

W. FRESE.
 PICKLING APPARATUS FOR DRAWN WIRES.
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1,175,429.

Patented Mar. 14, 1916.

Fig. 1.

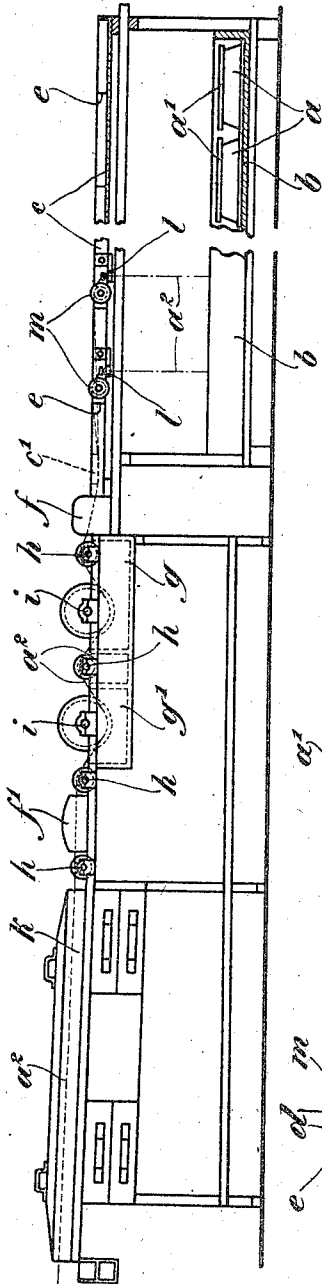


Fig. 3.



Fig. 2.

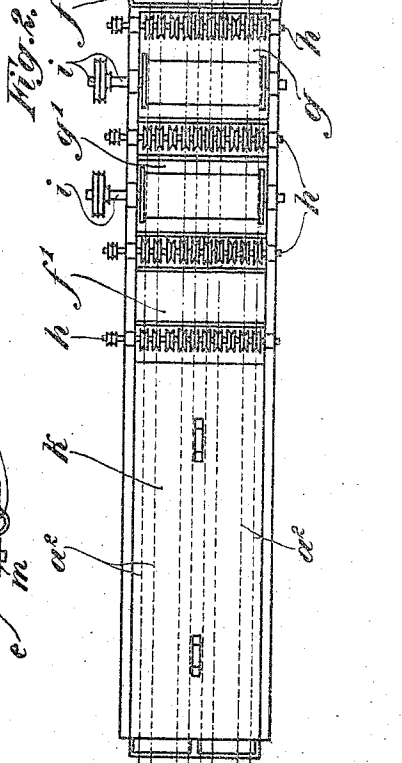
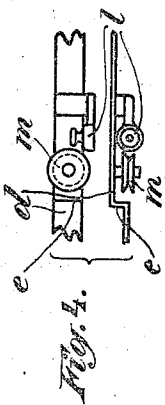


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PICKLING APPARATUS FOR DRAWN WIRES.

1,175,429.

Specification of Letters Patent.

Patented Mar. 14, 1916.

Application filed February 6, 1914. Serial No. 816,954.

To all whom it may concern:

Be it known that I, WILHELM FRESE, a subject of the Emperor of Germany, and resident of 55 Hagenstrasse, Dortmund, Germany, have invented a certain new and useful Pickling Apparatus for Drawn Wires; of which the following is a specification.

This invention relates to a new process for the subsequent treatment of wire after it has been drawn or rolled, and also to an apparatus for carrying out this process.

A constructional example of the apparatus is illustrated in the accompanying drawing, wherein:—

Figure 1 shows a side elevation of the apparatus, Fig. 2 shows a plan, Fig. 3 shows in cross section the drum employed, and Fig. 4 shows the method of guiding the wire in the water trough.

According to the invention, the wire, after it has been drawn or rolled and before it is wound up, is passed through a receptacle or brush filled with chalk or a similar substance forming a chalk bath, so that the surface of the wire is covered with a thin layer of chalk or the like. This facilitates the access of the hot gases to the surface of the wire in the annealing operation, as it prevents the metallic surfaces from actually contracting with one another. The wire is now wound on drums *a* (Fig. 1) and annealed while on these drums by placing a receptacle, in which a number of drums are superposed, into an annealing furnace. The drums *a* as shown in Fig. 3, are hollow and are of a somewhat conical form, so that the wire, when the drums are placed on end, can easily be unwound over the edge *a'* on the smaller side, and for annealing purposes the combustible (charcoal and the like) can also be placed in the interior of the drums.

After annealing and cooling a large number of the drums on which the wire has been wound are placed into the device shown in the drawing, being firstly placed into the bath *b*. This bath contains a suitable acid or steeping liquor which removes from the surface of the wire any annealing scale and the like which may have been produced during the previous treatments. The presence of the layer of chalk supports and expedites this action, as it allows the acid rapid and free access to all the superficial elements of the wires as it did to the heat or annealing gases when annealing. This

rapid and free access is permitted as the separate windings of the wire on the drum are a certain distance apart, in consequence of the interposed layers of chalk, and therefore do not directly contact with one another, and because the chalk, in view of its hygroscopic nature, rapidly absorbs the acid and effectively conducts it to the various parts of the surface of the wire.

The drums lying in the bath *b* have their smaller sides turned upward, and the wire *a²* is unwound from them, in an upward direction. Above the acid bath *b* is disposed a shallow water trough *c* through which water flows in the direction of the arrow (Fig. 2). At the outlet end the walls *d* of the trough are nearer together than at the inlet end, as at certain intervals they are provided with lateral indentations *e*. These indentations serve for the admission of the wires *a²* from the drums *a* into the water trough and at the same time to hold the wires a certain distance apart so that they will not contact with one another. Where the wires change their direction at the trough indentations *e*, that is to say, where they pass from a vertical into a horizontal direction of movement, guiding sockets *l* and guide rollers *m* are mounted in the walls of the trough *c*.

The wires *a²* pass through the trough *c* in an opposite direction to that of the water, and at the upper end of the trough pass underneath one or more bridges *c'*. Here the acid and any remaining chalk is rinsed from them by the water. After leaving the trough *c* the wires pass into a receptacle *f* filled with sand, which latter absorbs any water adhering to the wires and to a certain extent dries them. The wires then pass into a bath *g* containing an alkaline solution. Suitably distributed shafts *h*, *i*, having guide rollers loosely mounted thereon, submerge the wires in the alkaline solution and control its movement therein. The alkaline solution is adapted to clean completely the surface of the wires, especially to remove any adhering acid, and according to the solution used to produce other results, for example, to polish, smooth, oxidize or otherwise act upon the superficial structure. The first alkaline bath *g*, may be succeeded by a second bath, indicated in the drawings by *g'*, or by a number of such baths. From the alkaline baths the wires again pass through a receptacle *f'* containing sand, in order to

be dried, and from here they pass over a heated hearth *k* where they are completely dried. After leaving the hearth *k* the wire is wound in the known manner, by a winding machine, into coils or bobbins and can then be transported ready for use. The winding up of the wires forms suitable means for moving the wires through the device hereinbefore described. Only the shafts *h*, *i*, are driven from a source of power advantageously derived from the winding machine, so that they will rotate according to the movement of the wire and therefore need not be rotated by the wires *a*² which are mostly very thin. In this manner a breakage of the wire during its subsequent treatment after it has been drawn or rolled is obviated as far as possible.

The process described offers the advantage of an extremely rational method of working, as large quantities of wire can be rapidly and thoroughly subjected to a subsequent treatment.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:—

1. An apparatus for the subsequent treatment of drawn or rolled wires, comprising an acid bath, a water trough disposed above the acid bath, said trough being of tapered form and having lateral indentations at certain intervals, a drying device, a bath of

an alkaline solution, and a second drying device.

2. A device for the subsequent treatment of drawn or rolled wires, comprising an acid bath, a water trough above said acid bath, said water trough being adapted to receive the wires from the acid bath, means for guiding the wires into the water trough, a drying device, a bath of an alkaline solution, a second drying bath, and means for moving the wires in an opposite direction to the flow of water in the water trough.

3. A device for the subsequent treatment of drawn or rolled wires, comprising an acid bath, drums in said bath on which the wires are wound, said drums being of tapered form to permit of the easy unwinding of the wires therefrom, a water trough, means for guiding the wires into the water trough, a bridge, said bridge collecting together the wires and retaining them a certain distance apart, a drying device, a bath of an alkaline solution, and second drying device, and means for moving the wires through the device.

In witness whereof, I hereunto signed my name this 10th day of Jan. 1914 in the presence of two subscribing witnesses.

WILHELM FRESE. [L. S.]

Witnesses:

HELEN NUFER,
ALBERT NUFER.