

## **Improvements to and relating to hypodermic syringes / [Louis Roussy].**

### **Contributors**

Roussy, Louis.  
Boult, Wade & Kilburn.

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Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
<https://wellcomecollection.org>



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Complete Specification Left, 16th Mar., 1905—Accepted, 4th May, 1905

PROVISIONAL SPECIFICATION.

Improvements in and relating to Hypodermic Syringes.

I, Louis Roussy, Dentist, of 8 Rue St. Léger, Geneva, Switzerland, do hereby declare the nature of this invention to be as follows:—

This invention consists of certain new and useful improvements in hypodermic syringes, and is more particularly intended for use by dentists.

5 I am aware that several constructions of such syringes are already known and made use of, and the purpose of the present improvements is to do away with several objections which exist in similar devices now in use.

One of these objections is that, according to the large diameter of the piston of the syringe it requires too great an effort to make the injection by the mere action of one hand and that therefore it is necessary to use both hands.

10 A further objection is the form of attachment of the tubular needle to the collar of the glass-syringe, which renders the syringes either very cumbersome or does not provide a sufficiently secure joint.

Another objection is made to several of the well-known syringes of the afore-said class, because the same are not easily taken to pieces for cleaning purposes.

15 Now the present invention does away with these objections by means of the following devices.

The dimensions of the cylinder of the same are as follows:—The length of the stroke of the piston is made approximately 15 times the inner diameter of the cylinder. The exertion necessary for pushing the piston to obtain a certain pressure, is four times less with the present syringe than with those actually in use. On the open or upper end of the glass-cylinder, which is provided with the usual glass-collar, there is frictionally adjusted a metallic sleeve provided with slots forming suitable claws on the same, which securely grip the said glass-tube; the said metallic sleeve is further provided with suitable hooks or arms intended to be seized by the fingers of the operator.

The other end of the glass-cylinder, is provided with a collar, which on part of its length is cylindrical and externally screw-threaded and on the other part of said length is conical.

30 Upon the said collar there is firmly screwed a metallic sleeve which is internally screw-threaded and of a corresponding conical shape. The usual tubular needle is fixed to the said sleeve by any suitable means.

The accompanying drawings show, by way of example, one form of construction of the said syringe.

35 Figure 1 is an elevation of the complete syringe:

Figure 2 is a cross-section on the line A—B of the same:

Figure 3 shows, on a larger scale and in longitudinal section the connection of the glass-cylinder with the needle-bearer.

In several figures, the same letters of reference refer to the same portions.

40 The glass-cylinder *a* is made of such dimensions that the stroke of the piston *b*, that is to say the useful length of the cylinder, measures 15 or about 15 times the inner diameter of the said cylinder. The piston is preferably made of amianthas.

On the said glass-cylinder *a*, which has a collar *a*<sup>1</sup> there is frictionally adjusted a metallic sleeve *c* provided with several slots *c*<sup>1</sup> so as to form a series

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of claws which grasp the cylinder, the said sleeve *c* being further provided with suitable hooks *c*<sup>2</sup> or equivalent means intended to be seized by the fingers of the operator.

The end of the glass-cylinder *a* is provided with a collar extension (Figure 3) formed of an externally screw-threaded cylindrical portion *a*<sup>1</sup> and a conical portion *a*<sup>2</sup> intended to engage the conical portion of the cavity of a metallic sleeve *d* screwed on the said screw-thread *a*<sup>1</sup> of the collar. The tubular needle *e* of the syringe is soldered or fixed by any other suitable means to the sleeve *d*.

From the above description it will be seen that in order to clear the syringe after use, it is merely necessary to unscrew the metallic sleeve *d*, take out the plunger and piston *b* and immerse the parts in water or disinfectant fluid.

The form, dimensions and arrangement of the parts may vary and I wish to have it well understood that the syringe as shown and described has only been shown and described by way of example.

Dated this 25th day of November 1904.

BOULT, WADE & KILBURN,  
Agents for the Applicant.

## COMPLETE SPECIFICATION.

**Improvements in and relating to Hypodermic Syringes.**

I, LOUIS ROUSSY, Dentist, of 8 Rue St. Léger, Geneva, Switzerland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention consists of certain new and useful improvements in hypodermic syringes, and is more particularly intended for use by dentists.

I am aware that several constructions of such syringes are already known and made use of, and the purpose of the present improvements is to do away with several objections which exist in similar devices now in use.

One of these objections is that, according to the large diameter of the piston of the syringe it requires too great an effort to make the injection into a hard or dense tissue by the mere action of one hand and that therefore it is necessary to use both hands, which is inadmissible for certain delicate operations.

A further objection is the form of attachment of the tubular needle to the collar of the glass-syringe, which renders the syringes either very cumbersome or does not provide a sufficiently secure joint.

Another objection is made to several of the well-known syringes of the aforesaid class, because the same are not easily taken to pieces for cleaning purposes, or leak at the screw joints, or bring injury to the piston when it is put back to its place.

A further objection is that the piston of the usual syringes often allows the liquid under pressure to pass behind the said piston because the inner hole of the cylinder has not exactly the same diameter at its two ends.

Now the present invention does away with these objections by means of the following devices.

The dimensions of the cylinder of the same are as follows:—The length of the stroke of the piston is made approximately 15 times the inner diameter of the cylinder. The exertion necessary for pushing the piston to obtain a certain pressure, is four times less with the present syringe than with those actually in use. On the open or upper end of the glass-cylinder, which is provided with

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the usual glass-collar, there is frictionally adjusted a metallic sleeve provided with slots forming suitable claws on the same, which securely grip the said glass-tube: the said metallic sleeve is further provided with suitable hooks or arms intended to be seized by the fingers of the operator, when he intends to  
5 make use of the syringe.

The other end of the glass-cylinder is provided with a collar, which on part of its length is cylindrical and externally screw-threaded and on the other part of said length is conical.

10 Upon the said collar there is firmly screwed a metallic sleeve which is internally screw-threaded and of a corresponding conical shape. The usual tubular needle is fixed to the said sleeve by any suitable means.

The said syringe is thus very easily dismantled into four distinct pieces which are very easily again put together.

15 With reference to the drawings left with the Provisional Specification in which is shown by way of example, one form of construction of the said syringe,

Figure 1 is an elevation of the complete syringe;

Figure 2 is a cross-section through the upper part of the same;

Figure 3 shows, on a larger scale and in longitudinal section the connection of the glass-cylinder with the needle-bearer.

20 In the accompanying drawings,

Figure 4 is an elevation, of a modified construction.

Figure 5 is a cross-section of the upper portion of Figure 4.

Figure 6 is a section on the line  $x-y$  of Figure 5.

25 Figure 7 shows on an enlarged scale the connection of the glass-cylinder with the needle-bearer of this modified construction.

Figure 8 is a section on the line  $y-z$  of Figure 4.

In several figures, the same letters of reference refer to the same portions.

30 In the Figures 1 to 3, the glass-cylinder  $a$  is made of such dimensions that the stroke of the piston  $b$ , that is to say the useful length of the cylinder, measures 15 or about 15 times the inner diameter of the said cylinder, which diameter will preferably be  $4\frac{1}{2}$  to  $4\frac{3}{4}$  millimeters. The piston is preferably made of amianthas.

The interior of the said cylinder is finished to an exactly uniform diameter so that the piston  $b$  is fluid tight at any position.

35 On the said glass-cylinder  $a$ , which has a collar  $a^x$  there is frictionally adjusted a metallic sleeve  $c$  provided with several slots  $c^1$  so as to form a series of claws which grasp the cylinder, the said sleeve  $c$  being further provided with suitable hooks  $c^2$  or equivalent means intended to be seized by the fingers of the operator.

40 The end of the glass-cylinder  $a$  is provided with a collar extension (Figure 3) formed of an externally screw-threaded cylindrical portion  $a^1$  and a conical portion  $a^2$ , intended to engage the conical portion of the cavity of a metallic sleeve  $d$  screwed on the said screw-thread  $a^1$  of the collar. The tubular needle  $e$  of the syringe is soldered or fixed by any other suitable means to the sleeve  $d$ .

45 From the above description it will be seen that in order to clear the syringe after use, it is merely necessary to unscrew the metallic sleeve  $d$ , take out the plunger and piston  $b$  and immerse the parts in water or disinfectant fluid.

The construction shown in the Figures 4 to 8 is substantially the same as the one just described, but in this case the piston-rod is further combined with  
50 a metallic cap  $h$  having two hooks or projections  $h^1$  which engage the collar  $a^x$  of the glass-cylinder  $a$ .

The latter is provided with two notches  $a^4$  allowing the said hooks or projections  $h^1$  to be thus engaged.

55 This cap  $h$  is intended to work as an abutment for the piston  $b$  and to prevent the same being pulled out of the cylinder.

In this construction the needle-bearer is combined with a spring-shaped finger or arm  $f$  fixed to a metallic ring  $g$ , secured to the glass-cylinder  $a$ . This yield-

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ing connection is intended to prevent any gripping of the said-needle-bearer on the syringe as sometimes occurs with other connecting devices.

The slots  $c^1$  of the sleeve  $c$  are in this construction of such a form as to do away with several of the claws grasping the cylinder.

The form, dimensions and arrangement of the parts may vary and I wish to have it well understood that the syringes as shown and described have only been shown and described by way of example. 5

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:— 10

1. In a hypodermic syringe a metallic sleeve surrounding the upper end of the glass-cylinder and bearing hooks such as  $c^2$  the said sleeve being provided with slots to form one or more claws gripping the glass-tube, substantially as shown and described. 15

2. In a hypodermic syringe a glass-cylinder  $a$  having a collar  $a^x$  in combination with a cap  $h$  acting as an abutment to limit the stroke of the piston substantially as shown and described.

3. In a hypodermic syringe the combination of a glass-cylinder  $a$  having a collar  $a^2$  with a needle-bearer and means for connecting the said needle-bearer to the said collar  $a^2$  substantially as shown and described. 20

4. In a hypodermic syringe a spring-shaped needle-bearing finger or arm  $f$  mounted on the cylinder and connecting the needle-bearer to the same in a flexible manner substantially as shown and described.

5. The complete hypodermic syringe substantially as described or illustrated in Figures 1—3 or Figures 4—8 of the accompanying drawings. 25

Dated this 16th day of March 1905.

BOULT, WADE & KILBURN,  
Agents for the Applicant.



[This Drawing is a reproduction of the Original on a reduced scale.]

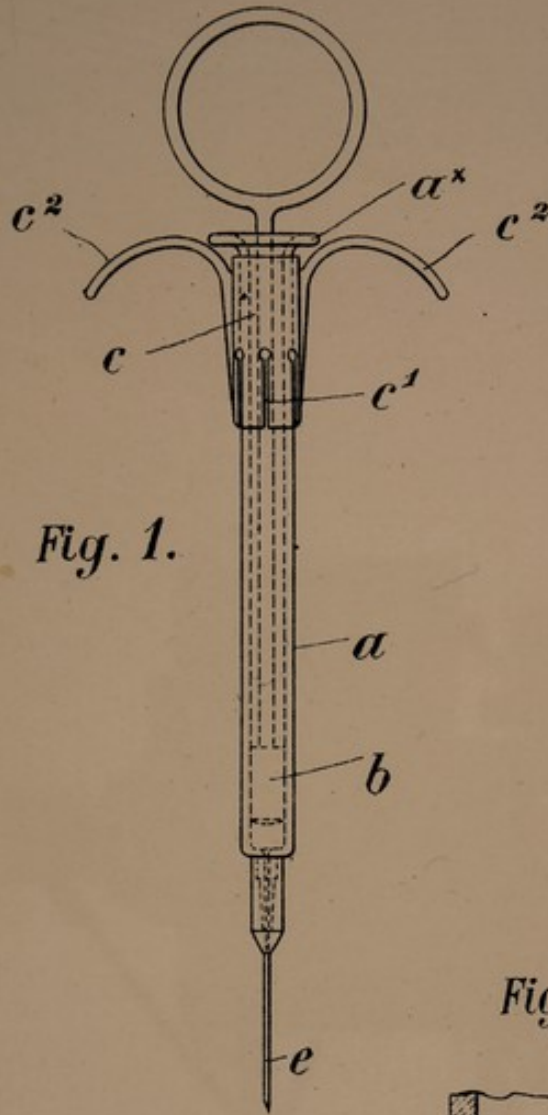


Fig. 1.

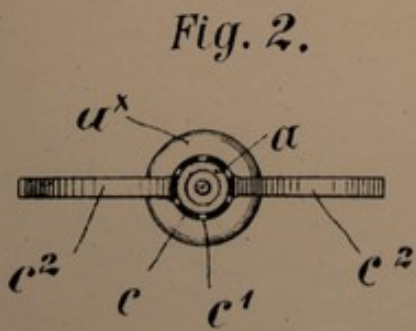


Fig. 2.

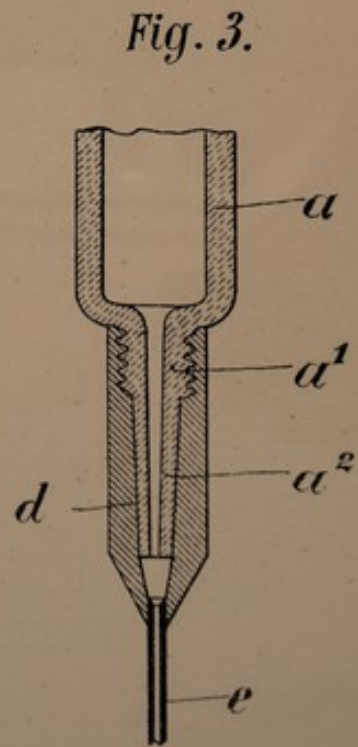
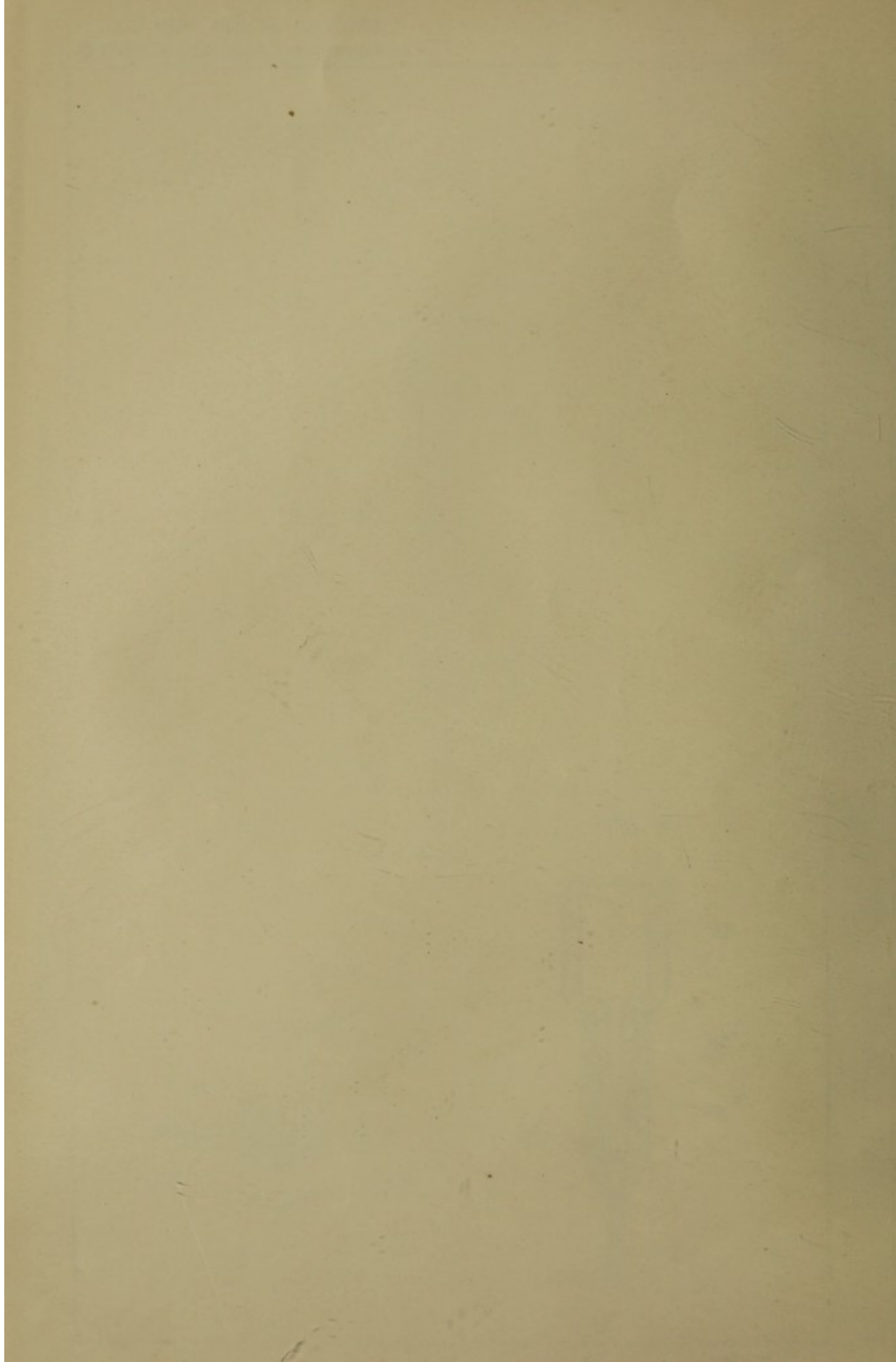


Fig. 3.



[This Drawing is a reproduction of the Original on a reduced scale.]

