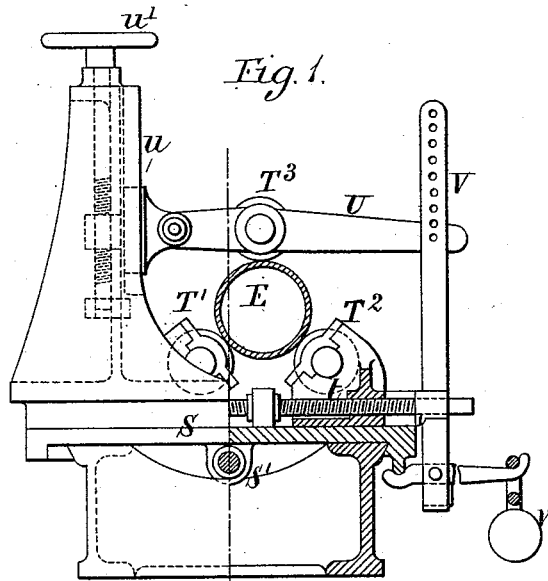


A. S. ELMORE.

APPARATUS FOR LOOSENING TUBES FROM MANDRELS.

No. 455,186.

Patented June 30, 1891.



Witnesses:-  
 J. A. Rutherford.  
 J. H. Daby.

Inventor:  
 Alexander S. Elmore  
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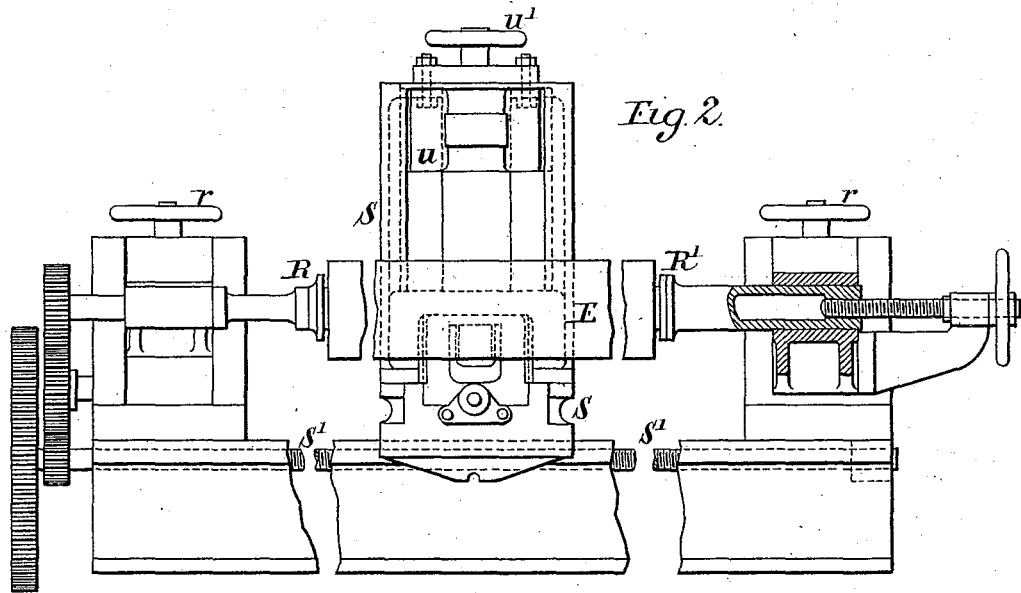


Fig. 2.

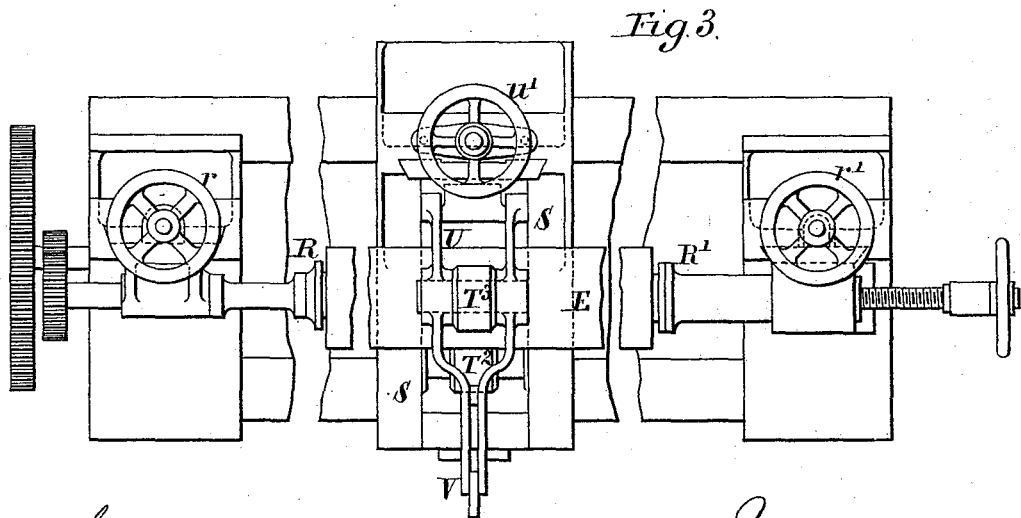


Fig. 3.

Witnesses:-  
 J. A. Rutherford.  
 J. H. Daly.

Inventor:  
 Alexander S. Elmore.  
 By James L. Norris,  
 Attorney.

# UNITED STATES PATENT OFFICE.

ALEXANDER STANLEY ELMORE, OF LEEDS, ENGLAND.

## APPARATUS FOR LOOSENING TUBES FROM MANDRELS.

SPECIFICATION forming part of Letters Patent No. 455,186, dated June 30, 1891.

Application filed May 2, 1891. Serial No. 391,409. (No model.) Patented in France November 18, 1890, No. 209,602; in Belgium November 18, 1890, No. 92,771; in Luxemburg November 18, 1890, No. 1,375; in England November 21, 1890, No. 18,896; in Italy December 3, 1890, LVI, 157; in Spain January 3, 1891, No. 11,472, and in Cape of Good Hope January 6, 1891, CC, 160, F 658.

To all whom it may concern:

Be it known that I, ALEXANDER STANLEY ELMORE, a citizen of England, residing at Spring Grove, Hunslet, Leeds, in the county of York, England, have invented a new and useful Apparatus for Loosening from Mandrels Metallic Tubes Electrolytically Deposited Thereon, (for which patents have been obtained in France, dated November 18, 1890, No. 209,602; in Belgium, dated November 18, 1890, No. 92,771; in Spain, dated January 3, 1891, No. 11,472; in Luxemburg, dated November 18, 1890, No. 1,375; in Italy, dated December 3, 1890, Vol. LVI, 157; in Cape of Good Hope, dated January 6, 1891, CC, 160, folio 658, and an application for patent in Great Britain, which patent when granted will bear date November 21, 1890, No. 18,896,) of which the following is a specification.

In the specifications of previous patents granted to me I have described the manufacture of metallic tubes by electrolytically depositing metal from its solution on a cathode in form of a mandrel, which is caused to revolve in the bath while burnishers are caused to travel to and fro longitudinally over the deposit of metal, rendering it dense, sound, and compact. I have also in my application Serial No. 375,141 described improvements in the process and apparatus for manufacturing tubes in this manner.

My present invention relates to apparatus whereby the electrolytically-deposited tubes can be loosened from the mandrels on which they are deposited, as I shall explain, referring to the accompanying drawings.

Figure 1 is an end view, partly in section. Fig. 2 is a side view, also partly in section, and Fig. 3 is a plan of the apparatus.

On a bed like that of a lathe or planing-machine is fitted to slide a platform S, its movement to and fro along the bed being effected by a screw S'. At each end of the bed is fixed a head-stock provided with a vertically-sliding bearing at the one end for a mandrel R and at the other end for an adjustable back center R', these bearings being raised or lowered by screws worked by hand-wheels r r', respectively. In the platform S are fitted two transverse slides carrying bear-

ings for rollers T' T<sup>2</sup>, which slides, with their rollers, by means of a right and left threaded screw t, can be adjusted nearer to or farther from each other. The back upright part of the platform S is fitted with a vertical slide u, which can be raised or lowered by a screw worked by a hand-wheel u'. On the slide u is pivoted a double lever U, in which is mounted a roller T<sup>3</sup>. The ends of the lever U embrace an upright bar V, having a number of holes, through any one of which a pin can be passed above U. At the lower end of the bar V is pivoted a lever, from the long arm of which is suspended a weight v, while the short arm catches under a rib projecting down from the platform S.

The operation of the apparatus is as follows: The bearings of R and R' being adjusted to the same level, a mandrel E, on which is the deposited tube, is centered between R and R', as in a lathe, the mandrel R having a suitable driver to engage with E; also by means of gear like the change-wheels of a lathe the mandrel R is connected to the screw S'. The rollers T' T<sup>2</sup> are then adjusted up toward E, so as to have E fairly bearing on them, and the lever U is moved over E and held by a pin to V, so as to make its roller T<sup>3</sup> bear upon E. The mandrel R being then caused to revolve by any convenient motor, the mandrel E revolves while the platform S and the rollers T' T<sup>2</sup> T<sup>3</sup>, carried by it, travel along it longitudinally, extending the metal of the periphery, and so loosening it from the mandrel that it can be easily drawn off.

The driving of the apparatus may be through reversing-gear, such as pulleys with straight and crossed straps, so that when the platform S has traveled a certain distance along the bed the movement is reversed, as in a planing-machine.

Having thus described the nature of this invention and the best means I know for carrying the same into practical effect, I claim—

For loosening from mandrels metallic tubes electrolytically deposited thereon, apparatus consisting of a bed with head-stocks at its ends having, respectively, a vertically-adjustable driving-mandrel and a back center between which the mandrel with its shell of de-

posit is mounted, a longitudinally - sliding platform having its screw geared to the driving-mandrel and carrying two horizontally-adjustable rollers, and a vertically-adjustable  
5 loaded lever carrying a third roller, arranged and operating substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of

two subscribing witnesses, this 20th day of April, A. D. 1891.

ALEXANDER STANLEY ELMORE.

Witnesses:

H. R. HALL,

*Engineer, Dalton, Nr. Leeds.*

A. S. FRYER,

*Stenographer, 66 Hunslet New Rd., Leeds.*