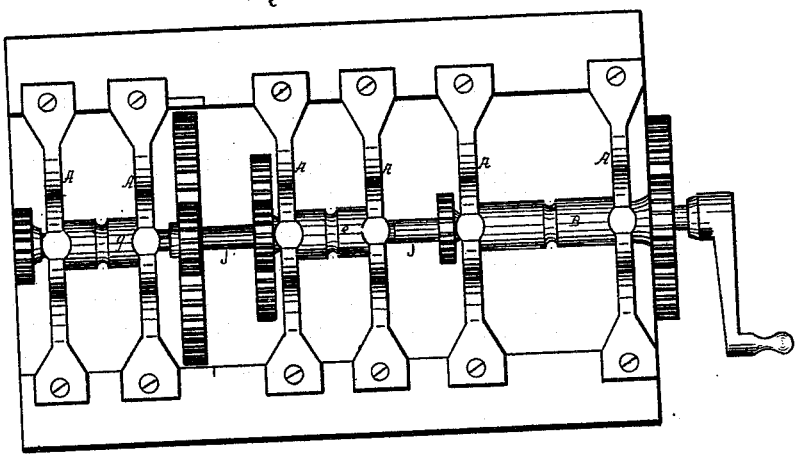
D. SHAW & D. SPENCE.
Wire-Rolling Machine.

No. 202,670. Patented April 23, 1878.

fig 1



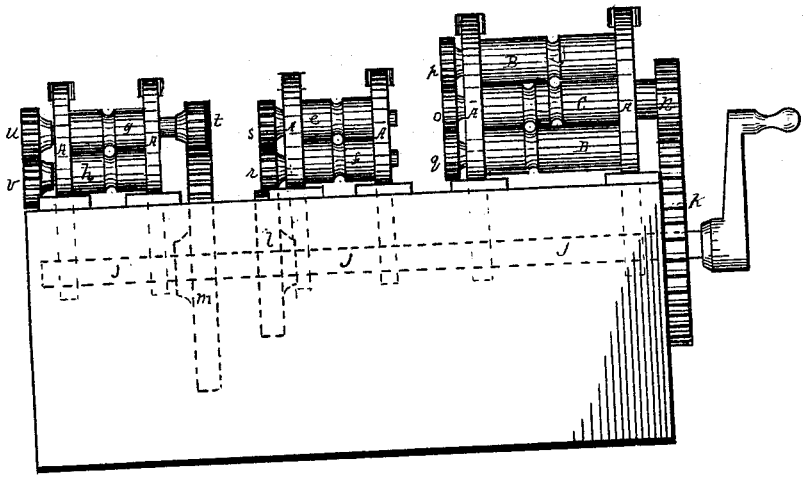
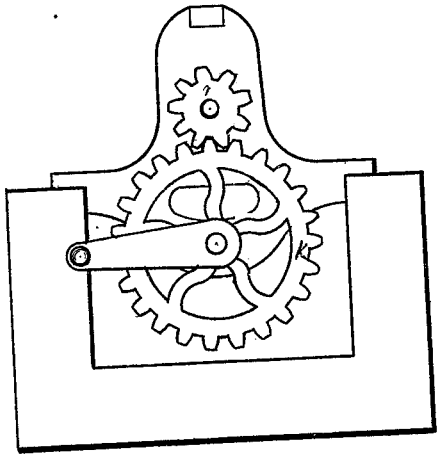


fig 2

fig 3



Witnesses
A. J. Davis
James I. Johnston

Inventor
David Shaw
David Spence
By A. & Johnston
Atty

UNITED STATES PATENT OFFICE.

DAVID SHAW AND DAVID SPENCE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN WIRE-ROLLING MACHINES.

Specification forming part of Letters Patent No. **202,670**, dated April 23, 1878; application filed November 1, 1877.

To all whom it may concern:

Be it known that we, DAVID SHAW and DAVID SPENCE, both of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machines for Rolling Wire; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Our invention relates to that class of machines for rolling wire in which the various sets of rolls employed are adapted to rotate with increasing rates of speed; and it consists in the combination and arrangement of rolls and gear-wheels with the main driving-shaft, as will be hereinafter fully described in connection with the drawing, and specifically pointed out in the claim.

In the drawing, A designates the housings, in which these rolls are suitably mounted. As shown in Figure 2, they are arranged in pairs, C D constituting the first pair or set; *e f*, the second; *g h*, the third. This arrangement of pairs may, of course, be continued, if desirable. Below these sets or rolls we locate a shaft, *j*, upon which are mounted the gear-wheels for imparting motion to the said rolls.

It is desirable that the second set of this series of rolls should rotate with a greater rate of speed than the first, that the third should have an increase of speed over the second, and so on, so that the slack caused by the elongation of the metal as it is rolled will be taken up, and thereby the buckling and twisting of the same avoided. It is also desirable to avoid the friction which is incident to numerous rolls, which are usually found arranged in one set, and also to provide such arrangement of rolls and gearing that the wire can be passed from one set to another without being suddenly bent at an angle to the grooves through which it passes.

Hence, we operate the first set, C D, through the medium of a gear-wheel, *k*, upon shaft *j*, a gear-wheel, *n*, upon the axis of the upper roll C, and small gear-wheels *o q*, respectively, mounted upon the axes of rolls C D. As this pair of rolls is designed to have the shortest rate of speed, we form the wheel *n* somewhat larger than either of the wheels *o q*, in order to counteract the tendency of the large wheel *k* to impart a swift rotation thereto.

It is obvious that the result would be same if the wheels *n* and *k* were both made small; but in view of the arrangement of rolls which follow, it is more practicable to employ wheels having about the relative sizes shown.

As before described, the first gear-wheel, *k*, on shaft *j* engages with a gear-wheel upon the axis of the upper roll C; but in the next pair of rolls the second gear-wheel, *l*, upon shaft *j* intermeshes with a gear-wheel, *r*, upon the axis of the lower roll *f*, this wheel *r* also engaging with a gear-wheel, *s*, of the upper roll *e*. In this way the rolls *e f* will rotate in a direction reversely to that of the rolls C D, so that as the wire passes through the groove between the latter it can be gradually carried up and around in a direction toward the rear of the same, at the same time so inclining toward the second set that it will enter the groove thereof on the other side.

It will be observed that while in the first set of rolls three gear-wheels, *n o q*, are employed, in the second set but two, *r s*, are necessary, and thereby the friction incident to the use of a third wheel is avoided; and, according to our arrangement, no matter how many sets are employed, in every alternate set but two gear-wheels upon the axes of the rolls will be necessary. The gear-wheel *l* is represented as being somewhat smaller than the first wheel, *k*, upon the same shaft, since, as it engages with the small wheel *r*, the rolls will have an increased rate of speed over the first pair, in which, as before explained, the wheels *n k* are, respectively, made larger than the wheels *r l* for purposes of convenience. In the third pair, *g h*, which are arranged to rotate faster than the second pair and in a reverse direction, we employ a gear-wheel, *t*, upon the axis of the upper roll, and two gear-wheels, *u v*, at the other ends of their axes, the wheel *t* intermeshing with a gear-wheel, *m*, upon shaft *j*, which, as shown, is considerably larger than the third wheel, *l*, and hence imparts to these rolls a greater rate of speed.

In connection with the first pair of rolls we propose to employ an upper auxiliary roll, B. This roll has a gear-wheel, *p*, upon its axis, which intermeshes with the gear-wheel *o* of

roll C, and is grooved, as shown in Fig. 2, the roll C being also formed with a corresponding groove, so that the wire may be passed between rolls B C before going between rolls C D in its regular way to the next of the series.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

The herein-described series of rolls arranged in pairs, each pair having two intermeshing gear-wheels, in combination with shaft *j*, and gear-wheels mounted thereon with reference to the said pairs of rolls, and adapted by means of their varying sizes to impart an increase of speed successively to the respective sets of rolls which they operate, the said gear-wheels upon the shaft alternately engaging with a third gear-wheel mounted upon the axis of the upper roll of one pair, and with the lower one of the aforesaid two intermeshing gear-wheels of the next pair, substantially as herein shown and described, and for the purposes set forth.

DAVID SHAW.
DAVID SPENCE.

Witnesses:
A. C. JOHNSTON,
JAMES J. JOHNSTON.