

(No Model.)

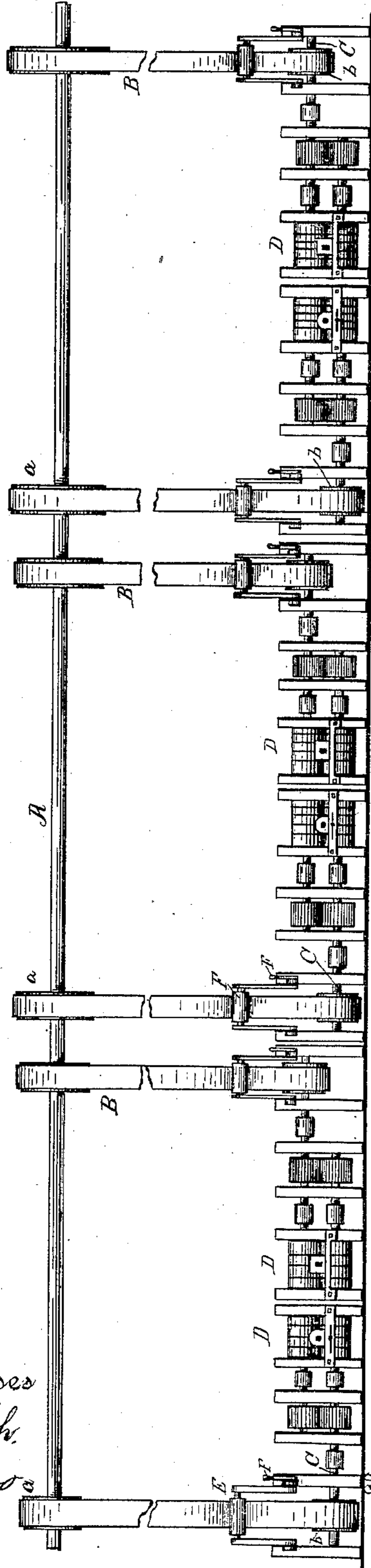
2 Sheets—Sheet 1.

C. B. BEACH.
ROLLING MILL.

No. 370,519.

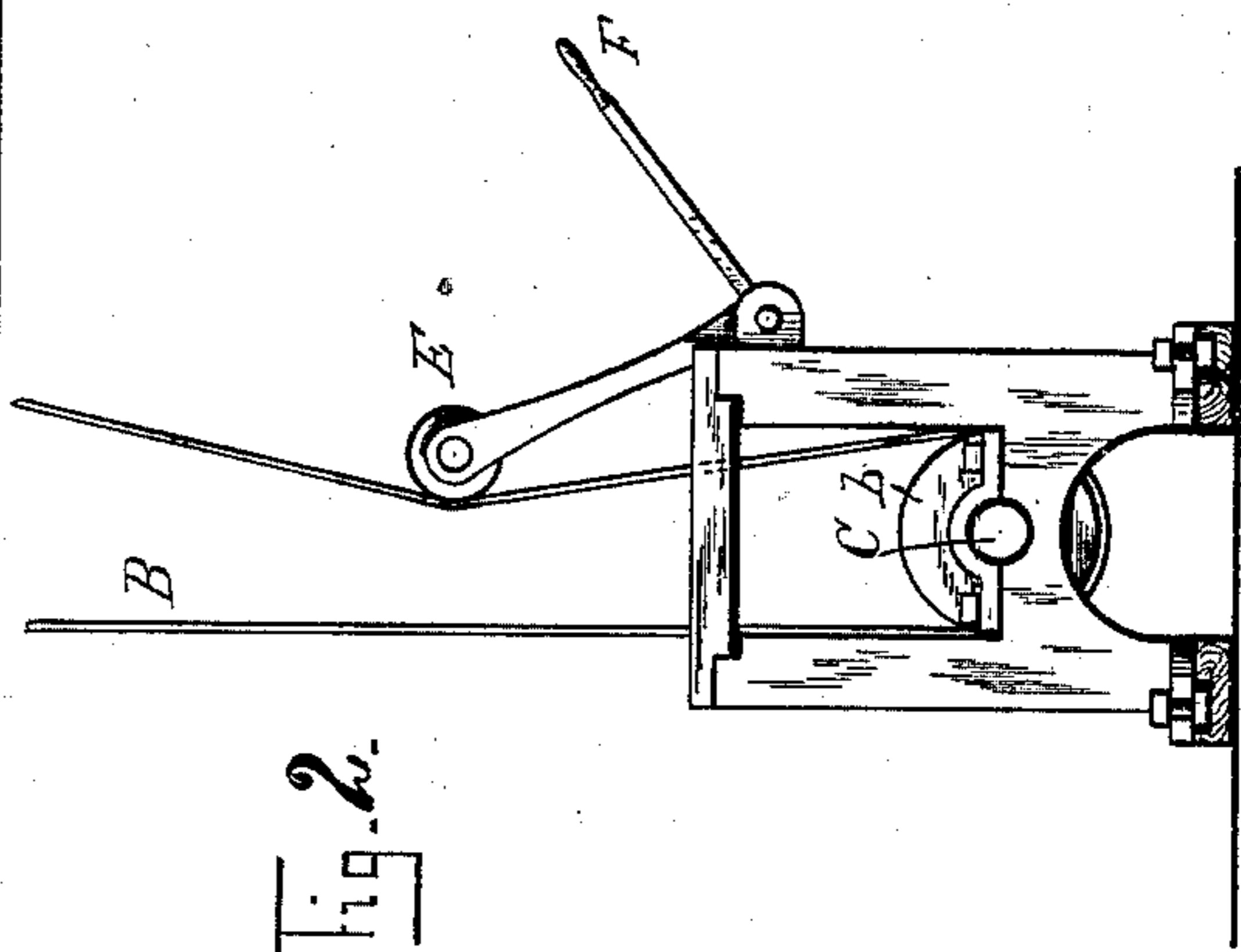
Patented Sept. 27, 1887.

Fig. 1.



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E. J. Climo

Fig. 2.



Inventor
C. B. Beach
By his Attorney
Thos. J. Hall

(No Model.)

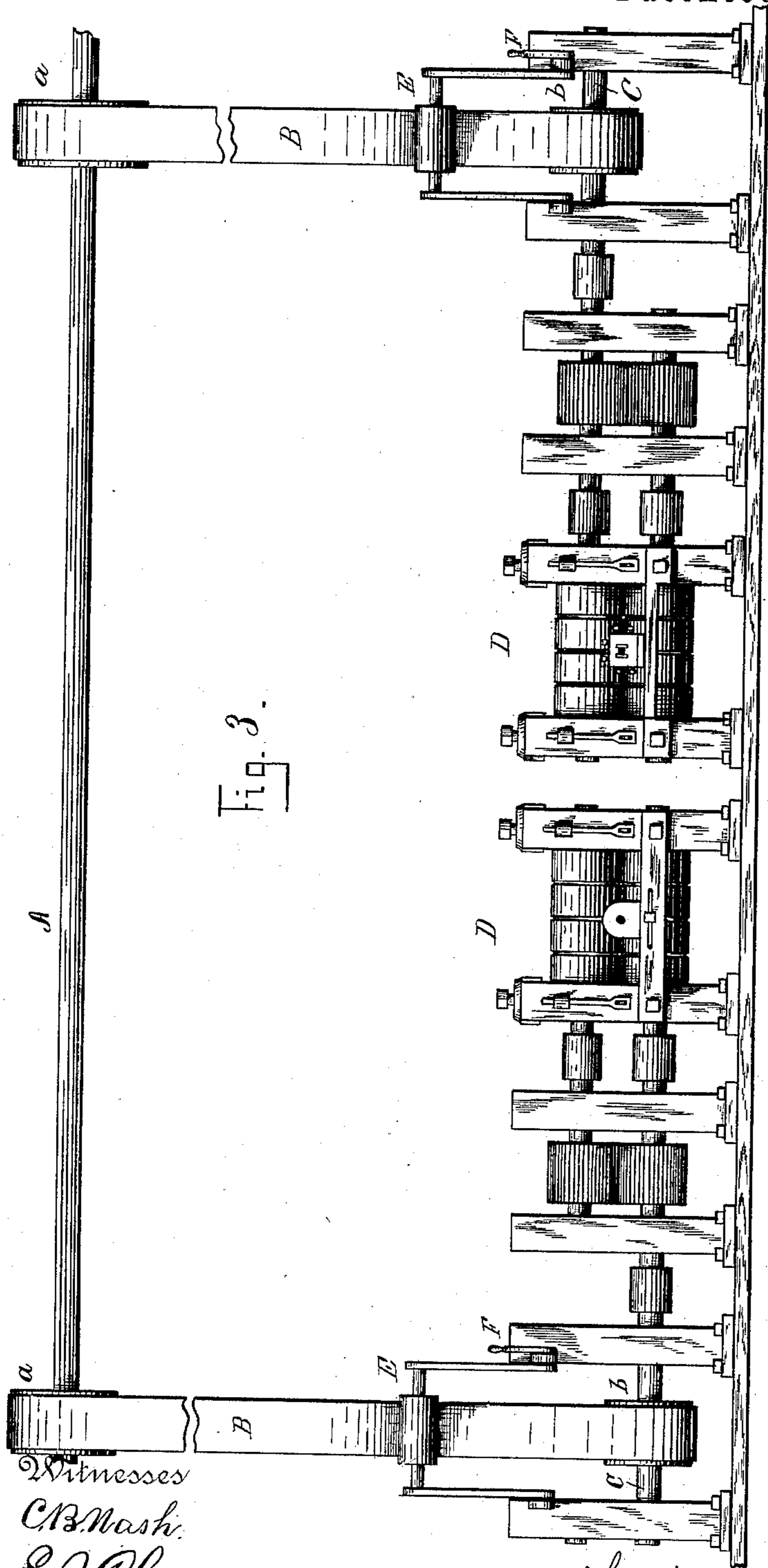
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UNITED STATES PATENT OFFICE.

CLIFTON B. BEACH, OF CLEVELAND, OHIO.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 370,519, dated September 27, 1887.

Application filed June 2, 1886. Serial No. 203,927. (No model.)

To all whom it may concern:

Be it known that I, CLIFTON B. BEACH, a citizen of the United States, residing at Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Rolling-Mills; and I do hereby declare the following to be a description of the same, and of the manner of constructing and using the invention, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, forming a part of the specification, the principle of the invention being herein explained, and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

In the drawings, Figure 1 is a side elevation of a rolling-mill having six stands of rolls embodying my invention. Fig. 2 is a detail view representing an end elevation of any one of said stands of rolls with the upper portion of its belt and the driving-shaft omitted. Fig. 3 is a detail view representing in side elevation a section of the mill, said view being drawn on a larger scale than Fig. 1, and for the purpose of more clearly showing the detail construction of the mill.

Overhead driving-shaft A is provided at suitable points thereon with pulleys *a*. Each said pulley is connected by a depending belt, B, with a corresponding pulley, *b*, on a shaft, C. Each said shaft C is connected with its appropriate stand of rolls D, suitable coupling and pinion mechanism being employed therefor. Each said belt B is a slack belt running loosely about its appropriate pulley *b*, so as not to drive the latter unless its slack be taken up. Each belt is provided with a belt-tightener, E, which latter is connected with a lever, F, for manually operating the latter, said belt-tightener being adapted to vary the friction of each belt with its appropriate pulley *b* by corresponding taking up or letting go of the slack of said belt.

Reference to the detail parts shown in the drawings has been had in the foregoing to avoid any possibility of confusion. It will, however, be understood that said detail parts—namely, each shaft C, together with the corre-

sponding coupling and pinion mechanism—are considered as substantially part of the respective stand of rolls, and hence in the following part of this specification and in the claims the term “stand of rolls” will be understood as inclusive of said incidental parts or their known mechanical equivalents.

The mill is thus constructed with a series of independent stands of rolls located end to end, driven by a single overhead driving-shaft in common for the same by means of a series of belts whose respective slack is taken up by a series of belt-tighteners, the said different stands of rolls being thereby actuated by driving apparatus independent of each other, the rate of speed at which each stand of rolls is driven being dependent upon the amount of slack of its belt taken up by the respective belt-tightener.

The operation of the mill is as follows: The driving-shaft running constantly in rotation, the series of slack belts does not operate the series of independent stands of rolls until the operator, by the appropriate belt-tightener, takes up the slack of the first belt in the series sufficiently to actuate the first stand of rolls in the train to cause the metal to be rolled to be taken into the first roll-pass, and in turn the successive roll-passes have the metal introduced therein, the respective belt-tighteners being appropriately operated in consecutive order. As soon as the mill thus has the metal in reducing operation the entire train should be gradually speeded up to its high capacity. Each loop of the metal in reduction formed, respectively, between the different stands of rolls should then be under constant watch by the operator, and the length thereof controlled by him according to the circumstances of each particular instance. The operator, by adjusting the proper belt-tightener so as to slacken or tighten any one belt, may maintain the loop of metal formed between any two stands of rolls at constant length, and thus all the different loops of the rod formed between the different stands of rolls may be prevented from growing upon the floor of the mill, and may be kept up close to the train of rolls.

As soon as the rolling of any one piece of metal is completed the mill may be immedi-

ately slowed down to receive the next piece of metal.

I have now pending in the United States Patent Office application Serial No. 215,131, 5 filed by me October 2, 1886, said application having as its subject-matter a method of rolling metal, which covers in subordination the use or operation of a rolling-mill constructed, broadly speaking, according to the mill on 10 which this present or herewith application is based, and hence all claim upon said method of rolling is rested in said other application.

I claim—

1. A rolling-mill consisting of the combina- 15 tion of a series of independent stands of rolls, driving-shafting, a series of slack belts connecting the stands of rolls with the driving-shafting, and a series of belt-tighteners, substantially as set forth.

2. The rolling-mill consisting of the combina- 20 tion of the series of independent stands of rolls located end to end, the single overhead driving-shaft in common for the same, the series of depending slack belts respectively connecting the latter with the stands of rolls, and the se- 25 ries of belt-tighteners, substantially as set forth.

3. The combination of two or more independ- ent stands of metal-reducing rolls, driving- shafting, two or more slack belts, and two or 30 more belt-tighteners, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 29th day of May, A. D. 1886.

CLIFTON B. BEACH.

Witnesses:

W. R. PEARSON,
THOS. B. HALL.