

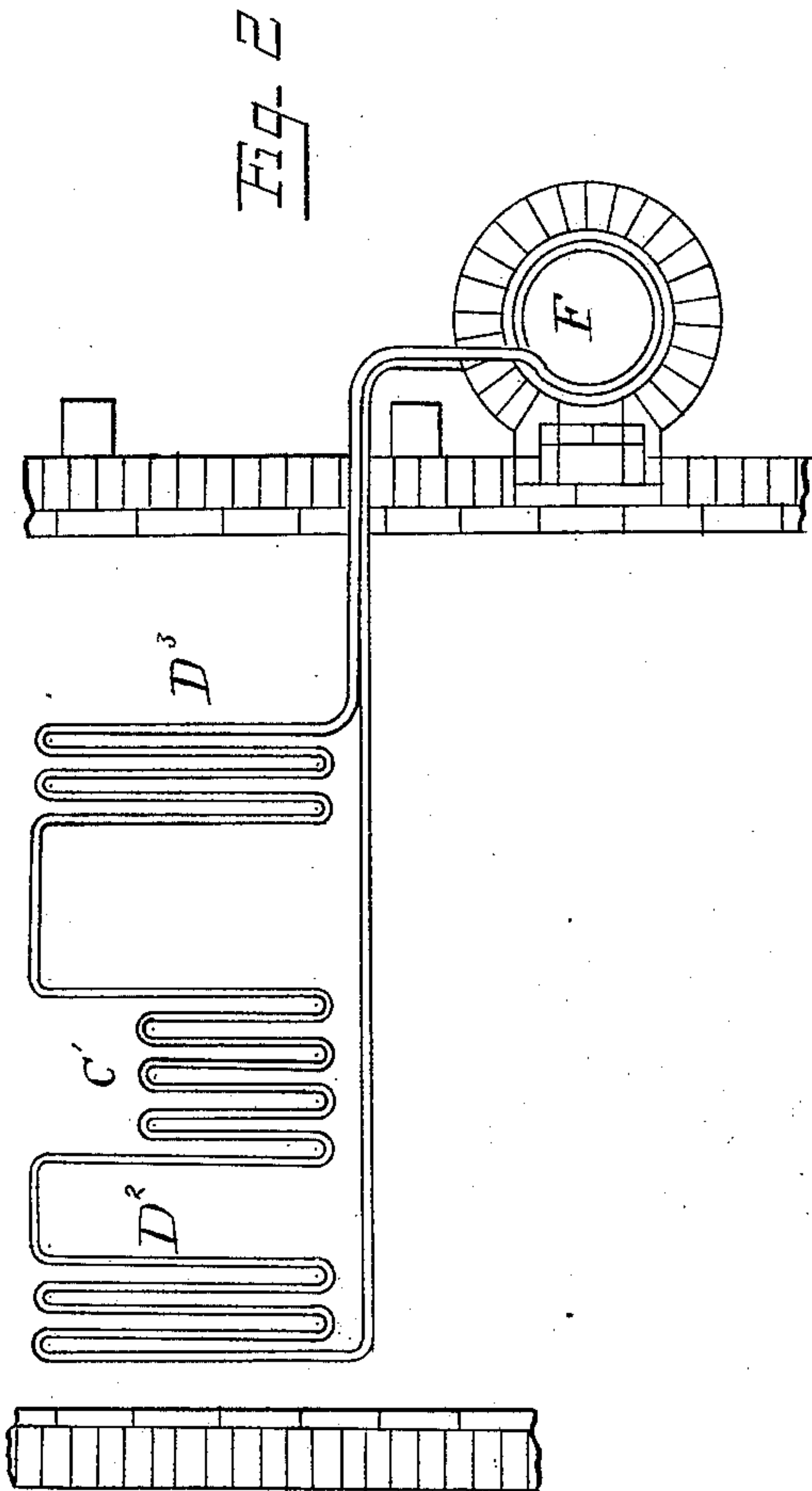
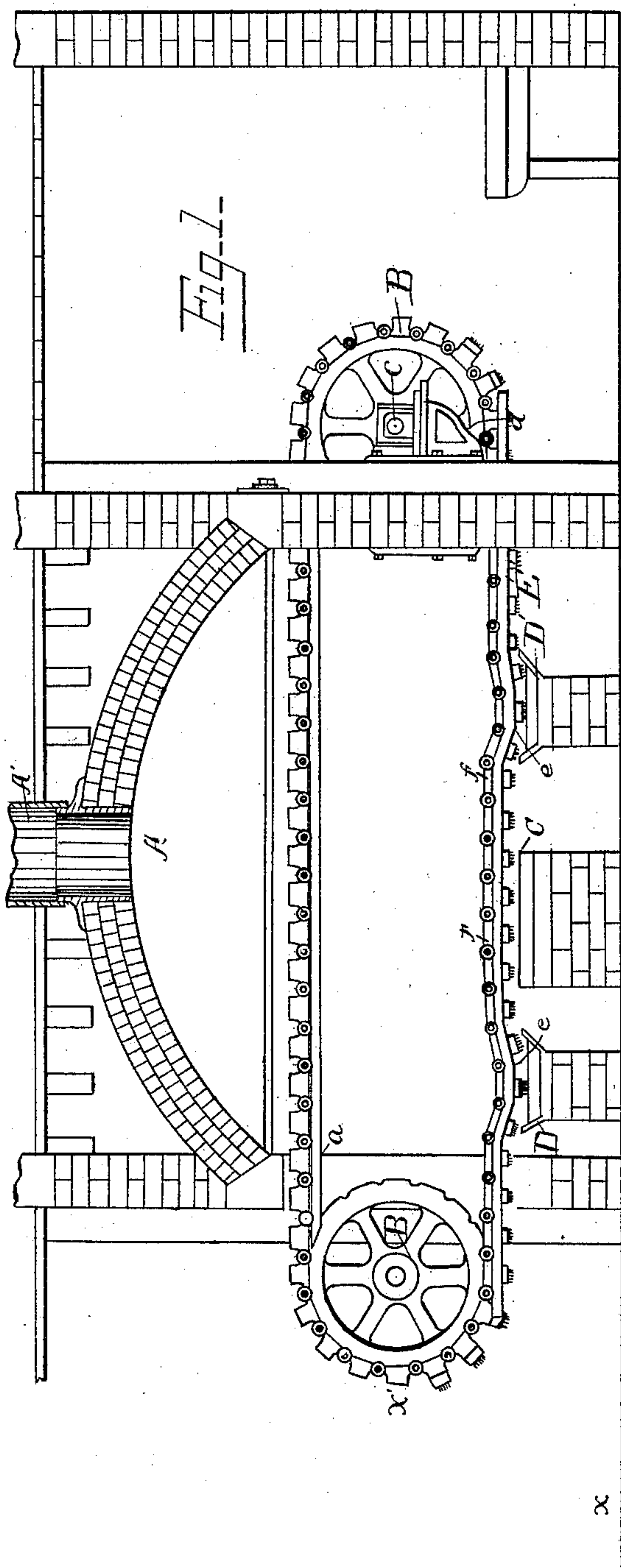
(No Model.)

2 Sheets—Sheet 1.

C. MARTIN.  
MATCH DIPPING APPARATUS.

No. 349,111.

Patented Sept. 14, 1886.



Witnesses

G. W. Brown.

Philip Hawley.

Inventor

Charles Martin.

Per Warwick and Bartlett.  
His attorneys.

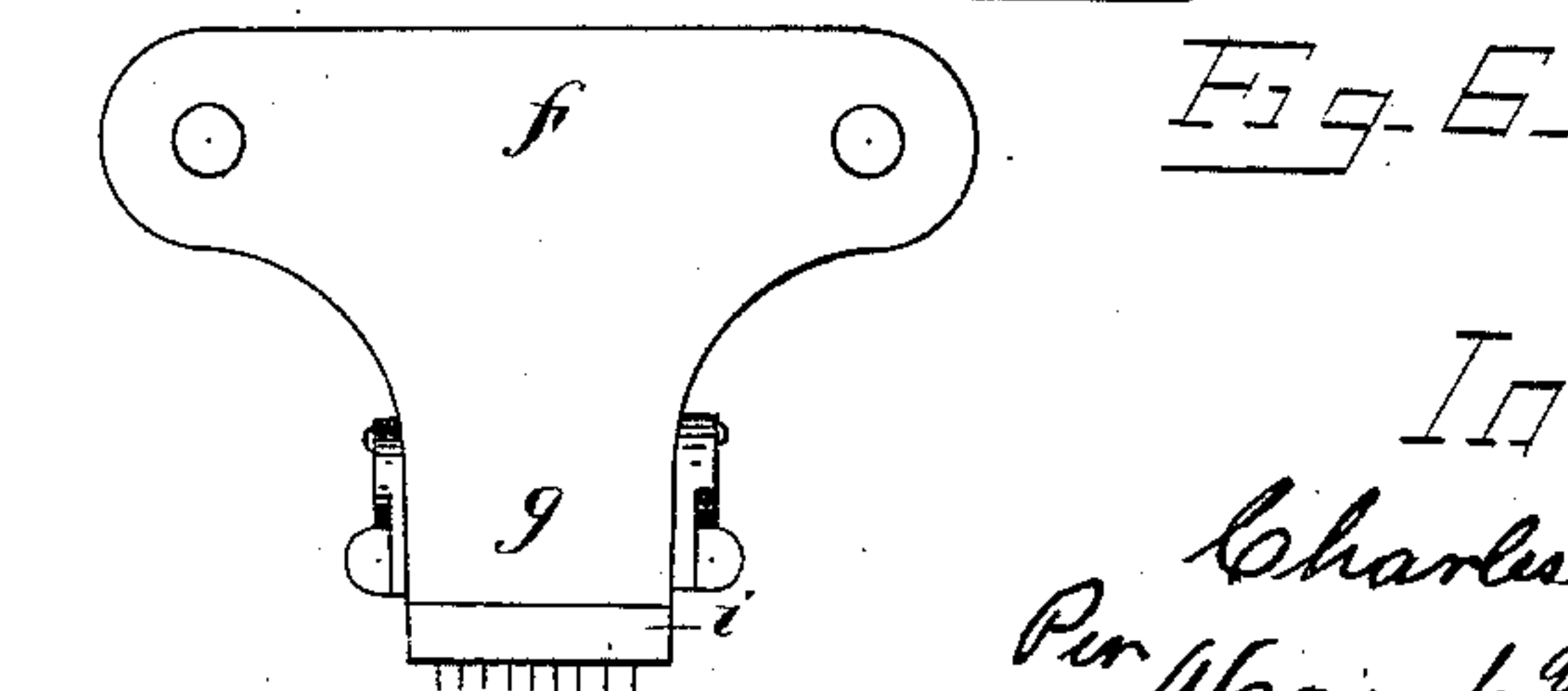
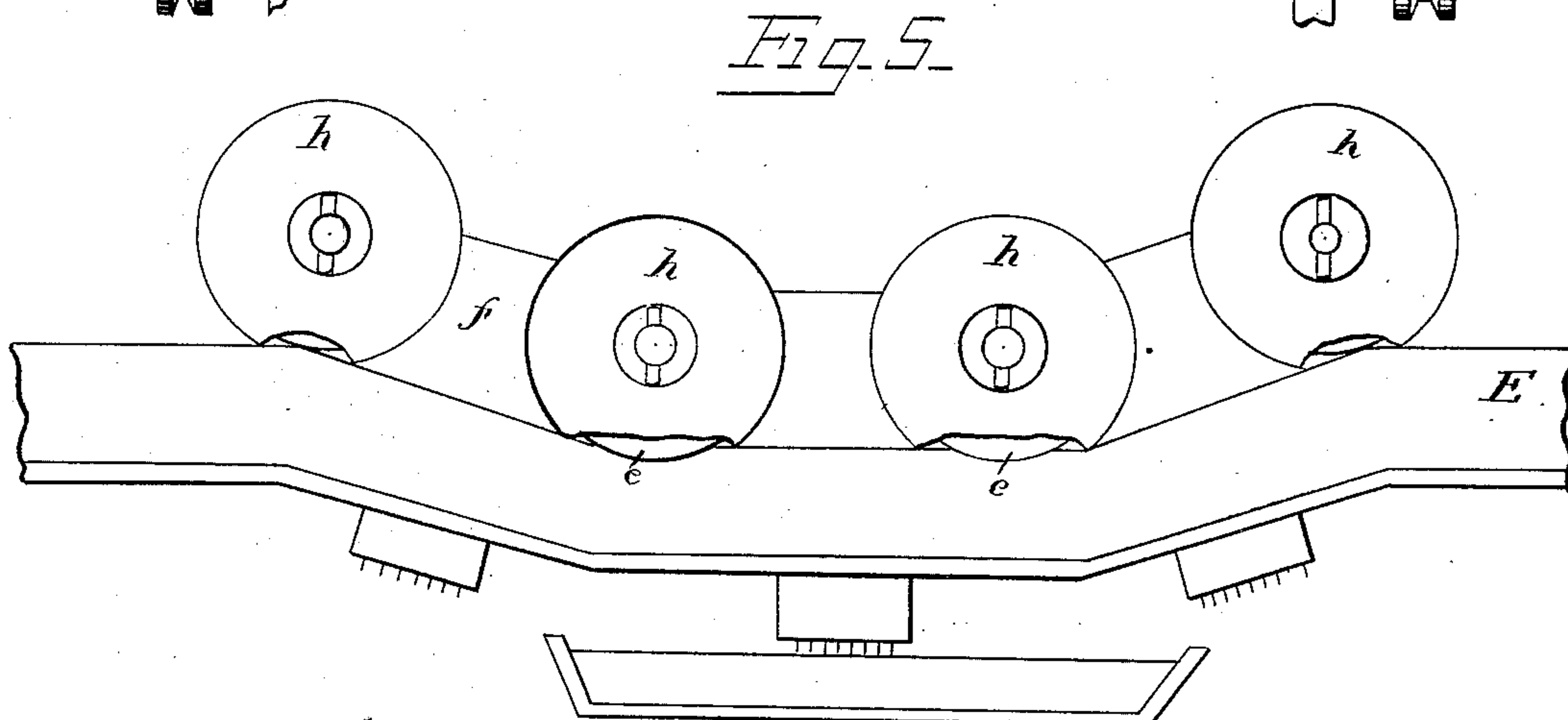
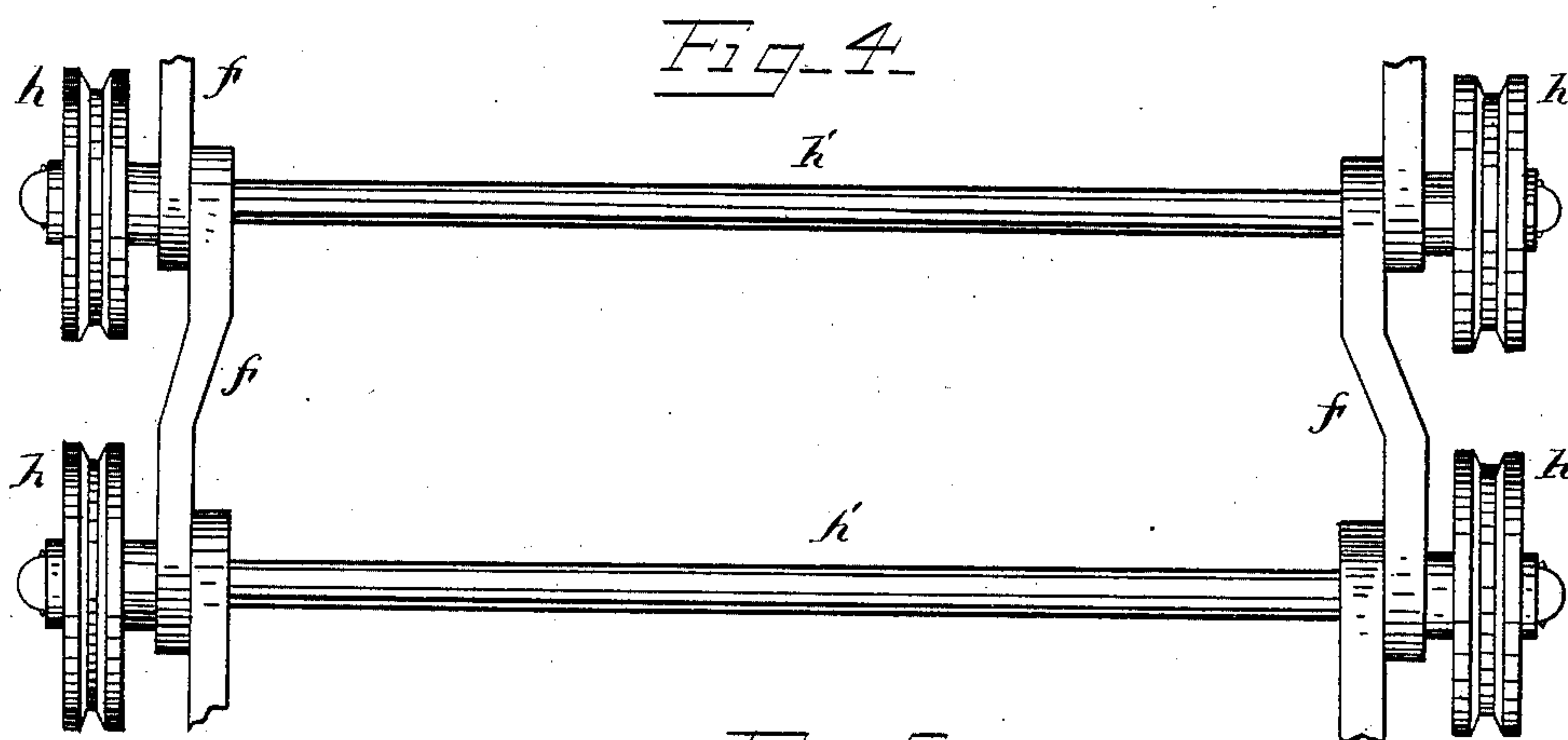
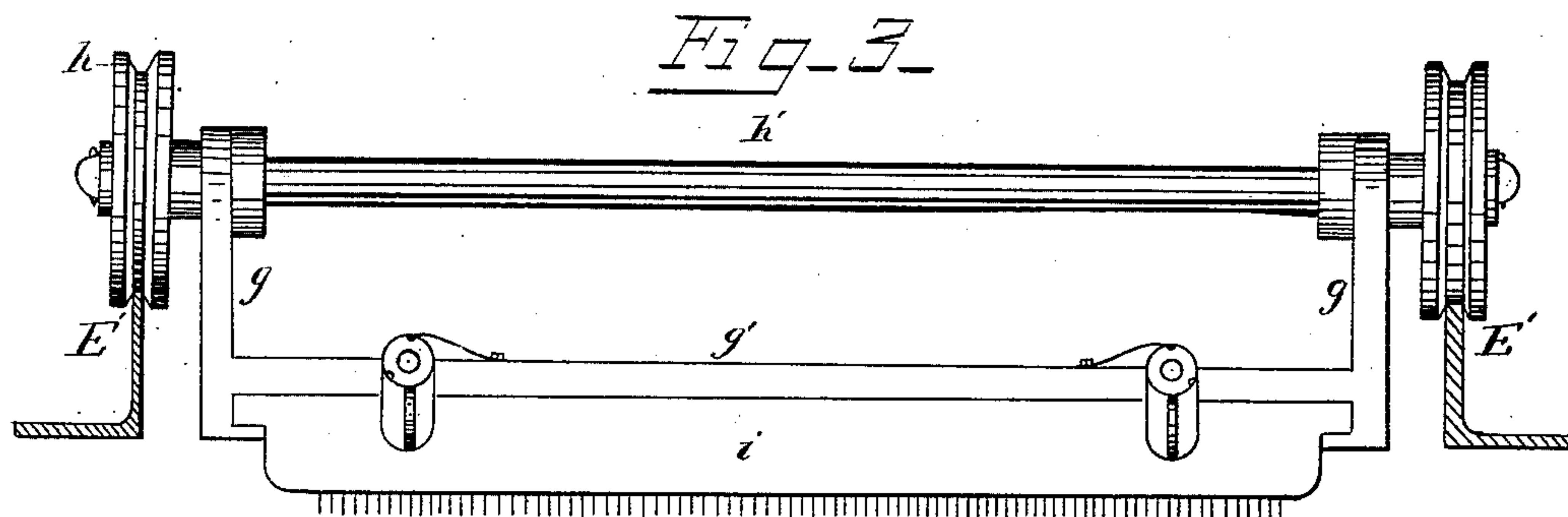
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# UNITED STATES PATENT OFFICE.

CHARLES MARTIN, OF TORONTO, ONTARIO, CANADA.

## MATCH-DIPPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 349,111, dated September 14, 1886.

Application filed November 8, 1883. Serial No. 111,216. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES MARTIN, a citizen of Canada, and a subject of the Queen of Great Britain, residing at Toronto, in the county of York and Province of Ontario, have invented certain new and useful Improvements in Match-Dipping Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to match-dipping devices; and it consists in certain constructions and details of construction, as hereinafter pointed out and claimed.

The object of my invention is to make such arrangement as will permit the match-dipping to be done in a closed room by mechanical means, so that the workmen shall not be compelled to inhale the fumes of the chemicals; also, to simplify the construction of match-dipping machines.

In the drawings, which form part of this specification, Figure 1 is a cross-section of the dipping house or room, showing the endless railway tray-carrier, the troughs, and the drying-plate. Fig. 2 is a sectional plan showing arrangement of hot-water pipes under the troughs and drying-plate. Fig. 3 is a cross-section, on an enlarged scale, of the wheels, tracks, and tray-holder of the endless railway. Fig. 4 is a plan of a portion of the endless chain and trucks which form the endless railway or carrier. Fig. 5 is an elevation, partly sectioned, of a portion of the endless railway and a section of one of the troughs for chemicals. Fig. 6 is an end view of one of the links or tray-carriers which go to make up the endless chain.

A represents the dipping house or chamber. This chamber is preferably arched and provided with a ventilating-flue, as A'. Railway tracks or bars extend across the room, as at E' E', and openings *a a* are made in the walls in line with the tracks, and no larger than may be necessary to permit the passage of the tray-carrying chain.

Outside the walls of the chamber, in line with the railway-tracks, are two sprocket-wheels, B, which may turn on axles, as *c*, having bearings in boxes supported by brackets *d*. An endless chain, composed of links *f*, passes round the two sprocket-wheels and through the chamber A. These links are

coupled together by rods *h'*, which serve as axles for the wheels *h*, which run on tracks E. The links *f* have hangers *g* and cross-bars *g'*, which cross bars or plates furnish bearing-seats for trays *i*, which contain matches spaced ready for dipping when the device is in operation.

The lower tracks E' are offset at *e e*, so that the wheels or trucks of the endless chain which travel on said tracks or ways will move down an incline, then move forward a short distance, and then mount a similar incline. This movement of the trucks will of course carry the trays with them. The offsets or depressions *e e* of the tracks are in line with or over trays D D', which contain chemicals. At the bottom of this depressed part of the rails I make two indents. When the rollers arrive at these indents, they will fall practically perpendicularly into these indents, and on moving forward they will rise vertically, thus lowering the matches into the chemicals and lifting them out perpendicularly, and thus avoiding any dragging through the chemicals, which, as the chemicals are generally in form of thick paste, is very objectionable. The tray D will usually contain the sulphur, and tray D' will contain phosphorus. A heating or drying plate, C, between the two serves to dry the sulphur on the matches after dipping. Steam-pipes, leading from boiler at F, are led under the troughs and drying-plate, as at D<sup>3</sup> C' D<sup>2</sup>, and the heat conveyed through these pipes may be regulated by valves outside the chamber A. The liquid in the troughs D D' is kept at uniform level by automatic feeding devices.

The hangers *g* and cross-plates *g'* furnish a seat for the reception and retention of trays *i*, which contain the match-splints. The hangers *g* have at their ends L-shaped arms or projections, which hook over the ends of the match-trays, as shown in Fig. 4.

The links and their cross-bars are each duplicates of the other, one end of each link-section being bent in, as shown in the plan, Fig. 4. Thus any link-section may be removed and replaced by taking out two of the rods *h'*.

The operation of the device is as follows. The match-splint-making machine is supposed to be near the point *x* in Fig. 1. Trays filled with matches are taken from the machine and



placed on the endless carrier at  $x'$ . The endless chain is driven slowly forward by any suitable mechanism connected with one of the wheels B. The troughs D D' are supposed to have been filled with the dipping compounds, and the chamber A closed, except the apertures through which the endless chain passes, glazed windows affording opportunity for observation from outside the chamber. As the trays  $i i$  move along, they will be carried down so as to pass the ends of the matches through the compound in tray D, then just above the drying-plate C, then through the compound in trough D', and, finally, out at the other side of the chamber, where the trays of matches are removed from the carriers, and the endless chain travels back empty along the track E. The heat from the coils of water or steam pipe will produce an upward draft through the ventilating-flue A', and the inrush of air through apertures  $a a$  will prevent any considerable escape of the fumes of the chemical compounds from chamber A. Further artificial draft may be employed, if found advisable.

The movement of the endless-chain carrier should be so slow as to give the matches time to dry in the dipping-chamber. About eight feet per minute is considered a fair rate of speed.

The heating-plate may be as large as desired and more than one may be employed.

I claim—

1. The improvement in the art of dipping matches which consists in conveying them through a chamber which is practically closed, and from which the operatives are excluded, and dipping and drying the matches while in said chamber by mechanical carriers, whereby the operatives are protected from the fumes of the chemicals, substantially as described.

2. A match-dipping chamber constructed to be practically closed, as described, an endless carrier passing through said chamber from side to side, the ends of said carrier extending from the chamber, troughs for containing chem-

icals within the chamber, and mechanism, substantially as described, whereby the ends of the matches are brought into the chemicals in the troughs, all in combination, substantially as stated.

3. An endless-chain carrier arranged, as described, to carry trays of match-splints, troughs arranged as described in proximity thereto, and guide-rails having offsets in line with the troughs, whereby the trays descend so as to carry the ends of the matches into the troughs, substantially as described.

4. The combination, with the walls of a dipping-chamber, of sprocket-wheels arranged outside said chamber, guide-rails which extend across the chamber, an endless chain of tray-carriers passing round said sprocket-wheels and along the guide-rails, offsets in the guide-rails, as described, and dipping-troughs arranged as described with relation to said offsets, all substantially as described and shown.

5. The endless chain of tray-carriers, consisting of links  $f$  having hangers  $g$  and tray-seats  $g'$ , said links being connected together, substantially as set forth.

6. The combination of the links  $f$ , having hangers  $g$  and tray-supports  $g'$ , with the connecting-bars  $h$ , said bars serving also as axles for trucks  $h'$ , all substantially as described and shown.

7. The combination, with the tracks, of endless-chain carriers traveling on said tracks, said carriers constructed to carry the match-trays, as described, the tracks being indented, as described, at points over the chemical-vessels, whereby the matches are dropped vertically into the chemicals and lifted therefrom, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES MARTIN.

Witnesses:

CHARLES H. RITCHIE,  
ARTHUR B. MCBRIDE.