

(No Model.)

W. P. MITCHELL & W. R. GILLESPIE.  
HYPODERMIC SYRINGE.

No. 561,059.

Patented May 26, 1896.

Fig. 1.

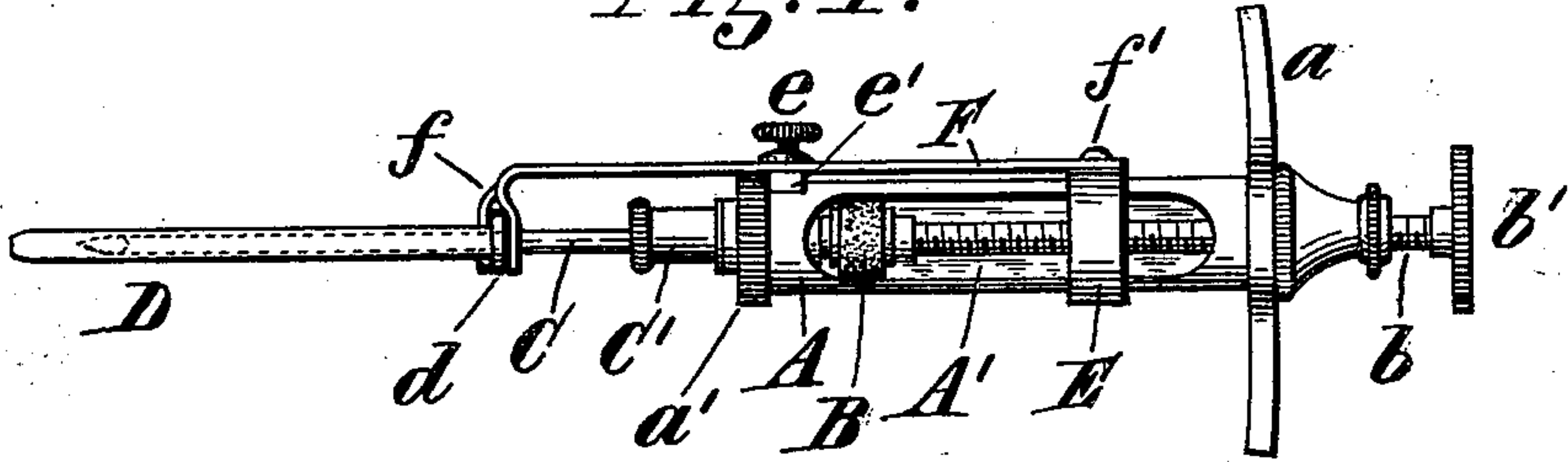


Fig. 2.

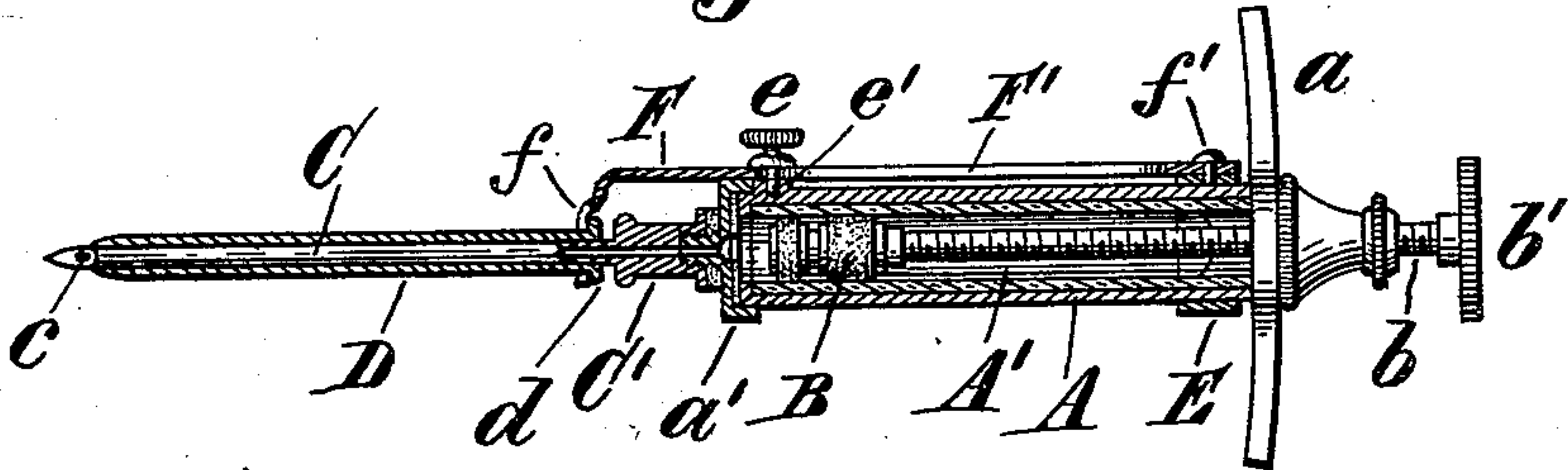


Fig. 3.

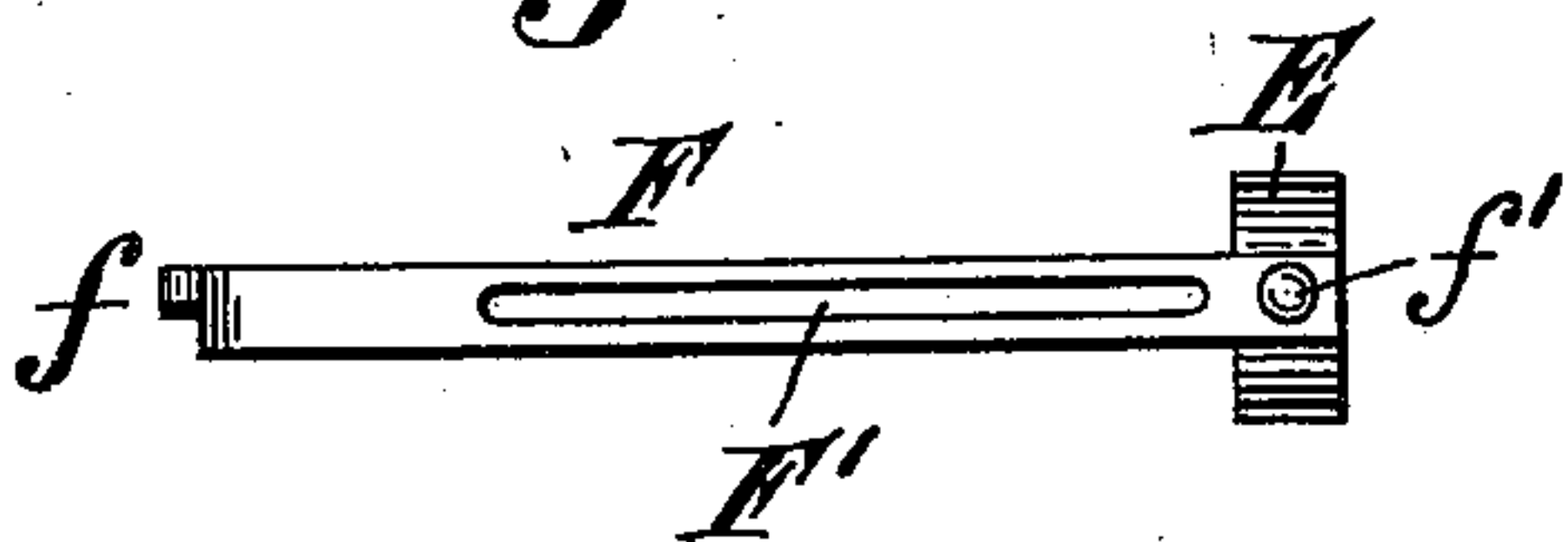


Fig. 4.

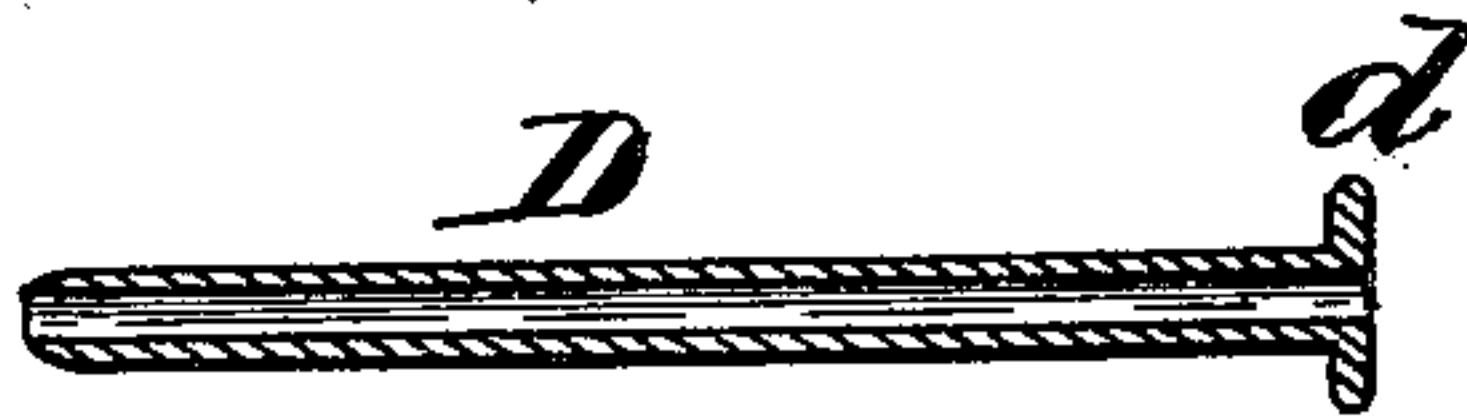


Fig. 5.

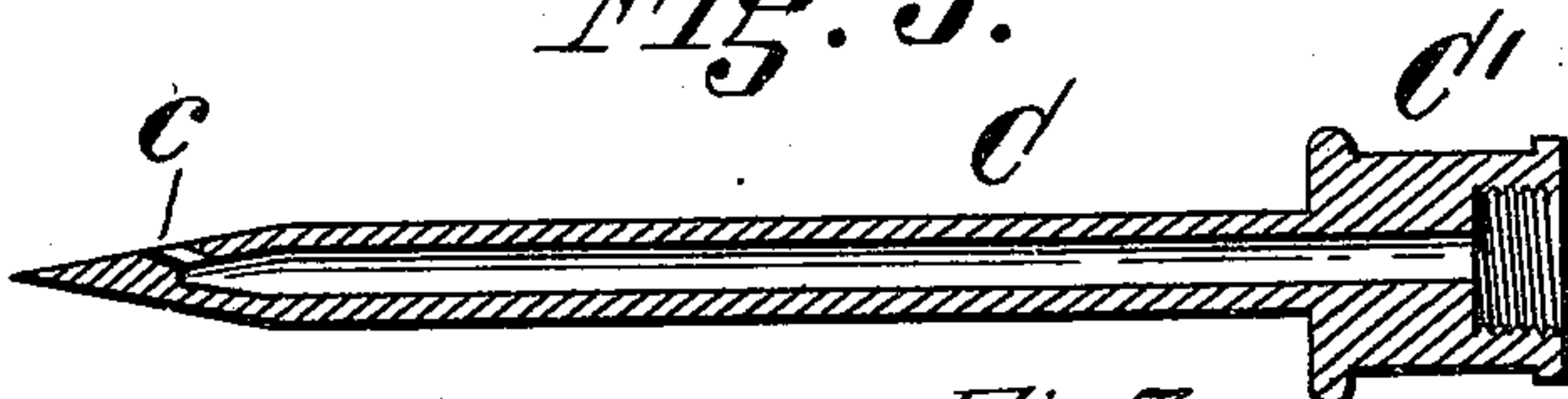


Fig. 6.

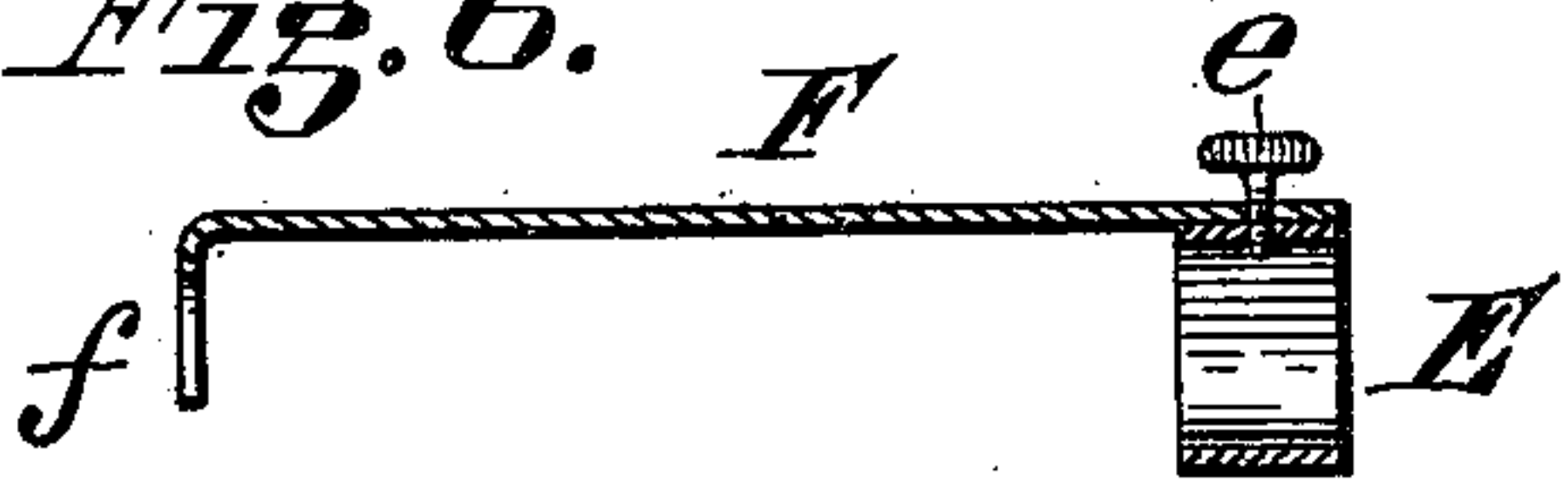


Fig. 7.



Attest

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# UNITED STATES PATENT OFFICE.

WALTER P. MITCHELL AND WILLIAM R. GILLESPIE, OF COVINGTON,  
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## HYPODERMIC SYRINGE.

SPECIFICATION forming part of Letters Patent No. 561,059, dated May 26, 1896.

Application filed June 25, 1894. Serial No. 515,582. (No model.)

*To all whom it may concern:*

Be it known that we, WALTER P. MITCHELL and WILLIAM R. GILLESPIE, citizens of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a specification.

Our invention relates to hypodermic syringes, or, more particularly speaking, to a combined syringe and safety hollow trocar-needle provided with a sheath or cannula for making the puncture and injecting fluid into a cavity without removing the instrument, and also permitting the evacuation of fluid from said cavity upon the withdrawal of all of said instrument except its cannula.

The objects of our invention are, first, to avoid and remove the danger of wounding blood vessels, nerves, or vital organs in depositing medicines in the vicinity of said vital organs; second, to provide a combined instrument, as above named, which may also be used to evacuate the liquid contents—such as pus, serum, and the like—from abscesses or other cavities; third, with the same instrument to inject such cavities with antiseptics or other medicaments, and, fourth, to provide a safety device or protecting-gage for the hypodermic needle and its sheath or cannula which may be used to properly restrict the depth of its passage into the tissues to any desired distance from full length thereof to, say, one-eighth of an inch, more or less. We attain these objects by means of the novel mechanism hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of our invention complete, showing the parts of the instrument in the position they are set for making the injection after the outer puncture or opening in the skin is made, the point of the trocar-needle lying back within the cannula; Fig. 2, a central longitudinal section, partly in elevation, of our instrument, with the parts adjusted to the position they assume when ready for puncturing the skin, the point of the trocar-

needle projecting the desired distance beyond the fore end of the cannula; Fig. 3, a detail plan view of the safety attachment for maintaining the proper relation between the point of the trocar-needle and the fore end of the cannula for both the puncturing operation and the insertion of the cannula with the hidden and sheathed needle-point of the hollow trocar within; Fig. 4, a central longitudinal section of the ordinary form of cannula used with our improvement; Fig. 5, an enlarged central longitudinal section of our novel construction of hollow trocar-needle; Fig. 6, a central longitudinal section of a modified form of the safety attachment seen in Fig. 3, and Fig. 7 a fore end view of Fig. 6.

A represents the open metallic shell or casing of the syringe, having the internal glass body or barrel A' and rear cross-bar or handle a, as customary.

B is the piston or plunger, and b the usual screw-threaded and graduated piston-rod, having the outer operating head or handle b'.

C represents the syringe-needle, constructed straight and hollow throughout its length, as clearly shown in the enlarged view, Fig. 5, and having a triangular or three-sided pyramidal point of trocar form, the extreme sharp tip thereof being central with its axis, as best seen in Figs. 2 and 5. The bore of this needle terminates in an opening c, made in one or more of the plane surfaces of said trocar-point.

C' is the usual internally-threaded enlargement or hub at the inner end of the needle, whereby it is attached to the orificed and externally-threaded syringe-cap a'.

D represents a straight cannula accompanying the said straight trocar-needle, and having the usual rear flange d.

E represents a band or thimble encircling the syringe, and adapted to be slid back and forth, as occasion may require, thereover. F is a bar projecting forwardly from said band E, and having its distal or fore end bent downward and forked at f to engage the flange d of the cannula, the latter being properly passed or freely slipped over the trocar-needle.



dle. Fork *f* is bent both front and rear, as best seen in Fig. 1, so as to engage both the front and rear sides of said flange *d*, one wing or branch of the fork projecting forward and  
 5 the other rearward, thus embracing the flange and enabling the cannula to travel in either direction over the needle simultaneous with said bar *F*, and being especially effective in positively grasping said cannula-flange when  
 10 the cannula is buried its full depth, and thereby otherwise difficult to catch hold of with the fingers in removing, as hitherto practiced.

*F'* is a longitudinal slot made in the bar *F*,  
 15 and *e* a set-screw whose shank passes through said slot into a block or lug *e'*, constructed on the fore end of the syringe-shell *A*, for securing the said bar and its accompanying cannula in the desired positions in relation to the  
 20 needle-point. The band *E* is provided to give the bar stability at its rear end as well as throughout its length, and the mode of attachment of said bar to the band may be effected by means of a rivet *f'*, as seen in Figs. 1, 2,  
 25 and 3, or soldered, as seen in Fig. 6.

In Fig. 6 the fork *f* does not have its prongs project fore and aft to engage over or straddle the cannula-flange, as in the first three views, but it constitutes simply a single bend  
 30 in the bar with a semicircular notch therein, which rests against the rear end or face of said cannula-flange, and the said notch partly surrounds the shaft of the trocar-needle between the cannula and the hub of said needle.  
 35 The set-screw in this view passes downwardly through the rear end of the bar, where the latter is attached to the band, thence through said band, and the lower end of its shank bears firmly upon the upper longitudinal bar  
 40 of the open syringe-shell *A* to adjustably and detachably secure the bar *F* (which is not slotted in this form) in the desired position. Bar *F* is given such extra length, as shown, to enable its operation and use in connection  
 45 with various lengths of needles and cannulae. The needle may be of any size and length required, and is made externally like the ordinary trocar, as stated; but it differs from the latter in being hollow throughout its length,  
 50 and it differs also from other hypodermic needles in having its hollow bore terminating in one or more openings *c* in the several plane faces of its pyramidal trocar-point, as aforesaid. These openings *c*, constructed and  
 55 located as shown, do not interfere with or affect the delicate point of the needle, but, at the same time, they are free and clear at all times to permit the full escape or ejection of the medicated fluid from the syringe through  
 60 and from the needle while the point of the latter is within the cannula. The trocar-point also enables the making of an opening on each face thereof to provide for a greater or less discharge or volume of injection.

65 The operation of our instrument is as follows: Having arranged or adjusted the parts,

as shown in Fig. 2, with the trocar-needle point projecting beyond the cannula, the syringe is charged with fluid by inserting the needle therein and withdrawing the plunger 70 *B* the desired stroke. The trocar-point of the needle and the accompanying cannula are then thrust into and through the skin, or such tissues as we wish to puncture and penetrate. The set-screw on the bar *F* is then loosened, 75 and the entire instrument, excepting the cannula, withdrawn a short distance (say one-fourth of an inch, more or less) outwardly till the said trocar-point lies back within the cannula. The said set-screw is then tightened 80 to firmly fix or hold the said bar and the cannula in the forward position, concealing and shielding the trocar-point, as seen in dotted lines, Fig. 1. The instrument, with the blunt cannula at its extreme fore end, can now be 85 passed with safety to its full depth, if desired, into the cavity, canal, or tissues wherein the medicine is to be deposited, and the injection completed by simply pressing forward on the syringe-plunger. This usually dangerous 90 operation is thus readily made by even an ordinary practitioner or a novice without danger of piercing or otherwise injuring delicate organs, and only possible heretofore by very skilful surgeons, who have been com- 95 pelled to use unprotected needles or other sharp instruments among said organs. It will be seen that the syringe having our hollow trocar-needle need not be withdrawn bodily from the cannula until after the injection 100 is made, thus effectually obviating the entrance of air through the heretofore open cannula, while the solid trocar of the past had to be removed before the injector-nozzle could be applied and reinserted. We thus provide 105 in connection with a syringe a combined trocar-needle and injector-nozzle, which, with a cannula or sheathing-tube, make a very simple, safe, and efficacious instrument.

This device is especially adapted to the 110 treatment of hernia, hydrocele, and varicocele, and the blunt cannula, adjusted as seen in Fig. 1, can be passed nowhere other than along the proper canal, thus making the instrument what might be fully termed "absolutely safe." 115

We claim—

1. A hollow needle and ejector-nozzle for hypodermic syringes, composed of a straight tube having at one end an attaching-head and 120 at the other constructed into a three-sided pyramidal point of trocar form, one or more of the three plane sides of said trocar-point having an exit-aperture therein leading to the bore of the needle, and the sharp tip of 125 said trocar-point being axially central with the body of the nozzle-needle, substantially as herein set forth.

2. The combination with a hypodermic syringe having a suitable barrel and plunger, of 130 a straight hollow needle having a pyramidal trocar-point, with a central, axial tip, the bore

of said needle terminating in an opening in  
one or more of the plane surfaces of the three-  
sided trocar-point, a straight flanged sheath  
or cannula on said trocar-needle, and a slid-  
5 ing slotted bar or gage having an open fore  
jaw or fork *f* and an adjusting set-screw and  
mounted on the syringe-barrel, substantially  
as and for the purpose specified.

In testimony of which invention we have  
hereunto set our hands.

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WILLIAM R. GILLESPIE.

Witnesses:

JOHN E. JONES,  
EDW. B. TROUTS.