

(No Model.)

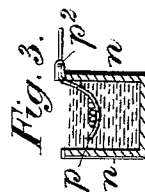
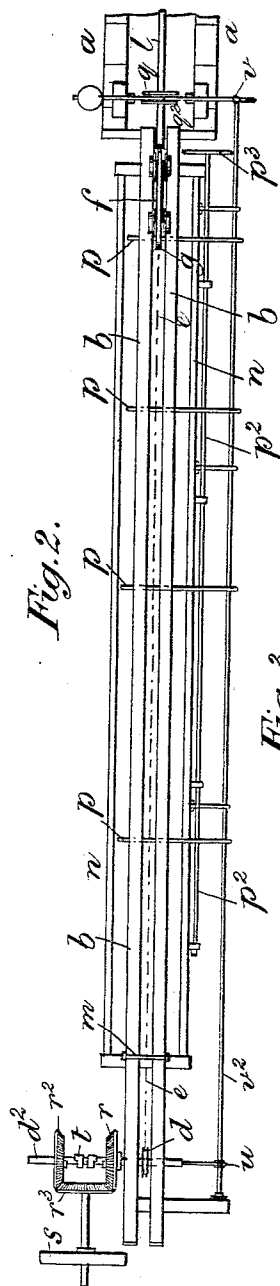
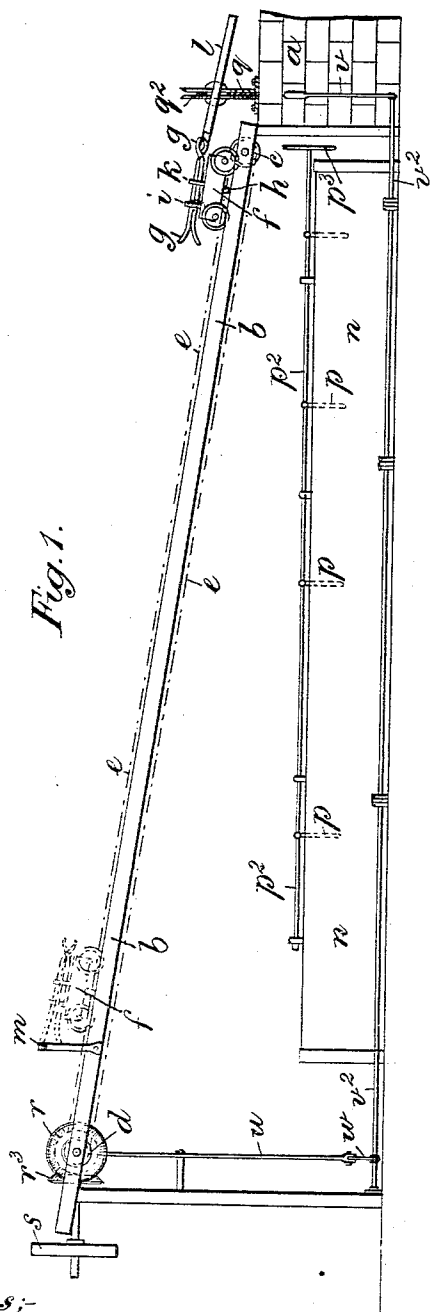
2 Sheets—Sheet 1.

T. JONES.

APPARATUS FOR GALVANIZING WROUGHT OR CAST IRON AND STEEL.

No. 476,651.

Patented June 7, 1892.



Witnesses;—

Richard Skerrett
Arthur John Powell

Inventor;—

Thomas Jones

(No Model.)

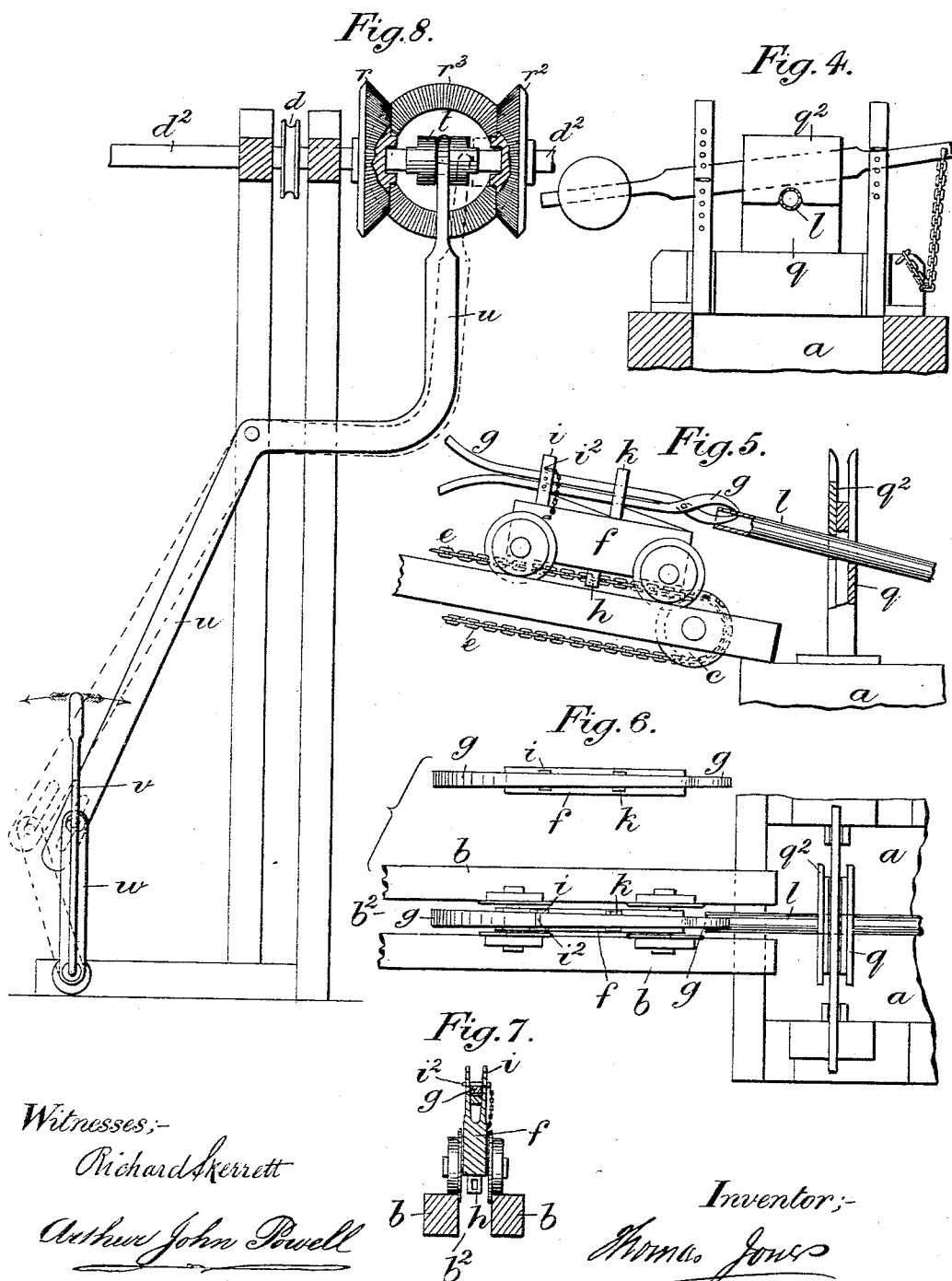
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UNITED STATES PATENT OFFICE.

THOMAS JONES, OF NETHERTON, ENGLAND.

APPARATUS FOR GALVANIZING WROUGHT OR CAST IRON AND STEEL.

SPECIFICATION forming part of Letters Patent No. 476,651, dated June 7, 1892.

Application filed December 31, 1891. Serial No. 416,618. (No model.)

To all whom it may concern:

Be it known that I, THOMAS JONES, a subject of the Queen of Great Britain, residing at Netherton, England, have invented certain
5 Improvements in Apparatus for Galvanizing Wrought or Cast Iron and Steel; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it
10 appertains to make and use the same.

My invention has for its object to facilitate the galvanizing of wrought or cast iron and steel pipes, bars, and hoops and other articles by removing them from the galvanizing bath
15 of melted zinc by means of machinery constructed and operating in the manner herein-after explained.

I will describe my invention in connection with the galvanizing of an iron pipe.

20 The said machinery consists, essentially, of the following parts: An inclined platform, the lower end of which is situated at that end of the bath of molten zinc from which the pipe is to be drawn, has at top and bottom pulleys
25 over which an endless band or chain passes. The axes of the said pulleys are horizontal. Traveling on rollers up and down the said inclined platform is a carrier supporting a pair of forceps or a gripper. By the closing of the
30 gripper its jaws grip the tube or article being operated upon. Motion is communicated to the upper pulley of the endless band or chain and the motion of the said endless band or chain reversed by two bevel-wheels actuated
35 from the driving-shaft and reversed by the action of a sliding clutch operated by a hand-lever.

The machinery is used in the following manner: The pipe is immersed in the galvanizing
40 bath in the usual way and after having remained therein sufficiently long is raised from the bath and one of its ends introduced between the jaws of the forceps or gripper, which are closed upon it. The endless band being
45 put in motion by the workman, the galvanized pipe gripped by the gripper is drawn up the inclined platform. When it has nearly reached the top of the inclined platform, the motion of the endless band is reversed. The gripper
50 is opened, and, losing its hold on the tube, the latter falls through a slot in the inclined plat-

form into a water-trough or other receptacle. The gripper, descending to the bottom of the inclined platform, is ready to receive another
55 pipe from the bath, which on the reversal of the motion of the endless band is gripped and carried up the inclined platform, as before described.

The machinery may be used for removing two or more galvanized pipes or articles at the
60 same time, instead of a single pipe or article.

I will now proceed to describe, with reference to the accompanying drawings, the manner in which my invention is to be performed.

Figure 1 represents in side elevation, and
65 Fig. 2 in plan, machinery constructed according to my invention to be used in galvanizing tubes, bars, hoops, and the like. Fig. 3 represents in cross-section the cooling-trough and one of the tube supporting and raising
70 levers in the said trough. Fig. 4 represents in front elevation, drawn to a large scale, the asbestos dies which I prefer to use for removing the superfluous zinc from the tubes as they are drawn from the galvanizing-bath.
75 Fig. 5 represents in side elevation, Fig. 6 in plan, and Fig. 7 in cross-section, a portion of the inclined platform and bath and the gripper and its carrier drawn to a larger scale; and Fig. 8 represents in end elevation, partly
80 in section, drawn to a larger scale, the endless band or chain driving and reversing mechanism of the gripper-carrier.

The same letters of reference indicate the same parts in the several figures of the draw-
85 ings.

a is the bath containing the melted zinc, from which bath the galvanized pipes (or other like articles) are to be drawn.

b is the inclined slotted platform, the lower
90 end of which is situated at the end of the bath from which the galvanized pipes or articles are to be drawn.

c and *d* are pulleys at the bottom and top of the platform *b*, over which pulleys the end-
95 less band or chain *e* passes. Traveling on the said platform and situated over the slot *b*² at its middle is the carrier *f*, mounted upon wheels, (see Fig. 7,) which supports the gripper *g*, the said carrier being connected at *h*
100 to the endless chain or band *e*. The long arms of the gripper are slightly tapered (see

Fig. 6) and are situated in the forked up-
 rights i and k on the carrier f . The forked
 upright k is of less width than the other
 forked upright i , so that when the long arms
 5 of the gripper have been closed for causing
 the gripper-jaws to grip the tube l the weight
 of the gripped tube tends to wedge the said
 gripper-arms in the uprights i k and prevent
 longitudinal back motion on the said gripper.
 10 The gripping-jaws are maintained in their
 closed position by the cross-pin or cotter i^2 ,
 passed through holes in the wider fork i on
 the gripper-carrier f . The long arms of the
 gripper g are separated for opening the grip-
 15 ping-jaws and releasing the tube when the
 gripper-carrier has nearly reached the top of
 the inclined platform b by means of the fixed
 stop m , over which the upper long arm of the
 gripper rides. (See Figs. 1 and 2.)
 20 Under the inclined platform b is a water
 trough or tank n , into which the coated tubes
 released from the carrier f and falling through
 the slot b^2 in the platform b are received for
 cooling the said tubes. Crossing the said
 25 trough or tank n is a series of curved levers p ,
 on which the tubes falling into the said trough
 are received and supported. (See Fig. 3.)
 These levers are carried on the axis p^2 , worked
 by the hand-wheel p^3 , the said axis turning
 30 in bearings on the side of the water-trough n .
 By operating on the hand-wheel p^3 the
 curved arms of the levers p , supporting the
 galvanized tubes, can be lifted out of the
 trough n when it is required to remove the
 35 said tubes.
 The superfluous zinc coating is removed
 from the tube as it is drawn from the bath by
 the asbestos dies q q^2 , the lower die q being
 fixed and the other die q^2 being carried by a
 40 weighted lever. As these asbestos clearing-
 dies constitute no part of my invention, I do
 not consider a further description of the same
 necessary.
 The mechanism for driving and reversing
 45 the motion of the endless band or chain e is
 situated at the higher end of the inclined plat-
 form b and consists of the following parts:
 The axis d^2 of the higher pulley d of the end-
 less band or chain is prolonged, and working
 50 loosely upon it are two bevel-toothed wheels
 r and r^2 , with which the middle bevel-toothed
 wheel r^3 gears, the said middle bevel-wheel re-
 ceiving rotatory motion from a driving-band
 passing over the pulley s on the shaft of the
 55 said middle bevel-wheel. By the rotation of
 the middle wheel r^3 rotatory motion in opposite
 directions is communicated to the wheels r
 and r^2 . Sliding on and connected to the shaft
 d^2 of the pulley d by a sliding key and key-
 60 way and situated between the bevel-wheels
 r r^2 is a sliding clutch t , having clutch-teeth
 on its opposite faces. By sliding the clutch t
 in one direction on its shaft the clutch-teeth
 on one face can be engaged with the wheel r^2
 65 and that wheel thereby geared to the shaft d^2 ,
 (see the dotted position in Fig. 8,) and by slid-
 ing the clutch t in the opposite direction the

opposite face of the said clutch can be en-
 gaged with the other wheel r and that wheel
 geared with the shaft d^2 . In this way rotatory 70
 motion in one or other direction is imparted
 to the shaft d^2 and the pulley d , and the mo-
 tion of the endless band e thereby reversed.
 The sliding clutch t is operated by the lever
 u , the fork of which embraces a collar of the 75
 said sliding clutch. The clutch-lever u is op-
 erated from the hand-lever v , situated near
 the bath a . The axis v^2 of the said lever v
 passes to the other end of the machine and
 carries the vertical slotted link w , the upper 80
 end of which is jointed by a pin and slot to
 the bottom of the long arm of the clutch-lever
 u . By pulling the hand-lever v from or push-
 ing it toward the bath a , as indicated by the
 arrows in Fig. 8, it operates the axis p^2 and 85
 link w , and the latter gives the required mo-
 tion to the lever u necessary to engage the
 clutch t with one or other of the bevel-toothed
 wheels r or r^2 . The positions which the lever
 u and link w take in order to gear the clutch 90
 t with the wheel r^2 are indicated in dotted
 lines in Fig. 8.

The machinery is used as follows: The tube
 having been immersed in the bath a suffi-
 ciently to galvanize it, the said tube is raised 95
 from the bath and one of its ends passed be-
 tween the asbestos dies q q^2 for removing the
 superfluous zinc from it. The end of the tube
 is then introduced between the open jaws of
 the gripper g . The long arms of the gripper 100
 g are then closed and preserved closed by the
 pin or cotter i^2 being passed through the holes
 on the forked upright i . The tube being thus
 gripped by the gripper, the endless band or
 chain e is put in motion by the workman op- 105
 erating the sliding clutch t through the hand-
 lever v , axis v^2 , link w , and lever u , and the
 galvanized tube is drawn up the inclined plat-
 form b . Just before the gripper g reaches the
 stop m near the top of the inclined platform, as 110
 indicated in dotted lines in Fig. 1, the workman
 withdraws the pin or cotter i^2 and by the action
 of the said stop m the long arms of the grip-
 per are opened and the tube released from
 the jaws of the said gripper. The released 115
 tube falls into the cooling-trough n and is re-
 ceived and supported upon the curved levers
 p in the said trough, and by lifting the said
 levers p the cooled tubes may be removed.
 The motion of the endless band or chain e 120
 being reversed by operating the lever v , the
 gripper-carrier f is returned to the bottom of
 the platform b and the operations hereinbe-
 fore described are repeated.

When two (or more) tubes or other galvan- 125
 ized articles are to be drawn from the galvan-
 izing bath a at the same time by the machin-
 ery, two (or more) pairs of grippers are ar-
 ranged on the same carrier and the slot on the
 inclined platform is made sufficiently wide to 130
 permit of the passage through it to the cool-
 ing-trough of two (or more) tubes or articles.

Having now particularly described and as-
 certain the nature of my invention and the

manner of performing the same, I declare that I claim as my invention—

1. In apparatus for removing material from a galvanizing bath, the combination, with an
5 inclined slotted platform, of an endless chain carried by pulleys on said platform, a gripper-carrier connected to said chain, a gripper carried by said gripper-carrier, and means for driving said chain, substantially as de-
10 scribed.

2. The combination, with an inclined slot-
ted platform and a galvanizing bath located
near one end thereof, of an endless chain car-
ried by pulleys on said platform, a gripper-
15 carrier connected to said chain, a gripper car-
ried by said gripper-carrier, gear mechanism

for driving said chain, and devices for revers-
ing the direction of movement of said chain,
substantially as described.

3. The combination, with a galvanizing 20
bath, an inclined slotted platform, and a trav-
eling gripper-carrier arranged thereupon, of
a cooling-trough located under said platform
for receiving the articles taken from the gal-
vanizing bath, and devices for supporting 25
said articles in and raising them from the
cooling-trough, substantially as described.

THOMAS JONES. [L. s.]

Witnesses:

RICHARD SKERRETT,
ARTHUR JOHN POWELL.