

J. & E. WOODS.

Machines for Drawing Wire.

No. 144,940.

Patented Nov. 25, 1873.

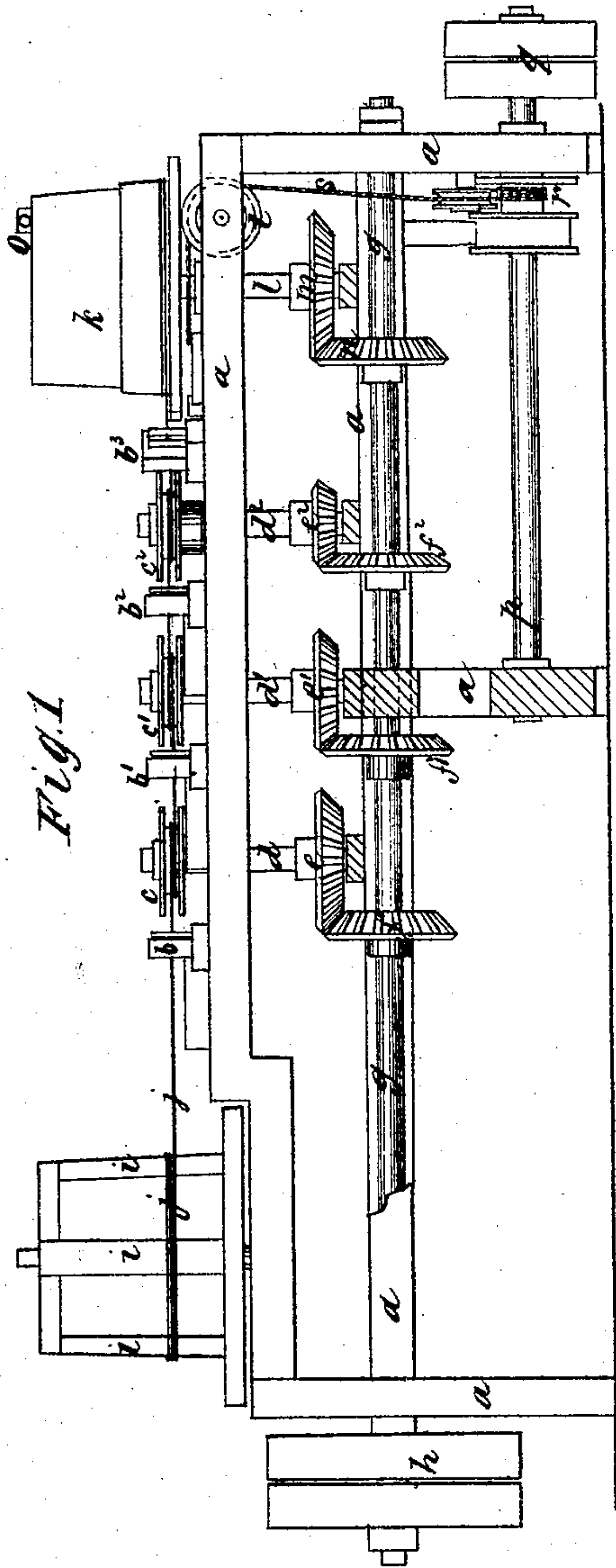


Fig. 1

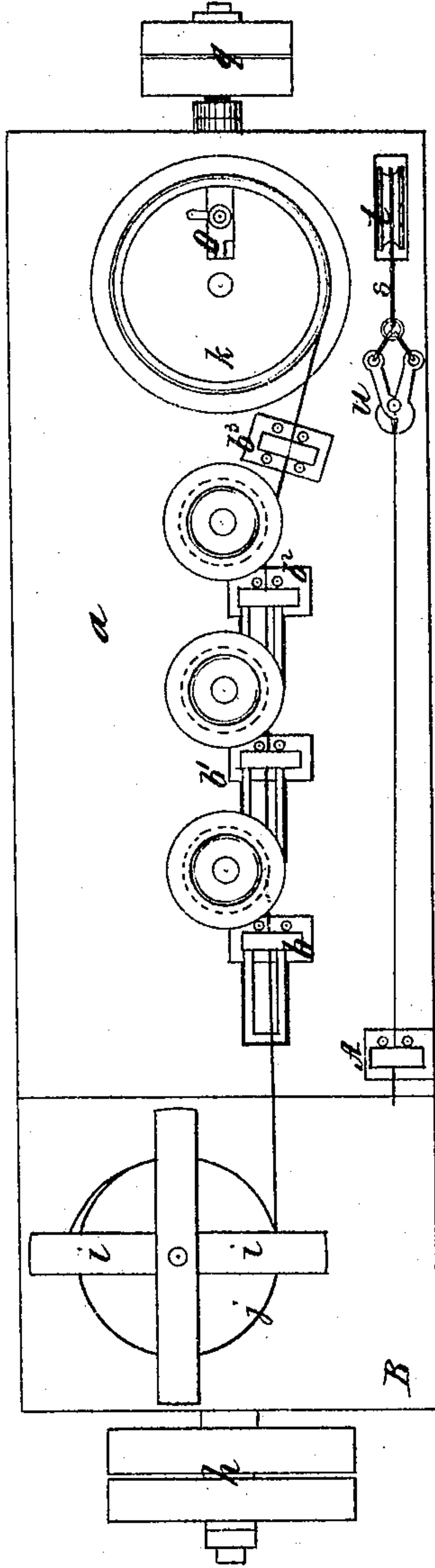


Fig. 2

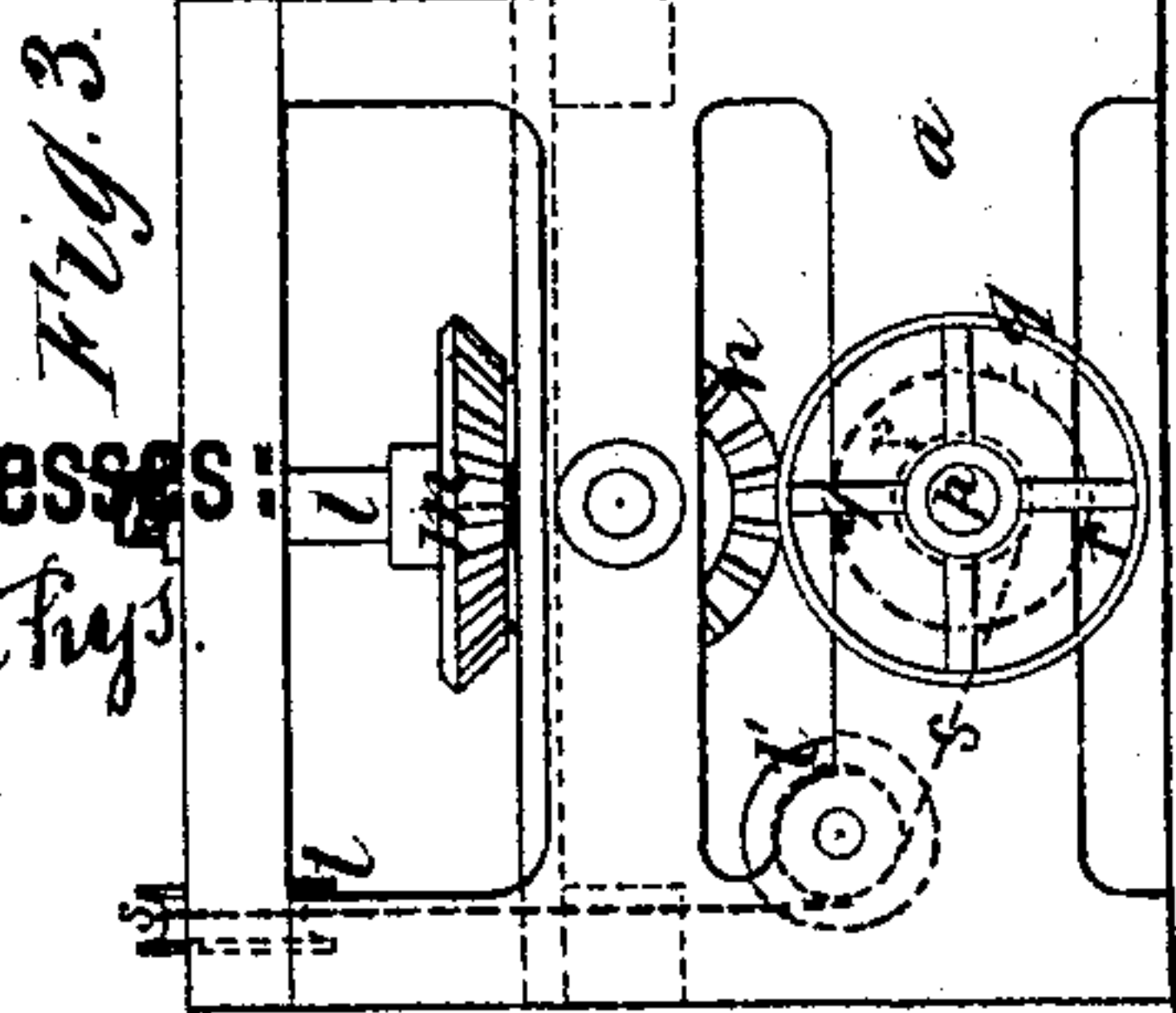


Fig. 3

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# UNITED STATES PATENT OFFICE.

JOSEPH WOODS AND EDWIN WOODS, OF WARRINGTON, GREAT BRITAIN.

## IMPROVEMENT IN MACHINES FOR DRAWING WIRE.

Specification forming part of Letters Patent No. 144,940, dated November 25, 1873; application filed September 22, 1873.

*To all whom it may concern:*

Be it known that we, JOSEPH WOODS and EDWIN WOODS, of Warrington, in the county of Lancaster, Great Britain, wire-drawers, have invented certain Improvements in Apparatus Employed in Drawing Wire, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a longitudinal view of the apparatus we employ; Fig. 2, a plan view, and Fig. 3 an end view in elevation.

The frame-work is shown at *a*, upon which there is fixed a series of draw plates or dies, *b b<sup>1</sup> b<sup>2</sup> b<sup>3</sup>*, of the usual construction. Between these are a series of pulleys, *c c<sup>1</sup> c<sup>2</sup>*, mounted upon shafts *d d<sup>1</sup> d<sup>2</sup>*, turning in bearings carried by the frame-work, and provided at their lower ends with bevel-pinions *e e<sup>1</sup> e<sup>2</sup>*, in gear with other pinions, *f f<sup>1</sup> f<sup>2</sup>*, mounted upon a shaft, *g*, which is provided at one end with the fast and loose pulleys *h*. At *i* is the ordinary disk or fusee which carries the wire *j* to be drawn, and which, as shown, is free to rotate; but it may be driven, if desired. At *k* is the winding-on drum or block, carried by the shaft *l*, which is driven by means of the bevel-pinions *m n*, the latter being mounted on the main shaft *g*.

On commencing operations, the end of the wire is led from the disk or fusee *i*, and drawn through the first plate or die *b*, after which it is lapped a number of—say, three—times around the pulley *c*; then through the second die or plate *b<sup>1</sup>* and around the pulley *c<sup>1</sup>*; then through the third plate or die *b<sup>2</sup>* and around the pulley *c<sup>2</sup>*, after which it is drawn through the fourth plate or die *b<sup>3</sup>*, and conducted to the block *k*, to which it is secured by the usual clamp *o*.

We will for the present assume that this drawing through of the wire has been effected by pinchers or other such apparatus used in any ordinary manner; but we will hereafter describe an apparatus which we have designed for that purpose.

The apertures in the plates or dies *b b<sup>1</sup> b<sup>2</sup> b<sup>3</sup>* are of successively decreasing diameters, the last, *b<sup>3</sup>*, being of the proper size for bringing the wire to the intended gage, and the numbers of teeth in the pinions *e f*, *e<sup>1</sup> f<sup>1</sup>*, *e<sup>2</sup> f<sup>2</sup>*, and *m n* are so proportioned as to cause the pul-

leys *c* and block *k* to rotate at an increased surface speed in proportion to the attenuation of the wire. Motion being now communicated to the main shaft *g*, the pulley *c* will draw the wire through the first plate or die *b*, the pulley *c<sup>1</sup>* through the second die or plate *b<sup>1</sup>*, the pulley *c<sup>2</sup>* through the third die or plate *b<sup>2</sup>*, and the block *k* through the fourth plate or die *b<sup>3</sup>*, the numbers of teeth in the pinions being, as explained, in such proportions as to enable the pulleys *c c<sup>1</sup> c<sup>2</sup>* and block *k* to take up the increasing length of wire. Instead of the pulleys *c c<sup>1</sup> c<sup>2</sup>* being of the same diameter, arranged to be driven at different speeds as regards their revolutions, they might be of diameters increasing toward the block *k*, in which case the series of bevel-pinions might be furnished with equal numbers of teeth; further, instead of one pulley being used for each draw plate or die and the wire wound around such pulley, a series of small pulleys (say, three) might be employed, the wire passing alternately under and over them, so as to provide sufficient surface for holding contact with the wire. The surface speeds of the pulleys and block will be required to be varied in practice for obvious reasons, such as when drawing wire of iron, steel, or brass; but the adjustment of the said pulleys and block, so as to provide a correct surface velocity, will be simple to practical wire-drawers.

We will now proceed to describe a method which may be adopted for preparing a fresh coil of wire to be drawn, as above described.

At *p* is a shaft carried by the frame-work, and provided with fast and loose pulleys *q*. Upon this shaft is a drum, *r*, to which is attached one end of a chain, *s*, after which it passes over guide-pulleys *t*, and is attached at its other end to a pair of nippers, *u*. When it is desired to lead the end of a fresh coil, a counterpart of the die *b* is placed in the position marked *A*, and the end of the said coil, (which is placed in any required situation,) having been pointed as usual, is passed through the said die or plate. The driving-strap now being on the loose pulley, the nippers *u* may be drawn forward and caused to grasp the projecting end. The driving-strap is now placed on the fast pulley, by which means the chain *s* becomes wound upon the



drum  $r$ , and the nippers  $u$  are drawn forward. When a sufficient length of wire has been drawn forward to enable it to be coiled upon the pulley  $c$ , the plate or die  $A$  is placed farther back, say at  $B$ , and a counterpart of  $b^1$  secured in its place, through which the wire is drawn, as above described, leaving in like manner a length to be coiled upon the pulley  $e^1$ , and so on through the series; but, in practice, it will generally be found sufficient to employ the chain  $s$  for two dies only, the wire being drawn through the others by hand-gear.

The above-described operations are performed while the wire is being drawn, as above described, and when that operation is completed the dies or plates  $b$   $b^1$   $b^2$  are re-

moved, and their counterparts, with the wire drawn through them, substituted, the successive lengths above mentioned being coiled around the pulleys  $c$   $c^1$   $c^2$ .

We have above shown and described four plates or dies; but two, or more than four, may be employed.

We claim as our invention—

The series of two or more dies, with intervening drawing-pulleys moving at increasing surface speeds, substantially as and for the purpose hereinbefore set forth.

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