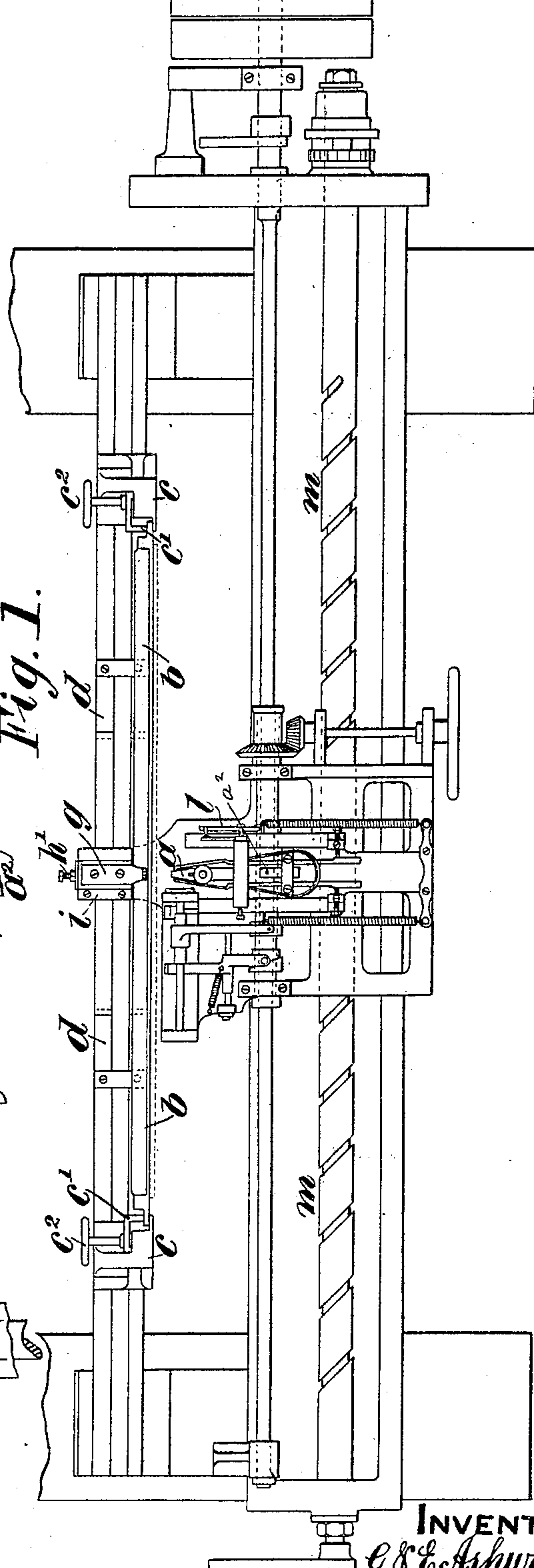


2 Sheets—Sheet 1.

APPARATUS FOR ATTACHING CARD CLOTHING TO FLAT BARS.

~~Patented Feb. 5, 1889.~~



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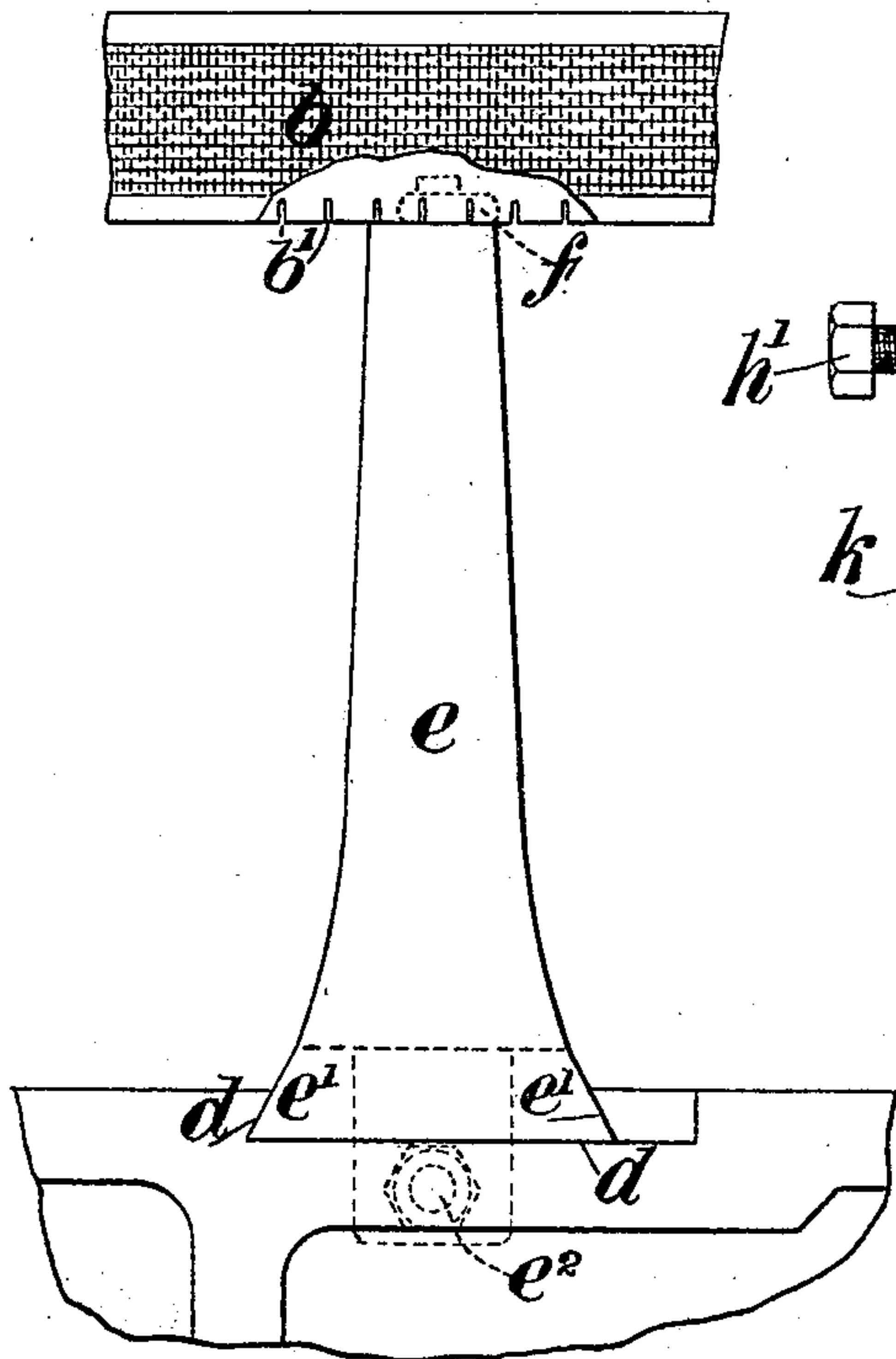
G. & E. ASHWORTH.

APPARATUS FOR ATTACHING CARD CLOTHING TO FLAT BARS.

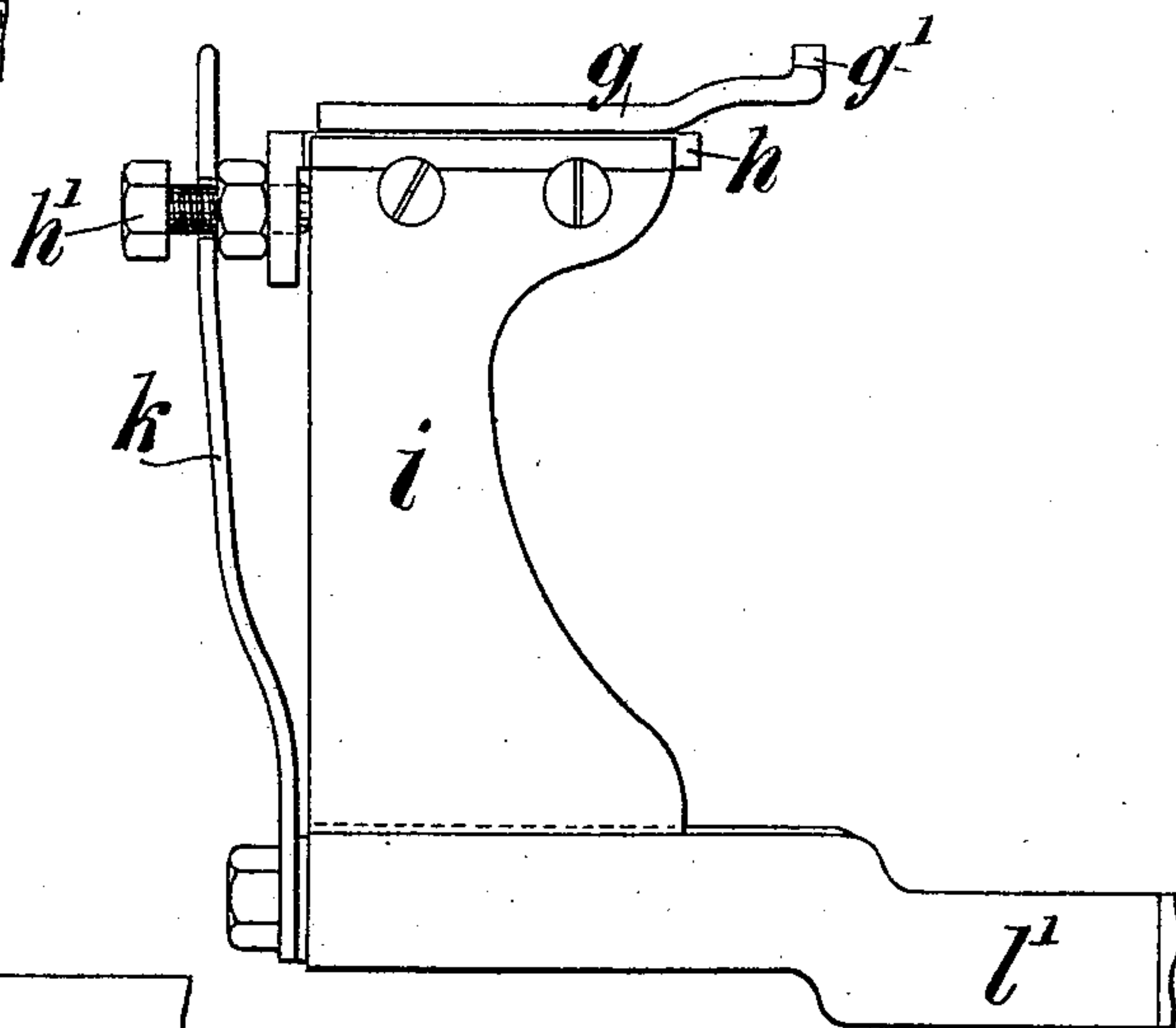
No. 397,267.

Patented Feb. 5, 1889.

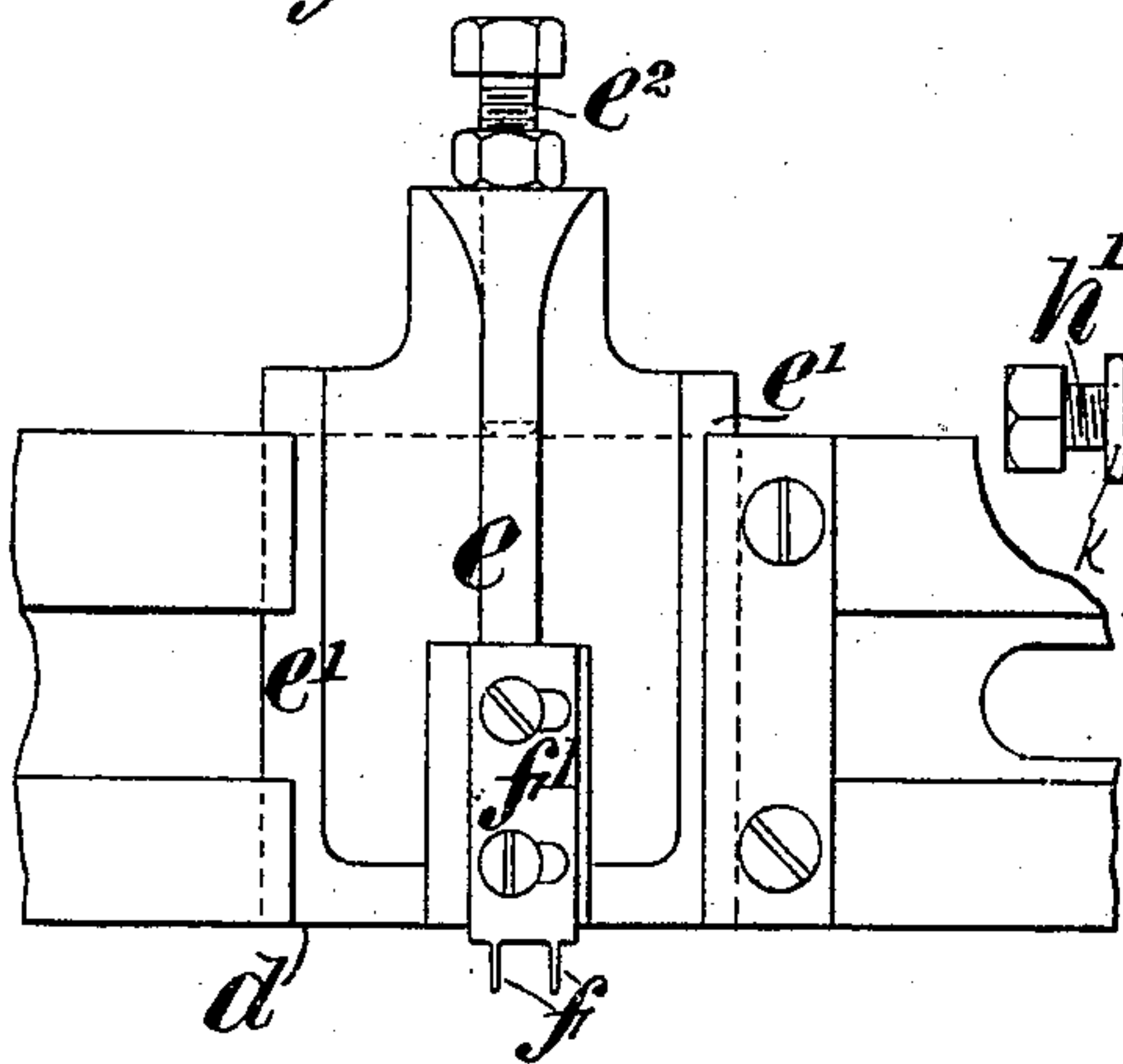
*Fig. 7.*



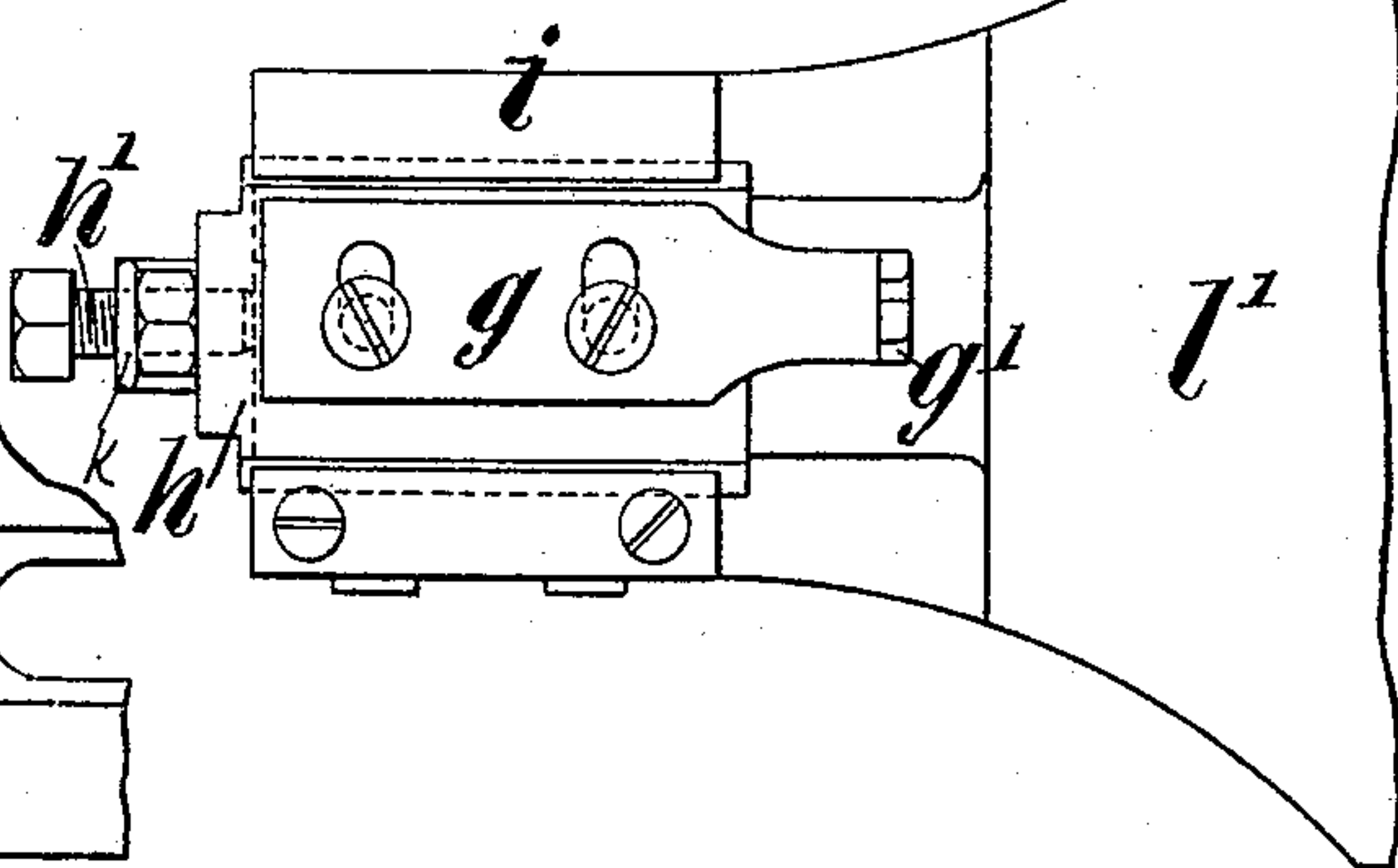
*Fig. 9.*



*Fig. 8.*



*Fig. 10.*

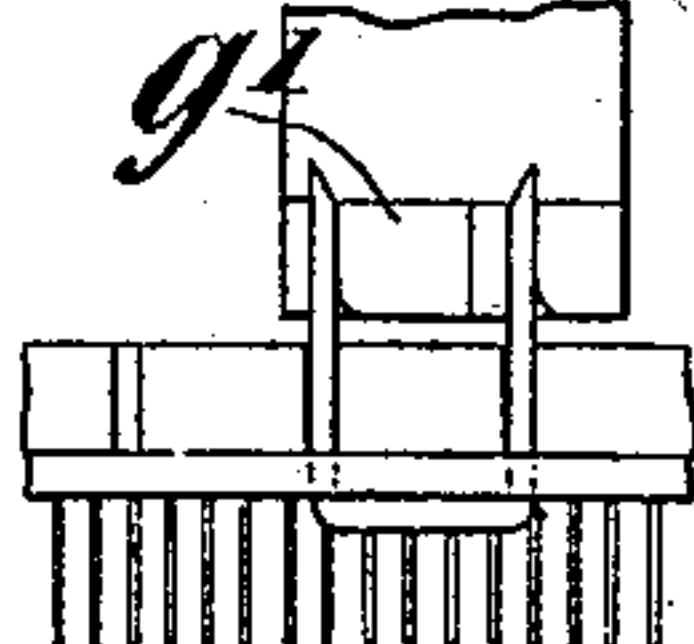
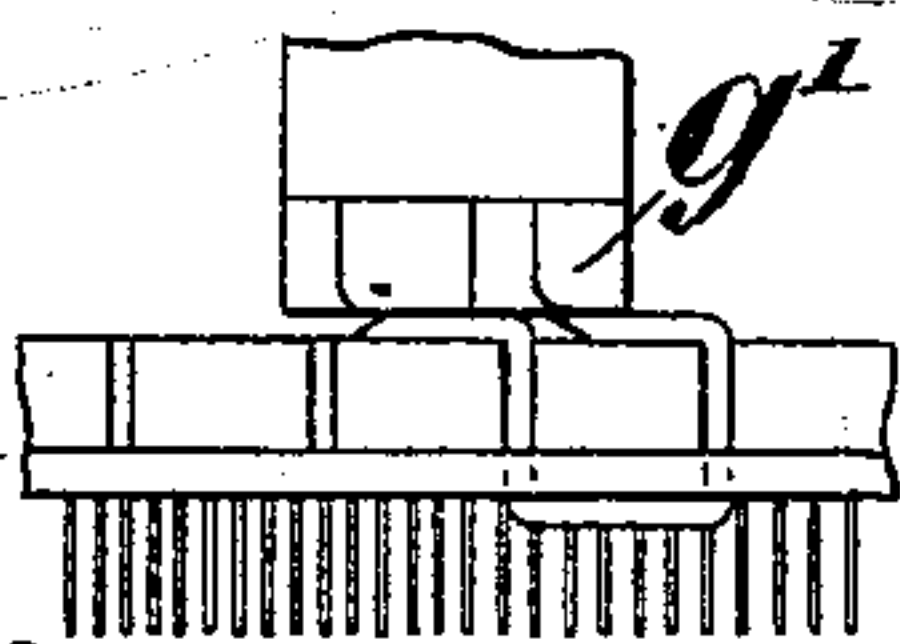


*Fig. 11.*

*Fig. 12.*

Witnesses.

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Elijah Ashworth.  
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# UNITED STATES PATENT OFFICE

GEORGE ASHWORTH AND ELIJAH ASHWORTH, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

## APPARATUS FOR ATTACHING CARD-CLOTHING TO FLAT-BARS.

SPECIFICATION forming part of Letters Patent No. 397,267, dated February 5, 1889.

Application filed August 21, 1888. Serial No. 283,395. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE ASHWORTH and ELIJAH ASHWORTH, engineers, subjects of the Queen of Great Britain and Ireland, and residing at Manchester, county of Lancaster, England, have invented certain Improvements in Apparatus for Attaching Card-Clothing to Flat-Bars, of which the following is a specification.

Our invention relates to the traveling flats used in certain classes of carding-engines which are employed in the carding of cotton and other textile materials. Formerly the card-clothing was secured to the iron bars of the flats by means of lead rivets, which necessitated the bar being much wider than the carding-surface; but in the year 1877 we invented and introduced into use in Great Britain a method of attaching the clothing to nicked metal bars by means of metal staples, which required much narrower margins on the card-clothing, so that we were enabled to increase the number of flats in the endless chain, and to so increase the useful effect of the carding-engine. For this invention we obtained Letters Patent of the United Kingdom, No. 4,091, of the year 1877. The object of our present invention is to secure the clothing to such nicked bars by means of a modification of ordinary card-setting machinery, which forms staples from a continuous length of wire and passes them through the foundation-fabric of the card-clothing and the nicks in the bar and clamps the points of the staples at the back of the bar. The machine is provided with setting or adjusting tools for quickly adjusting the flat-bar in the machine.

Our invention will be best described with reference to the accompanying drawings, wherein—

Figure 1 is a plan view of the machine. Fig. 2 is a side view of the jaws which hold and aid in the formation of the wire staples, the jaws being shown as closed. Fig. 3 shows the ends of the jaws as when open. Fig. 4 is a plan view showing the jaws holding a length of wire. Fig. 5 is a corresponding view showing the length of wire bent into a staple. Fig. 6 is a back view of a short length of a flat, and shows the wire staples clamped on the back of the bar. Fig. 7 is an elevation of one

of two setting-tools which we use to adjust the flat-bar in position. Fig. 8 is a plan of the same tool. Fig. 9 is a side view of the bending-tool and of the bracket by which it is carried. Fig. 10 is a plan of the same parts. Figs. 11 and 12 illustrate the clamping of the ends of the wire staples.

In Fig. 1, *a* is the pair of jaws shown in Figs. 1 to 5. *b* is a flat-bar in position. *c c* are two brackets which are fitted to grip the ends of the bar, and *d d* are two V slides or seatings in which the setting-tools are seated when in use. One of these slides *d* appears in Figs. 7 and 8. The remainder of the parts which appear in Fig. 1 are substantially of an ordinary character so far as card-setting machinery is concerned, and we therefore do not claim them as new.

Preparatory to the fixing of a flat-bar in position two setting-tools are slid into the seatings *d d*. In Figs. 7 and 8 it will be seen that the standard *e*, which carries the setting-fingers *f*, is formed with V's *e'*, which are planed and fitted to slide in the seating *d*, so that the tool can be placed at once in the correct position. The standard is pushed forward in the seating until an adjustable screw, *e<sup>2</sup>*, comes in contact with the side of the bed of the machine. This determines the forward position of the tool. The tool is provided with two thin fingers, *f*, which are adapted to enter two contiguous nicks in the flat-bar. In Fig. 7 a part, *b*, of the flat-bar is shown in position. The nicks in the bar are shown at *b'*. When the bar is dropped into place, the two fingers on each of the two setting-tools enter two nicks in the bar, and the bar is sustained by the four fingers, which at once determine both the horizontal and the vertical position of the bar. For convenience of adjustment the two fingers *f* are formed upon a plate, *f'*, which can be adjusted upon the top of the the standard. There might be only one finger or more than two. Each end of the bar *b* enters between a movable gripping-dog, *c'*, and a fixed part of a bracket, *c*, which is bolted to the bed of the machine. By turning a screw, *c<sup>2</sup>*, the dog *c'* is forced against the end of the bar, which is thereby securely held. The two setting-tools are now withdrawn from the seatings *d*.



This setting and fixing of the bar can be done in a few seconds. Wire is fed to the machine and passes into the jaws *a* when they are open. One of the said jaws, *a*, is fixed, the  
 5 other jaw, *a'*, being hinged, as clearly shown in Fig. 2. The hinged jaw is provided with a hooked tail, *a*<sup>2</sup>, which is operated upon to open and close the jaws by the rod or part which operates the "crown" in the ordinary  
 10 setting-machine, such rod being indicated by the letter *a*<sup>3</sup> in Fig. 2. As the ordinary crown would come in contact with the card-teeth on the flat, we have been obliged to dispense with it, and have adopted the holding-jaws *a*  
 15 *a'* in lieu of the ordinary tongue and crown. When the wire has been fed forward by the ordinary means, (not shown in the drawings,) the rod *a*<sup>3</sup> is pushed down onto the tail *a*<sup>2</sup>, thereby forcibly closing the jaw *a'* against  
 20 the jaw *a*. It will be seen that the outer tip of the jaw *a'* extends a little beyond the end of the jaw *a*, and is also bent a little, so as to extend a little beyond or in front of the grooved end of the jaw *a*. The wire is  
 25 gripped between the ends of the jaws. The wire being thus held is cut by the cutters, which act in the ordinary manner, with the exception that we shape the cutters to remove a piece of wire, so as to form sharp points  
 30 upon the ends of the wire. The length of wire is then bent into a staple by the advance of the ordinary side wings, *a*<sup>4</sup>, as seen in Fig. 5. The bar which carries the jaws *a* is then pushed forward, as in the ordinary machine, and the  
 35 staple is driven through the foundation of the card-clothing and through two nicks in the bar. Before the staple is driven fully home the rod *a*<sup>3</sup> is raised by the same movement which in the ordinary machine withdraws the  
 40 crown out of the way, and by such movement the jaw *a'* is lowered so that it clears the lower edge of the flat-bar. The importance of the exact adjustment of the flat-bar will be appa-  
 45 rent, because if the bar were not exactly in the correct position horizontally the points of the staple would strike the metal, and if the vertical position were not correct the staple would either strike the bottoms of the nicks or oth-  
 50 erwise there would be liberty for the clothing to become relaxed from the degree to which it had been stretched. The points of the wire staples, which project from the back of the bar, pass close to two upright fingers, which are formed on the end of an adjustable plate,  
 55 *g*, which is secured to a sliding plate, *h*, which is fitted to slide on the top of the fixed bracket

*i*. A spring, *k*, presses the plate *h* toward the flat-bar, an adjustable screw, *h'*, limiting this movement.

A plan view of the end of the plate *g* is shown 60 in Figs. 11 and 12, in which the flat bar and staple also appear. In Fig. 12 the staple is in the position as when just driven home. The carriage *l*, on which all the staple forming and fixing parts are mounted, as is usual, 65 is now moved along the bed by the rotation of the ordinary screw, *m*, the movement of the carriage being equal to the distance from the center of one nick to the center of the next but one. The bracket *i* is attached to a pro- 70 jection, *l'*, on the carriage, so that the plate *g* moves with the carriage, and the fingers *g'* bend back the ends of the staple by the yielding pressure of the spring in the manner shown in Fig. 11. 75

Having described our invention, we hereby declare that what we claim is—

1. In a machine for wiring card-clothing to flat-bars, the setting-tool *e f*, provided with a finger or fingers to enter nicks in the flat bar, 80 in combination with the seating in the frame, into which the said tool slides, substantially as set forth.

2. The setting-tools provided with fingers to enter into nicks in the flat-bars, in combi- 85 nation with the dog apparatus to receive and hold the flat-bar, substantially as set forth.

3. The setting-tools *e f*, the seatings for such setting-tools, the bar-holders, the wire-grip- 90 ping jaws, and the clamping-tool to bend up the wire points, in combination with the sliding carriage provided with ordinary mechanism for cutting lengths of wire, bending such wire into staples, and forcing such staples through the card-clothing foundation and the 95 nicks in the flat-bar, substantially as set forth.

4. The carriage provided with ordinary mechanism for cutting lengths of wire, bending such wire into staples, and forcing such staples through the card-clothing foundation 100 and the nicks in the flat-bar, in combination with a clamping-tool, *g g'*, connected to the carriage to bend up and clamp the wire points, all substantially as described.

In testimony whereof we have signed our 105 names to this specification in the presence of two subscribing witnesses.

GEO. ASHWORTH.

ELIJAH ASHWORTH.

Witnesses:

DAVID FULTON,  
 FREDK. DILLON.