the desired quantity may always be injected.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a syringe, a plunger formed of two sections, each having a recess and provided with a semicircular threaded extension at its outer end, and a nut screwing on said extensions, substantially as and for the purpose set forth.

2. In a syringe, the combination with a barrel having a screw-threaded opening in its outer end, of a sectional plunger, each section being formed with a recess, means for securing sections of the plunger together, and a plunger-rod screw-threaded and working in the screw-threaded opening of the barrel, the inner end of the said rod having an enlargement and a reduced portion between the enlargement and screw-threaded portion, substantially as herein shown and described.

LEMUEL HINES.

Witnesses:
ANDREW MARTIN,
JOHN GRANGER.