

(No Model.)

F. F. RAYMOND, 2d.

NAIL STRIP AND METHOD OF FORMING NAILS.

No. 356,551.

Patented Jan. 25, 1887.

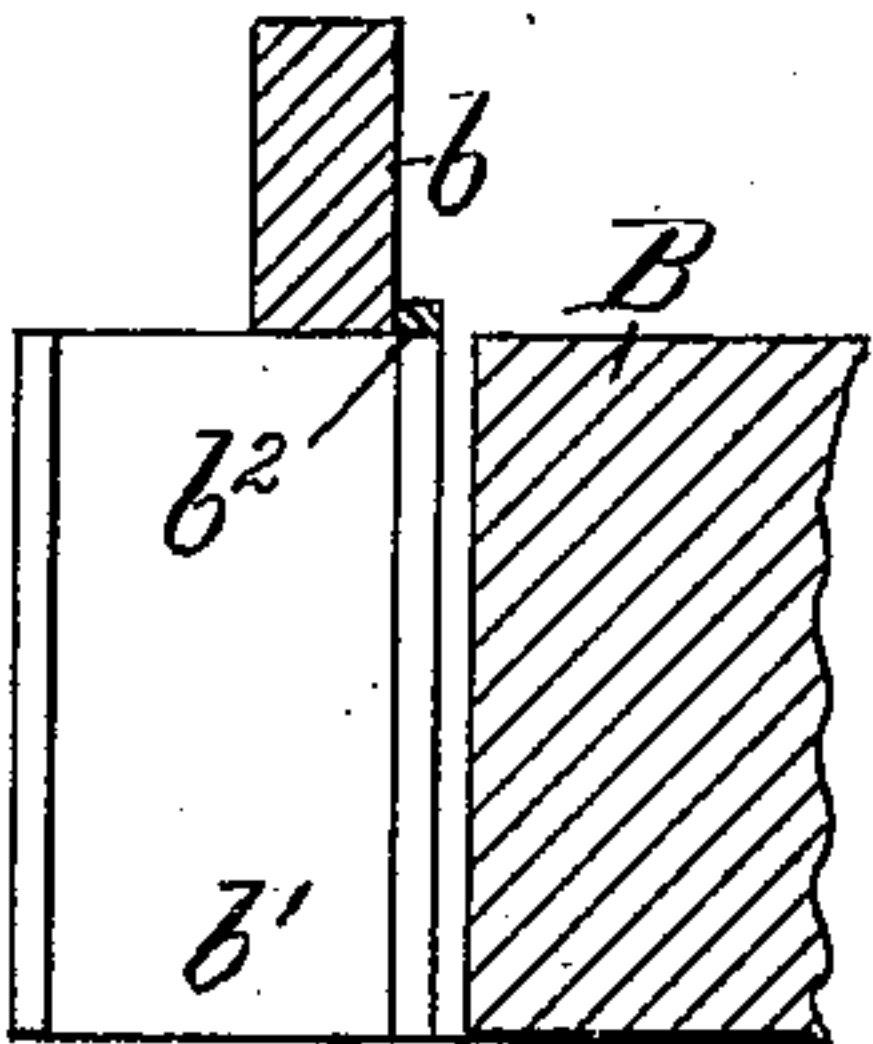
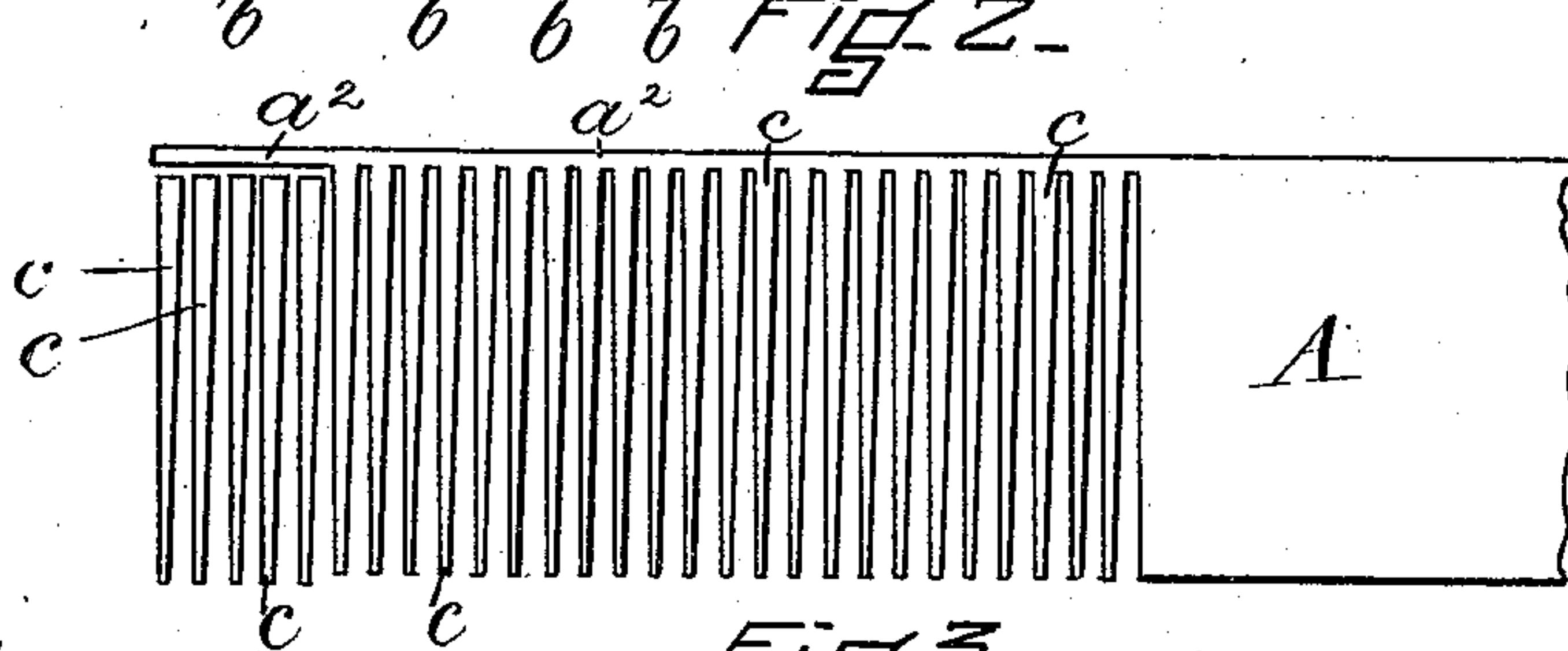
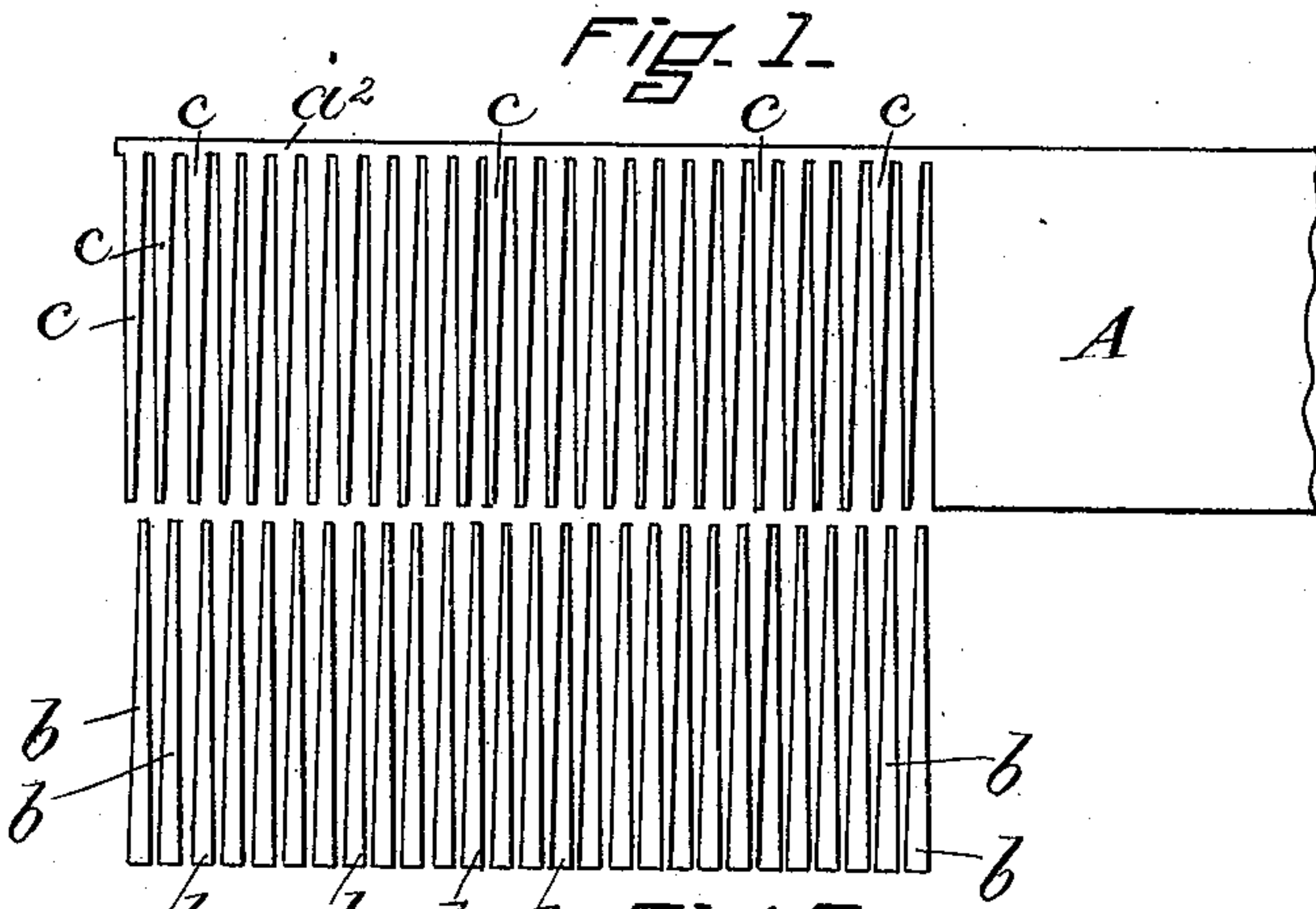
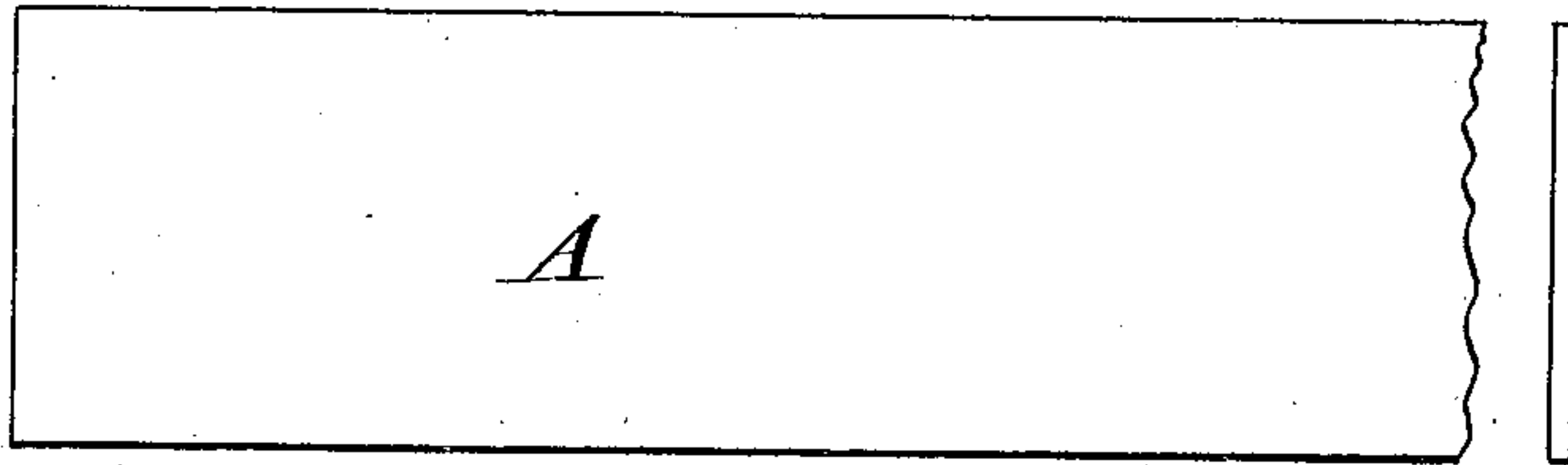


Fig. 4-

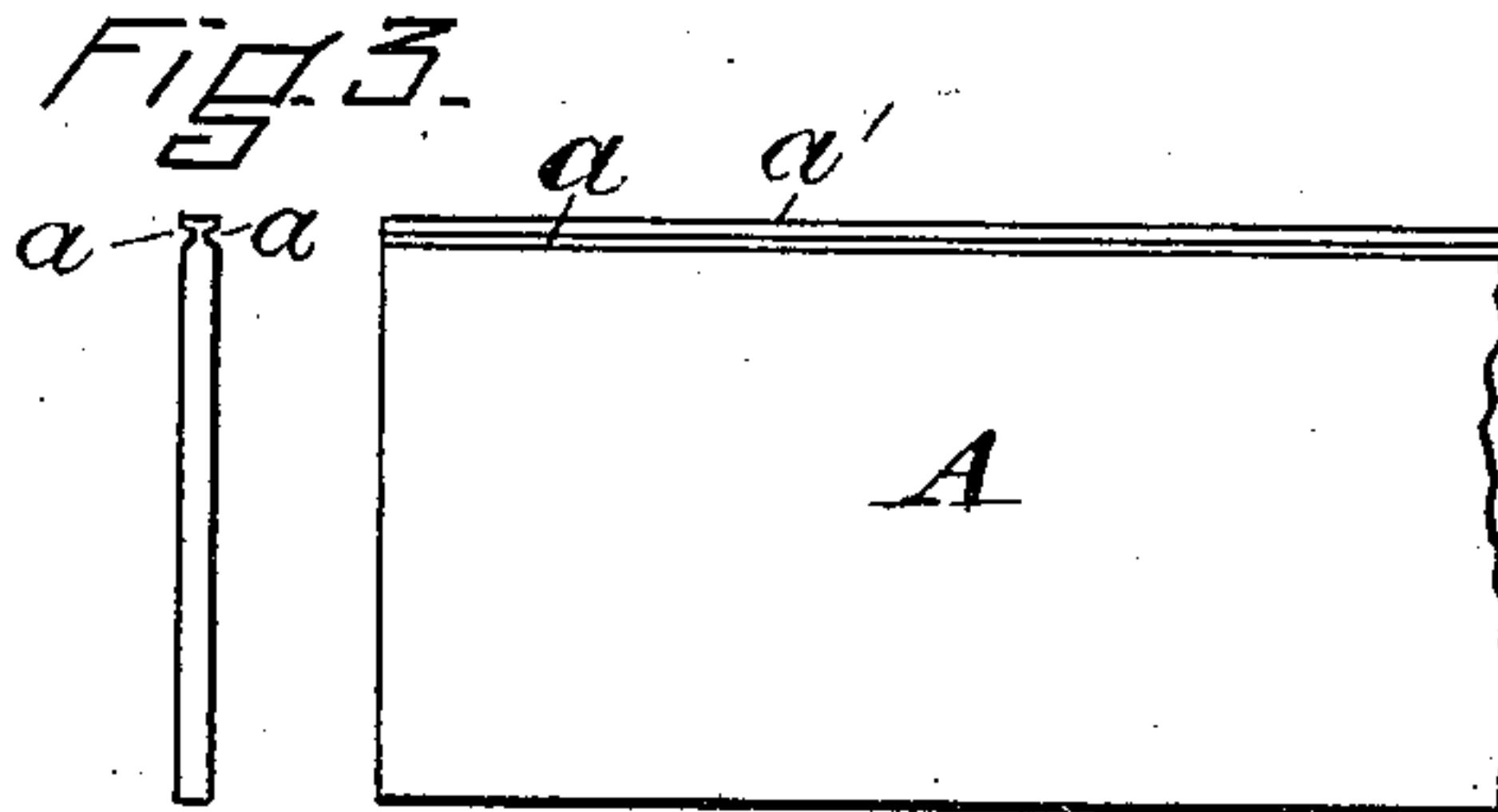


Fig. 5-

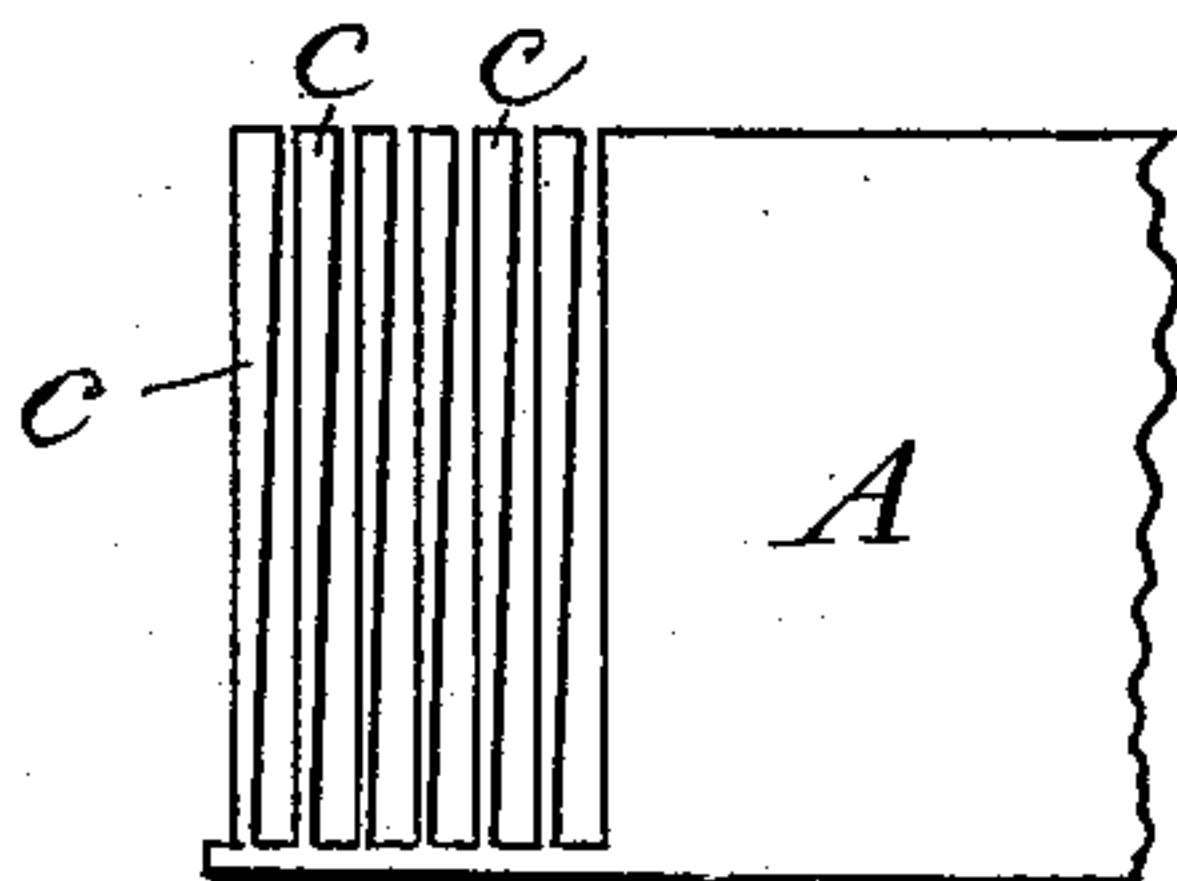


Fig. 6-

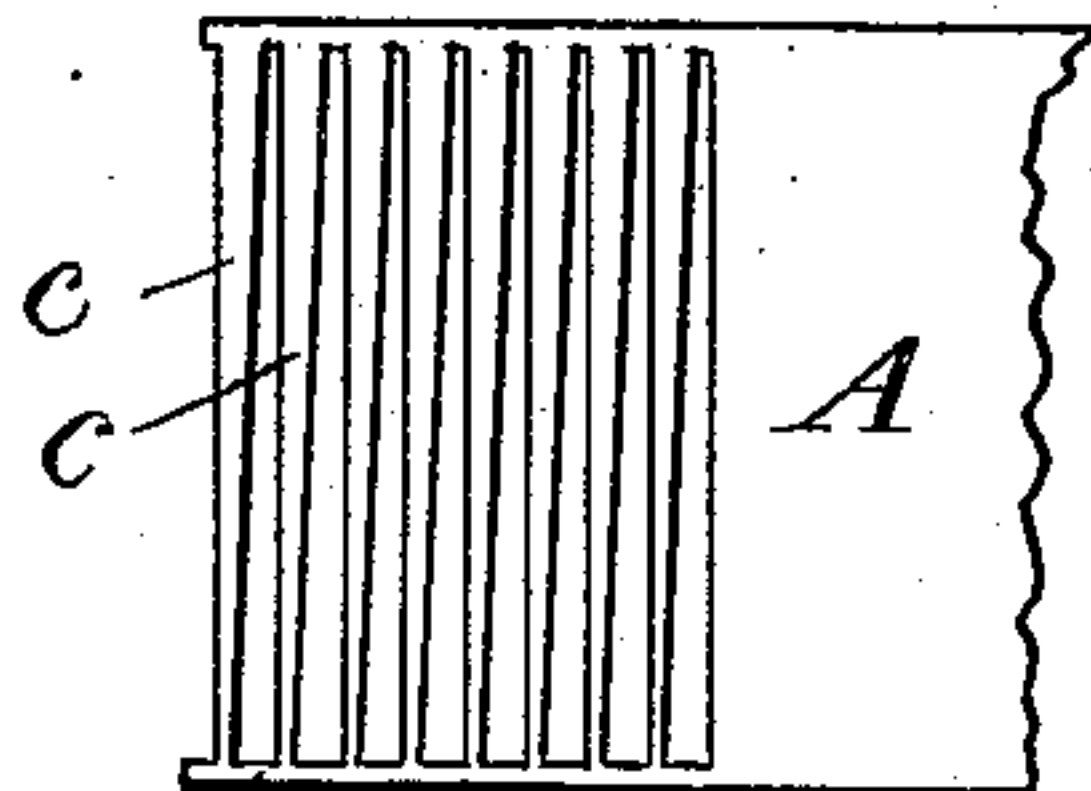


Fig. 7-

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# UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2D, OF NEWTON, MASSACHUSETTS.

## NAIL-STRIP AND METHOD OF FORMING NAILS.

SPECIFICATION forming part of Letters Patent No. 356,551, dated January 25, 1887.

Application filed November 1, 1886. Serial No. 217,666. (No model.)

*To all whom it may concern:*

Be it known that I, FREEBORN F. RAYMOND, 2d, of Newton, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Nail Strips and Methods of Feeding Nails or Fastenings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The object of the invention is to provide means for feeding nails to nail-distributing or nail-driving devices; and it comprises a nail-strip having a series of nails connected at their heads and points, or either, by an uncut margin of the plate from which the strip is made.

It further relates to a strip having a series of shanks, the heads of which are connected by an uncut margin of the plate from which they are made, and which are partially disconnected from the head-holding margin by one or more grooves or recesses formed between their heads and the connecting portion of the strip. In use the uncut bars, sections, or margins of the strip, or one of them, serve as a means for holding the nails in regular and uniform order for driving, and also to serve as a means by which a uniform or regular feed of the nails to the distributing or driving devices is obtained; and the nails are detached from the holding bars or sections, or one of them, by means of one or more punches, according to the number which are to be detached simultaneously, which disconnect or sever them from the holding-bar or margin parallel with the inner edge of the bar and close to it.

In the drawings, Figure 1 is a view in side and end elevation of the plate from which the strip is made. Fig. 2 represents a plate partly formed into a nail-strip and the separate or independent nails punched therefrom. Fig. 3 shows the use of the bar or connecting margin of the strip in feeding the nails to the nail distributing or driving devices, the nails at the left end of the bar or margin being represented as severed or cut therefrom by nail-strip punching or severing devices. Fig. 4 represents a section of a punching-die for thus separating the nails from their holding-bar or margin. Fig. 5 represents the nail-plate as

provided with recesses or grooves to make the connection between the nails and the bar as slight as possible, in order that the nail may more readily be removed or cut. Fig. 6 shows the nails as connected at their points instead of at their heads by a bar or uncut margin. Fig. 7 represents the nails as connected both at their heads by a bar or margin and at their points by a bar or margin.

A represents the plate from which the strip of nails is made. It preferably is of uniform thickness throughout. It is then preferably submitted to rolls, which form the recesses or grooves *a* parallel with the edge *a'*, and very closely thereto. I have represented the grooves as formed in each surface of the plate; but one only may be used, if desired. They are for the purpose of enabling the nails to be more easily or readily detached from the holding bar or margin, as will hereinafter appear. The plate A may also have additional recesses or grooves formed therein, preferably parallel with the grooves or recesses *a*, for the purposes of providing the shanks of the nail with notches or corrugated or roughened surfaces. The plate is then submitted to the action of suitable punching mechanism, which removes therefrom the sections *b*, which form complete detached nails—that is, nails which are salable in bulk—and also the nails *c*, which are connected at their heads with the holding-bar or uncut margin *a*<sup>2</sup>.

The nails are separated from each other by a space sufficiently large to produce a merchantable detached or loose nail, so that the sections punched from the plate shall make merchantable articles rather than waste. This produces a strip of complete nails connected at their head ends by a bar or margin which is integral with the nails. The nail-strip thus formed affords means for feeding complete nails to the nail distributing or driving devices in an accurate and simple manner, the bar or margin *a*<sup>2</sup> holding the nails in predetermined positions while the strip is being fed by the feeding mechanism and until the nails are brought into position to be removed from the bar or margin by a punch, which disconnects or cuts the nails therefrom, singly or in groups, upon a line parallel with the under surface of the bar or margin *a*, and as closely



thereto as possible. (See Fig. 3.) Nails thus disengaged or detached from the bar or margin are shown in Fig. 3. The bar or margin is then of course waste, its only purpose being to hold complete nails so that they may be fed with uniformity and precision.

Of course I do not limit myself to a strip in which the heads are attached to a connecting-bar, as the points instead of the heads can be attached to the bar, as represented in Fig. 6, and upon some accounts this form of construction is desirable, because the nails can more readily be detached therefrom, there being less metal at the point to sever or cut. If desired, I may use a bar connecting the heads, and another bar,  $a^3$ , the points, as represented in Fig. 7, and for some purposes this form of construction is desirable, because, for instance, it permits strips to be transported with less liability of the fastenings or nails being thrown out of line or place, and it also serves to hold the nails in place until they are detached therefrom and driven.

In making a strip with a bar connecting the points, or with two bars, the intermediate sections, which are removed or punched out, still form separate or detached nails, as above stated, instead of waste. By connecting the nails at their heads and points thinner bars or sections may be used than if only one were employed, and in severing nails from a double-barred strip the punch or severing device must be constructed to detach the nails from the point-holding bar as well as from the head-holding bar. It will be seen that nails, when thus formed, are connected at their heads and points, or either, by a bar which is in effect a holder—that is, it holds the nails by their ends and maintains them in a separate and predetermined relation to each other while they are

being fed; and I consider that this bar or holder is best obtained in the act of forming the nails, as above specified.

In Fig. 4 I represent one method of detaching or separating the nails from their holding and connecting bar, comprising the punch B, a die,  $b$ , having a recess,  $b'$ , through which the cut nail is forced or moved by the punch B, and a surface,  $b^2$ , by which the margin or bar is held while the nails are being cut or severed therefrom.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A nail-strip comprising a nail-holding bar or margin, the complete nails  $c$ , and one or more grooves or recesses,  $a$ , substantially as described.

2. A nail-strip comprising a bar and a line of partially-disconnected complete nails extending from one edge of the bar, adapted to be disconnected therefrom, as and for the purposes described.

3. The method of forming nails herein described, which consists in separating a suitable nail-strip blank into independently-formed nails depending from a separable bar or margin, then punching or removing such formed nails from the bar or margin singly or in groups, all substantially as set forth.

4. A strip of formed nails connected at their heads by an integral connecting bar or support and at their points by an integral connecting bar or support, substantially as described.

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Witnesses:

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