

No. 632,206.

Patented Aug. 29, 1899.

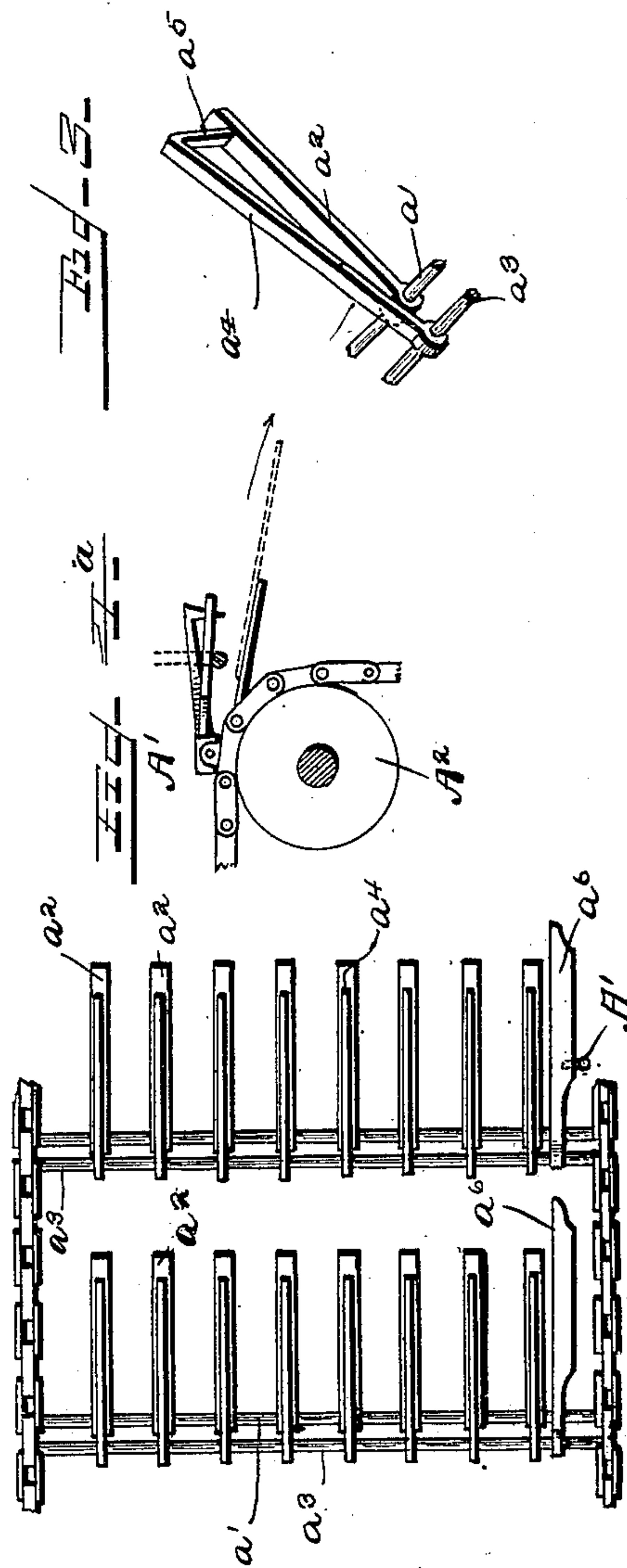
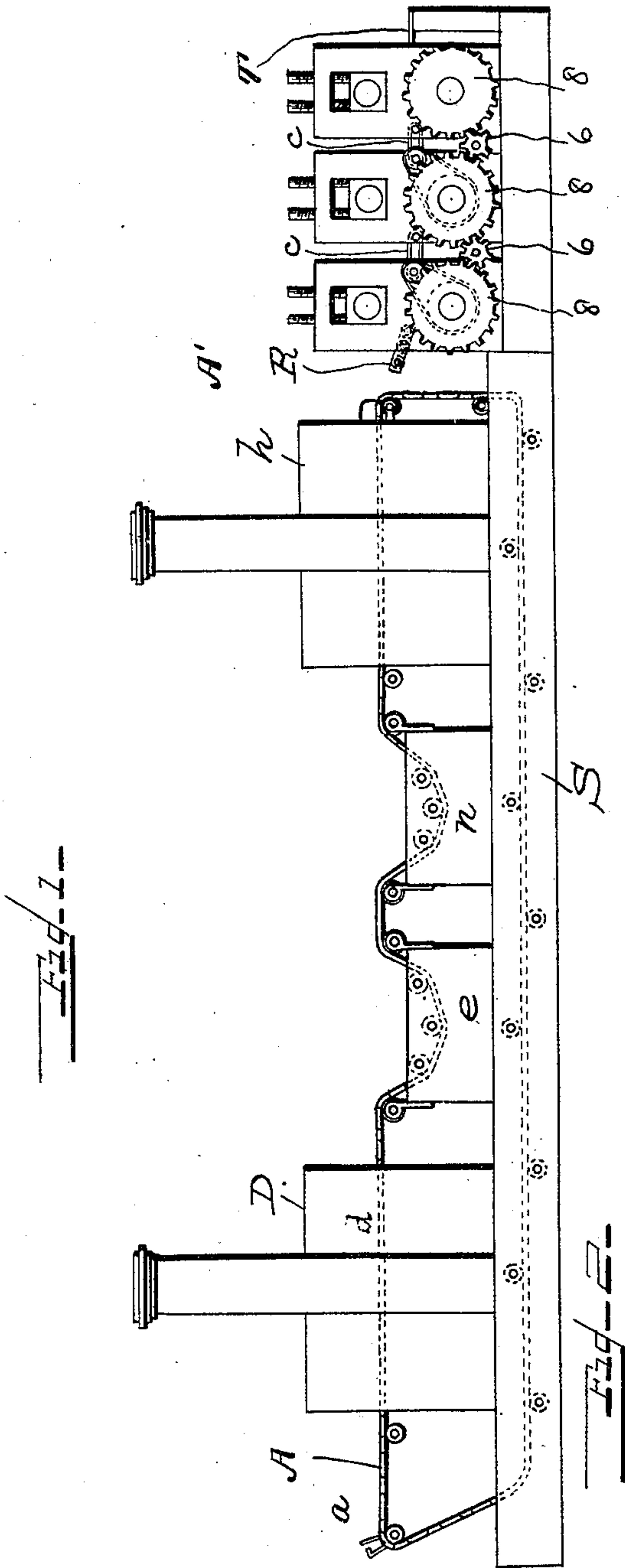
W. & J. SCHAEFER.

APPARATUS FOR TREATING BLACK PLATE FOR TINNING.

(Application filed Jan. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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Fig. 4

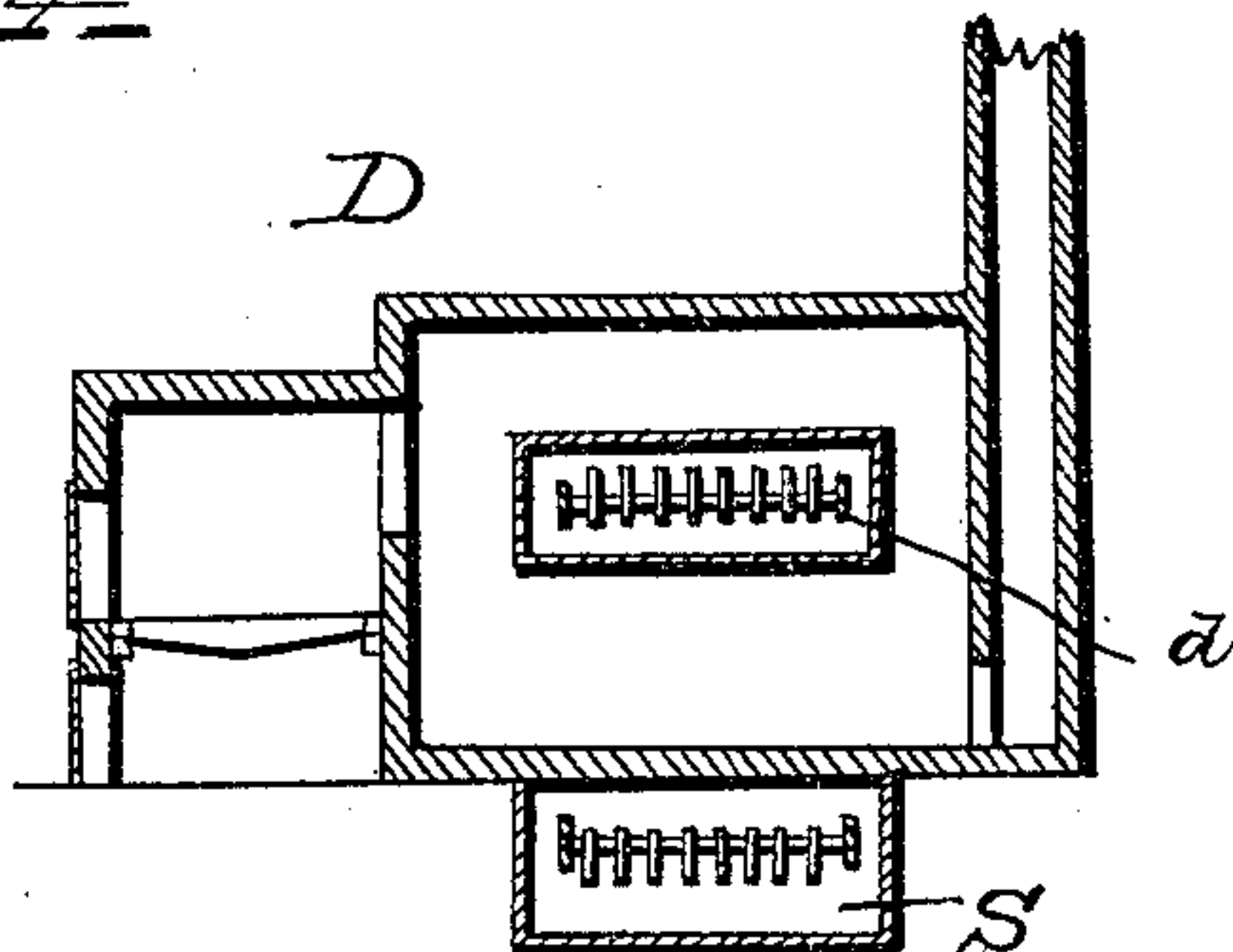


Fig. 5

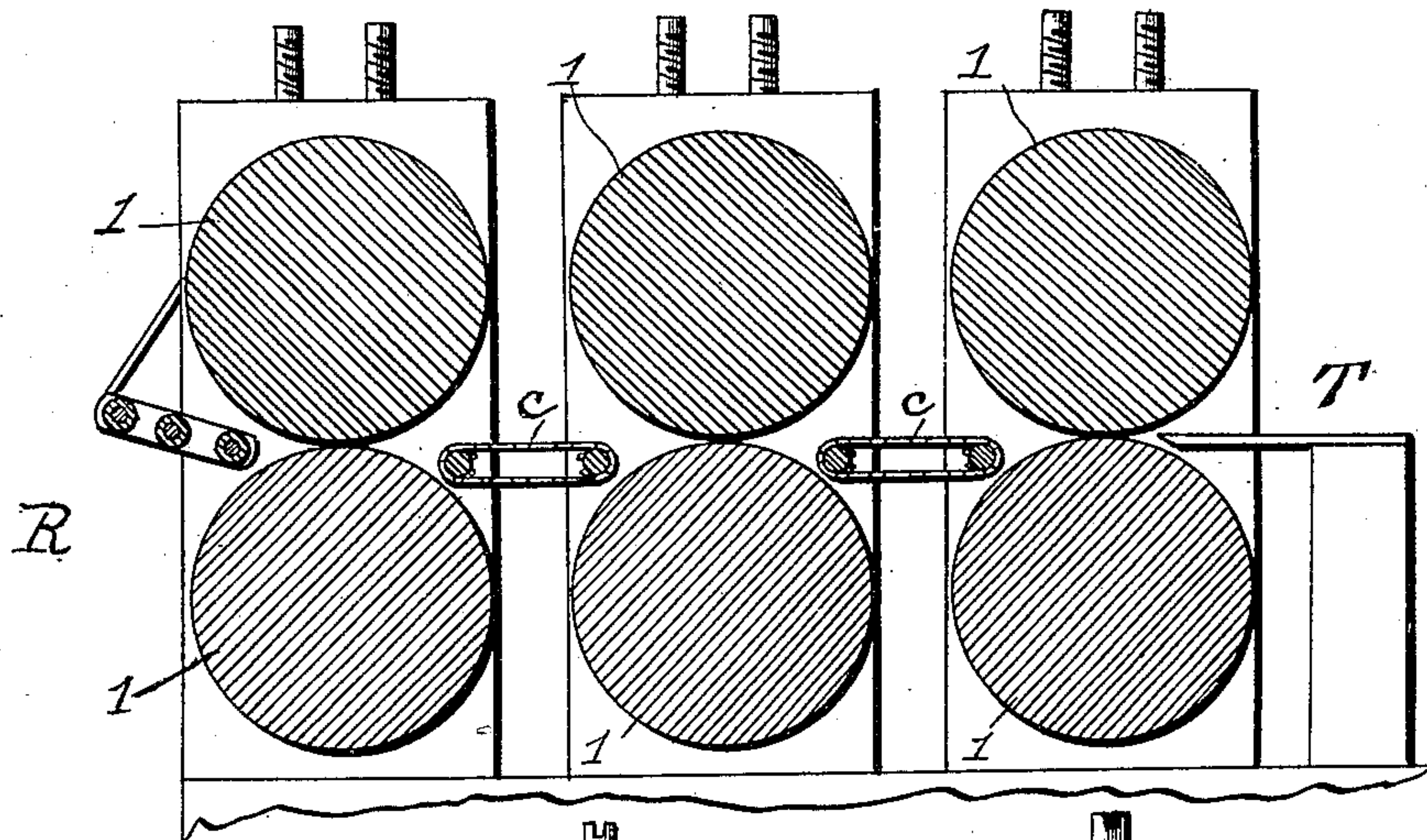
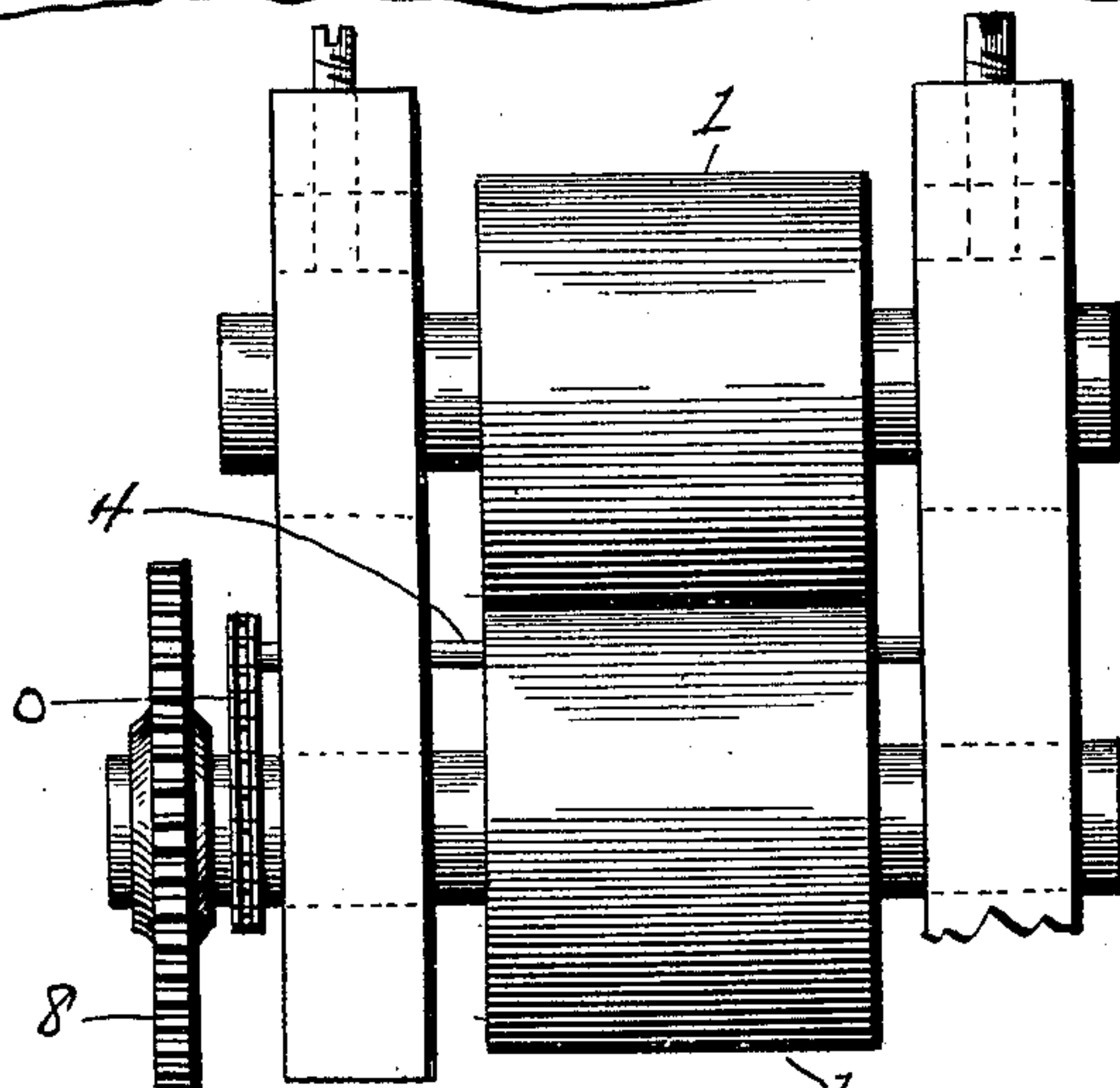


Fig. 6



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UNITED STATES PATENT OFFICE.

WILLIAM SCHAEFER AND JOHN SCHAEFER, OF WHEELING, WEST VIRGINIA,
ASSIGNORS OF TWO-THIRDS TO A. H. WIEDEBUSCH, JOSEPH HANDLAN,
JOHN C. DEVINE, AND GEORGE STEIN, OF SAME PLACE.

APPARATUS FOR TREATING BLACK-PLATE FOR TINNING.

SPECIFICATION forming part of Letters Patent No. 632,206, dated August 29, 1899.

Application filed January 30, 1899. Serial No. 703,950. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM SCHAEFER and JOHN SCHAEFER, residing in the city of Wheeling, Ohio county, West Virginia, have
5 invented new and useful Improvements in Apparatus for Treating Black-Plate for Tinning, of which the following is a specification.

Our invention is an improvement in apparatus for treating black-plate for tinning; and
10 it consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which we have contemplated embodying our invention, and said invention is fully dis-
15 closed in the following description and claims.

In the drawings, Figure 1 represents a side elevation of our complete apparatus. Fig. 2 represents a top plan view of a portion of the endless carrier for the black plates. Fig. 3
20 is a detail perspective view of one of the rigid fingers and one of the movable fingers. Fig. 4 represents a transverse vertical section through the annealing-furnace, showing the endless conveyer, one part within the furnace and another part within the cooling-
25 trough below the furnace. Fig. 4^a represents a detail view of a portion of the endless conveyer, one of the revoluble supports therefor, and the stationary device for separating the
30 rigid and movable fingers to allow the plates to be discharged therefrom. Fig. 5 represents a longitudinal vertical section of the rolling device for rolling the plates after they leave the drying-furnace. Fig. 6 is an end
35 view of the same.

In the drawings, D represents an annealing-furnace of any desired construction, provided with a longitudinally-disposed passage
40 *d*, extending therethrough.

e represents a bath or tank containing an acid solution, located in line with the longitudinal passage through the annealing-furnace, for pickling the plates. *n* represents a
45 similar bath or tank containing water for washing the plate and removing scale therefrom, and *h* is a drying-furnace of any desired construction and which may be constructed similar to the annealing-furnace D and having a longitudinal passage extending
50 therethrough, the said passages in said fur-

naces and the tanks *e* and *n* being located in a straight line. S represents a cooling-trough extending underneath the said tanks and furnaces and vertically in line with the longitudinal passages through said furnaces, as
55 shown in Fig. 4, the said tank S being supplied with water.

A represents an endless carrier which passes through the annealing-furnace D, the pickling-bath *e*, the water-bath *n*, the drying-furnace
60 *h*, and returning through the cooling tank or trough S, said carrier being guided and supported throughout its length by suitable stationary rollers and driven by any suitable means. The construction of said carrier will
65 be apparent from Figs. 2, 3, and 4^a. The said carrier consists of two endless chains *a a*, which are connected at intervals by transverse bars *a' a'*, rigidly secured thereto, each bar being provided with a series of rigid fin-
70 gers *a*², extending in the general direction of the carrier. Adjacent to each of the bars *a'* is a transverse rock-shaft *a*³, mounted in bearings carried by the chains *a*, and each of said rock-shafts is provided with a series of mov-
75 able fingers *a*⁴, rigidly secured to the rock-shaft, each of said fingers being preferably provided with a downwardly-extending retaining-arm *a*⁵, which engages one of the rigid
80 fingers *a*² or a plate resting upon said rigid fingers, as the case may be. Each of said rock-shafts is provided with an operating-arm *a*⁶ for rocking the same. The plates to be treated are inserted between the fingers *a*² *a*⁴
85 on the end of the carrier before said carrier enters the annealing-furnace D, and the plates will be held between said fingers and carried through the annealing-furnace, the pickling-bath, the water-bath, and the dry-
90 ing-furnace and successively treated by these devices.

Beyond the drying-furnace *h* we provide a stationary cam A' (see Figs. 2 and 4^a) in the path of the operating arms or levers *a*⁶. Said
95 arms or levers are so constructed, as shown in Fig. 2, that they have a broad bearing portion which engages the said stationary cam A', said arms or levers having the portions thereof nearest the rock-shaft reduced in
100 width, as shown in Fig. 2, so that said arms

will disengage the cam A' upon the further movement of the carrier. We prefer to locate the cam A' at such a point adjacent to the last supporting-roller of the upper series (shown in Fig. 1) that the engagement of said operating-arms a^6 with said cam A' will cause a separation between the rigid fingers a^2 and movable fingers a^4 as the carrier passes around said roller, which is indicated at A² in Fig. 4^a, so as to allow the plates carried by said fingers to be discharged therefrom, as indicated in dotted lines in Fig. 4^a.

Beyond the drying-furnace *h* we provide a series of vertical pairs of rollers, three pairs being shown, (see Figs. 5 and 6,) the said rollers *l l* being mounted in a suitable frame or housing and driven by suitable gearing 6 8. Adjacent to the drying-furnace we provide the housing with an inclined series of rollers R, forming an inclined guide or slide upon which the plates are delivered from the endless carrier and slide down by gravity into the bite of the first pair of rollers *l l*. Between the adjacent pairs of rollers we also arrange short conveying-belts *c c*, which receive the plates from one pair of rollers and carry them to the next pair, the plates being delivered from the last pair of rollers upon a table T or other suitable device. It will thus be seen that after a plate is placed upon the carrier it is carried through the annealing-furnace, pickling-bath, water-bath, drying-furnace, and rollers without being touched by any operator, thus rendering the process a continuous one and dispensing with the handling of the plates from one device to another. It will also be seen that as the endless carrier leaves the drying-furnace it will return through the cooling-trough S to the annealing-furnace, and during its immersion in said trough it will become cooled.

By the use of our improved apparatus the treatment of black plates preparatory to tinning can be carried on very cheaply and rapidly with the use of a very small number of men.

What we claim, and desire to secure by Letters Patent, is—

1. In apparatus for treating black-plate for tinning, the combination with an annealing-furnace provided with a longitudinal passage therethrough, a pickling-bath, and a water-bath, a drying-furnace having a longitudinal passage therethrough and a cooling-trough extending beneath said baths and furnaces, of an endless carrier having a portion extending through said baths and furnaces and a por-

tion extending through said cooling-trough, substantially as described.

2. In apparatus for treating black-plate for tinning, the combination with an annealing-furnace, a pickling-bath, a water-bath and a drying-furnace, of an endless carrier extending through said baths and furnaces, comprising parallel endless chains, a series of rows of fingers rigidly connected thereto, a series of rows of movable retaining-fingers pivotally secured to said chains, one of said rows being adjacent to each row of stationary fingers, and adapted to cooperate therewith to grasp a plate between them, and stationary devices for separating said movable fingers from said stationary fingers, to permit them to discharge the plates carried thereby, substantially as described.

3. In apparatus for treating black-plate for tinning, the combination with an annealing-furnace, a pickling-bath, a water-bath and a drying-furnace, of an endless carrier extending through said baths and furnaces comprising parallel endless chains, a series of rows of fingers rigidly connected thereto, a series of rows of movable retaining-fingers pivotally secured to said chains, one of said rows being adjacent to each row of stationary fingers, and adapted to cooperate therewith to grasp a plate between them, an operating-arm for each row of movable fingers, and a stationary device in the path of said arms for separating said movable fingers from said rigid fingers, to permit the plates carried thereby to be discharged, substantially as described.

4. In an apparatus for treating black-plate for tinning an endless carrier, comprising among its members, a plurality of endless chains, a series of transverse shafts rigidly secured thereto, at intervals, a series of fingers secured to each of said shafts, a rock-shaft pivotally secured to said chains adjacent to each of said rigidly-connected shafts, a series of retaining-fingers on each of said rock-shafts, each finger having a retaining projection extending toward one of said rigid fingers, an operating-arm secured to each rock-shaft, revoluble supports for said chains and a stationary part in the path of said arms for rocking said rock-shafts, substantially as described.

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Witnesses:

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