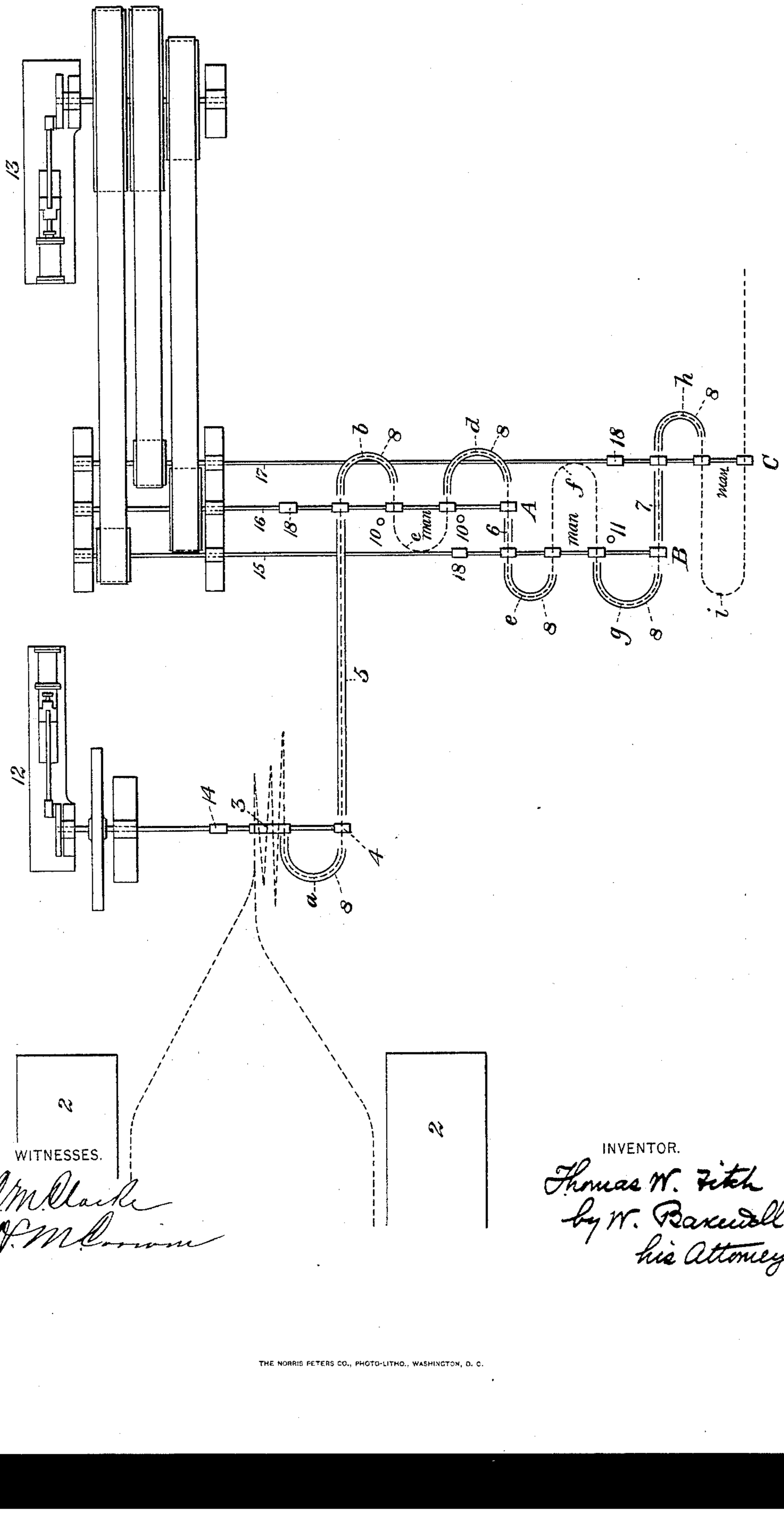
(No Model.)

T. W. FITCH.

WIRE ROD MILL.

No. 435,814. Patented Sept. 2, 1890.



WITNESSES.

D. M. Clarke

H. M. Cousins

INVENTOR.

Thomas W. Fitch

by W. Baxendell Howe

his Attorneys

UNITED STATES PATENT OFFICE.

THOMAS W. FITCH, OF EDGEWOODVILLE, PENNSYLVANIA.

WIRE-ROD MILL.

SPECIFICATION forming part of Letters Patent No. 435,814, dated September 2, 1890.

Application filed July 14, 1890. Serial No. 358,715. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. FITCH, of Edgewoodville, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Wire-Rod Mills, of which the following is a full, clear, and exact description.

My invention has for its object to provide an improved plant or system of rolls for wire-rod mills adapted to afford a mill compact and convenient in arrangement capable of being operated with comparatively little labor.

The invention is illustrated in the accompanying drawing, which shows my improved mill in plan view. This drawing does not illustrate the details of construction of the rolls or of their housings and driving-gear, since these are so familiar to those skilled in the art that minute description and illustration of them would not serve to make the specification more intelligible.

In the drawing, 2 2 are the usual bloom-heating furnaces.

3 is the set of three-high rolls, through which the bloom is passed several times, as indicated in the drawing by the dotted line, which represents the continuous course of the metal through the mill. After its reduction by the billet-train the rod travels in a loop *a* through a set of rolls 4, which, together with the rolls 3, form the billet-train, and thence it passes through a guide-trough 5 to the rolls of the Belgian rod-train. These consist of three parallel lines or trains of rolls A, B, and C, the last pass of each of the trains A and B being connected by a guide-trough 6 7 with the first pass of the next train. Through the train A the rod travels in loops *b*, *c*, and *d*, thence from the last pass of the train A through the trough 6 to the first pass of the train B, then through the train B in loops *e* *f* *g*, and from the last pass of the train B through the guide-trough 7 to the train C, through which it passes in loops *h* *i*. From the last pass of the train C the rod may travel to the reel or other device in which it is coiled or bundled. In its passage through the rolls the rod is converted alternately from a round or square section to an oval section. Thus the loops *a*, *b*, *d*, *e*, *g*, and *h* are square or round in cross-section, and the rod in passing is guided by suitable repeaters 8. The direct passes through the guide-troughs 5, 6, and 7 are oval, and the loops *c*, *f*, and *i* are also oval. Since it is necessary to employ men to attend the oval loops only, the labor required of the man in guiding the rod being to seize it with tongs to shear it off if its end is bad, to loop or reflex it, and to insert it in the next pass, it will be seen that I reduce the number of men to the minimum number permitted by the necessary conditions of operating the mill, adjusting the rolls, &c.

The shears employed by the men in their work I indicate at 10 11, and I have also indicated in the drawing the position of the men who are employed in the work above described.

12 13 are the engines for driving the rolls. The engine 12 may be employed to drive the rolls of the billet-train and may be connected therewith by shafts and the usual pinions 14. The engine 13 may be employed to drive the rolls of the rod-trains and may be connected with the several trains by lines of shafting 15, 16, and 17 and pinions 18. It will be noticed that my arrangement of the rolls is of marked convenience, in that the shafting and pinions do not interfere with each other or with the rod as it travels through the mill. The rolls of the billet-train and the three trains A B C are of such diameter and are so geared as to run at successively greater rates of speed and to put a tension upon the rod in its direct passes 5, 6, and 7. Thus, for example, the rolls of the train A may be arranged to rotate at 1.55 times the speed of the rolls of the billet-train, the speed of the rolls of the train B may be twice the speed of the rolls of the train A, and the speed of the rolls of the train C may be 1.437 times the speed of the rolls of the train B. By driving the rolls of the rod-trains from the same engine I secure beneficial results, because all variations of speed of one train must be accompanied by proportional variations of the other trains. The result is increased ease of working the mill, lessened danger of breakage of the rod, and correspondingly increased safety to the workmen.

The advantages of my invention will be appreciated by those skilled in the art, and need not be indicated further than has been done already in the course of the foregoing description.

I claim—

1. The combination, with the billet-train, of a rod-train comprising parallel series or trains of rolls, through each of which the rod passes in reflexed loops, said series being set relatively to each other so that the rod travels in a continuous or direct pass from the last pass of one series to the first pass of the next, and the rolls being shaped to impart to the rod an oval section in its continuous passes and alternate oval and square or round sections in the looped passes, substantially as and for the purposes described.

2. The combination, with the billet-train, of a rod-train comprising three parallel series or trains of rolls, through which the rod travels in two square or round loops and one oval loop through each of the first two trains, in continuous passes between the last pass of the first train and the first pass of the second train and through the last pass of the second train and the first pass of the third train, and in loops through the third train, substantially as and for the purposes described.

3. The combination, with the billet-train, of a rod-train comprising parallel series or trains of rolls, through each of which the rod passes in reflexed loops, said series being set relatively to each other so that the rod travels in a continuous or direct pass from the last pass of one series to the first pass of the next, the rolls being shaped to impart to the rod an oval section in its continuous passes, alternate oval and square or round sections in the looped passes, and a driving-engine connected with all of said parallel series or trains, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 10th day of July, A. D. 1890.

THOMAS W. FITCH.

Witnesses:

W. B. CORWIN,

H. M. CORWIN.