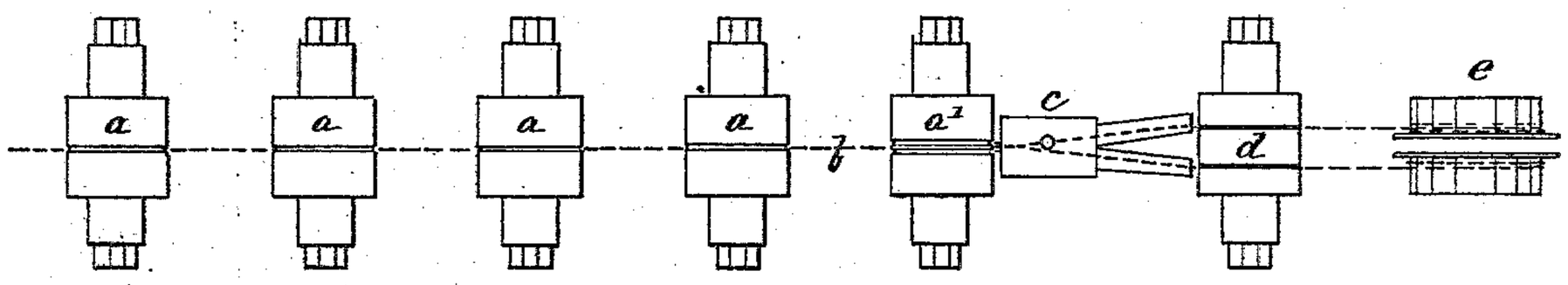
(No Model.)

F. H. DANIELS.

ART OF MAKING WIRE RODS.

No. 283,469. Patented Aug. 21, 1883.

Fig. 1



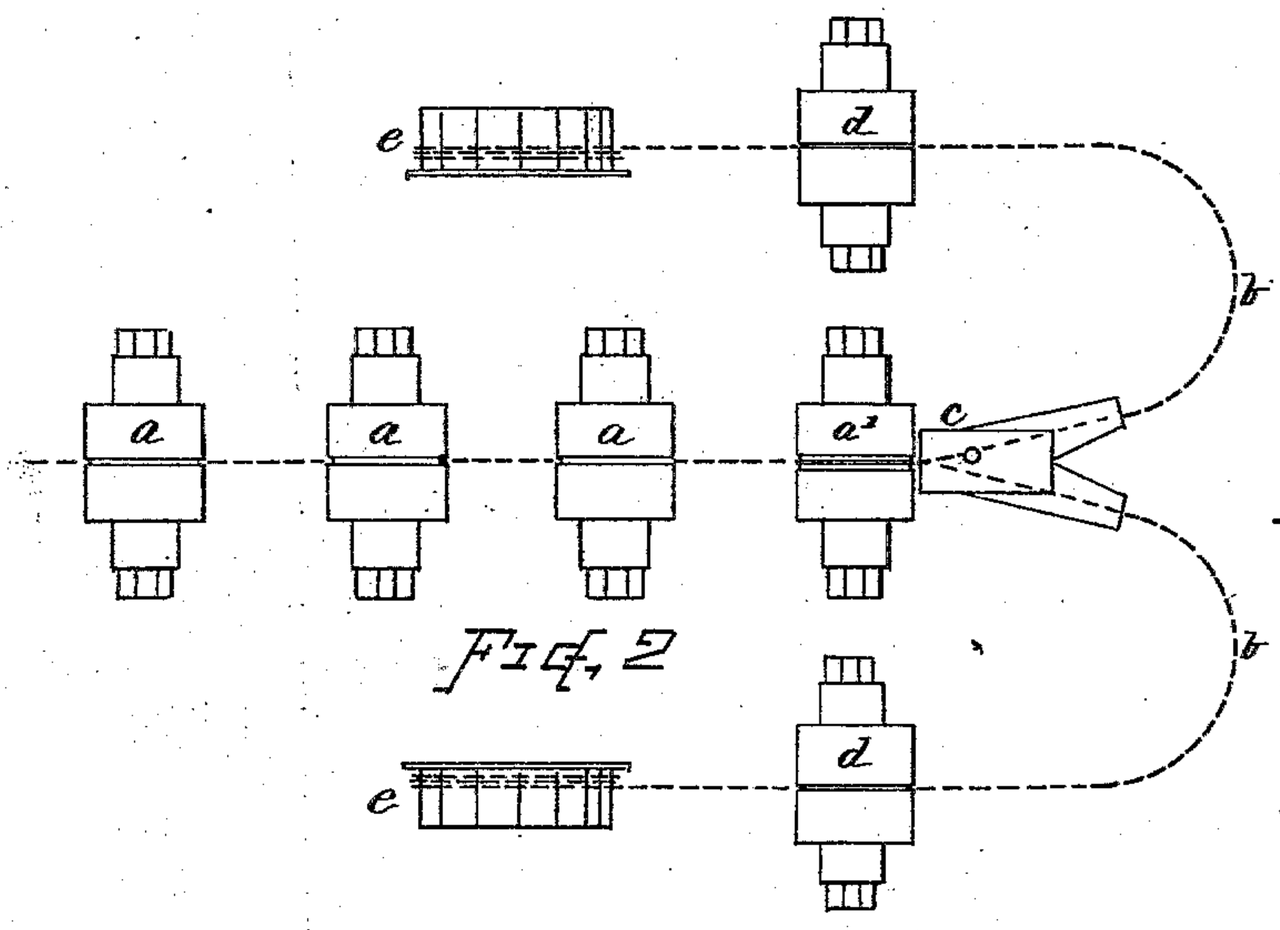


Fig. 2

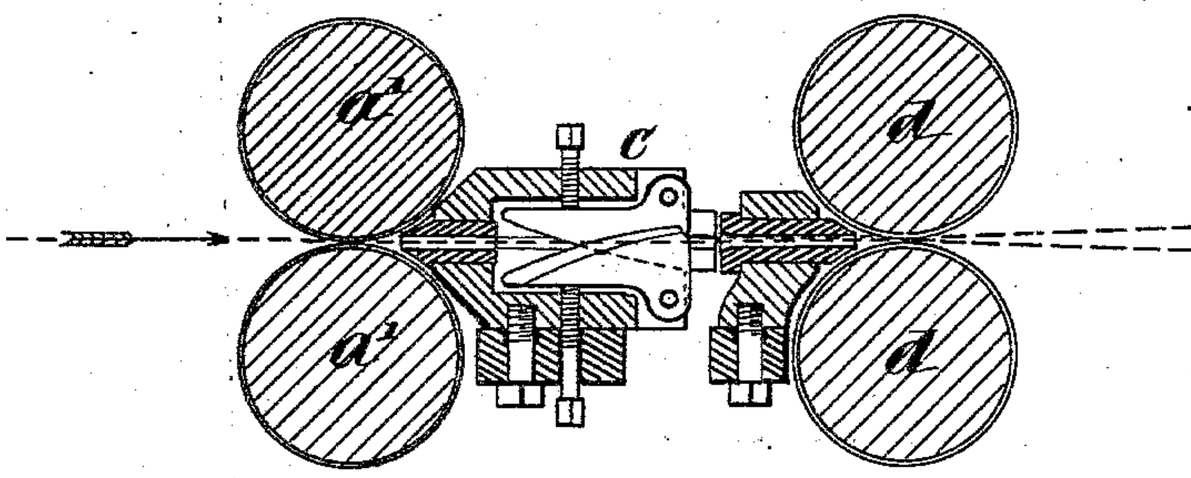


Fig. 3

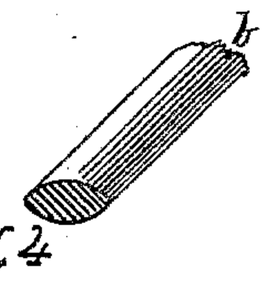


Fig. 4

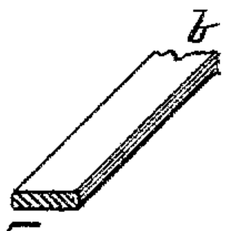


Fig. 5

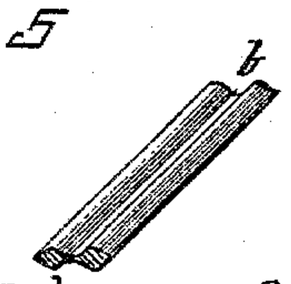


Fig. 6

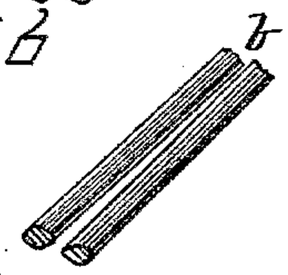


Fig. 7

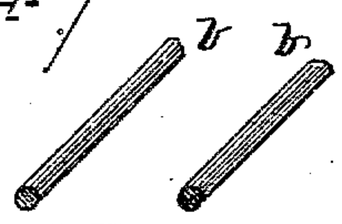


Fig. 8

WITNESSES.

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INVENTOR

Fred H. Daniels

By Chas. A. Burleigh

Atty

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FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

ART OF MAKING WIRE RODS.

SPECIFICATION forming part of Letters Patent No. 283,469, dated August 21, 1883.

Application filed April 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRED H. DANIELS, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvement in the Art of Making Wire Rods; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The object of my present invention is to afford a process or practical method whereby wire rods can be produced by rolling operation of much smaller gage or diameter than it has heretofore been practical to make by the ordinary processes of production; also, to afford a process whereby several wire rods may be simultaneously produced or rolled from a single billet or bar of metal and at a single heat.

The nature of my improved process of forming wire rods of small size consists in reducing the bar by continuous rolling until the sectional area of the partially-reduced rod is nearly the same or but slightly greater than the required sectional area of the finished product, then molding the rod by the following pair or pairs of rolls into a form or shape composed of a series of two or more ribs connected to each other by a thin web, then dividing the rod along the thin webs and directing the separate strands or rib portions through separate grooves or dies that round or form each strand into a separate finished wire rod of the dimension required.

In carrying out my process the best plan now known to me is to employ a continuous rolling-mill fitted near the latter end with means for forming and separating the ribbed rod, and with duplicate guides and dies following for receiving and working the several strands, so that the reduction, separation, and finishing can be accomplished direct from the bar and at a single heat.

For severing the rod into separate strands, any suitable mechanism may be employed. One device which may be employed for the purpose is a pair of stationary shear-blades or sharp jaws, against the interangle of which the rod is forced or drawn by the action of the working-rolls. These shear blades or jaws may be adjustable, so as to be set closer or more open to change the contact-point as any portion of their edges becomes rounded or dulled. The rolls for reducing and finishing the rods may be of the ordinary kind, with dies or grooves of the required size and shape, the guides being constructed in a manner to meet the requirements of the separate rod.

As my improvements in mechanism for working this process form the subject-matter of separate Letters Patent, it will not be necessary to herein describe the devices more fully in detail.

In the drawings I have illustrated the manner of passing the rod through the rolling-mill and the shapes at some of the principal stages of my improved process.

Figure 1 is an outline sketch, indicating the course of the rod through a continuous mill. Fig. 2 is a similar diagram, showing the adaptation in mills of the class known as the "Belgian" mill. Fig. 3 shows my improved shear for separating the rod into independent strands. Figs. 4, 5, 6, 7, and 8 show sections of the rod at different stages of reduction—viz., as partially reduced, as in ribbed condition, as divided into separate strands, and as finished. These sections are drawn to a scale twice the actual size. The form or outline of these shapes or sections can be modified as required to make a round, flat, square, hexagonal, oval, or other shaped wire.

In reference to the drawings, *a* denotes the reducing-rolls; *b*, the wire rod; *a'*, the roll for ribbing the rod; *c*, the shears or dividing device; *d*, the finishing-rolls; *e*, reels on which the finished rods are coiled.

By my process herein described the wire rod remains at a size sufficient to retain a good forging-heat to near the final action, and it is then quickly reduced to several small-sized rods before it has time to become cold and hard. Thus it is practical to produce wire rods several sizes smaller by my process than can be done by the ordinary process of rolling.

My process is adapted for making wire for barbed fencing, telegraph-lines, and similar purposes direct from the rods without the need of drawing the wire after it is rolled, thus

making a great saving in the expense of production, while for fine-drawn wire the rods thus produced are superior, as they require a less number of drawings than a larger rod to reduce them to any given size, and the wire made therefrom is less brittle than corresponding sizes which have passed a greater number of drawings. The process could be worked by reducing the rod to the ribbed condition at one rolling, and then reheating it before it is subjected to the dividing and finishing operations. This method, while it is included within the scope of my invention, does not at present seem to me to be so advantageous and desirable as to complete the entire operation at a single heat and by continuous action.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. The improvement in the art of making wire, which consists in reducing a billet or bar into a rod, composed of a series of ribs connected by thin web, and subsequently dividing the same along the web and forming an independent wire rod of each rib portion.

2. The improved process of forming wire rods by continuous rolling, which consists in reducing the billet or bar, then converting it by rolling into a series of incipient wire rods connected by longitudinal webs, dividing the bar along said webs to form separate rods, and finally rounding up or imparting the finished form to said rods separately, as independent wire rods of small size, as hereinbefore set forth.

Witness my hand this 24th day of April, A. D. 1883.

FRED H. DANIELS.

Witnesses:

CHAS. H. BURLEIGH,

SAMUEL P. PERRY.