N. BETZ.

Machine for Scaling, Cleaning and Polishing Wire.

No. 197,242. Patented Nov. 20, 1877.

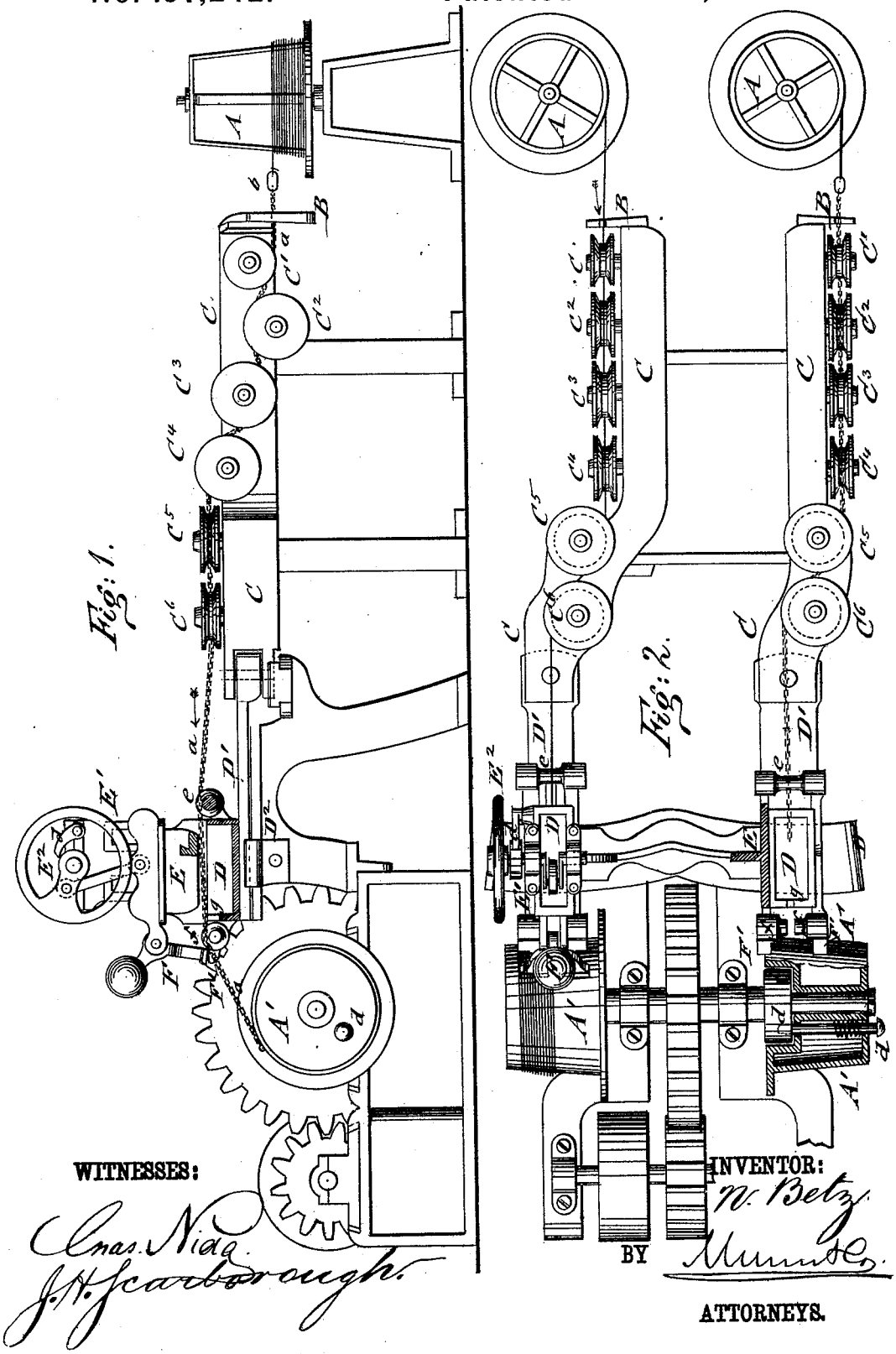

Fig: 1.

Fig: 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

NICKOLAUS BETZ, OF ST. INGBERT, GERMANY.

IMPROVEMENT IN MACHINES FOR SCALING, CLEANING, AND POLISHING WIRE.

Specification forming part of Letters Patent No. **197,242**, dated November 20, 1877; application filed October 17, 1877.

To all whom it may concern:

Be it known that I, NICKOLAUS BETZ, of St. Ingbert, in the Empire of Germany, have invented a new and Improved Machine for Scaling, Cleaning, and Polishing Wire, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of my improved machine for scaling, cleaning, and polishing wire, partly in vertical section through the clearing-box; and Fig. 2 is a plan view of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to an improved machine for scaling, cleaning, and polishing wire by mechanical means without the use of sulphuric acid, which is detrimental to the metal and unhealthy to the workmen.

By my machine the wire may be cleaned in cheaper and more rapid and effective manner, without requiring skilled workmen, as heretofore, and without exerting the least injurious influence on the metal in removing the scales.

The invention consists, essentially, of a claw-guide and of a set of vertical and horizontal stretching and cleaning rolls, over which the wire is drawn to be cleared of scales on all sides, being finally passed through a cleaning-box filled with a mixture of calves' hair and sand, and then wound up again on a reel.

Rolled wire, especially when rolled hot, is covered with forge scales or crust, which have to be removed for drawing the wire in cold state. This operation has heretofore been accomplished by the use of sulphuric acid, which my machine is intended to supersede, as it cleans the wire entirely by mechanical means.

I prefer to construct the machine in duplicate, in such a manner that one-half may be used while the other remains standing.

Referring to the drawing, A A′ are the wire-reels, on which the rolled wire is placed just as it is left by the rolls. One end of the wire is attached to a chain, *a*, which is provided at the end with a button or catch, *b*, by which the wire is started through the machine, so as to be successively acted upon by the parts of the same, and finally wound up again on horizontal reels A′, which are revolved by suitable driving machinery, the horizontal reels being thrown in or out of gear with the revolving shaft by a spring clutch-pin or other suitable device, *d*.

The wire is first passed from reel A through a claw-shaped guide, B, which is wider at the upper part to admit the passage of the chain. The claw-shaped guide serves to take out any loops in the wire caused by coiling it up hot after rolling. From the claw-guide the wire passes over four vertical rolls, as follows: first, under roll C^1, then over a roll, C^2, the so-called "stretching-roll," where the wire is cleaned from scales on its under side; then under a roll, C^3, which cleans the wire on the upper side; and then again over a stretching-roll, C^4, that transfers the wire to a horizontal roll, C^5, where it is cleaned on the right side, being then conducted diagonally to and over a second horizontal roll, C^6, where the wire is cleaned on its left side. All these rolls are supported on a bed, C, the vertical rolls at different heights at the side, and the horizontal rolls on the top part of the same. From the scaling-rolls the wire is passed through the cleaning-box, which forms the second important feature of my invention.

The cleaning-box D is supported on a pivoted and laterally-swinging carriage, D^1, which follows the lateral motion of the wire as the same winds up on the horizontal reel A′, at the other side of the cleaning-box, the carriage D^1 being guided on a supporting-bracket plate, D^2, and stopped when arriving at a side flange of the same.

The cleaning-box D is filled with a mixture of calves' hair and sand, on which the wire is pressed by means of a weighted plunger, E, that is guided on pins of a vertical frame, E^1. The plunger is raised for the passage of the chain that starts the end of the wire through the machine by a plunger-rod connected to a crank-shaft of a weighted fly-wheel, E^2, turning in top bearings of upright frame E^1. The shaft of the fly-wheel E^2 is provided with a ratchet-wheel and pawl, *d*, to keep the plunger down in the box, and press thereby the wire into the polishing material. By releasing the pawl the fly-wheel may be turned and the plunger raised for the passage of the starting-chain, the plunger being retained in raised position by a lever, F, which is fulcrumed to the side of guide-frame E^1 nearer to the wind-

ing-up reel, said lever having curved and forked lower arms and a weight at the top part.

The lower forked part of the lever F is carried by the top weight on projecting seats or rests F′ of the clearing-box D, so as to support the plunger thereby in raised position until the button or catch *b* at the end of the chain, having passed through the cleaning-box, forms contact with the lower arms of lever F, carries them off their rests, and causes thereby the instant dropping of the plunger so as to bear on the wire in the box.

The cleaning-box is provided at the front part with an annularly-grooved roll, *e*, over which the wire passes, and at the rear part with half-guide rolls *f*, one at each side, that leave a space between them, through which the wire falls down into the box as soon as the end button of the chain has passed over the supporting half-rolls.

The rear end of the box has a central slot, *g*, which admits the wire to pass at an inclination from the front roll through the polishing material of the box, so as to be surrounded more or less by the same, so that the wire issues in perfectly clean and bright state from the box.

The bottom of the plunger may be covered with some yielding material, especially at the front corner, where a rubber or other elastic block may be inserted for the purpose of pressing the wire down into the polishing material and securing the effective polishing of the same.

The engaging and disengaging appliances of the plunger are necessary, as otherwise the chain, being much thicker than the wire, would pull out all the sand and hair from the box, if it were passed through the same.

When the piece of wire is finished the plunger is raised again, and then the next piece of wire drawn through and polished by being attached to the chain, in the same manner as before, and by being then exposed, first to the cleaning action of the vertical and horizontal rolls, by which the scales are removed, and finally to the polishing action of the cleaning-box.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a set of vertical and horizontal tension and cleaning rolls with a claw-guide, scouring-box, and reel, arranged as shown and described, for the purpose specified.

2. In a wire cleaning and polishing machine, a cleaning-box filled with polishing material, and provided with a guide-roll at one end, and half-rolls and projecting seats at the opposite end, in combination with a vertically sliding and guided plunger, a fulcrumed and weighted supporting-lever, and with a releasing button or knob at the end of the wire-drawing chain to drop wire and plunger after the chain has passed over box, substantially in the manner and for the purpose set forth.

3. In a wire cleaning and polishing machine, the combination, with the stretching and cleaning rollers, and with the horizontal winding-up or drawing reel, of a polishing-box and plunger placed intermediately between rolls and reel, and supported on a laterally swinging and guided carriage, so that the box can adjust itself to the direction of the winding-up wire, substantially in the manner and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of September, 1877.

N. BETZ.

Witnesses:
FRANZ HASSLACHER,
JOSEPH PATRICK.