

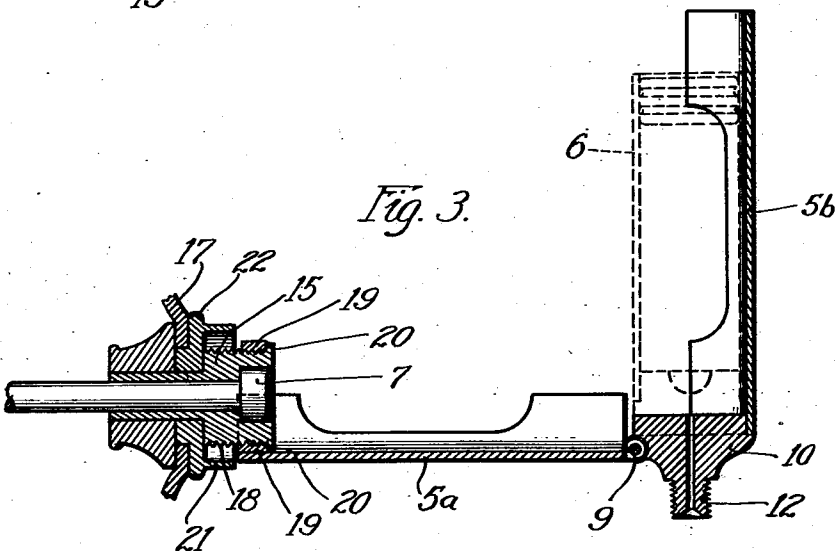
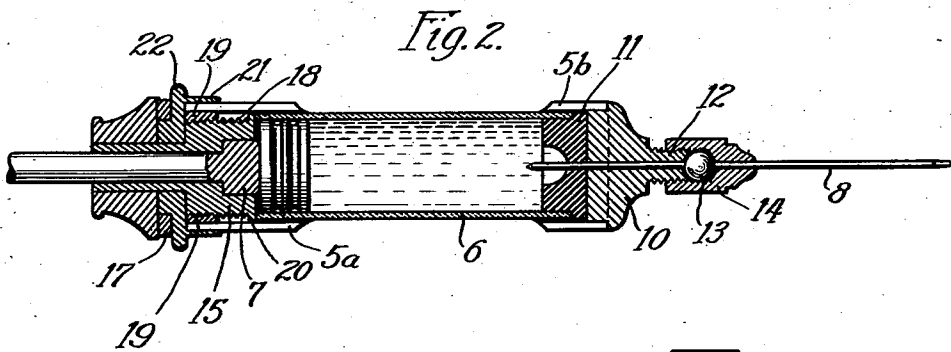
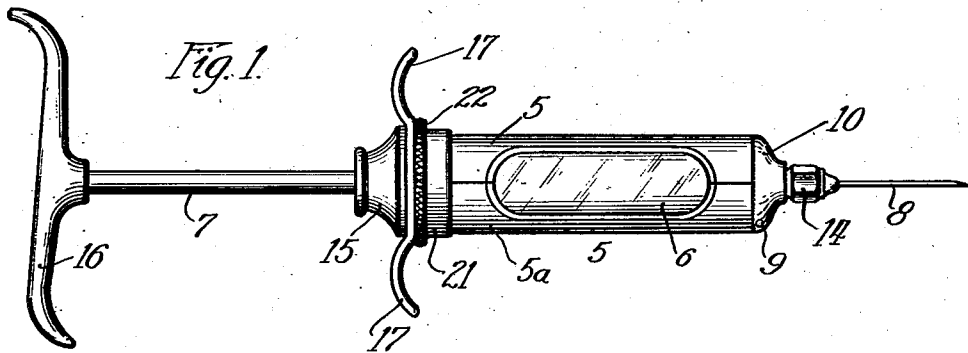
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HYPODERMIC SYRINGE

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# UNITED STATES PATENT OFFICE.

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## HYPODERMIC SYRINGE.

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This invention relates to hypodermic syringes, and among other objects aims to provide a conveniently loaded syringe of the cartridge holding type.

5 The invention may be understood by reference to one illustrative embodiment shown in the accompanying drawings, in which:

Fig. 1 is an elevation of the syringe shown ready for use;

10 Fig. 2 is a longitudinal sectional view of the same on an enlarged scale; and

Fig. 3 is an enlarged sectional view of the syringe shown open for loading.

15 It is to be understood that the illustrative form shown in the drawings is simply a preferred embodiment of the invention; and that in the following explanation of that specific form, the described details of structure and organization are merely exemplary.

20 Referring to the drawings, the syringe comprises a barrel 5, serving as a holder for the cartridge 6, a plunger 7 for dispensing the medicament from the cartridge, and a needle 8 secured to the barrel, and arranged  
25 to conduct the medicament from the cartridge to the point of injection.

To facilitate insertion of the cartridge, the barrel 5 comprises two hinged sections 5<sup>a</sup>, 5<sup>b</sup> joined together at one end, herein  
30 the needle-carrying end, by hinge 9. Conveniently the barrel sections are semi-cylindrical, so that they may together enclose the cartridge, as shown in Fig. 2. The barrel section 5<sup>b</sup> carries a head 10 at one end providing an abutment for the pierceable end  
35 11 of the cartridge, and having a screw-threaded boss 12 providing a seat for the needle enlargement 13, which is clamped in its seat by nipple 14.

40 The plunger 7 slides through a head 15 secured upon barrel section 5<sup>a</sup> and has the usual handle 16 for cooperation with finger grips 17 on head 15 when dispensing the medicament. It is desirable that the two  
45 barrel sections be locked together in cartridge-holding position, and for this purpose head 15 is movable relative to the barrel end by means of screw threads 18 engaged within a collar or nut 19 fast to barrel section 5<sup>a</sup>. An end flange 20 on screw  
50 head 15 serves as a stop to prevent withdrawal from the barrel. Upon the screw head is secured an annular locking flange or cap 21 whose dimensions are such that when  
55 the screw head is advanced within the bar-

rel, the locking flange will be moved over the ends of the barrel sections to prevent their separation, as in Fig. 2. The screw head is easily advanced or retracted, to lock or unlock the barrel, by means of the knurled  
60 portion 22.

In using the syringe, the barrel is opened as shown in Fig. 3 and the cartridge is laid in the open receptacle provided by either of the semi-cylindrical barrel sections. Then  
65 the barrel is closed and the screw head is turned to lock the barrel sections. As the screw head advances within the barrel, it engages the end of the cartridge to thrust it firmly against the abutment head 10. (Fig. 70 2); and if the needle has been initially secured in position, the screw head completes piercing of the end plug 11. After the contents of the cartridge have been discharged  
75 through the needle by the plunger, the cartridge may be removed when the screw head is retracted far enough to permit separation of the barrel sections.

The feature of the invention by which the cartridge is secured against longitudinal  
80 movement has been found to be of special value when the syringe is used for injections in tissue which offers considerable resistance, e. g., bony tissue. If very great pressure is exerted on the syringe plunger, and if the  
85 cartridge has a slight longitudinal play within the syringe, the plug which is pierced by the needle may permit loss of the medicament because of back movement of the glass cylinder of the cartridge responsive to the  
90 extremely high pressure on the pierced plug, which cannot move because of the cylinder head 10. But if the glass cartridge is clamped, as shown in Fig. 2, and if the glass walls are of proper strength, no amount of  
95 pressure which the practitioner can exert on the plunger will cause loss of the medicament.

Of course, it will be understood that the term "hypodermic" is used descriptively and  
100 not as a limitation. The syringe shown is useful not only for strictly hypodermic injections, but also for intraosseous, intravenous, intramuscular and other injections.

Obviously the present invention is not restricted to the particular embodiment there-  
105 of herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly since they may be employed advantageously in various  
110

combinations and subcombinations as defined in the claims.

What I claim is:

1. A hypodermic syringe comprising, in combination, a sectional barrel constructed and arranged for lateral insertion of a medicament-cartridge; means for holding a needle on the barrel; and means carried by one of said sections for locking the barrel sections together, said means thrusting the cartridge in the direction of the needle and securing it substantially immovably within the barrel.

2. A hypodermic syringe comprising, in combination, a sectional, hinged barrel constructed and arranged to open laterally for lateral insertion of a medicament cartridge; a screw-threaded member on one barrel section constructed and arranged to lock the two sections together in cartridge-enclosing position; and a plunger slidably carried by the screw-threaded member for reducing the interior volume of the cartridge to expel its contents.

3. A hypodermic syringe comprising, in combination, a barrel composed of two mating longitudinal sections which when brought together form a cartridge-enclosing chamber; and a screw-threaded head carried upon one end of one barrel section and designed to engage over the ends of both barrel sections, when brought together, to lock said sections.

4. A hypodermic syringe comprising, in combination, a barrel composed of two mating longitudinal sections which when brought together form a cartridge-enclosing chamber; a hinge connecting the sections at one end of the barrel; a screw-threaded barrel-section locking member at the opposite end of the barrel; needle carrying means at the hinge end of the syringe; and a plunger slidably through the locking member.

5. A hypodermic syringe comprising, in combination, a barrel composed of two mating longitudinal sections which when brought together form a cartridge-enclosing chamber; one of said sections having an abutment head at one end against which the cartridge may be thrust; means on said head for supporting the hypodermic needle; a hinge connecting the head with the other barrel section; and a plunger slidably carried by the barrel section last named.

6. A hypodermic syringe comprising, in combination, a barrel composed of two mating longitudinal sections which when brought together form a cartridge-enclosing chamber; one of said sections having an abutment head at one end against which the cartridge may be thrust; means on said head for supporting the hypodermic needle; a hinge connecting the head with the other barrel section; and a screw head carried by the barrel section last named and constructed and arranged to lock the two barrel sections to-

gether and to enter the cartridge chamber to thrust the cartridge towards the needle.

7. A hypodermic syringe comprising, in combination, a barrel composed of two mating longitudinal sections hinged together at one end and providing a cartridge-enclosing chamber when brought together; and a lock at the end opposite to the hinge constructed and arranged to prevent separation of the barrel sections; said lock comprising a nut or screw-threaded collar fast to one of the barrel sections at one end, an exteriorly threaded sleeve or head engaged within said collar, and means secured to the head and designed to fit over the ends of the barrel sections.

8. A hypodermic syringe comprising, in combination, a barrel composed of complementary longitudinal sections which are hinged to each other so that when they are brought together they will form a longitudinally divided cartridge-enclosing chamber; a medicament cartridge; and a lock for the barrel sections which is constructed and arranged to be moved over the corresponding ends of the barrel sections and simultaneously to enter the end of the chamber aforesaid, thereby engaging the end of the cartridge and thrusting it against the opposite end of the chamber to secure the cartridge against longitudinal movement.

9. In a cartridge syringe, a jointed cartridge-holding and operating instrument having a cartridge-operating plunger and constructed to be opened laterally for lateral insertion of the cartridge and embodying in its breech end an axially-movable member in which the plunger is mounted adapted to lock the instrument in closed operative condition.

10. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying in its breech end means to thrust the cartridge against said abutment and to lock the instrument in closed operative condition.

11. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying in its breech end an axially-movable locking member for locking the instrument in closed operative condition.

12. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end

to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying a breech-head having screw-actuated means to lock the instrument in closed operative condition.

13. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying a breech-head having means in which the plunger is mounted to bear on the butt end of the cartridge and force it forward against said abutment.

14. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying a plunger-carrying breech-head having locking means to lock the instrument in closed operative condition.

15. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying a plunger-carrying breech-head having locking means to lock the instrument in closed operative condition and means to bear on the butt end of the cartridge and force it forward against said abutment.

16. In a cartridge syringe, a jointed cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and constructed at its fore end to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument adapted to be opened laterally for lateral insertion of the cartridge and embodying in its breech portion screw-actuated means to force the cartridge forward against said abutment and to lock the instrument in closed operative condition.

17. In a cartridge syringe, a cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and having its fore end constructed to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument embodying hinged complemental cartridge-enclosing sections, the line of separation between which sections extend longitudinally of the instrument, whereby the instru-

ment can be opened to permit lateral insertion of the cartridge, and having a longitudinally movable locking sleeve adapted to cooperate with said sections to lock the instrument in closed operative condition. 70

18. In a cartridge syringe, a cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and having its fore end constructed to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument embodying hinged complemental cartridge-enclosing sections, the line of separation between which sections extends longitudinally of the instrument, whereby the instrument can be opened to permit lateral insertion of the cartridge, and having axially adjustable means to force the cartridge against said abutment and to lock the instrument in closed operative condition. 85

19. In a cartridge syringe, a cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and having its fore end constructed to provide a cartridge abutment and to accommodate a cartridge-piercing canula, said instrument embodying complemental longitudinal cartridge-enclosing sections hinged at one end of the instrument and having locking means at the opposite end of the instrument. 95

20. In a cartridge syringe, a cartridge-holding and operating instrument having in its breech end a cartridge-operating plunger and having a hinged fore head providing a cartridge abutment and centrally apertured to accommodate a cartridge-piercing canula, said instrument comprising complemental longitudinal cartridge-enclosing sections, one carried by said head which is hinged to the other section, said hinged fore head and section carried thereby adapted to be swung out of position to permit lateral insertion of the cartridge, the instrument embodying locking means to hold the parts in operative relation after the cartridge is inserted. 110

21. A hypodermic syringe comprising, in combination, a sectional, hinged barrel; and means for locking the hinged barrel sections together consisting of a hollow sleeve fitting over both sections to lock the barrel when closed, and means connected with the sleeve and screw-threaded on one of the barrel sections to move said sleeve longitudinally. 115

22. A hypodermic syringe comprising, in combination, a sectional, hinged barrel; and means for locking the hinged barrel sections together consisting of a hollow sleeve and an actuating member engaged by screw threads with one of the hinged sections of the barrel, said sleeve lock actuating member, when turned so as to lock the barrel, engaging a cartridge of medicament placed within the barrel and thrusting the cartridge toward the opposite end of the instrument. 125

23. A hypodermic syringe comprising, in 130

combination, a sectional barrel; one of the barrel sections having a rotatable barrel head; a screw threaded member secured to the rotatable barrel head and to the end of said section, said screw-threaded member being hollow axially to provide a slideway for the syringe plunger; and means on the barrel head controlled by said screw-threaded member and constructed and arranged to engage the sections of the barrel to prevent separation thereof in use.

24. A hypodermic syringe comprising, in combination, a sectional barrel constructed and arranged to hold a cartridge of medication; one of the barrel sections having at one end an internally screw-threaded ring; a member screw-threaded within said ring and having an axial passage for the syringe plunger; and means connected with the screw-threaded member to lock the barrel sections together.

25. A hypodermic syringe comprising, in combination, a sectional barrel for containing a medicament cartridge; one of the bar-

rel sections having at one end an internally screw-threaded ring; a member screw threaded within said ring and having an axial passage for the syringe plunger; a locking sleeve carried by the screw-threaded member to be moved over the ends of the barrel sections to hold them together; the screw-threaded member being constructed and arranged to engage one end of the cartridge when turned toward barrel-locking position; and an abutment at the other end of the same barrel section against which the cartridge is thrust by said screw.

26. An instrument of the class described comprising, in combination, a cartridge-holder longitudinally divided comprising complementary hinged sections, one of said sections having a breech head and plunger and associated means embodying an axially adjustable screw for locking the sections in closed or cartridge-holding position.

In testimony whereof, I have signed my name to this specification.

FRED W. STEUER.