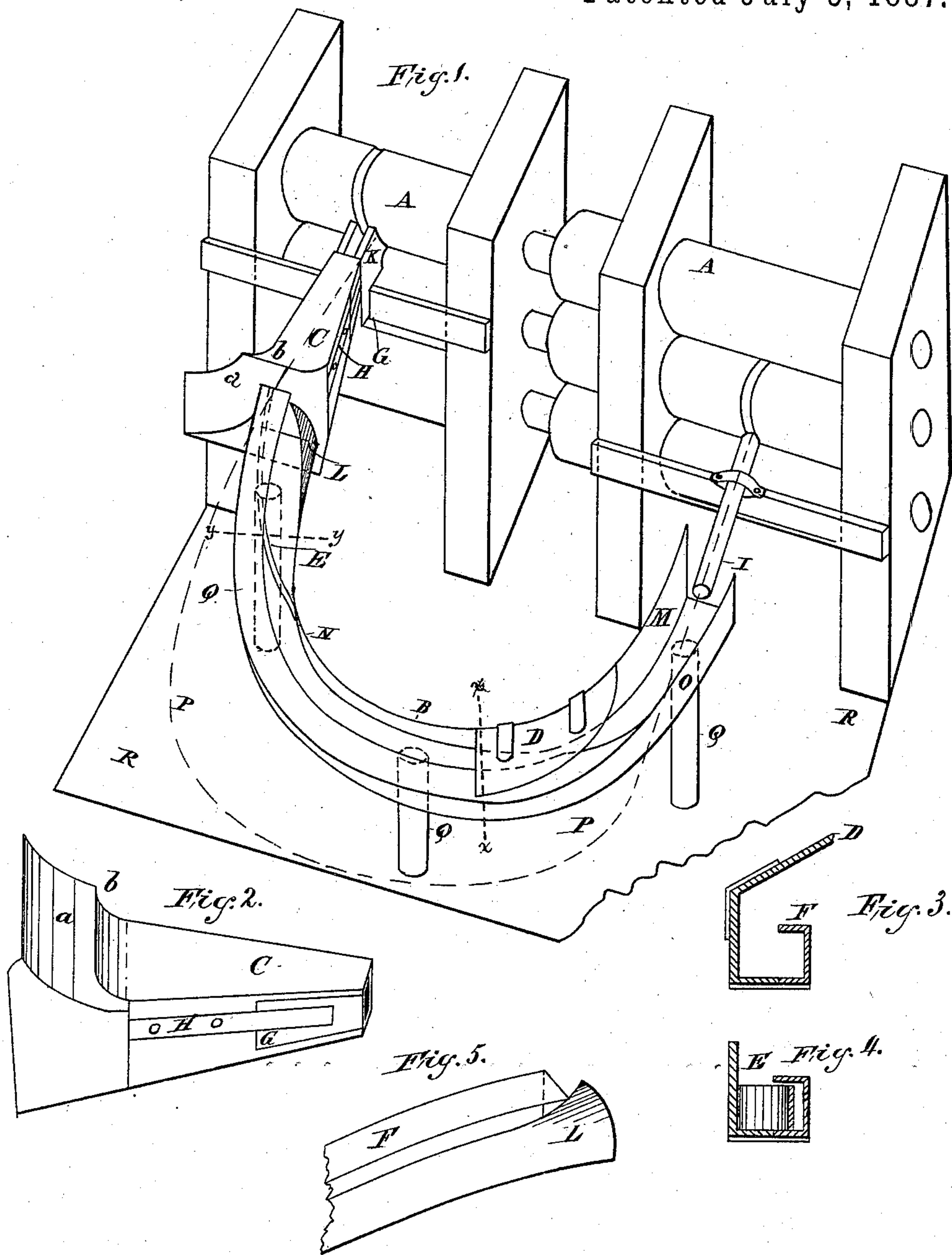


(No Model.)

F. G. TALLMAN.
CONDUCTOR FOR ROLLING MILLS.

No. 366,136.

Patented July 5, 1887.



WITNESSES:

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FRANK G. TALLMAN, OF BEAVER FALLS, PENNSYLVANIA.

CONDUCTOR FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 366,136, dated July 5, 1887.

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To all whom it may concern:

Be it known that I, FRANK G. TALLMAN, of Beaver Falls, county of Beaver, and State of Pennsylvania, have invented certain new and useful Improvements in Conductors or Repeaters for Continuous Rolling-Mills, of which the following is a specification.

Up to the present time a great number of different conductors have been tried to repeat or conduct an oval wire in a continuous mill from one pass to another; but for some reason or other all these various devices heretofore tried have failed.

The object of my invention is to provide a conductor that will conduct an oval from one pass of a continuous mill and deliver into another, said conductor being so constructed that it will take stock from any kind of a guide that a man can catch from and deliver into any kind of a guide that a man can stick the bar into, said conductor being constructed and attached to the floor or the train in such a manner that should it get out of order it can be taken away and a man substituted without stopping the train or interfering with the running, or without even losing a single bar. This enables me to attach this conductor or repeater to any train now built without any expensive or troublesome alterations. This medium is so constructed that as soon as the front end of the bar strikes the receiving-rolls and the loop forms by reason of the delivering-rolls delivering stock faster than the receiving-rolls take it the loop can form and then can free itself from the repeater or conductor, and thereby run out on the floor and keep itself free from knots, tangles, or snarls. By making the inclined or curved surfaces of the funnel-box large and roomy I am enabled to keep this loop free from knots, snarls, &c., and to deliver stock into any number of passes of a given set of rolls by adjusting the position of the repeater or conductor and of the funnel-box. The funnel-box is also constructed with a portion of one side near the delivering end cut away and an adjustable and movable piece put in the place of it, held by a spring or other suitable device. This allows for adjusting the size of the opening, and should a knot be drawn in the side can spring out and thus prevent the breaking of the funnel-box.

In repeaters heretofore tried for the purpose of conducting an oval it has always been thought necessary to provide a twisting-guide to turn the oval up before going into the repeater. This twisting-guide has always been a decidedly troublesome contrivance. It has never been used successfully, and has now been thrown aside altogether.

In my invention I do not use a twisting-guide of any kind, but run the material into the repeater from the train precisely the same as though a man were there to catch the end. I depend altogether on the shape of the material itself to turn it up on edge before it gets around to the entering guides in the next set of rolls, for it is a well-known fact that a flat bar, whether oblong section or oval section, will not bend on its edge. Consequently, if it is directed around in a circle, it turns up edge-wise in bending around, and is then in the right position to enter the next set of rolls.

My invention is especially adapted to the manufacture of rods of small diameter made in trains running very fast, where it is exceedingly difficult to obtain men active enough to keep the train full of work. One form of my improved repeater or conductor is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a set of rolls provided with one of my improved repeaters or conductors. Fig. 2 is a perspective view of the funnel-box. Fig. 3 is a section of the conductor or repeater on line *xx*. Fig. 4 is a section of the repeater or conductor through the guard-spring at line *yy*. Fig. 5 is an enlarged perspective view of the curved end of the repeater or conductor adjacent to the spring.

The same letters indicate similar parts in the different figures.

A shows an ordinary three-high rod-train.

B shows my improved repeater or conductor attached to said train.

C is the funnel-box, with the inclined or curved surfaces *a a*.

D is the deflector.

E is the guard-spring.

F is the top cover or side of the repeater, which is partly cut away, as shown.

G is the adjustable and movable side of the funnel-box held by the spring H.

I is an ordinary delivering-pipe.

K is an ordinary receiving-guide.
 L is the curved or bent end of the repeater.
 M is the inside guard of repeater.
 N is the hinged joint of the spring-guard.
 5 O is the cut-away part of repeater.
 P P is the elongated loop that has sprung out of the repeater.
 Q Q are the stands of the repeater.
 R is the floor or bed.
 10 The action of my repeater or conductor is as follows: The oval section of rod coming from the delivering-rolls, with its longest dimension in a horizontal plane, is delivered into the repeater B, and by its own motion is
 15 carried around to the receiving-rolls. As it bends around in a semicircle described by the repeater it turns up, as before explained, so that its longest dimension is in a vertical plane. It is then in position to be delivered to the
 20 receiving-rolls. To guard against its turning down, the spring E is placed at the delivering end of the repeater, as shown in the drawings. The front end of the oval in going around the circle of the repeater has a tendency to come out upward and jump over the
 25 top of the repeater. This I have obviated by making the repeater of channel-iron, or a channel-section with the top F. This channel-section is the pith of the whole construction. It renders the delivery of the
 30 front end of the rod into the funnel-box and then to the receiving-rolls an absolute certainty. The funnel-box C, with the inclined surfaces *a b*, guides the front end of the rod to the regular guides next to the rolls, and
 35 gathers in the loop and prevents knots, snarls, &c. When the front end of the rod touches the receiving-rolls, another difficulty comes up by reason, as before explained, of the
 40 delivering-rolls delivering stock to the repeater faster than the receiving-rolls take it. This difficulty consists in getting rid of the loop or surplus material that is formed, as described. The section of the oval from the
 45 delivering-rolls, having its largest dimension in a horizontal plane, of course forms a loop in a vertical plane. This loop, by reason of the motion of the rod, is then carried around against the back side of the
 50 repeater B, and is then carried in toward the inside guard, M, by the curved upper edge of the repeater F, which has been cut away to allow the overfeed to escape, as hereinafter described. When the loop is carried in by this
 55 curved edge F, the upper part of the loop strikes against the deflector D, which is placed at this point, and which projects at an angle over top of repeater. This deflector then pushes the loop outward and over the top F
 60 of the repeater B. It is then carried around to the curved portion L of the inside guard, M, which still further throws it out and over the top of the repeater into the funnel-box. The spring-guard E, being made of spring-
 65 steel or being made so it can swing on the joint N, allows this loop to pull through readily. As the loop has now been thrown over the

top of the repeater and the delivering-rolls are still delivering stock faster than the receiving-rolls take it, the loop enlarges and the material runs over the top of the repeater at the point O, as indicated by the dotted lines P P in the perspective view, Fig. 1. The stock is able to run over the top of the repeater by reason of the top side, F, of the channel being cut away from the end next to the delivering-rolls up to the point O, where the curved edge is shown.

In a continuous mill it is necessary to have the stock go down the train as fast as possible in order to keep up the heat. It is therefore necessary to have the most active men to catch the material as it leaves one set of rolls and stick it into the next set. It was found very difficult for any man to work fast enough, and to replace these men the first repeaters were made. These repeaters worked well on the square side of the train, but were dead failures on the oval side.

In continuous rolling of rods it is universal to employ a system of squares and ovals—that is, as the stock comes out one side of the train it is square in section, and as it comes out the other side it is oval in section. This change of shape is accompanied by a reduction of area. The square shape has been found very easy to repeat; but the oval up to the present time has defied all contrivances so far gotten up.

With my improved conductor I can not only repeat the squares, but also the ovals, and with such absolute certainty that the forward end is taken down the train a great deal faster, and consequently a great deal hotter. Every one is taken down the same, and the “misses” or failures to repeat the ovals have been reduced to a minimum. In fact, when the train is running at full speed and crowded full of work, the best men on the trains are unable to keep up with my improved repeater or conductor.

A continuous mill fitted up with my improved repeater or conductor can be run at an almost unlimited speed, as the repeater or conductor will repeat the material delivered into it at any speed. In fact, it will work, if anything, more certain at a high speed than a slow speed.

By reason of being enabled to run the train faster on account of doing away with the men, a longer and heavier rod can be rolled. Its heat can be kept up and the wear and tear of the rolls decreased, also the power necessary to reduce the rod being very materially lessened.

When a man bends the material around and sticks it into the receiving-rolls, the most active man cannot do this quick enough to prevent quite a long loop forming on the floor. To prevent this loop from getting tangled, it is necessary to employ what is technically termed a “hook-boy.” With my improved repeater or conductor the material is delivered to receiving-rolls so fast that the loop does not get out on the floor at all until a third or more of

the rod has passed along down the train, and even with the longest rods the loop does not elongate or get out on the floor far enough to need the services of this hook-boy. I am therefore enabled to dispense with the man, or "bender," and the hook-boy, and the cost of the repeater or conductor being small, its use saves the wages of the man and boy entirely.

This repeater or conductor is applicable to any kind of rolling-mill where long lengths are made, and is not confined to rod-trains or the style of rolls or housings shown in Fig. 1.

I claim—

1. The combination of a rolling-mill with a curved repeater or conductor, B, formed of a channel-section having a greater depth than breadth, its partially-opened top being inclined to the center of the curve, as and for the purposes specified.

2. A curved conductor or repeater for use in rolling-mills, which consists of a partially-inclosed channel-section provided with a deflector near its receiving end, and a guiding-spring near its feeding end, substantially as described, and for the purposes specified.

3. The combination of rolling-mill A with a curved conductor, B, constructed of a channel shape, provided with a spring-guard, E,

at its delivering end, as and for the purposes described.

4. The combination of a rolling-mill, A, with a curved conductor or repeater, B, constructed of channel shape, to the inside guard, M, of which a deflector, D, is attached, bent at an angle and so placed as to forcibly throw out the loop P P when it forms, as and for the purposes described.

5. The combination of a rolling-mill, A, with a curved repeater or conductor, B, constructed of channel section, with the inside guard, M, having its delivering end bent over to forcibly throw out the loop P P, as and for the purposes described.

6. The combination of a rolling-mill, A, with a curved repeater or conductor, B, constructed of channel shape and with a funnel-box, C, and inclined or curved surfaces *a b*, a portion of one side of said funnel-box, G, being adjustable and movable and held in place by a spring, H, or other suitable contrivance, as and for the purposes described.

FRANK G. TALLMAN.

Witnesses:

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JOHN REEVES.