

(No Model.)

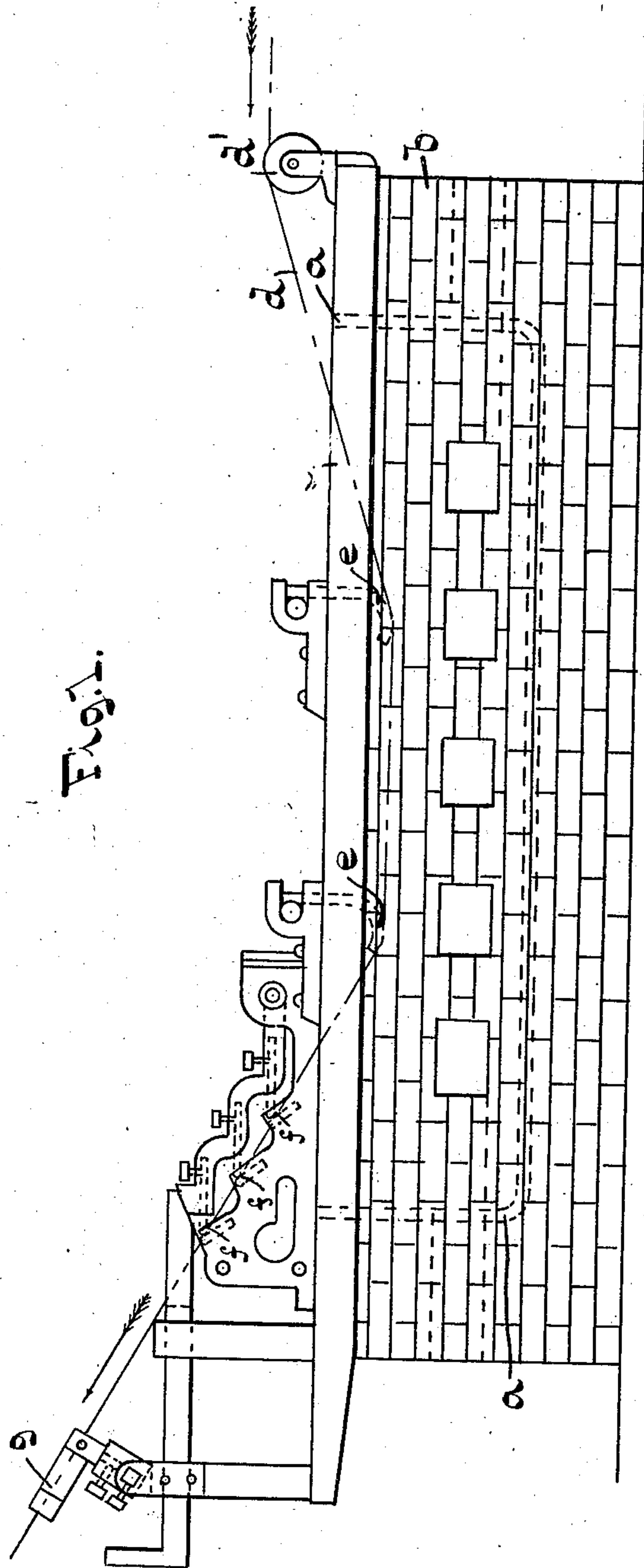
2 Sheets—Sheet 1.

T. V. ALLIS.

APPARATUS FOR GALVANIZING STRIPS.

No. 543,822.

Patented July 30, 1895.



WITNESSES.

*W. J. Morgan*  
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INVENTOR.

*Thos V. Allis*  
*By T. P. Thayer*  
*att'y*

(No Model.)

2 Sheets—Sheet 2.

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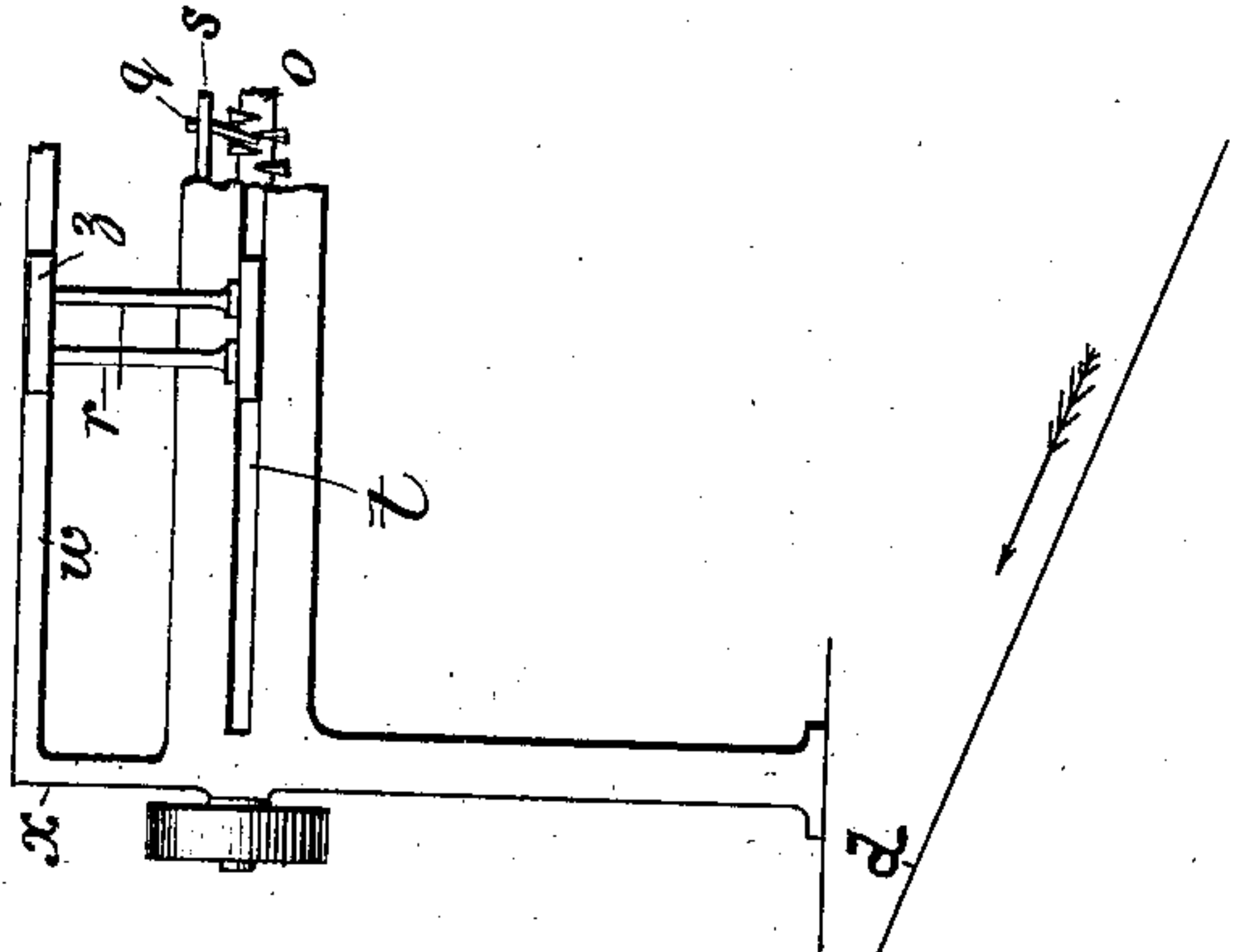


Fig. 6.

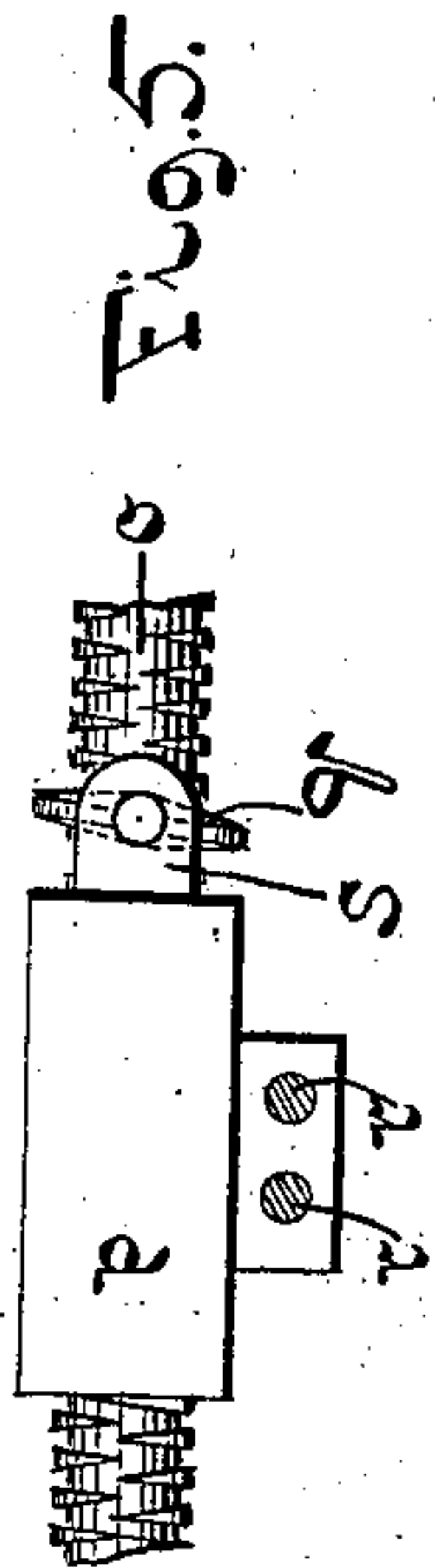


Fig. 5.

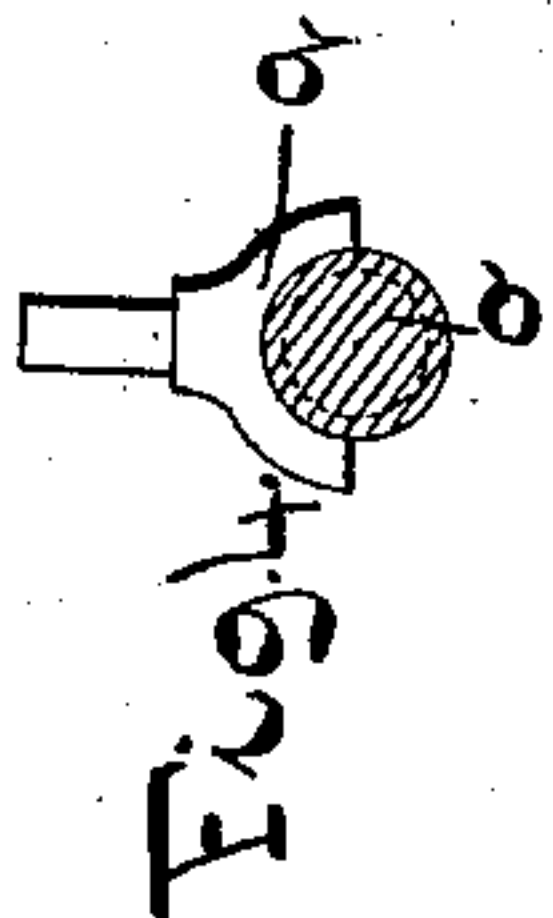


Fig. 4.

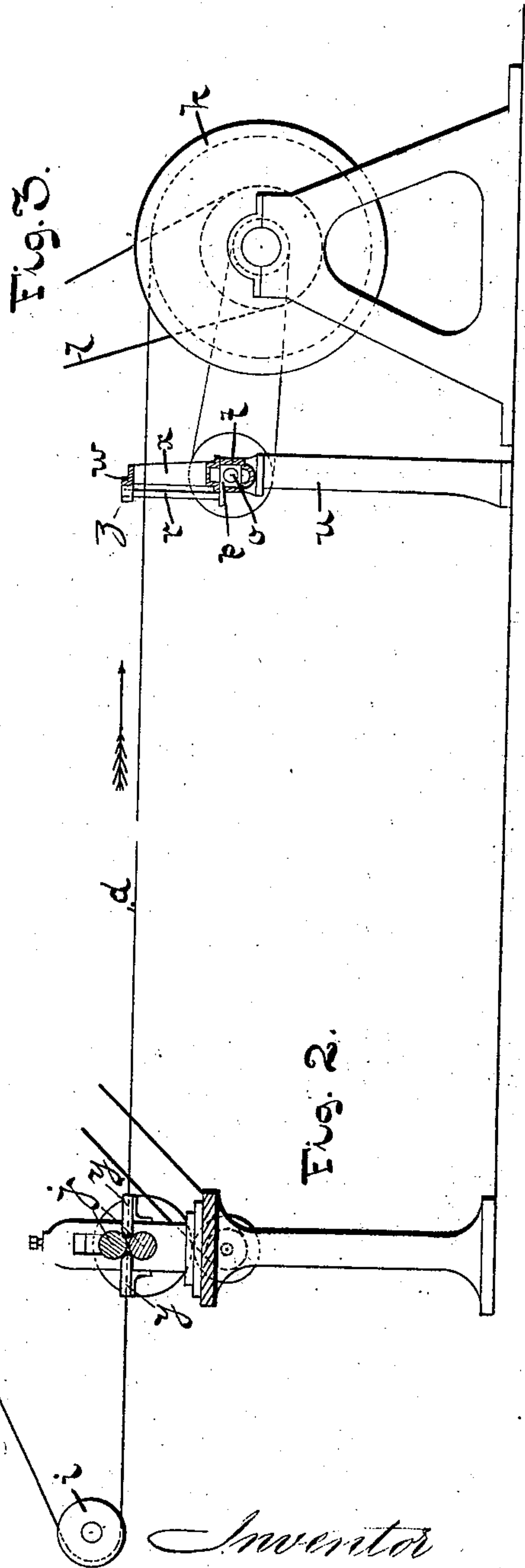


Fig. 3.

Fig. 2.

Witnesses  
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# UNITED STATES PATENT OFFICE.

THOMAS V. ALLIS, OF NEW YORK, N. Y.

## APPARATUS FOR GALVANIZING STRIPS.

SPECIFICATION forming part of Letters Patent No. 543,822, dated July 30, 1895.

Application filed April 20, 1894. Serial No. 508,291. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS V. ALLIS, a citizen of the United States, and a resident of New York city, in the State of New York, have invented certain new and useful Improvements in Apparatus for Galvanizing Strips, of which the following is a specification.

My invention consists in improved apparatus, in combination with a galvanizing-bath, for uniformly drawing strips through the bath to be evenly coated and for delivering them with regularity upon large spools designed to carry several hundred pounds.

In the ordinary practice of galvanizing wire the bundles as taken from the reels after passing through the galvanizing process may weigh possibly one hundred and fifty pounds. The inside diameter of the said bundles or coils of wire is about twenty inches and the outside diameter about thirty inches, so it will be seen there is not much variation between the mean diameter and the inside and outside diameters; so that a spool revolving at a uniform rate does not create a very great difference in the circumferential speed, and the rate of travel of the wires through the bath does not vary beyond practicable limits, nor does this slight difference in speed have any very detrimental effect upon the quality of galvanizing, and as the finished galvanized bundles of wire for market are not much heavier than the ungalvanized bundles there is not so much necessity of putting them upon large spools as they come from the galvanizing pan. The bundles can be taken from the reels where the splices occur, but in the case of flat strips for fencing purposes, where there is a subsequent process of twisting and reeling into bundles or upon spools of varying sizes, as the market demands, it becomes desirable to make large spools or bundles in the process of galvanizing. It is also desirable because the raw material comes to the galvanizing process wound upon similar large spools, one length of strip being evenly brazed to the preceding length, thus enabling a continuous passage of strips through the bath, which is most desirable. Frequent stoppages not only cause delay but an uneven coating of zinc or spelter, which wastes the metal and makes the finished product spotted and unsalable; besides, frequent stoppages make it difficult to

keep the molten spelter at a uniform heat, which is most essential in the process of galvanizing. Hence the longer, more continuous, and uninterrupted the run of strips the more advantageous and better the quality of work done, and, therefore, the necessity of providing for more uniformity in the rate of speed through the bath than when drawn by the reel, which increases the speed too much as the diameter of the coil gets large as compared with the core. I have therefore devised the plan of interposing drawing and feed rolls and spreading or distributing apparatus between the galvanizing-bath and the large receiving-spool. These drawing and feed rolls revolve at a uniform speed and draw the strips through the bath without variation; and they also hold the strips back to prevent the spool, which is driven through a friction device or by a slip-belt, from pulling the strips too fast as the diameter of the spool increases, and the spreading apparatus distributes the coils evenly along the spool from end to end so as to make it feasible to coil the strips connected in great lengths in the large bundles desired.

The spool revolves at a circumferential speed a little greater at the drum than the feed-rolls deliver the strips at the start, so that there is a little slip of the reel-driver from the beginning, causing sufficient tension to wind the material closely upon the spool. This spool may be mounted upon trucks for convenient handling, or it may be adapted for enabling the handle to be removed therefrom.

In the accompanying drawings, Figure 1 is a side elevation of the galvanizing-bath and wipers for wiping off the surplus metal while in a molten or semi-molten state. Fig. 2 represents a sectional elevation of apparatus for drawing and feeding the strips and controlling the reel, so that they pass through the bath at a fixed rate of speed, thereby insuring uniformity in plating. Fig. 3 is a side elevation of a reel for coiling the coated strips. Fig. 4 is a sectional elevation of the screw of the traversing-guide for distributing the strips on the reel. Fig. 5 is a detail of the said traversing-guide in plan view. Fig. 6 is a detail of the traversing-guide in front elevation.

In Fig. 1, I have represented a side elevation of the galvanizing-pan, as indicated by the



dotted lines *a*, inclosed in the brick-setting *b*, covered by a coping-plate *c*, with a metallic strip *d* to be galvanized as passing over the guide-rolls *d'*, under the sinker *e*, through the molten zinc in the pan and upward through the wipers *f*, acting on the sides of the strips, and, through the edge-wipers *g*, to wipe off the surplus metal before cooling.

The improvements in the apparatus thus far described are the subject of another application for a patent, filed April 19, 1894, Serial No. 508,159, and are not therefore particularly described herein; but it is to be noted that the wipers are arranged in series inclined upwardly from the bath and giving an upward direction to the strips to which a part of my present invention is related. The said upward inclination of the series of wipers is for a useful purpose that is not necessary to be set forth in this case.

The strips *d* pass over suitable carrying-sheaves *h'*, thence to the positively-driven drawing and feeding rolls *j*, whereby it is designed to cause the strips to pass through the galvanizing-bath at a regular rate of speed for the most uniform action in the bath, it being of the greatest importance that the molten spelter should be kept at the proper degree of heat, which is best maintained by the regularity of speed at which the strips traverse the bath, the heat of which varies greatly with the rate of movement of the strips. From the drawing and feed rolls the strips pass on to the reel *k*, the speed of which is controlled by said rolls, the reel being driven by a slip-belt *l* or a friction-clutch to permit the speed to be so controlled. Guides of any approved kind, as *y*, are employed in connection with the rolls for guiding the strips to and from the rolls, and the rolls may be of any approved kind.

It is to be noted that a suitable length of runway for the strips between the galvanizing-bath and the drawing and feed rolls will be provided for allowing the strips to cool down before passing through said rolls and onto the reel, and the guide-roll *h* first receiving the strips from the wipers is arranged in the ascending lines corresponding with the line of the passage through the wipers, the purpose of which is to draw the strips with like relation to both wiping-edges of the last pair of wipers, so that the effect will be the same on both sides, which would not be the case if the strips were drawn from the wipers in a line below the line of the passage through the wipers, and the lower wipers would be unduly worn. The upward direction of the strips from the wipers also favors the progress of the work by directing the strips above the workmen.

A traverse-guide is employed for distributing the coils on the reel uniformly. It consists

in this case of the well-known right-and-left-threaded screw *o*, which works a slide *p* by means of a forked traveler *q*, which is pivoted in a boss *s* of the slide suitably to allow the fork to reverse in the reverse turns of the threads at the ends of the range of the slide. The slide works in suitable ways *t* on the stand *u*, and carries the upwardly-projecting guide-studs *r*, between which the strips *d* run. As the coils vary considerably in diameter between the core and the full size, these guide-studs have necessarily to be of considerable length and require some support at the top. I therefore provide a cross-bar *w* over the guideway at a suitable height, supported by a standard *x* at each end, and on the upper ends of the guide-studs I apply a cross-head *z*, connecting them together and so as to bear against the side of the cross-bar to resist the friction of the strips on the guide-studs. The standards *x* and the cross-bar *w* are fixed, and the cross-head *z* slides forward and backward along the said cross-bar *w*.

I am aware that traversing-guides are common in thread-spooling apparatus, and I do not claim such guides broadly.

I am also aware that drawing and feed rolls have been used in sheet-metal-tinning apparatus, as in the patent to Duffy, No. 229,527, and I do not broadly claim such rolls.

I claim as my invention—

1. In apparatus for galvanizing and reeling metallic strips, the combination of the galvanizing bath, wipers through which the strips pass upward, reel having means for driving it of such construction as to be controlled by the feed rolls, and the positively driven drawing and feeding rolls located intermediately of said bath and reel and having driving mechanism constructed to control the speed of the reel to feed said strips through the bath at a uniform rate of speed for uniform application of coating to said strips, and to favor uniform temperature of the bath substantially as described.

2. The combination with the drawing and feeding rolls and reel, of the traversing guide located between the rolls and the reel, and means for actuating it consisting of a single traverse guide screw, said traversing guide having the upwardly extended guide studs, the cross head on the upper ends of said guide studs, and the guide-supporting stand having the cross bar supporting said cross head of the guide studs against the pull of the strips substantially as described.

Signed at New York city, in the county and State of New York, this 18th day of April, A. D. 1894.

THOMAS V. ALLIS.

Witnesses:

A. P. THAYER,  
W. J. MORGAN.