

(No Model.)

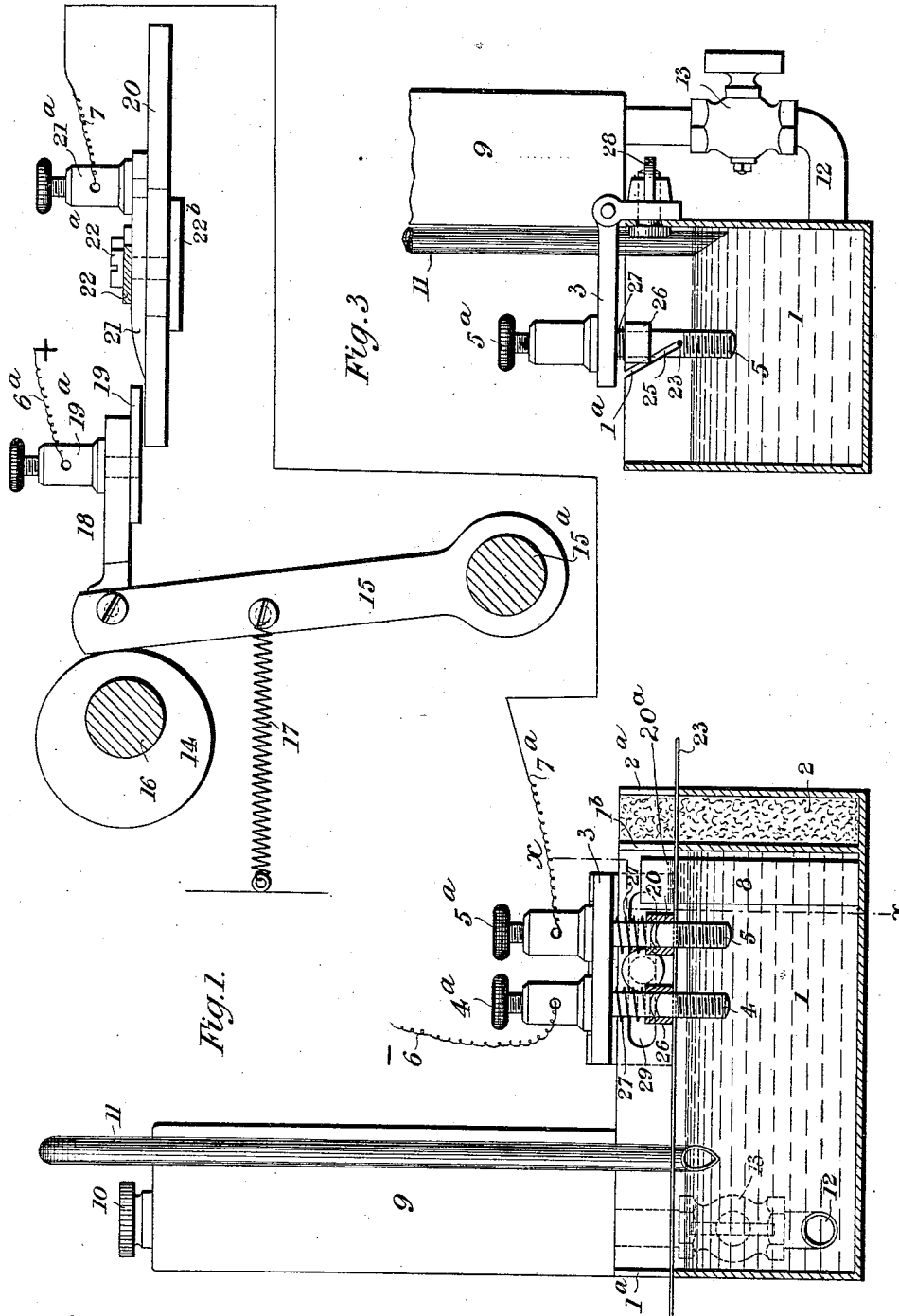
2 Sheets—Sheet 1.

J. PLATT.

METHOD OF AND MEANS FOR MANUFACTURING CARD TEETH.

No. 525,997.

Patented Sept. 11, 1894.



WITNESSES.  
*J. S. Howard.*  
*G. P. Appleyard.*

INVENTOR.  
*John Platt.*

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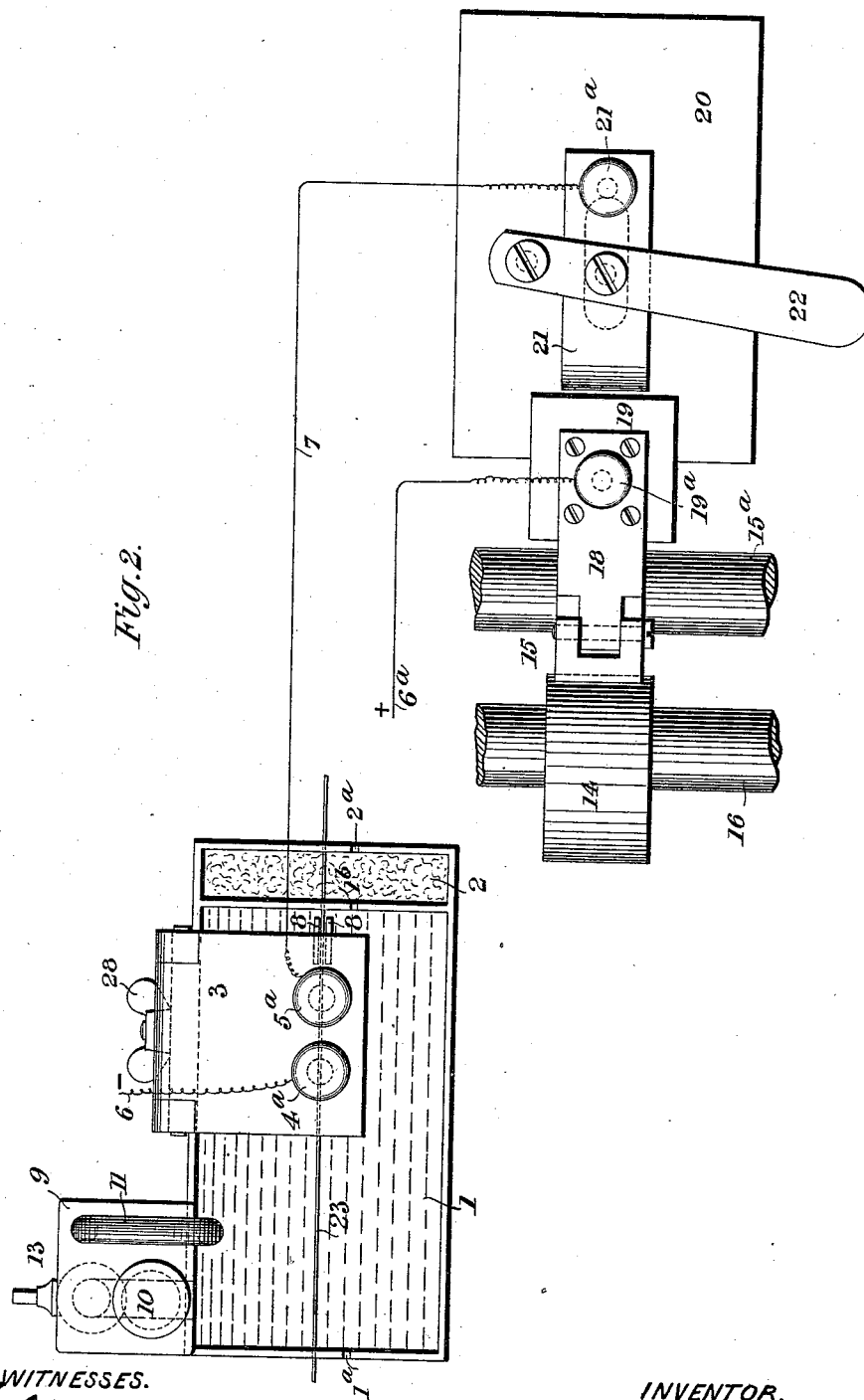
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# UNITED STATES PATENT OFFICE.

JOHN PLATT, OF LONDON, ENGLAND.

## METHOD OF AND MEANS FOR MANUFACTURING CARD-TEETH.

SPECIFICATION forming part of Letters Patent No. 525,997, dated September 11, 1894.

Application filed May 24, 1894. Serial No. 512,343. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN PLATT, a subject of Her Majesty the Queen of Great Britain, residing at London, England, have invented certain new and useful Improvements in the Hardening and Tempering of Wire for the Manufacture of Card-Teeth, of which the following is a specification.

My invention relates to improvements in the method and means employed for manufacturing card teeth from mild steel wire, the points of which and a portion of the length of the working part of the teeth are hardened, the object being accomplished by passing the length of wire from which the dents or teeth are to be made through an apparatus which will harden the wire at intervals of its length previous to the teeth being formed therefrom and in such a manner that the dents or teeth formed or cut from the wire will have their points and a portion of the working part of the tooth hardened, the remaining portion being soft *i. e.* mild steel.

The invention consists in the employment of electrical apparatus wherein an intermittent contact is made between two poles between and through which the wire is passed and thereby heated after which it is passed into oil or other cooling medium and thence to a card setting machine where the dents or teeth are cut, formed and set as usual.

In the accompanying drawings Figure 1 is an elevation partly in section of an apparatus adapted for the purpose above named. Fig. 2 is a plan of same, and Fig. 3 is a side sectional elevation of a portion of Fig. 1 on the line *x x* of Fig. 1.

According to my invention I employ a trough divided into two compartments 1, 2, the compartment 1 containing oil or other cooling medium and the compartment 2 felt, fiber or other material which will clean and dry the wire 23. To the side or upper edge of the trough I hinge a small flap 3 of non-conducting material such as vulcanite, and carried by this flap 3 are two poles 4, 5 having binding posts 4<sup>a</sup> 5<sup>a</sup> connected by wire 6, 7 with a source of electric supply. The lower ends of the poles 4, 5 dip into the cooling medium in the trough 1. Close to one of the poles 5 are two plates 8, 8 fixed close together to the bottom of the trough 1 the upper ends

of which extend to above the level of the cooling medium which is drawn up between the plates by capillary attraction to above the level of the surrounding medium, as shown at 20<sup>a</sup> in Fig. 1.

The cooling medium in the trough 1 is automatically maintained at about one level by filling the tank 9 with medium by way of the screwed plug 10. The top of the tank has a bent pipe 11 fixed to it and the open end of this pipe dips into the medium in the trough 1. Near the bottom of the trough 1 and opening into it is a pipe 12 which is connected with the bottom of the tank 9, and on this pipe 12 is a tap or valve 13. When the apparatus is in operation the tap 13 is opened and the medium just covers and closes the orifice of the pipe 11 and when from any cause the medium sinks below this level the end of the pipe 11 is opened and air enters and forces the medium out of the tank 9 through the pipe 12 into the trough 1. The medium rising in this trough, closes the end of the pipe 11 and prevents more cooling medium passing from the tank 9 into the trough.

The necessary intermittent opening and closing of the electric circuit sent through the two poles 4, 5, is obtained by means of a tappet or eccentric 14 mounted on a shaft 16. This tappet or eccentric 14 imparts a to and fro motion to an arm 15 free to move on its stud or pin 15<sup>a</sup> said arm being moved in one direction by means of a spiral spring 17 attached to any fixed point.

On the arm 15 is a hinged bracket 18 of non-conducting material and on this bracket is fixed a plate of copper 19 a binding post 19<sup>a</sup> being carried by the bracket 18 and connected to the plate 19. On the plate 20 of non-conducting material is a plate of copper 21 with a binding post 21<sup>a</sup>, and this copper 21 can be moved nearer to or farther from the copper 19 by means of the lever 22 so that the length of time the circuit is completed can be regulated, the screw 22<sup>a</sup> and plate 22<sup>b</sup> serving to hold the copper 21 in the position in which it is set on the plate 20 which is slotted to enable the plate 21 to move.

The wire 23 to be tempered is drawn through saw gates 1<sup>a</sup>, 1<sup>b</sup> and 2<sup>a</sup> in the troughs 1, 2 and through the poles 4, 5 thence between the two plates 8, 8, and through the cooling medium

therein by the ordinary intermittent feed motion of the card setting machine.

The pole 4 is connected by wire 6 with the negative pole of the dynamo or other source of electric supply and the pole 5 by wire 7 to the binding post 21<sup>a</sup> of the contact maker 21 and the binding post 19<sup>a</sup> is by wire 6<sup>a</sup> connected to the positive pole of the dynamo or other source of electric supply so that when contact is made between the two plates 19, 21 the current passes along the wire 23 and heats same, the circuit being then broken and the wire drawn forward into the cooling medium and hardened.

In order to readily pass the wire 23 through the poles 4, 5 an inclined saw gate 25 (Fig. 3) is cut in each one and over each saw gate is a short collar or socket 26 forced downward by means of a spiral spring 27. By moving the collar 26 up the pole and compressing the spring 27 as shown in Fig. 3 the wire can be passed into the saw gate, and the collar 26, when released is forced down on to the wire and so holds same in position. The lower ends of the poles 4, 5 are chased or screwed so that the cooling medium is drawn up same and prevents their being overheated. The position of the flap 3 can be adjusted and fixed by the thumb screw 28 which works in a slot 29 in the wall of the trough 1.

What I claim is—

1. The method of treating wire for the manufacture of card teeth, which consists in passing an electric current through alternate lengths of a moving wire, and in then tempering the parts heated by the electric current, substantially as described.

2. In an apparatus for hardening and tempering wire for card teeth, the combination

with a tank having compartments for a tempering medium, and a wiping substance, of two poles through which the wire passes, a pair of plates behind the poles adapted to draw up the tempering medium by capillary attraction, and between which the wire passes, and a make and break apparatus in the circuit of which the poles form a part, substantially as and for the purpose described.

3. In combination, the tank 1 having compartment 2, the poles 4, 5, slots in said poles through which the wire passes, collars on said poles for retaining the wire in place, means for keeping the tempering medium in the tank at a constant level, an electric circuit of which the poles form a part, contact plates 19 and 21 in said circuit, and means for reciprocating one of said plates to make and break the circuit, substantially as described.

4. In combination the tank 1, having compartment 2, a supply tank 9, pipes 11 and 12, hinged flap 3, poles 4, 5 carried thereby, slots in the poles and spring-adjusted collars carried thereby, means for adjusting the position of the flap, plates 8 in the tempering medium, an electric circuit of which the poles 4, 5 form a part, contact plates 19 and 21 in said circuit, a pivoted arm, a bracket carried thereby to which plate 19 is connected, and means for reciprocating the arm, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN PLATT.

Witnesses:

J. V. HOWARD,

G. P. APPLEBYARD,

*Penny Bank Chambers, Halifax.*