

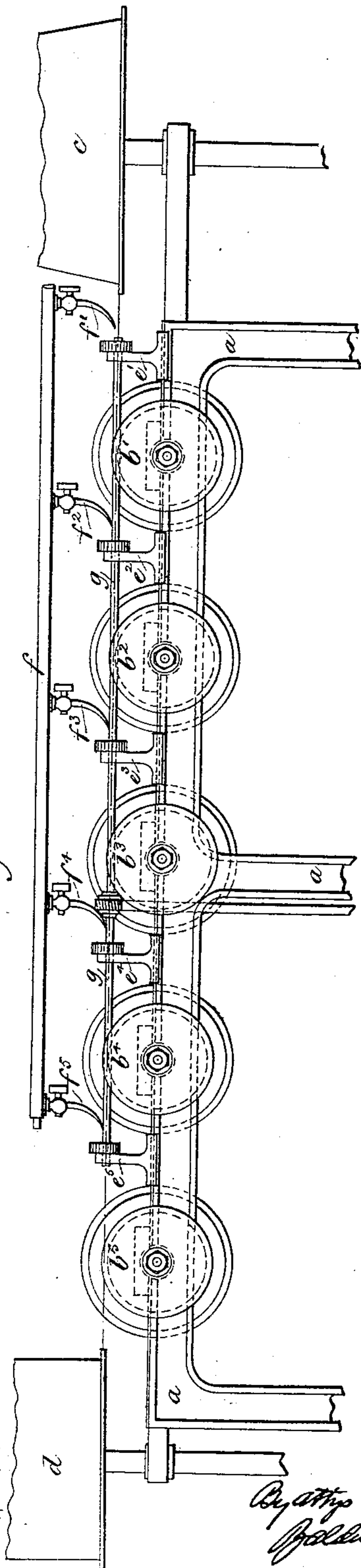
(No Model.)

S. H. BYRNE.
APPARATUS FOR DRAWING WIRE.

No. 353,663.

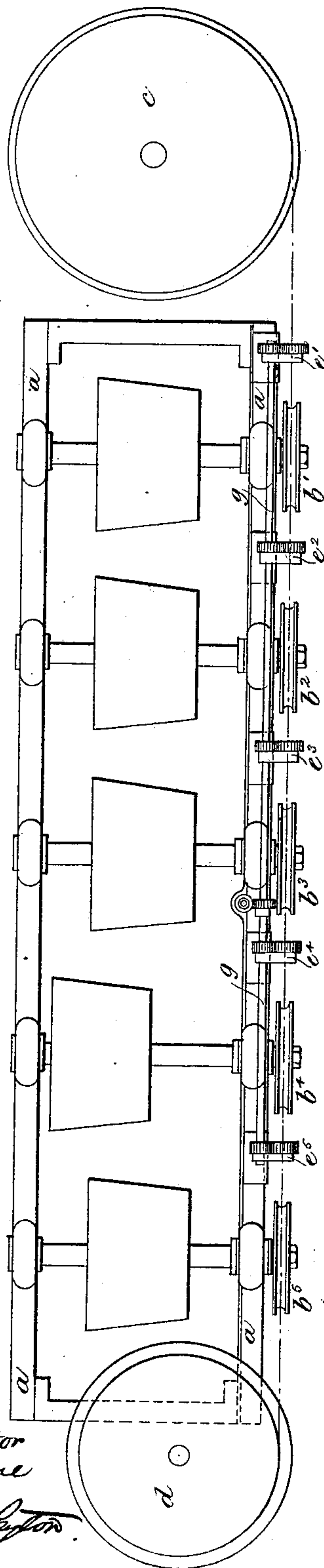
Patented Dec. 7, 1886.

Fig. 1.



Witnesses.
B. DeLong
A. W. S. Hunt

Fig. 2.



Inventor
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UNITED STATES PATENT OFFICE.

SAMUEL HENRY BYRNE, OF BRIGHOUSE, COUNTY OF YORK, ENGLAND.

APPARATUS FOR DRAWING WIRE.

SPECIFICATION forming part of Letters Patent No. 353,663, dated December 7, 1886.

Application filed July 15, 1885. Serial No. 171,688. (No model.) Patented in England January 30, 1885, No. 1,359; in France July 8, 1885, No. 170,028; in Belgium July 9, 1885, No. 69,542; in Germany July 11, 1885, No. 34,758, and in Austria-Hungary October 9, 1885, No. 26,402.

To all whom it may concern:

Be it known that I, SAMUEL HENRY BYRNE, a subject of the Queen of Great Britain, residing at Brighouse, in the county of York, England, wire-manufacturer, have invented certain new and useful Improvements in Apparatus for Wire-Drawing, (for which I have secured Letters Patent in Great Britain, No. 1,359, dated January 30, 1885; in Austria-Hungary, No. 26,402, dated October 9, 1885; in Germany, No. 34,758, dated July 11, 1885; in France, No. 170,028, dated July 8, 1885, and in Belgium, No. 69,542, dated July 9, 1885,) of which the following is a specification.

This invention has for its object improvements in apparatus for wire-drawing.

My invention is especially applicable when drawing wire at one operation through a series of rotating dies, as is described in the specification of a former patent granted to me, No. 319,556, June 9, 1885; but it is also applicable when drawing wire in other ways.

The invention has reference to the lubrication of the wire as it passes through the dies. I provide a pipe which passes to each die, and has a nozzle adapted to throw a jet of liquid into the eye of the die. Stop-cocks are provided to stop the flow of liquid when the machine ceases to work. I employ in this manner a lubricating-liquid prepared by dissolving fatty matter by the aid of an alkali. I find soft soap dissolved in water to be very suitable. I supply this solution from an elevated cistern or in other convenient manner under suitable pressure.

In order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is a side elevation, and Fig. 2 is a plan with some parts omitted, indicating the arrangements of the machine which I employ.

a is the frame of the machine. A length of framing sufficient to carry five dies is shown; but in practice I usually make the machines sufficiently long to receive ten or twelve dies.

The frame a carries the bearings for the axes of the pulleys b' , b^2 , b^3 , b^4 , and b^5 , and by suit-

able driving-gear these axes can be so driven as to give any desired surface-speeds to the peripheries of the pulleys.

c is a drum, also carried by the frame, and capable of turning freely. Upon it is placed the wire as it is brought to the machine, and the wire unwinds from this drum as it is drawn forward through the dies. d is another drum, on which the wire is wound as it comes from the dies. The axis of this drum is driven in order that the drum may wind up the wire as it is delivered to it.

e' , e^2 , e^3 , e^4 , and e^5 are brackets on the frame carrying the dies. The dies consist of perforated jewels or minerals. (The minerals known as "carbonate" and "bolas" are very suitable.) The minerals or stones are set concentrically in a metal disk, and this in turn is set in a holder which is provided with a hollow axis, through which the wire passes. The holder in each case has spur-teeth upon its periphery, which engage with corresponding teeth upon a pinion on an axis, g , which is slowly rotated in order to impart a continuous rotary motion to the dies while the machine is in action. In all these features the machine resembles that for which a patent has already been granted to me, No. 319,556. The wire passes into the machine from the drum c first through the die on the bracket e' , thence once around the pulley b' , next through the die at e^2 , and to the pulley at b^2 , and so on until it arrives at the receiving-drum d . The surface-speeds of the pulleys b' , b^2 , b^3 , b^4 , and b^5 are carefully adjusted to accord with the extensions of the wire resulting from its passage through the dies.

The novel feature is the lubricant-supplying pipe f , the parts in connection therewith, and the use made of the same. This lubricant-supplying pipe receives the lubricant in a suitable and obvious way—as by way of a pipe connecting it with a cistern (not shown) sufficiently elevated to insure the forcible exit in jets of the lubricant from the nozzles f' , f^2 , f^3 , f^4 , f^5 , with which the pipe f is supplied. These nozzles are provided with stop-cocks. The nozzles, of which the openings may be an eighth of an inch in diameter, are curved and so di-

rected that the streams of liquid issuing from them impinge in each case at the eye of the die. The liquid which I have found most suitable for the lubrication of the dies or for application to the dies in the manner described is prepared by boiling one part of soft soap with thirty parts of water until perfect solution is obtained.

Beneath the pulleys b^1 , b^2 , b^3 , b^4 , and b^5 a trough or troughs are provided, in which the said pulleys are immersed nearly up to their axes. This trough, to avoid confusion, is not represented in the drawings. It catches the liquid issuing from the jets after it has impinged upon the dies. This liquid is returned to the cistern in any convenient manner. The dies which I employ in preference to all others have the eyes formed in the mineral known as "bolas" or "pea-bort." It is a form of carbon, and is found in the beds which also yield diamonds. The shape it takes is that of pea-like balls, either clear or more or less colored. The eye is drilled in the bolas in the same way as diamonds and other jewels have heretofore been drilled for wire-drawing, and the stone is in like manner set firmly in a metallic setting.

In place of forming the eye of the die in bolas, it may with great but not equal advantage be formed in the mineral known as "carbonate" or "carbonado," which also is a well-known form of carbon.

My invention is applicable not only to the drawing of wire of iron and steel, but also to drawing wire of copper or brass, and especially fine wire. Wire of any metal from which wire is usually made, and wire of various sizes, may be produced in accordance with my invention.

The method of lubricating the die by a jet of liquid directed upon the eye, although especially advantageous when drawing at one operation through several rotating jewel or stone dies, is also useful wherever jewel or stone dies are employed.

I claim as my improvements in wire-drawing and in apparatus employed therein—

1. The combination of a die through which the wire passes, the lubricant-supplying pipe, and the nozzle connected with said pipe and directing the lubricant-jet to the eye of the die, substantially as and for the purpose set forth.

2. The combination of the series of rotating dies through which the wire passes, the lubricant-supplying pipe, and the series of nozzles directing the lubricant in jets to the eyes of the dies, substantially as and for the purpose set forth.

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