

L. C. SCHNEIDER.  
 APPARATUS FOR HARDENING THE TEETH OF CARD CLOTHING, &c.  
 APPLICATION FILED JAN. 12, 1909.

958,326.

Patented May 17, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

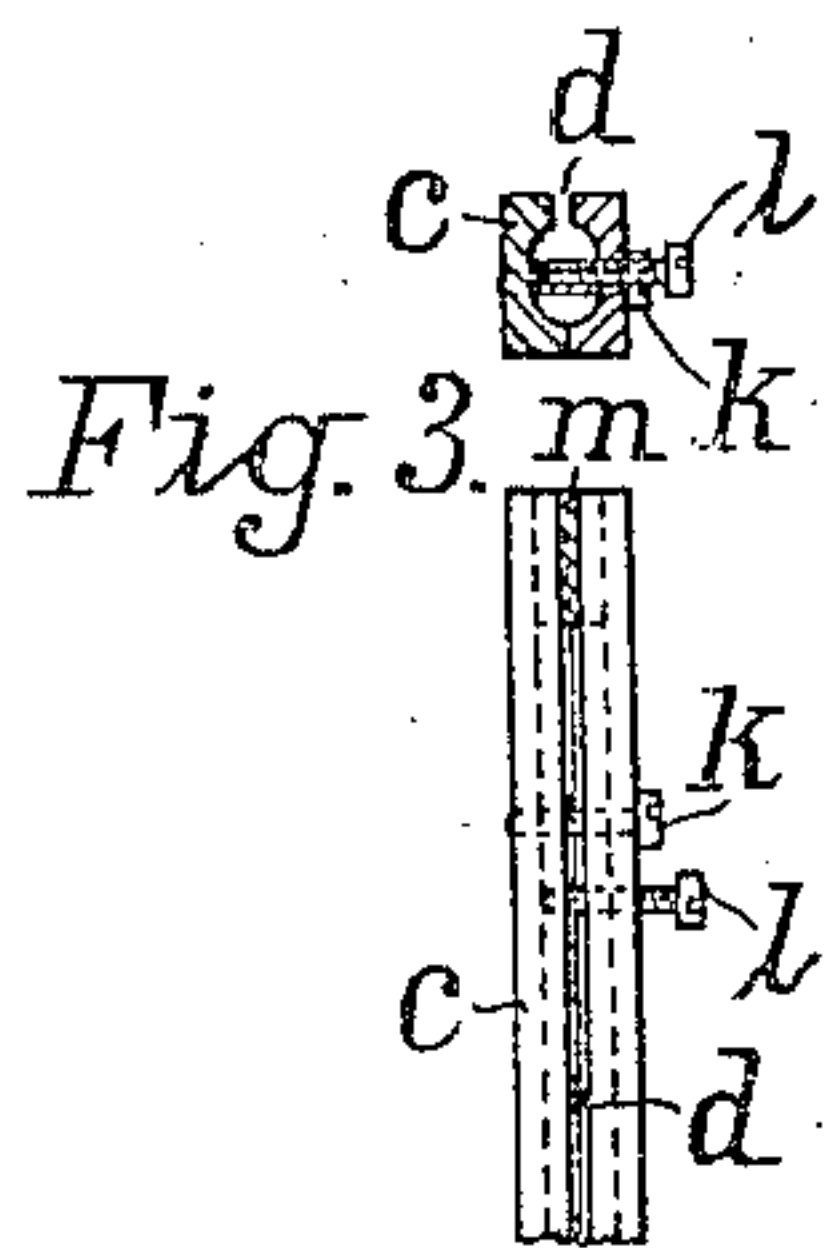
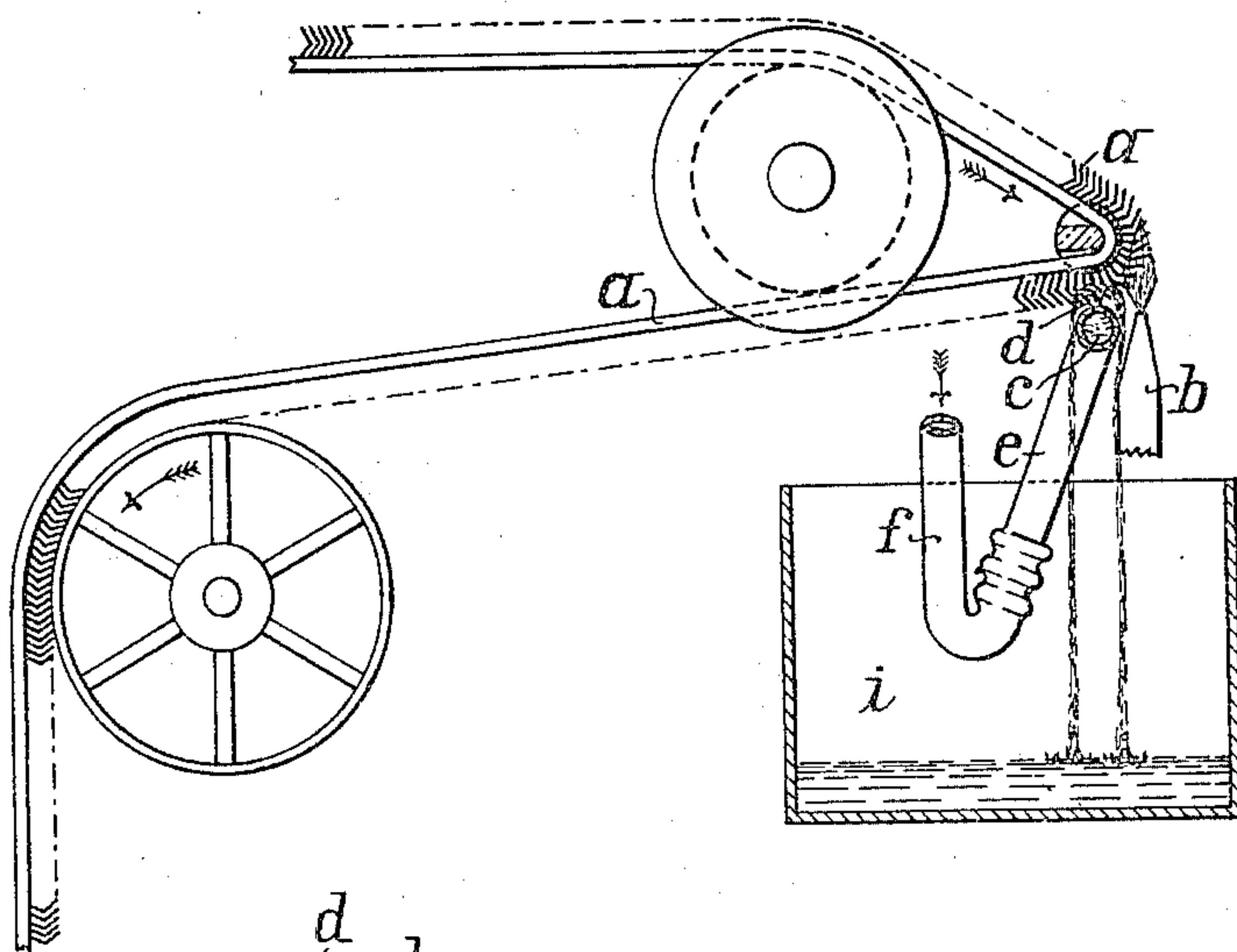
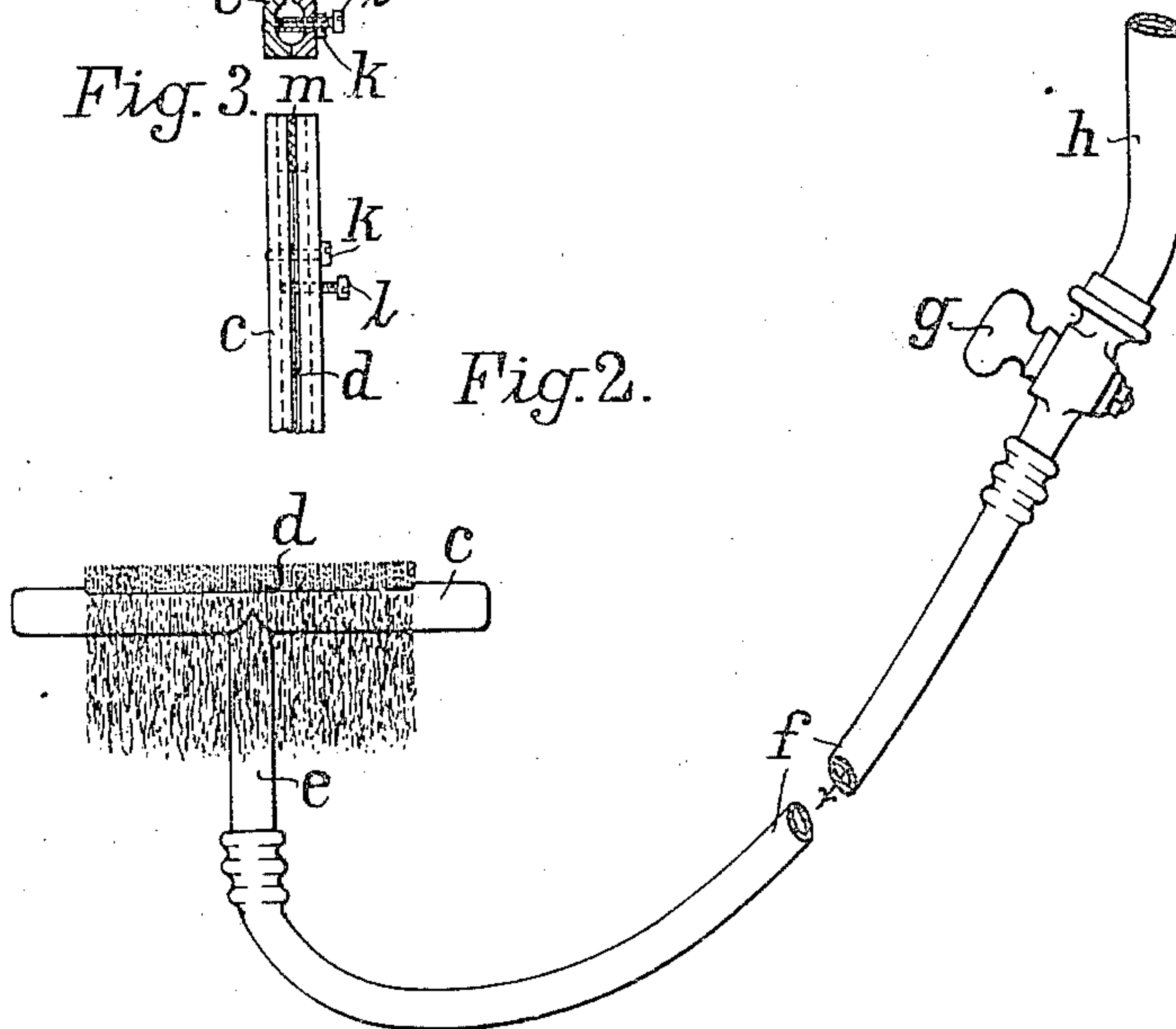


Fig. 2.



Witnesses:-  
 Henry Shene  
 J. George Barry

Inventor:-  
 Louis Constantin Schneider  
 by his attorneys  
 Brown & Luard

L. C. SCHNEIDER.

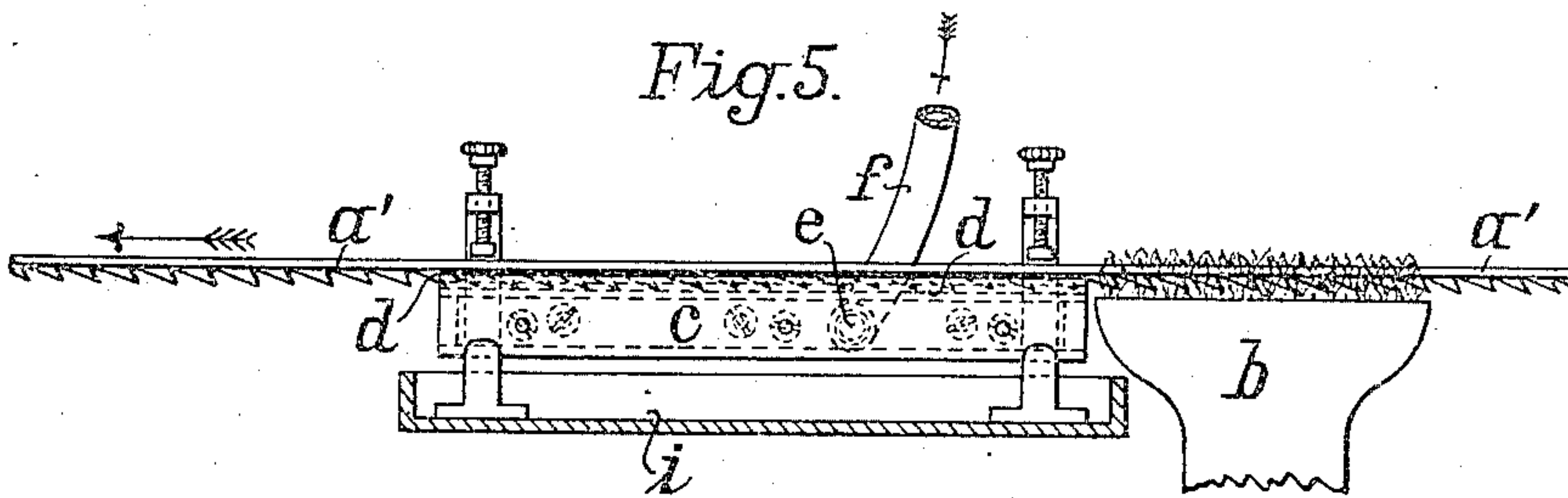
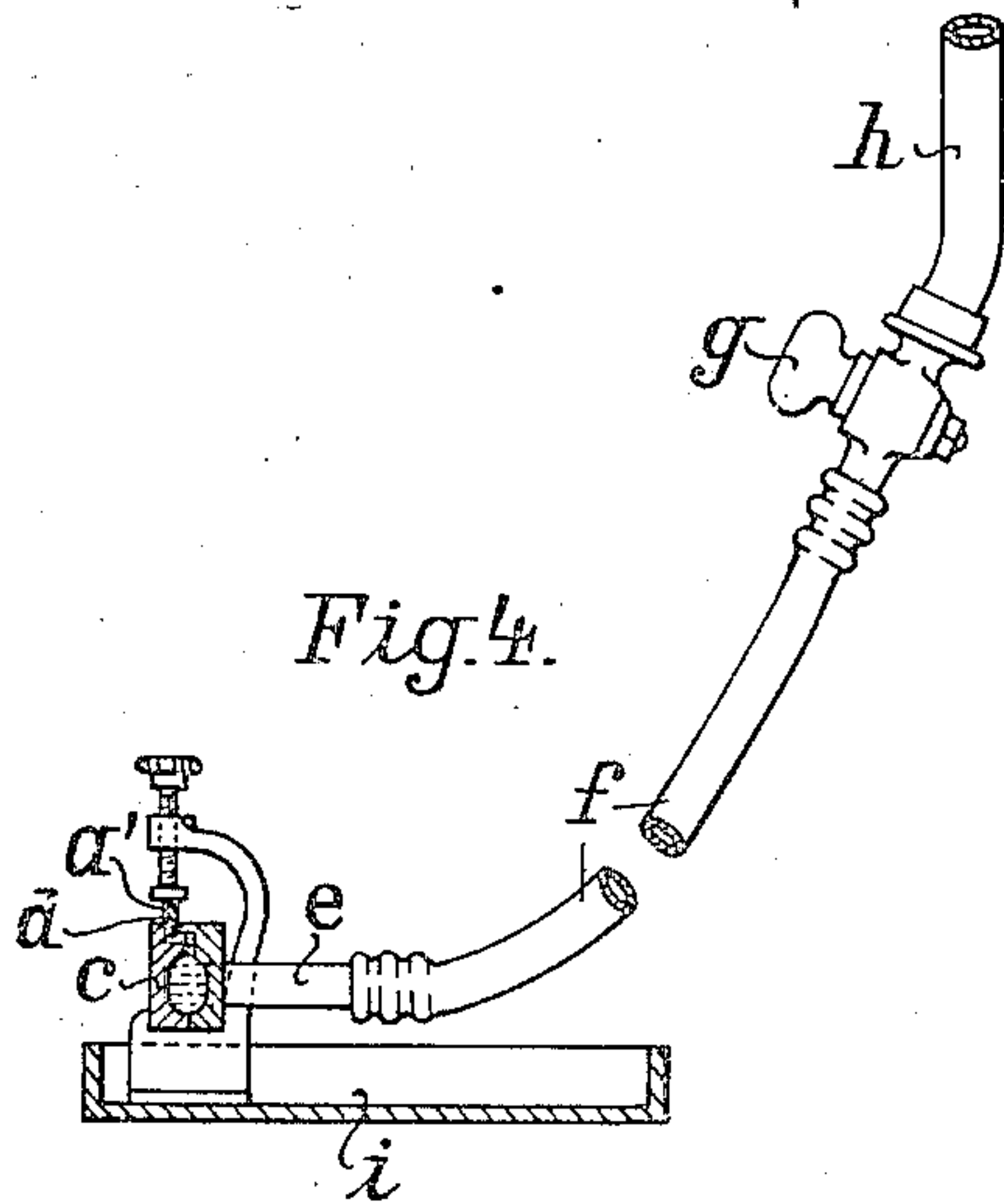
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2 SHEETS—SHEET 2.



*Witnesses:-*

*Henry Scheine.*

*J. George Barry*

*Inventor:-*

*Louis Constantin Schneider*

*by his attorneys*

*Brown & Shward*



# UNITED STATES PATENT OFFICE.

LOUIS CONSTANTIN SCHNEIDER, OF MITTWEIDA, GERMANY.

APPARATUS FOR HARDENING THE TEETH OF CARD-CLOTHING, &c.

958,326.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed January 12, 1909. Serial No. 471,930.

*To all whom it may concern:*

Be it known that I, LOUIS CONSTANTIN SCHNEIDER, a citizen of the United States of America, and resident of Mittweida, Kingdom of Saxony, German Empire, have invented a new and useful Improvement in Apparatus for Hardening the Teeth of Card-Clothing or the Points of Toothed Wires for Carding-Machines or the Like, of which the following is a specification.

This invention has for its object an improvement in apparatus for hardening the teeth of card clothing or the points of toothed wires for carding machines or the like.

In face of known processes for hardening teeth or toothed wires, the process used in combination with the improved apparatus forming the object of the present invention is characterized in that the tooth or wire points heated to redness are passed immediately through a jet of cold or fresh water, continuously rising through pressure, the rising height of which is capable of being adjusted according to how far the points of the teeth or how high up the points of the wires are to be hardened.

The apparatus constructed according to the present invention consists of a pipe or tube-like hollow body arranged as near as possible to the point where the teeth or toothed wires are heated to redness and connected to a suitable water supply. This pipe or tube-like hollow body is provided with a slot extended over its entire length and allowing the water supplied under pressure to issue in the shape of a fountain-like jet. The rising-height of such fountain-like jet can be adjusted or regulated, as required by a suitable adjusting device inserted into the water supply. The slit pipe or tube-like hollow body is in communication with a suitable water-supply in such a manner that the water issuing from the slot will rise to the same height throughout. The length of the slot provided for the free issue of the cooling water jet may be regulated by suitable slides or the like.

Instead of the slit pipe two pipes surrounding or encircling one another may be used, the inside one of which is connected to the water supply being under pressure whereas each of them is provided with a slot of longitudinal opening arranged in such a manner that on suitably turning both pipes within each other the slot for the

issue of cooling-water jet is more or less widened and thus the time or period which the teeth or points of the wires to be hardened remain within the permanently rising cooling-water jet, may be regulated at will. Furthermore, a slit pipe or tube-like hollow body may also be used composed of two mold shaped hollow parts connected in such a manner that the width of the slot for the issuing cooling-water jet may also be regulated at will. With this form of construction especially adapted for hardening card clothing composed of toothed wires, a deflecting part may be provided on the edges of both mold shaped hollow parts forming the slot for the issue of the cooling-water. This deflecting part will form a guide securing the height up to which the teeth of the wire heated to redness are to be hardened, whereas it effects at the same time in combination with the regulation of the pressure a throttling of the cooling water jet issuing in the slot in such a manner that only the points of the heated wire are

Figure 1 is a side elevation partly in section of a hardening apparatus used according to the invention. Fig. 2 is a device for supplying cooling-water to such hardening apparatus. The Figs. 3 to 5 are modified forms of the apparatus shown in Figs. 1 and 2.

As shown in Fig. 1, the card clothing *a* is guided in the usual manner in the direction of the arrow and passed along in close proximity to the point where the teeth are heated to redness with suitable speed. The heating at the point mentioned may be effected by means of a nozzle *b* which may be suitably arranged in a manner to be set at will, whereby the direction of the flame issuing from said nozzle may be adjusted according to requirement with regards to the points of the teeth to be hardened. In close proximity to the nozzle *b* a pipe *c* is firmly or movably arranged on a suitable level. This pipe which may be closed at both ends is provided with a slot *d* extended along its entire length and is connected to a water supply pipe *e*. As shown in Fig. 2 the opposite end of the pipe *e* may be connected by means of a flexible tube or hose *f*, to a water supply *h* being under pressure and adapted to be turned on or off by a cock *g* or the like. According to the position of this cock a throughout even jet of cold or fresh water



will issue from the slot *d* of the pipe *c* like a rising fountain to either a larger or smaller height; to this water jet the flame issuing from the nozzle *b* may be neared to such an extent that the points of the teeth are, immediately after being heated to redness moved or passed through such water-jet, as shown in Fig. 1. Thus the points mentioned are immediately chilled and hardened without having to pass through and being exposed to the air, whereby an oxidation of the points will be prevented. The water dripping down is collected within an appropriate tank or receptacle *i* from which it is let off in a suitable manner.

According to Fig. 3 the slit pipe or tube-like hollow body *c* is formed by two hollow bars which are mold-shaped for the purpose of forming a chamber for the passage of the cooling water. These bars may be fastened together by screws *k* and can be separated at their upper edges by adjusting screw-bolts *l* in such a manner that the slot *d* provided for the issue of the rising cooling water jet may be narrowed or widened at will. For the purpose of closing the space between the upper edges of the tube-like hollow chamber a suitable packing *m* may be inserted between these edges. As shown in Fig. 4, this tube like hollow body *c* may be constructed in such a manner that the upper edges forming the slot *d* for the issue of the water are provided with projections forming an angle-shaped slot and effecting a deflection of the rising-water. The width of such slot may be adjusted in the manner described with reference to Fig. 3 so as to regulate the quantity and pressure of the issuing water. The tube-like hollow body *c* arranged within or above the water collecting tank *i* by suitable holding devices especially serves to harden card clothing, formed by flat toothed wires and is connected by means of the pipe *e* and the flexible tube or hose *f* to the pressure water supply *h* to be regulated by a cock *g* or the like, as clearly seen by Fig. 4. In close proximity to one of the ends of the hollow body *c* a suitable burner or nozzle *b* for heating the points of the toothed wires to redness is arranged in longitudinal axis of such body, Fig. 5. The toothed wire *a'* is passed along above the burner and heated to such an extent that the teeth enter the upper deflected part of the slot *d* within the hollow body *c* in a red hot state, whereby the water supplied under pressure in consequence of regulating its pressure correspondingly and due to the deflection taking place near the edges of the slot, only rises up to the mouth of such slot. Consequently only the points of the continuously progressing wire are hardened whereas the back of the wire heated to redness remains thoroughly unhardened and flexible, so that this wire provided with

glass hardened teeth may easily be mounted on rollers or cylinders without the fear of breaking or injuring the same. It is evident that the tube-like hollow body instead of being composed of two parts may also consist of one part only. The wire may be moved or fed along by a drum on which the finished thread is wound up. During the passage of the teeth through the slot *d* the back part of the wire being thicker than the teeth limits the depth down to which the teeth immerse into the slot and partially shuts off the slot against the issue of water. The rising water is carried along on a level with the teeth in the direction in which the wire moves and drops into the tank *i*.

In consequence of being able to precisely adjust the height to which the jet of cooling water is to rise any contact between the water and the card-cloth can absolutely and safely be prevented during the operation of hardening card-teeth, whereas when hardening toothed wire the cooling water is prevented from running over the wire-back heated to redness not to be hardened. Thus by the hardening and chilling used in connection with the apparatus described and forming the object of the present invention, a hardened card-clothing of first class quality is obtained.

What I claim is:—

1. In an apparatus for hardening the teeth of card clothing or the points of toothed wire for carding machines, the combination with a burner for heating the teeth until red hot, and being arranged as near as possible to the heating point, of a longitudinal slit tube-like pipe adjacent to the point where the teeth are heated, a water conduit supplying cooling water in the said tube-like pipe, and means for continuously passing the teeth or points through the cooling water, substantially as and for the purpose specified.

2. In an apparatus for hardening the teeth of card clothing or the points of toothed wire for carding machines, the combination with a burner for heating the teeth until red hot and being arranged as near as possible to the heating point, of a longitudinal slit tube-like pipe adjacent to the point where the teeth are heated, a water conduit supplying cooling water in the said tube-like pipe, means for regulating the pressure of the water supplied through such conduit and the rising height of the jet issuing from the tube-like pipe and means for continuously passing the teeth or points through said jet, substantially as and for the purpose specified.

3. In an apparatus for hardening the teeth of card clothing or the points of toothed wire for carding machines, the combination with a burner for heating the teeth until red hot and being arranged as near as



possible to the heating point, of a longitudinal slit tube-like pipe adjacent to the point where the teeth are heated, a water conduit supplying cooling water to the said  
5 tube-like pipe, means for regulating the pressure of the water supplied through such conduit and the rising height of the jet issuing from the tube-like pipe, means for regulating the position of the jet relative to the  
10 heating means and means for continuously passing the teeth or points through said jet, substantially as and for the purpose specified.

4. In an apparatus for hardening the  
15 teeth of card clothing or the points of toothed wire for carding machines, the combination with a burner for heating the teeth until red hot and being as near as possible to the heating point, of a chamber formed of

two sections provided with a slot at their  
meeting edges on one side thereof, a pressure water supply, means for regulating the pressure of said water supply, means for connecting the chamber with the pressure water supply, means for adjusting the width  
25 of the slot for the cooling water jet to issue, and means for continuously passing the teeth or points through said jet, substantially as and for the purpose specified.

In testimony, that I claim the foregoing  
30 as my invention, I have signed my name in presence of two witnesses, this nineteenth day of Dec. 1908.

LOUIS CONSTANTIN SCHNEIDER.

Witnesses:

WILLIAM J. KONJDEN,  
FREDERICK J. DIETZMAN.