

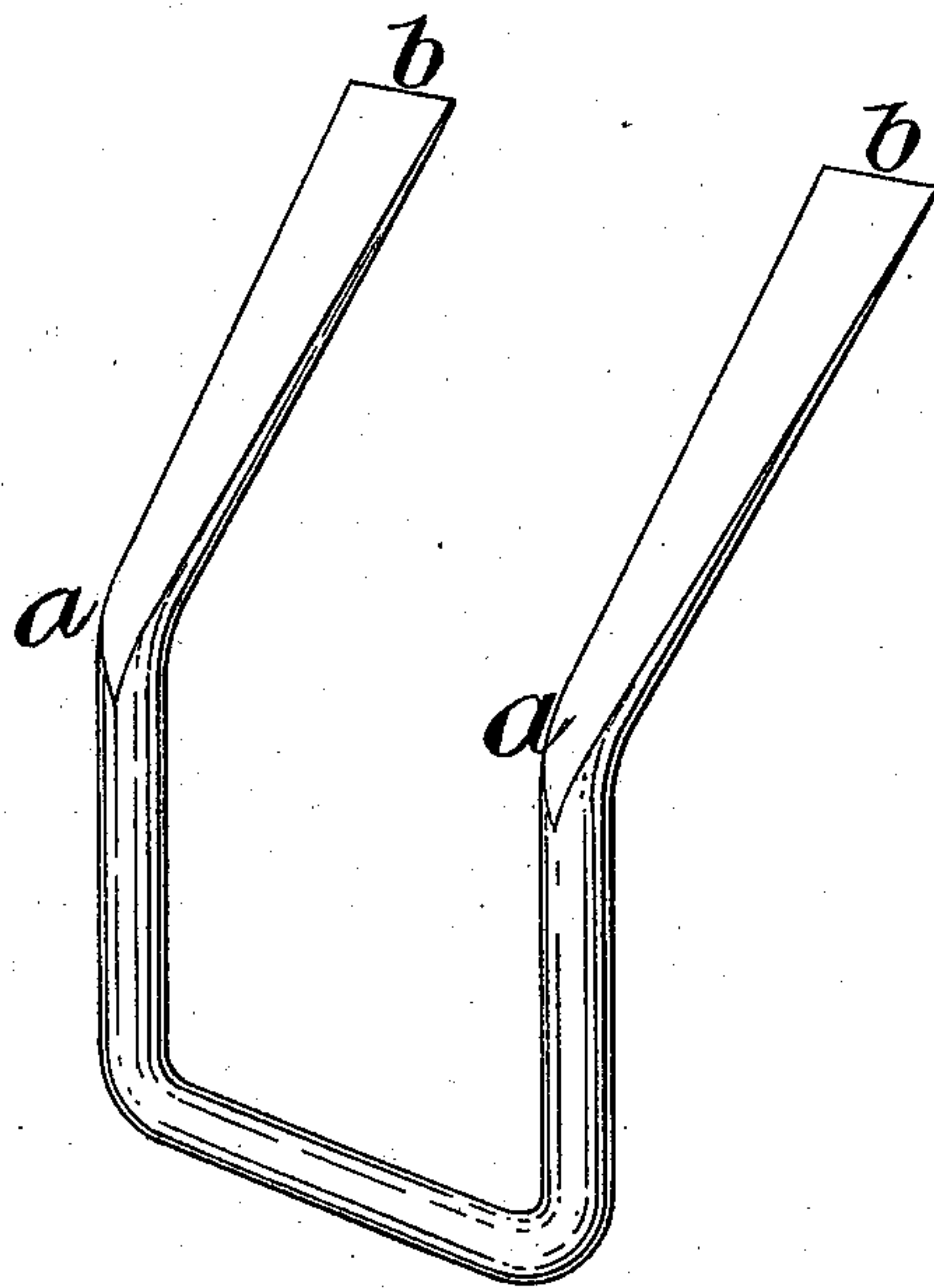
(No Model.)

G. & E. ASHWORTH.  
MODE OF MAKING CARD TEETH.

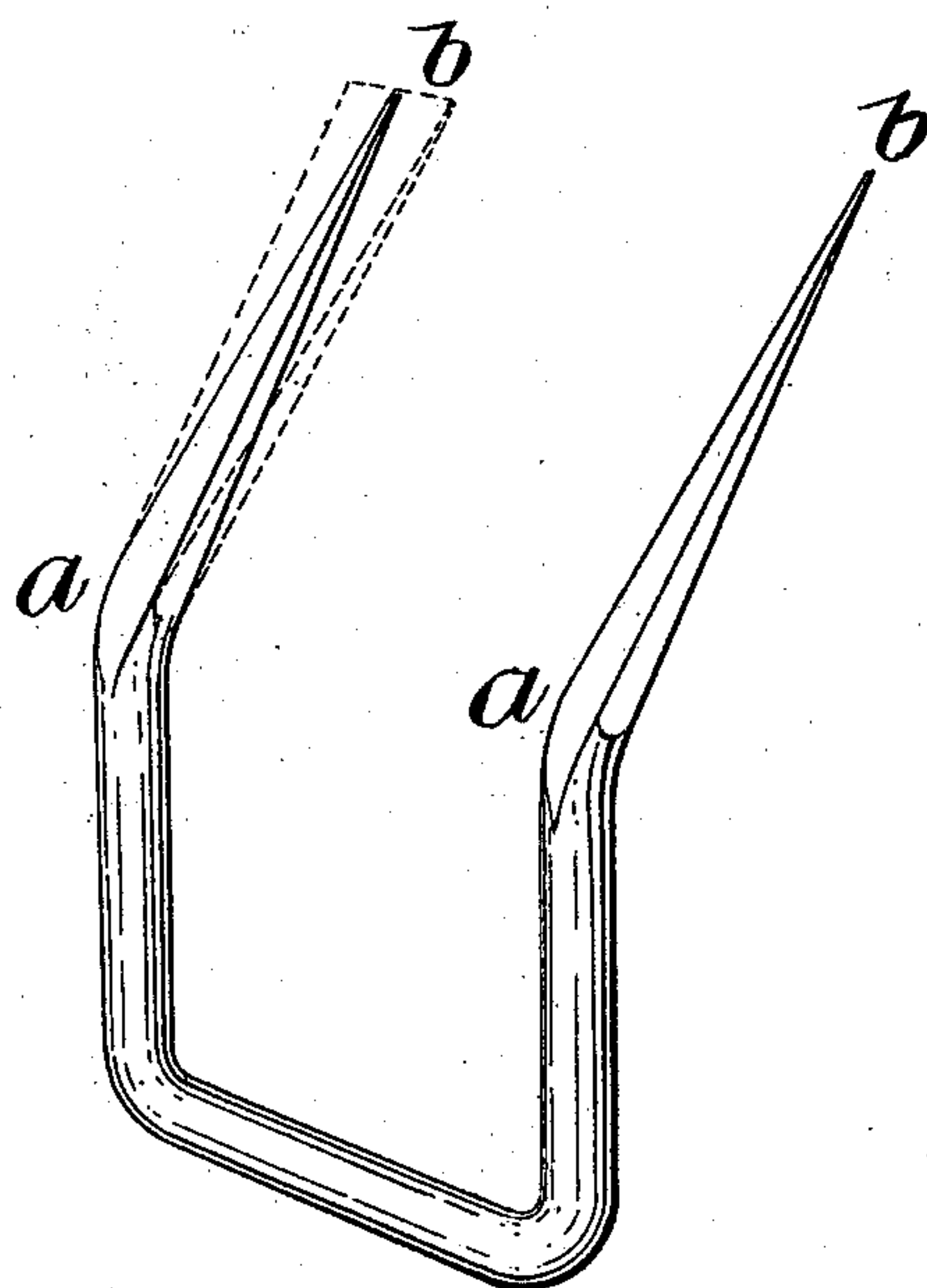
No. 401,991.

Patented Apr. 23, 1889.

*Fig. 1*



*Fig. 2*



Witnesses

John E. Parker  
William D. Conner.

INVENTORS

George & Elijah Ashworth

by their Attys. Howson & Son



# UNITED STATES PATENT OFFICE.

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

## MODE OF MAKING CARD-TEETH.

SPECIFICATION forming part of Letters Patent No. 401,991, dated April 23, 1889.

Application filed March 15, 1887. Serial No. 231,005. (No model.) Patented in England November 19, 1886, No. 15,035.

*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, residing at Manchester, county of Lancaster, England, have invented an Improved Mode of Making Card-Teeth, (for which we have obtained a patent in Great Britain, No. 15,035, dated November 19, 1886,) of which the following is a specification.

Our invention consists of an improved mode of making the dents or teeth of the wire cards with which the carding-cylinders, rollers, and flats of carding-engines are covered; and the object of our invention is to increase the sharpness or keenness of the dents, so as to add to the efficiency of the carding-engines. We make each dent of a flattened form, tapering from the bend, or thereabout, to the point, the flat places being situated on the back and front of the wire staple, and after the card is made we grind away the two edges of the flattened parts. The formation of the dents is illustrated by the accompanying drawings.

Figure 1 is an enlarged view of a staple as it would appear before the grinding operation. Fig. 2 represents the staple after the grinding operation.

In Fig. 1 the two limbs of the staple which are to constitute two dents of the card are flattened at the back and front from about the bend at *a* to the point *b*. This flattening would, for convenience, be obtained by flattening the wire at the required places before it is bent into a staple. We are aware that this flattening of the wire at places has been effected before the date of our invention, pressing dies or rollers which have acted in concert with other ordinary parts of the card-setting machine having been employed for the purpose; but the staple has been so formed that the flat places have been situated on the inside and outside of the limbs of the staple, instead of at the back and front—that is to say, the flat places have been at right angles to the flat places appearing in Fig. 1. This flattening of the sides of the dents, while increasing the clearance, has also had the effect of increasing the breadth of the dent

in the direction of its working movement, so that when ground ready for use the points *b* of the dents have been chisel-shaped, or have resembled the ends of knives rather than the points of needles.

When the dents, flattened in the manner indicated in Fig. 1, are ground at the sides, the dents will have the form indicated in Fig. 2, each dent tapering at the back and front and at the two sides from *a* to *b*. In other words the dents have four-sided tapering or pyramidal points. We effect this grinding of the sides of the dents by means of revolving emery wheels or grinders which penetrate between the rows of dents. This method of grinding card-dents is the subject-matter of an invention for which we have been granted Letters Patent of the United States, No. 261,650, dated July 25 of the year 1882.

In Fig. 2 the metal removed in the grinding operation is indicated on one side of the staple by dotted lines. Such dents, when sharpened in the ordinary manner, will take very keen points.

What we claim as our invention is—

1. The mode herein described of making card-dents, said mode consisting in first flattening the wire at the points which form the back and front of the dent-points, then removing the metal at the sides, and thereby producing card-teeth the wires of which are tapered from about the bend to the points, all substantially as set forth.

2. The mode herein described of making wire cards, said mode consisting in first flattening the parts of the wires forming the dent-points at the back and front, then inserting the flattened dents in the foundation, and finally grinding the dents at the sides, to produce tapering points, substantially as set forth.

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

GEO. ASHWORTH.  
ELIJAH ASHWORTH.

Witnesses:

DAVID FULTON,  
ARTHUR LEDGER.