

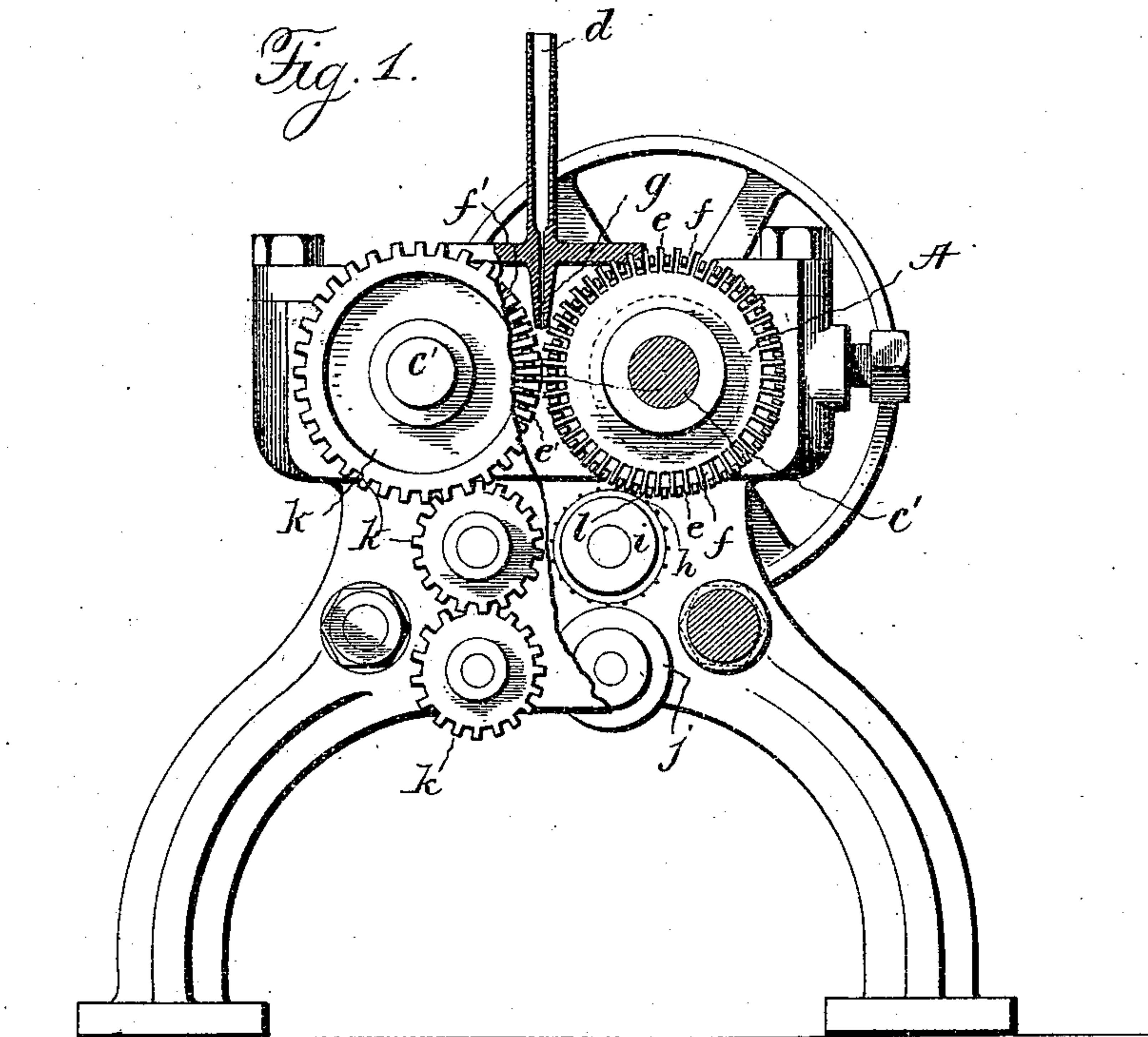
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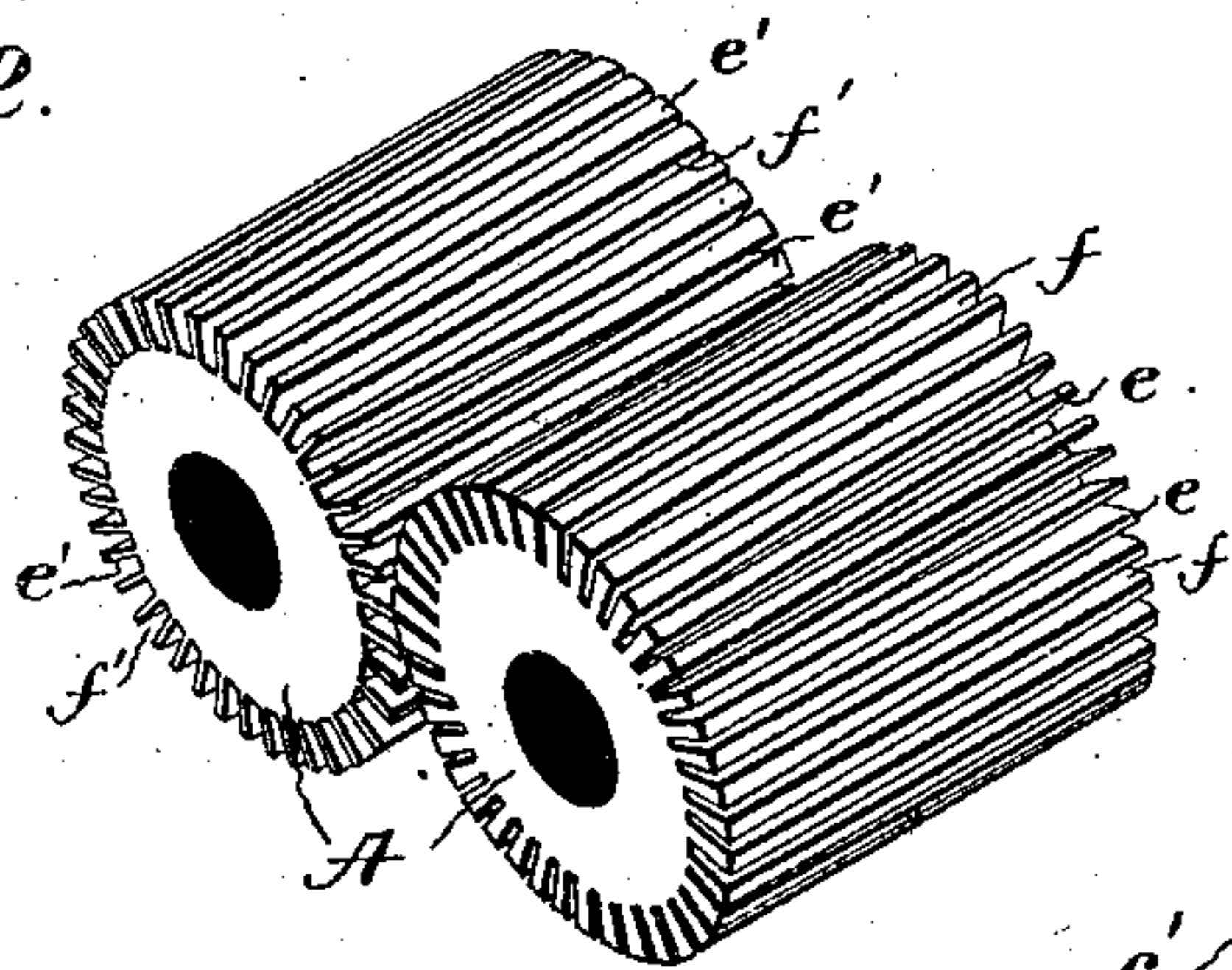
E. B. BENHAM & H. E. BARLOW.  
TOOTHPICK MACHINE.

No. 549,428.

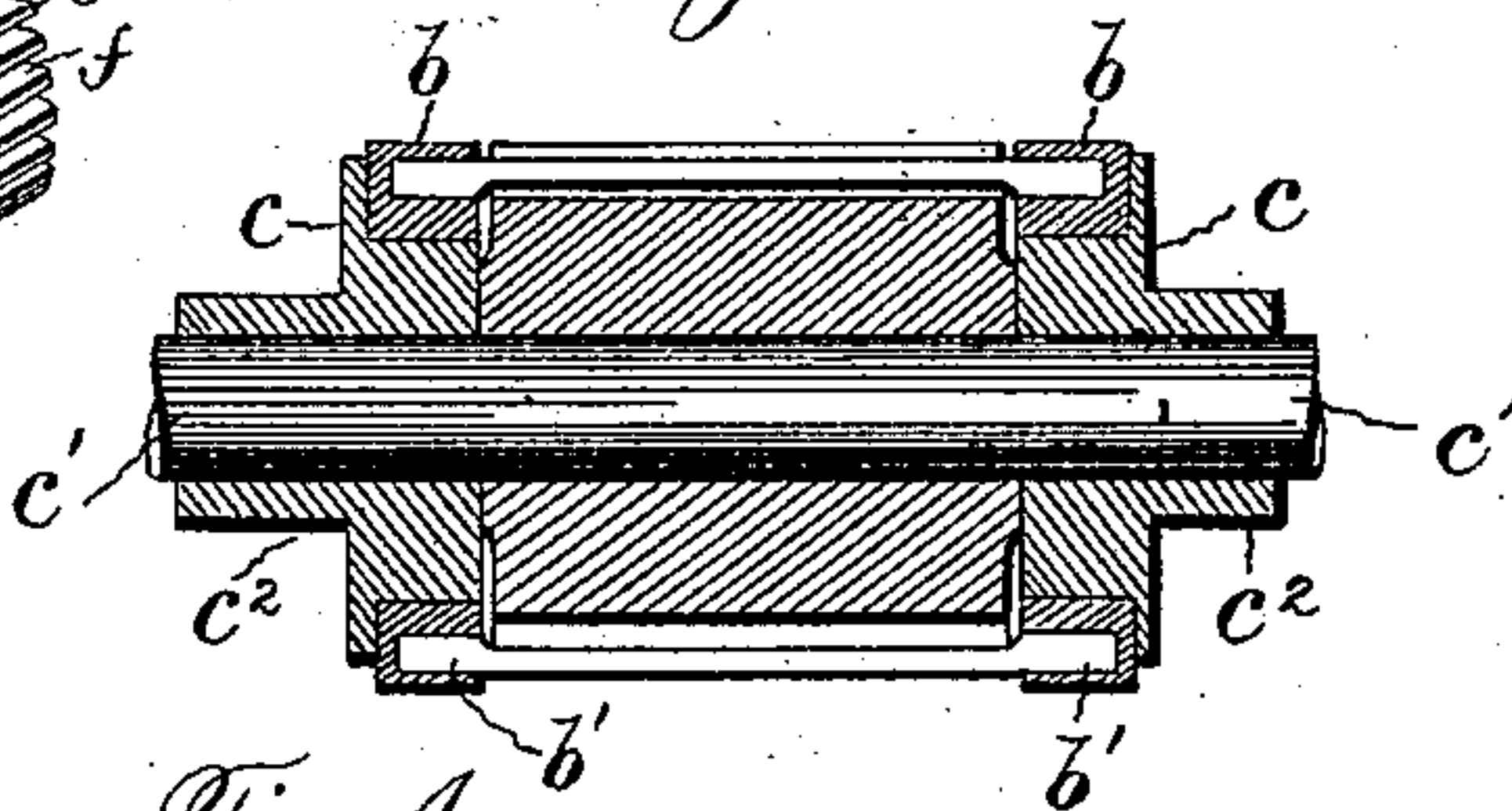
Patented Nov. 5, 1895.



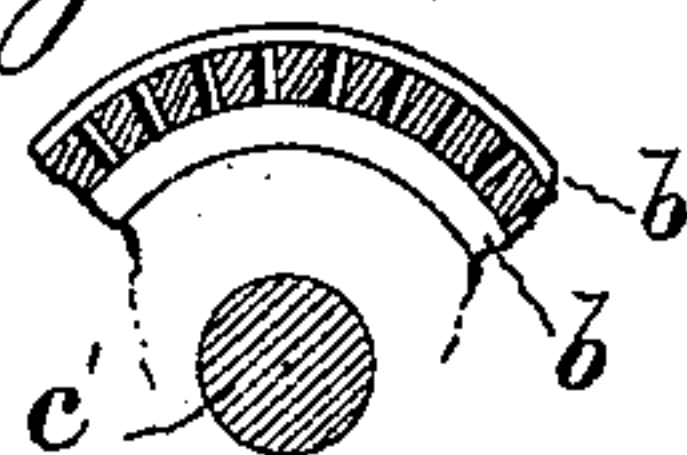
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses:  
Jas. C. Hutchinson  
Henry C. Hazard.

Inventors.  
E. B. Benham & H. E. Barlow, by  
Pindle & Russell, their Attys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 6.

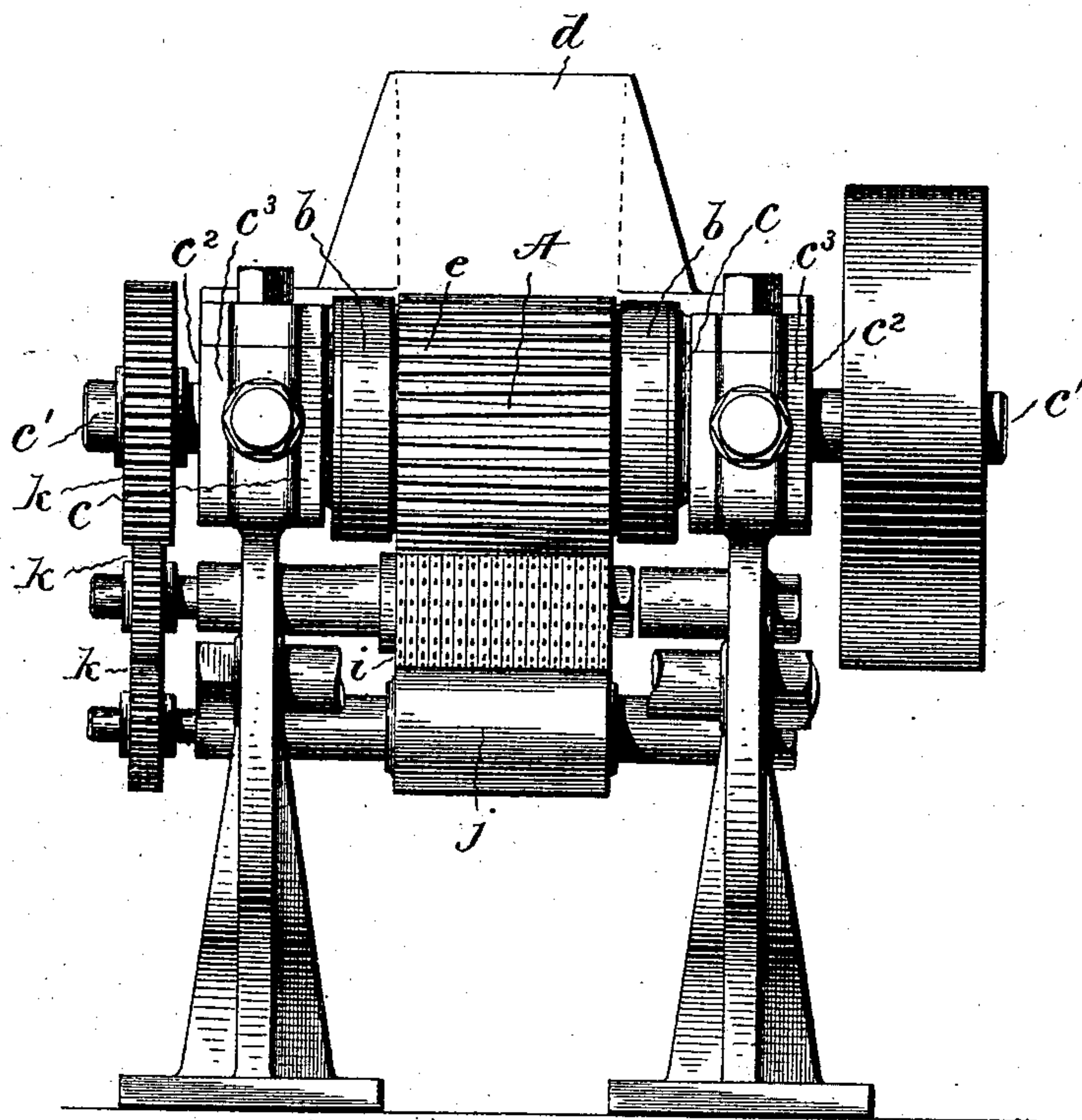


Fig. 7.

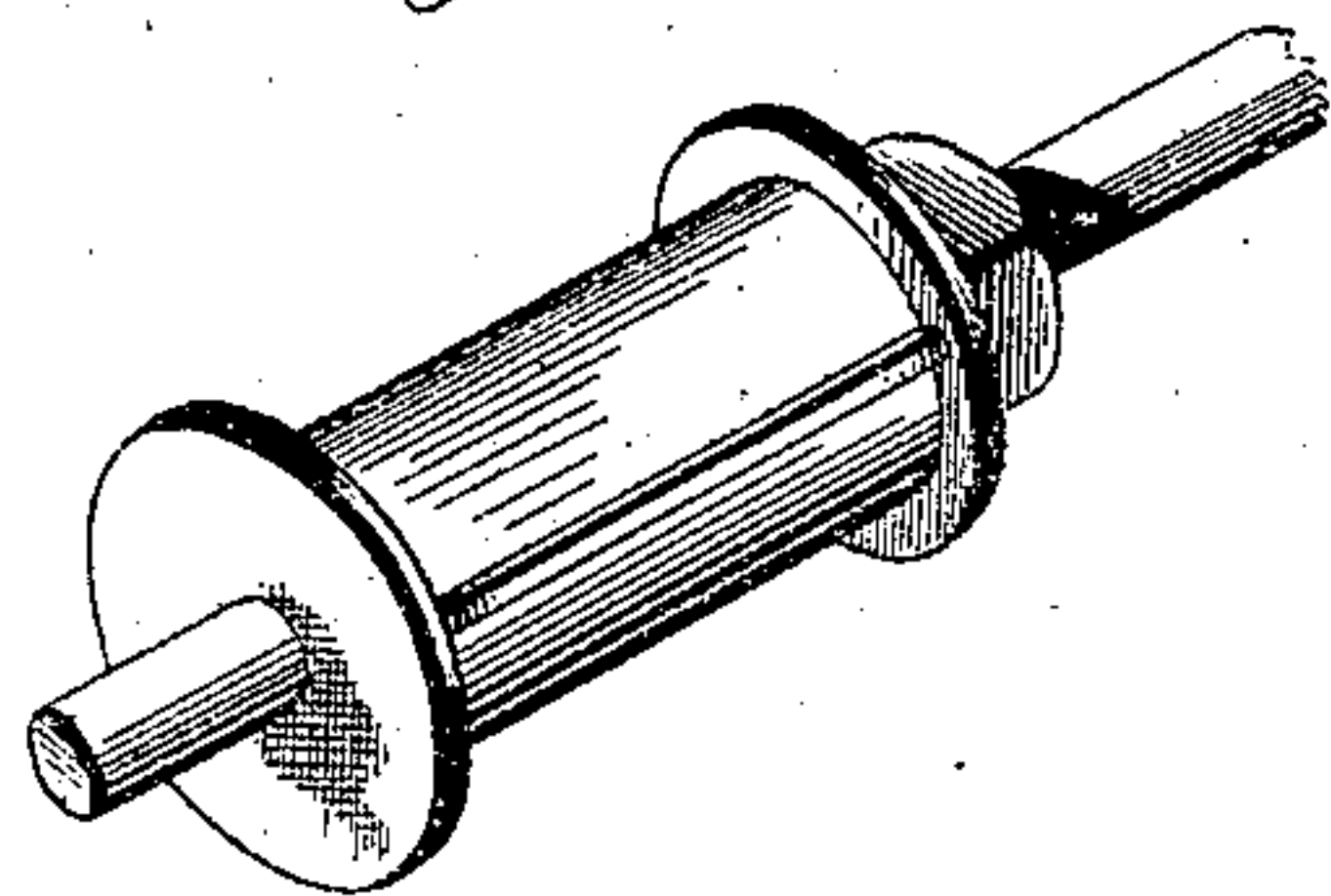
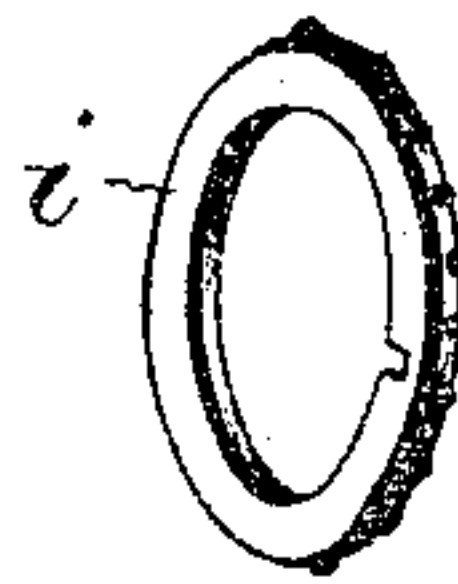


Fig. 8.



Witnesses:

James Hutchinson.  
Henry C. Hazard

Inventors.

E. B. Benham & H. E. Barlow, by  
C. M. and Russell, their Attys



# UNITED STATES PATENT OFFICE.

ELIJAH B. BENHAM AND HOWARD E. BARLOW, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE DIAMOND MATCH COMPANY, OF CHICAGO, ILLINOIS.

## TOOTHPICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 549,428, dated November 5, 1895.

Application filed March 19, 1892. Serial No. 425,635. (No model.)

*To all whom it may concern:*

Be it known that we, ELIJAH B. BENHAM and HOWARD E. BARLOW, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Machines for Making Splints for Matches, Toothpicks, &c.; and we do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

The object of our invention is to produce a machine for making splints for matches, toothpicks, &c., from thin strips or veneers of wood.

The characteristic feature of our invention consists in the employment of two rolls arranged to revolve tangentially, each of said rolls being provided with alternate cutters and spaces, each of the shape and size of the splints or blanks to be formed, the rolls being adjusted so that the cutters on one of said rolls will come opposite to the spaces in the other roll, and so that the cutters on one roll will co-operate with the cutters upon the other roll to form shearing-edges for cutting the splints from a strip or veneer of wood fed between said rolls.

Another feature of invention consists in the combination, with the cutting-rolls, of means for ejecting the splints or blanks from the spaces in said rolls, so that they may be delivered from the machine.

A third feature of invention consists in the combination, with the cutting-rolls, of type-rolls for printing upon the blanks while in the spaces of the cutting-rolls.

Referring to the drawings, Figure 1 represents an end elevation of the machine, partly in section. Fig. 2 is a perspective view of the two cutter-rolls. Fig. 3 is a sectional view of one of the cutter-rolls, and showing the mechanism for ejecting the splints which have been cut from the spaces in the cutter-rolls. Fig. 4 is a broken sectional view showing a portion of the bars for removing the splints from the cutter-rolls, and a grooved ring in which the same are mounted. Fig. 5 is a perspective view of one of said bars. Fig. 6 is a side elevation of the machine.

Fig. 7 represents the type-roll upon which rings of type may be secured, and Fig. 8 represents one of such rings of type.

The machine is provided with a suitable frame in which the different parts are mounted. Journaled in this frame are two rolls A, which are arranged to revolve tangentially to each other, and which are geared together so as to revolve in unison. Each of these rolls is provided upon its periphery with a series of alternate cutters *e* and spaces *e'*, each of the shape and size of the splint or blank to be cut, said rolls being arranged so that a cutter upon one roll comes opposite a depression upon the corresponding roll, as shown in the drawings.

It being understood that each of the rolls A is similarly supported and provided with similar mechanism for ejecting the splints, it will be sufficient to describe said mechanism with relation to one of said rolls.

The shaft *c'* of the roll A is journaled in bearings *c c*. Each of the journal-bearings *c* is provided with the hub *c<sup>2</sup>*, said hubs being keyed or otherwise fixed to the boxes *c<sup>3</sup> c<sup>3</sup>*. Each of said boxes are in turn mounted in the frame, the construction being such that the bearings *c* are prevented from revolving. Each of the bearings *c* has a portion *c<sup>4</sup>*, formed eccentrically to the axis of the shaft *c'*, and surrounding each of said eccentric portions *c<sup>4</sup>* is a grooved ring *b*, arranged as shown in Fig. 3, the rings *b* being free to turn upon such eccentric portions. In each of the spaces of the cutter-roll A is placed a bar *b'*, said bars being longer than the roll, and so that the ends of said bars project into the grooves in the rings *b*. The ends of the bars are not fixed rigidly to the rings, but simply project into the ring grooves. They could not be fixed to the rings, as they must be capable of some movement in the ring grooves toward and from each other as the bars are moved radially in and out with reference to the roll in the grooves of which the bars are held and guided.

Journaled in the frame below each of the cutter-rolls A is a type-roll *i*, upon which may be secured any desired number of rings of type, and below the rolls *i* may be journaled



ink-rolls *j* to supply ink to the type. The cutter-roll *A* and the rolls *i* and *j* are geared together by the gears *k* to properly feed said last-mentioned rolls.

5 *d* is a guide for the stock or strip of wood to be cut.

The operation of the parts above described is as follows: Power being applied to revolve the rolls *A* and the stock or strip of wood being fed through the guide *d* and between the rolls *A*, the revolution of the rolls, as will be seen, will serve to cut from said strip splints or blanks of the proper shape and size, the cutters upon the two rolls co-operating with each other to form shearing-edges to effect the severing of the wood, the cutting taking place at the point marked *g*, as shown in Fig. 1.

1. As the cutters and recesses are alternately arranged in the two rolls, the splints when cut will be deposited alternately, first in a space in one roll and then in a space in the other roll, and the splints so deposited in these spaces will be carried around with the rolls, being held in the spaces by frictional contact. As the cutters upon one roll, however, do not enter the spaces upon the other roll, the splints when cut will be forced into the spaces only to a distance where their faces will be flush with the periphery of the roll. At the time when the splint is cut and deposited in a space of the roll *A*, the bar *b'* is substantially at the bottom of the space and so as not to come in contact with the splint. As the roll *A* revolves, carrying the splint in any given space around with it, the bar *b'* in said space is by reason of the eccentricity of the rings in the grooves of which the ends of said bar are mounted gradually moved outward from the axis of the roll, until when said space in the revolution of the roll *A* is brought into a proper position for the splint or blank thereon to be operated upon by the types upon the printing-roll the bar *b'* will have been brought into contact with the rear face of the splint and thus will serve to support the splint against the action of the printing-roll. As the roll *A* continues to revolve, the bar *b'* will be forced still farther outward, until when the space referred to has reached the point *l*, Fig. 1, the bar will have been moved sufficiently far to eject the splint from the space and thus deliver it from the roll. During the remainder of the revolution of the roll *A* the bar *b'* will be gradually withdrawn into its space until it is brought to its original position.

It will be understood that each of the bars *b'* in each of the spaces of both rolls *A* will be similarly operated.

60 It will be understood from the drawings that the type-rolls *i* will be revolved by their gearing, so as to imprint upon the splints or blanks at the point *h* any desired letters or figures, the ink-rolls *j* supplying the types upon the type-rolls with ink.

If desired, the ink-rolls may be omitted and

the type used to merely make depressions upon the face of the splints.

It will also be understood that if it be not desired to print upon the splints the type-rolls may also be omitted.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In combination with a roll provided with alternate ribs and grooves, a series of movable bars in the grooves, and rotating grooved rings mounted on bearings eccentric to the axis of the roll, and having their grooves engaging the ends of the bars, substantially as and for the purpose specified. 75 80

2. In combination with a roll provided with alternate cutters and spaces, movable bars in the spaces, and rotating grooved rings mounted on bearings eccentric to the axis of the roll, and having their grooves engaging projecting portions of the bars, to move such bars toward and from the axis of the roll, as the latter revolves, substantially as and for the purpose shown. 85

3. In combination with the two opposing rotary rolls, each having alternate ribs and grooves, arranged so that the grooves of one come opposite the ribs on the other, movable bars in the grooves of the rolls, and rotating rings having grooves engaging projecting portions of the bars mounted on bearings eccentric to the axis of the rolls, substantially as and for the purpose set forth. 90 95

4. In combination with a roll provided with longitudinal cutters having spaces between them, a series of movable bars in such spaces, bearings in which the shaft of the roll is journaled, and rotating grooved rings engaging projecting portions of the bars mounted on bearings on the roll bearings, which are eccentric to the axis of the roll, substantially as and for the purpose described. 100 105

5. In a machine for cutting splints, in combination with a roll having a series of longitudinal grooves into which the cut splints are inserted, a series of movable bars mounted in the grooves, a printing device to print on the splints while in the grooves, and means for moving the bars outward to move the splints into contact with the printing device, and eject the splints after they have passed such device, substantially as and for the purpose specified. 110 115

6. In a machine for cutting splints, in combination with a roll having a series of cutters with spaces between them, means for forcing the splints down into such spaces, movable bars mounted in the spaces, a printing device to print on the splints while in the spaces between the cutters, and means for moving the bars to force the splints outward in the holding spaces, into position to be engaged by the printing device, substantially as and for the purpose shown. 120 125

7. In a machine for cutting splints, in combination with a roll having a series of cutters with spaces between them into which the 130

splints are forced, movable bars mounted in such spaces, a printing roll close to the periphery of the cutter roll, and means for moving the bars outward to raise the splints in the respective spaces so as to bring their outer faces in position to be engaged by the printing roll, and then moving such bars farther outward to eject the printed splints, substantially as and for the purpose set forth.

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

ELIJAH B. BENHAM.  
HOWARD E. BARLOW.

Witnesses:

AUGUSTUS O. BOURN, Jr.,  
HERBERT L. LIGHTFOOT.