

(No Model.)

S. J. ADAMS.
TUBE WELDING BALL.

No. 361,569.

Patented Apr. 19, 1887.

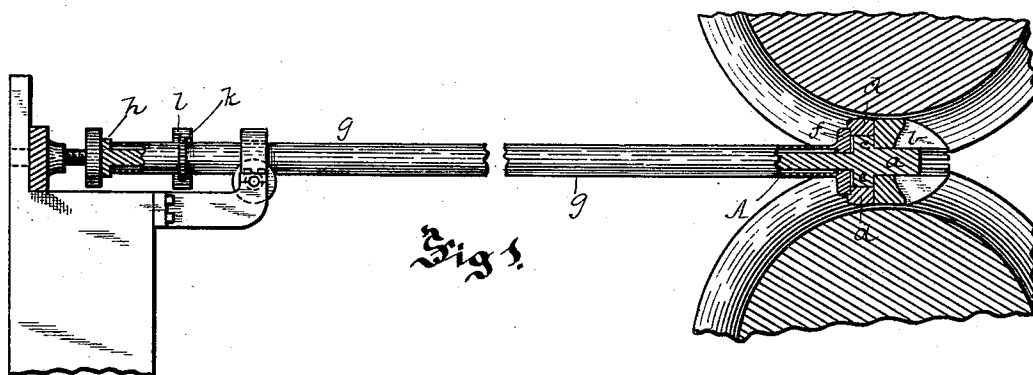


Fig. 1.

Fig. 2.

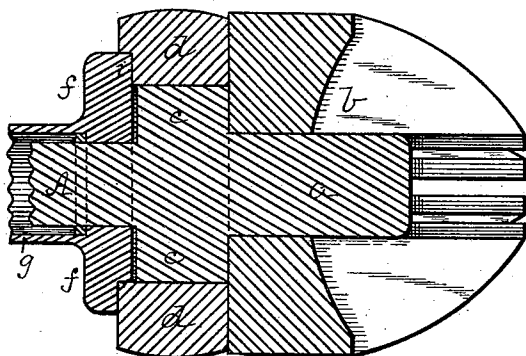


Fig. 4.

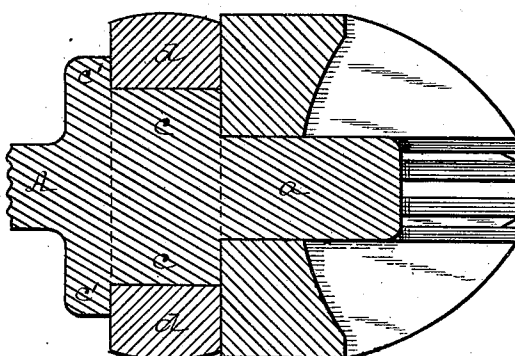


Fig. 3.

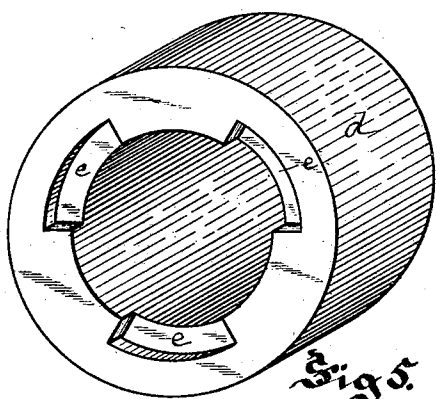
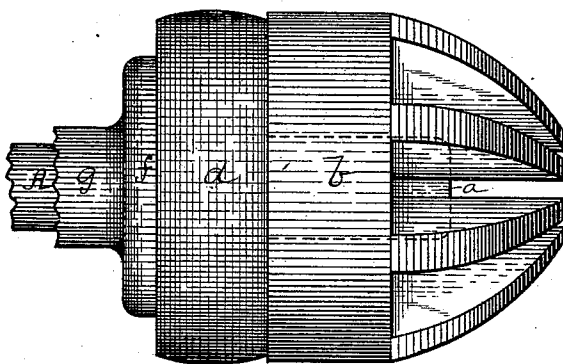


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

S. JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

TUBE-WELDING BALL.

SPECIFICATION forming part of Letters Patent No. 361,569, dated April 19, 1887.

Application filed November 15, 1886. Serial No. 218,878. (No model.)

To all whom it may concern:

Be it known that I, S. JARVIS ADAMS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tube-Welding Balls; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to pipe-welding balls, these balls being employed in the manufacture of wrought-metal tubing, and being supported on a suitable rod between a pair of concave rolls, which press the skelp upon the ball and weld the lapping edges thereof, the ball forming the anvil in the welding operation. In this welding operation, as the ball is stationary while the rolls are revolving in the same direction in which the skelp is carried, the rolls act to draw the skelp over the ball, and it is evident that the interior of the skelp is in many cases scored by the ball as it is drawn over the same, especially where worn out or defective balls, or balls made from unsuitable metal, are used, while the interior of the pipe may be imperfect on account of irregular heating of the skelp, or from other causes.

The object of my invention is to sleek or smooth the interior surface of the tube while it is at a high heat, and so overcome any roughness on the interior of the welded tube.

It consists, essentially, in combining with the welding-ball and supporting-rod a sleeker located back of the ball and adapted to press upon and smooth the interior of the tube after it is subjected to the welding-pressure.

It is also consists in forming this sleeker rotary, so that it will act by a rotary or spiral motion within the tube to smooth and polish the interior thereof.

It also consists in certain improvements in the construction of the sleeker and the manner of operating the same.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal section illustrating my invention. Fig. 2 is an enlarged sectional view of the same when the rotary sleeker is employed. Fig. 3 is a side view of the same. Fig. 4 is a longitudinal section illustrating my invention when the stationary sleeker is em-

ployed, and Fig. 5 is a perspective view of the sleeker.

Like letters of reference indicate like parts in each.

In the most approved form of my invention the sleeker has a rotary motion imparted to it, and I will therefore describe in particular this part of my invention.

The supporting-rod A is provided at the forward end with the extension *a*, on which the welding-ball *b* is placed, this ball being of any desired construction, and back of this extension *a* is the ring or enlargement *c*, which forms a support to sustain the back-pressure of the ball during the welding operation, and at the same time forms a support or journal for the sleeker *d*, which fits upon this ring *c*, the sleeker shown in Fig. 4 being simply a stationary ring, which fits onto the ring or enlargement *c* of the supporting-rod and against the shoulder *c'* thereof, and acts by passing longitudinally through the tube after the welding operation to smooth its interior, but the sleeker shown in Figs. 1 and 2 has a rotary motion imparted thereto, in order to act to smooth or polish more perfectly the interior of the tube by reducing the longitudinal ridges and grooves more effectually than the stationary sleeker.

The face of the sleeker may be of any suitable shape to smooth the interior of the tube, where the sleeker is stationary, as shown in Fig. 4, it preferably having simply a rounded surface of almost the exact diameter of the ball, this surface being highly polished, so that it will act to smooth the interior of the tube, and in case the tube is scored on its interior by the welding-ball this sleeker will act to smooth the surface and overcome substantially all the imperfections formed in the interior of the tube during welding. In order, however, to more perfectly sleek or smooth the interior of the tube, I provide means for imparting a rotary motion to the sleeker *d*, these means being more particularly shown in Figs. 1 and 2.

The sleeker *d* is provided at its rear with notches or seats *e*, into which corresponding lugs on the annulus *f* fit, this annulus forms the end shoulder of the tube *g*, which fits around the welding-rod A, and the tube is confined between the enlargement *c* at the for-

ward end of the rod and the enlargement *h* at the rear end thereof, and the tube is properly journaled on the rod, so that it can be rotated without great friction thereon.

5 This tube is supported and operated with the ordinary welding-rod, so that the device is employed in substantially the same manner as where the ordinary rod is employed, the roll or rolls for advancing and retracting the rod

10 acting on the exterior of the tube, instead of on the body of the rod. On the tube, near the head *h*, at the rear end of the rod, is secured the pinion *k*, which is arranged to mesh into any suitable pinion, *l*, by means of which rotary

15 motion can be imparted to the tube and to the sleeker connected to the forward end thereof, and in order to arrange the ball for the welding and sleeking operation the tube and welding-rod are advanced, the sleeker *d* first

20 slipped onto the journal *c* thereof and into engagement with the head *f*, at the forward end of the tube *g*, so that the shoulders *i* thereon engage with the seats *e* in the sleeker, and the ordinary tube-welding ball is then placed onto

25 the extension *a* of the welding-rod. The ball is then advanced into position, and the pinion *k*, as the rod is advanced, engages with the pinion *l*, or any other suitable power apparatus for imparting motion thereto, and the

30 tube is rotated, thus imparting a rotary motion to the sleeker *d*. As the skelp to be welded passes between the welding-rolls and the welding-ball *b* and its overlapping edges are brought together and welded at the same

35 time, on account of the pressure of the rolls upon the tube and the friction between the tube and ball, the interior of the tube is generally scored either by the ball itself or slag, scale, or other such material within the tube,

40 and after it passes over the ball, and as soon as the pressure of the welding-rolls is relieved therefrom the sleeker, by rotating within the tube, acts to roll or smooth or polish the interior surface thereof, so smoothing down any

45 irregularities or scorings on the interior of the tube and imparting a fine polish thereto. It can operate in this manner when placed close to the welding-rolls, for the reason that the tube is at a high heat, the metal thereof being necessarily raised to a welding-heat in order to

50 make the weld, and the metal being soft, so that the polished surface of the rotary sleeker will smooth down the interior before the pipe chills and impart an even surface thereto.

55 After the welding operation is finished and the supporting-rod is to be withdrawn, the operation is the same as in the ordinary manufacture of tubing, the roll or rolls operating

to withdraw the supporting-rod acting on the outer tube, *g*, instead of upon the supporting-rod *a*, and the sleeker *d* and pipe-ball *b* are pressed by the welded tube off the supporting-rod, and in order to prepare for another welding operation the same or another sleeker and a fresh ball are placed on the supporting-rod. 65

In the employment of a ball provided with the stationary sleeker the operation is the same except that no means for rotating the sleeker are required, and the sleeker simply acts to smooth over the interior surface of the heated metal just after it leaves the welding-roll, and while it is in a heated and soft condition; but it cannot impart as perfect a finish to the interior of the pipe as when the rotary sleeker is employed. 75

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

1. In combination with a pipe welding ball, a separate sleeker located back of the ball and adapted to smooth the interior of the pipe after welding, substantially as set forth. 80

2. In combination with the pipe-welding ball, the rotary sleeker located back of the ball and adapted to smooth the interior of the pipe after welding, substantially as set forth. 85

3. In combination with the welding-ball and the rotary sleeker, the supporting-rod having the enlargement *c*, forming the journal for the rotary sleeker, substantially as and for the purposes set forth. 90

4. In combination with the welding-ball and the supporting-rod, the sleeker, the tube fitting around the supporting-rod and engaging with the sleeker, and means for rotating the said tube, substantially as and for the purposes set forth. 95

5. In combination with the supporting-rod, the tube mounted thereon and confined between enlargements at each end thereof, and engaging with the sleeker mounted at the forward end of the rod and back of the tube-welding ball, and means for rotating the said tube, substantially as and for the purposes set forth. 100

6. The combination of the supporting-rod *A*, having the ring or enlargement *c*, forming a journal for the sleeker, the sleeker *d*, having seats *e*, and the tube *g*, provided with a head, *f*, having shoulders engaging with the seats *e*, substantially as and for the purposes set forth. 110

In testimony whereof I, the said S. JARVIS ADAMS, have hereunto set my hand.

S. JARVIS ADAMS.

Witnesses:

JAMES I. KAY,
J. N. COOKE.