

No. 648,384.

Patented May 1, 1900.

L. BOUET.

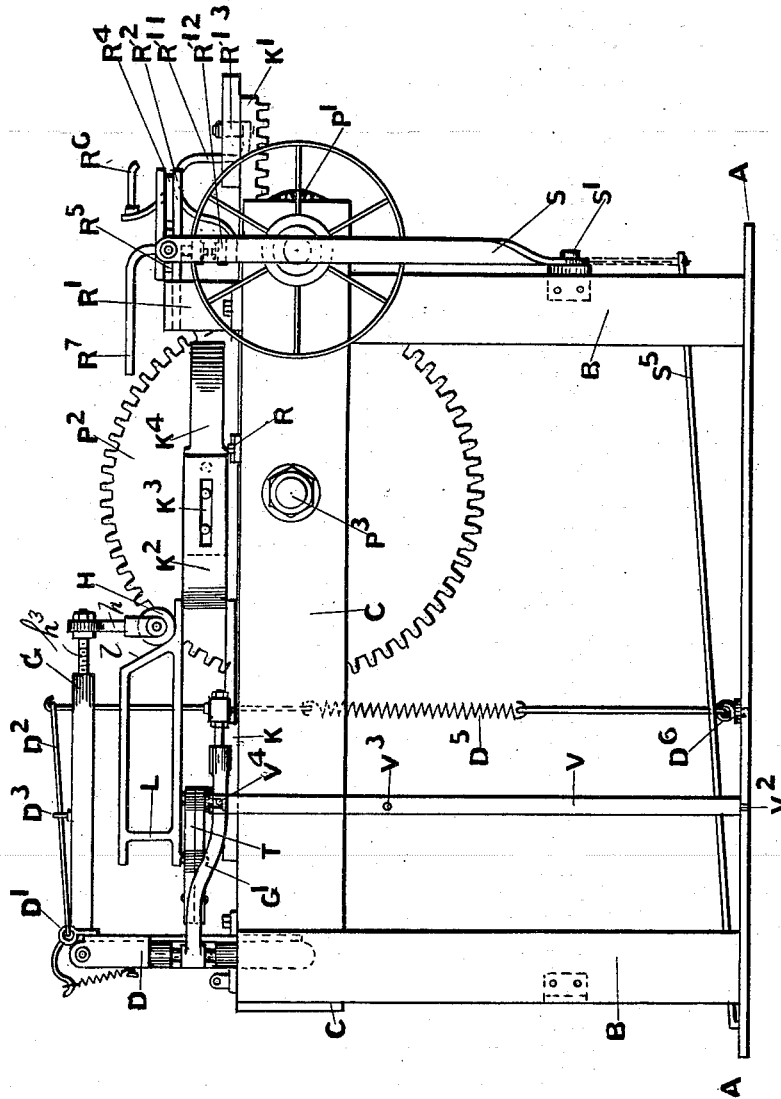
WIRE DRAWING MACHINE.

(Application filed June 9, 1898.)

(No Model.)

5 Sheets—Sheet 1.

FIG. 1.



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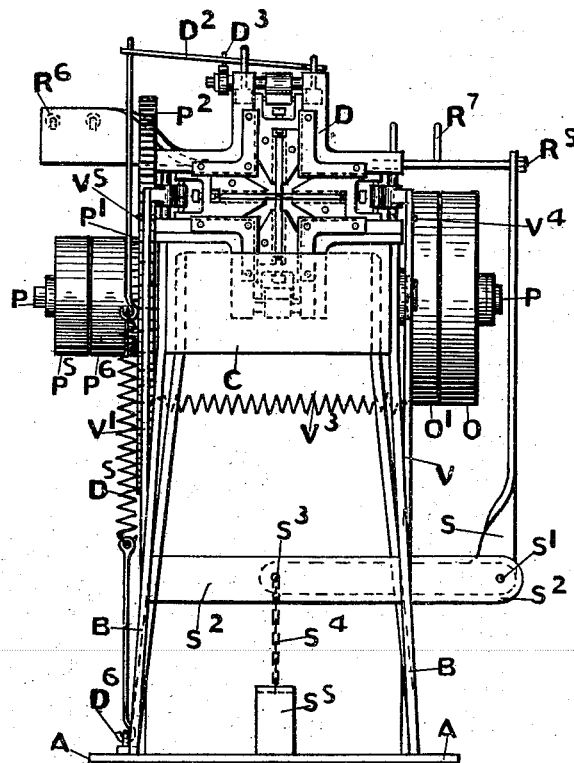
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(No Model.)

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FIG. 2.



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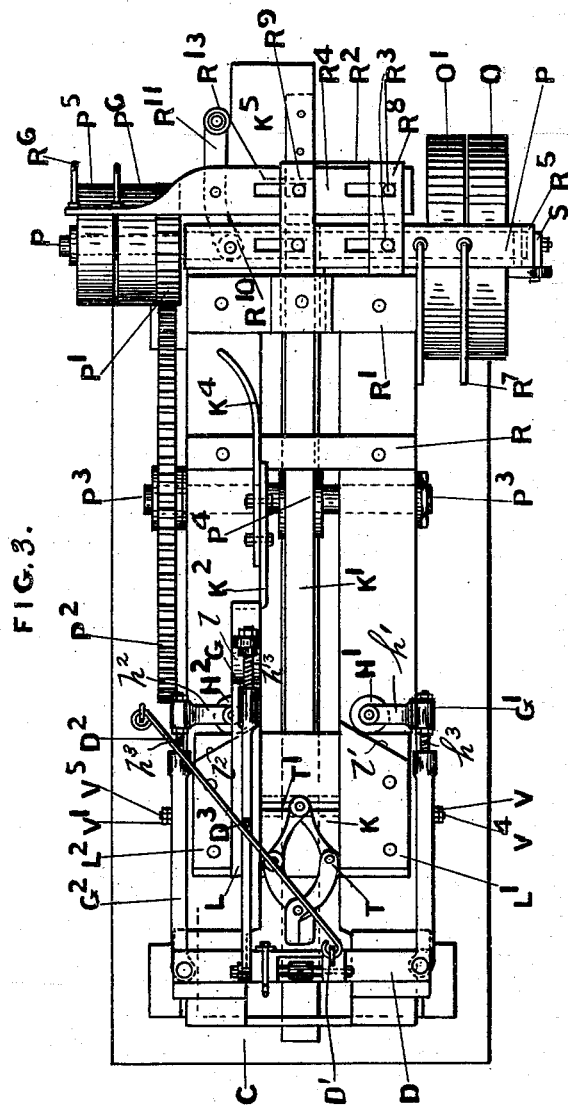
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FIG. 4.

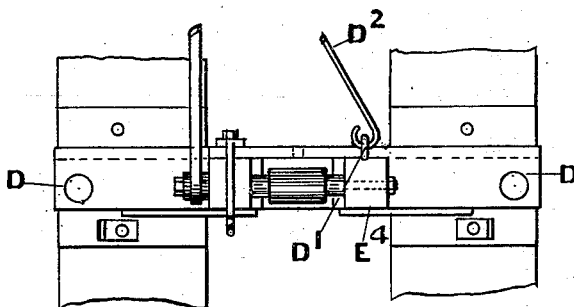


FIG. 5.

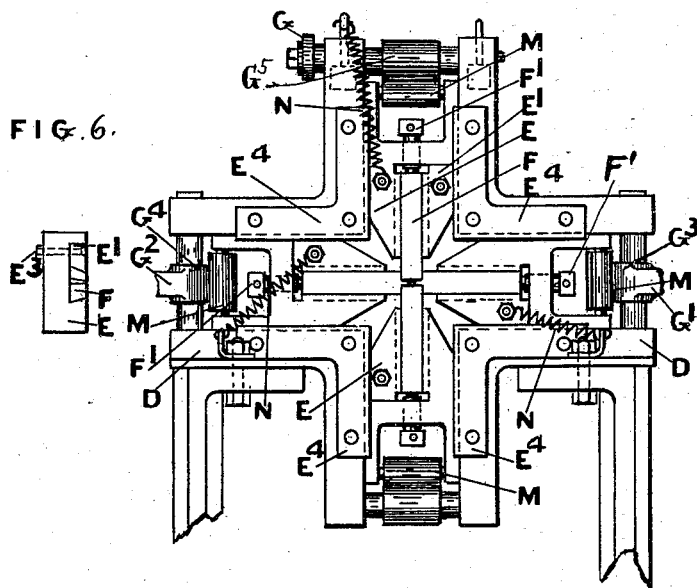
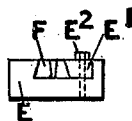


FIG. 7.



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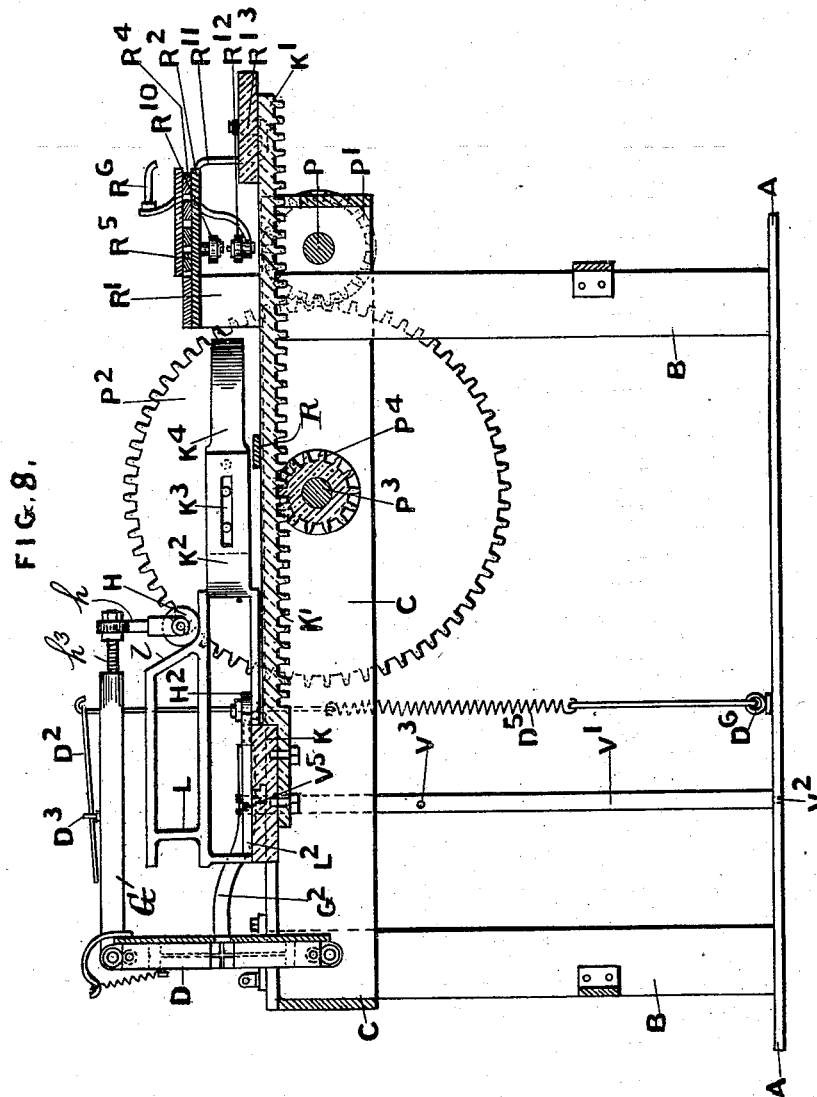
Patented May 1, 1900.

L. BOUET.
WIRE DRAWING MACHINE.

(Application filed June 9, 1898.)

(No Model.)

5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

LOUIS BOUET, OF SHEFFIELD, ENGLAND, ASSIGNOR OF ONE-HALF TO
ARTHUR FARNHILL, OF SAME PLACE.

WIRE-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,384, dated May 1, 1900.

Application filed June 9, 1898. Serial No. 682,974. (No model.)

To all whom it may concern:

Be it known that I, LOUIS BOUET, a citizen of the Republic of France, residing at No. 244 Newhall road, Sheffield, in the county of York, England, have invented certain new and useful Improvements in or Relating to Wire-Drawing Machines, (for which I have obtained Letters Patent in England, No. 1,375, dated January 18, 1898,) of which the following is a specification.

This invention relates to wire-drawing machines more particularly intended for use in the manufacture of the spokes of cycle-wheels, its object being to enable the ends of the spokes to be "butted," while the intermediate portion is formed either parallel or tapering as desired.

The machine comprises a fixed head, carrying the dies and mounted upon a suitable base, and a carriage which can be caused, by means of a rack and pinion, to move away from the fixed head. The carriage has mounted upon it suitably-shaped nippers or the like by means of which the end of the wire to be drawn is firmly held. It also carries suitably-shaped guide-plates by means of which motion is imparted to the dies in the manner hereinafter to be described. The fixed head is provided with four radiating grooves in each of which lies, so as to slide freely therein, a block which carries a die. The position of the dies in their respective sliding blocks may be adjusted by means of set-screws. At the outer end of each groove in the head is pivoted a lever provided with a cam-shaped piece which bears against a friction-roller carried on the outer end of each sliding block. These levers are arranged to project from the head at that side of the latter on which is situated the drawing-carriage, each lever being so shaped that a roller carried at its end will bear upon one of the guide-plates on the carriage. It will thus be readily understood that as the carriage moves away from the head in the act of drawing the wire through the dies the latter are caused to approach each other as the rollers on the ends of the levers mount the inclined planes of the guide-plates.

If desired, the lowermost die may be fixed either by suitably fastening the lever controlling it or otherwise, as found convenient,

while the other dies are operated, or the top and bottom dies may be caused to first come into action and afterward the two side ones, or vice versa.

Conveniently springs are arranged so as to hold the ends of the die-operating levers in contact with the guide-plates, springs being also arranged, if desired, to cause the dies to open at the end of a draw.

The machine is driven by suitable gearing and may be provided with an automatic device by means of which the driving-belts or the like are shifted at the end of a draw, so as to reverse the movement of the carriage, the change of direction of motion being accompanied by a change in the speed of travel of the carriage, so that the latter may make a quick return, so as to be ready for a fresh draw.

It must be understood that the details of the mechanism may be varied to suit requirements.

In the accompanying drawings, Figure 1 is a side elevation of the improved machine. Fig. 2 is a front elevation. Fig. 3 is a plan. Fig. 4 is an enlarged plan of the head. Fig. 5 is an enlarged front elevation of the same. Fig. 6 is an enlarged plan of an outer die-box. Fig. 7 is a similar view of an inner die-box. Fig. 8 is a vertical longitudinal sectional view of the machine.

Like letters indicate like parts throughout the drawings.

From a base A rise legs B, supporting a bed or table C, upon which is a head D, carrying die-boxes E, with dies F, which are moved radially in the manner hereinafter described. To the head D are pivotally attached levers $G' G^2$, the levers $G' G^2$ having cam-shaped pieces $G^3 G^4$ formed on one end and the lever G being arranged to operate a similar cam G^5 , carried upon the pivot-pin by which it is attached to the head. The free ends of the levers $G' G^2$ are provided with adjustable runners or rollers $H H' H^2$.

Behind the head D upon the bed C is arranged a sliding carriage K, provided with a rack K' to enable it to be moved along the bed. Upon the carriage K are guide-plates $L L' L^2$, against which lie the rollers $H H' H^2$ on the ends of the levers $G' G^2$, so that as

the carriage moves away from the head the rollers passing up the inclined faces $l' l'^2$ of the guide-plates cause the levers $G' G' G^2$ to move about their pivots in the head D. I preferably make the position of the rollers $H' H' H^2$ adjustable to the arms $G' G' G^2$, and for this purpose the rollers are carried by short arms $h' h' h^2$, threaded upon the threaded projections or spindles h^3 of the arms $G' G' G^2$. Thus by screwing the arms upon the projections h^3 the position of the rollers will be varied.

The die-boxes E are provided with rollers M, with which the faces of the cams $G^3 G^4 G^5$ come in contact. Each of the die-boxes E has in it a groove, one side of which is undercut. The dies F are beveled to fit into this groove, being there retained by plates E', secured by bolts and nuts $E^2 E^3$ in the manner shown in Figs. 6 and 7. With this arrangement the position of the dies F in the die-boxes can be accurately adjusted by means of set-screws F', the dies being then clamped in position by means of plates E'. The die-boxes can move radially, being guided by plates E', the inward radial movement being brought about by the cams $G^3 G^4 G^5$ acting upon the rollers M when the levers $G' G' G^2$ are caused to move as the carriage K travels along the bed. On the return of the carriage the die-boxes and dies are caused to move radially outward by means of springs N. On the bed C, preferably at the end remote from the head D, is arranged a spindle P, carrying fast and loose pulleys O' and O. Upon the spindle is keyed a pinion P', which engages with a toothed wheel P² on a spindle P³, which carries a pinion P⁴, engaging with the rack K' on the carriage K. The spindle P also carries two smaller fast and loose pulleys P⁶ P⁵.

A plate R upon the bed C serves to retain the rack K' in position. Upon the end of the bed between the two pairs of fast and loose pulleys is situated a plate or bracket R', which supports a plate R², carrying guide-pins R³. Plates R⁴ R⁵, slotted to allow the passage of the guide-pins R³, are arranged so as to slide upon the plate R², these sliding plates carrying at their ends the belt-shifting forks R⁶ R⁷ and being kept in place by the plates R⁸ R⁹. The slots in the plates R⁴ R⁵ allow of their being moved a sufficient distance to throw the belts controlled by them in or out of gear.

On a bracket S² beneath the bed C is pivoted at S' a bell-crank lever S, one arm of which is attached to the end of the plate R⁵, the other end being connected at S³ by a chain S⁴ with a footboard S⁵. As will be seen, pressure by the foot on the board S⁵ will cause the lever S to turn about the pivot S', and so shift the position of the belt from the pulley O to the pulley O'.

Upon the back of the carriage K is a projection K², slotted at K³, to which is adjustably attached, by bolts passing through the

slot K³, a plate K⁴. The latter is curved or cam-shaped and arranged to come in contact with a roller R¹⁰, upon the plate R⁵. The plate R⁴ carries an arm R¹¹, at the end of which is a roller R¹², Fig. 1, against which the curved plate K⁴ also comes in contact, thus bringing about the shifting of the belt from the fast pulley O' to the loose pulley O and a corresponding movement of the belt from the loose pulley P⁵ onto the fast pulley P⁶, the latter belt being arranged to drive the mechanism, and consequently the carriage, in the opposite direction, giving a quick return. The arm R¹¹ on the plate R⁴ is extended on the side of this plate remote from the roller R¹², this extended part carrying a roller R¹³, with which a plate K⁵, carried on the end of the rack K' or otherwise connected to the carriage K, comes in contact when the carriage is returning, the effect being to shift the reversing-belt from the fast pulley P⁶ onto the loose one, P⁵. In order to start the mechanism again, the belt must be shifted by means of the lever S from the loose pulley O onto the fast pulley O' in the manner previously described.

The carriage K is provided with nippers T, of suitable construction, for nipping the end of the wire to be drawn. The nippers are connected to the carriage K by a bolt passing through a slot T' in the latter, this arrangement allowing of the position of the nippers to be varied relatively to the head.

The plate K⁴, as above described, can be adjusted so as to regulate the moment at which the drawing process is to cease.

The levers $G' G' G^2$ are controlled by springs in order to keep the rollers $H' H' H^2$ upon their respective guide-plates. The arrangement of the spring for controlling the rod G is as follows: A rod D², attached at one end at D' to the head D, passes across the lever G, and its opposite end is connected with a rod D³, which is attached to one end of a spring D⁵, whose opposite end is attached to a rod D⁶, which is secured to a ring D⁶ on the base A. Thus the tendency of the spring D⁵ is to normally retain the lever G in the position represented in Figs. 1 and 8; but when said lever has been raised under the action of the inclined face of the plate L during the forward movement of carriage K and the said carriage is on its return movement the said spring will draw down upon the lever and cause it to assume its normal position when the inclined face of plate L has freed the roller H. A pin D⁵ on lever G prevents rod D² from slipping. The side levers $G' G^2$ are controlled by means of rods V and V', which are pivoted at V² on base A, and said rods are connected beneath bed C by a spring V³, the tendency of which is to normally draw the rods toward each other. The upper ends of the rods are forked and engage with pins V⁴ V⁵ on the levers $G' G^2$. Thus when the carriage K is making its return movement the spring by acting to draw the rods toward

each other causes the latter to force the levers $G' G^2$ into their normal position (represented in Fig. 3) as soon as the inclined faces of the plates $L' L^2$ have freed the rollers $H' H^2$.

5 In the above description only three dies have been mentioned as being operated by the levers and guide-plates as the carriage moves away and draws the wire through the dies; but, if desired, a fourth die may be employed and operated in the same manner, but
10 preferably this fourth die is fixed.

I claim—

1. In a spoke-drawing machine, the combination with a fixed head carrying radially-
15 movable dies, of a movable carriage, bearing guide-plates $L' L^2$, levers pivoted on the head adapted to be operated by the plates and cause the dies to converge as the carriage moves away from the head and draws the wire
20 through the dies substantially as described.

2. In a spoke-drawing machine, the combination with a fixed head, movable die-boxes carried thereby and provided with rollers and dies carried by the die-boxes, of levers $G' G^2$
25 pivotally connected at one end with the head and having cam portions at the pivoted end adapted to bear against the said rollers, rollers $H' H^2$ at the opposite end of the levers, the position of the rollers relatively to the
30 levers being adjustable, a movable carriage, guide-plates $L' L^2$ carried by the carriage and having inclined faces against which the rollers are adapted to bear to effect the inward movement of the die-boxes and dies,
35 springs arranged to move the die-boxes and dies outwardly when the cam portions of the levers are not acting upon the rollers of the die-boxes, and mechanism for reciprocating the carriage.

40 3. In a spoke-drawing machine, the combination with a head carrying dies, of a mov-

able carriage, a plate K^4 carried by the carriage, a main driving-shaft, two sets of fast and loose pulleys thereon, mechanism intermediate the driving-shaft and the carriage
45 for reciprocating the latter, a plate carried by the carriage and having pins, belt-shifting plates having slots in which the said pins engage, a roller on one of the belt-shifting plates, an arm on the other plate, rollers on the ends
50 of the latter arm and a plate on the carriage adapted to operate upon one of the latter rollers when the carriage is making a return movement, all arranged for coöperation substantially as described.

4. In a spoke-drawing machine, the combination with a head carrying movable dies, of a movable carriage, levers pivotally connected
55 at one end with the head, rollers carried by the levers and plates on the carriage having inclined faces adapted to operate upon the rollers as described, and cams arranged to be
60 operated by the levers when the latter are operated, to effect the movement of the dies as set forth.

5. In a spoke-drawing machine, the combination with a head carrying movable dies, of levers pivotally connected at one end with
65 the head and having a threaded extension at the opposite end, an arm threaded upon each of said extensions, a roller carried by each of said arms, a movable carriage, plates carried thereby and having inclined faces adapted to
70 operate upon the rollers, as set forth.

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

LOUIS BOUET.

Witnesses:

THOMAS HARVEY,
JOHN ALBERT WILSON.