

No. 648,684.

Patented May 1, 1900.

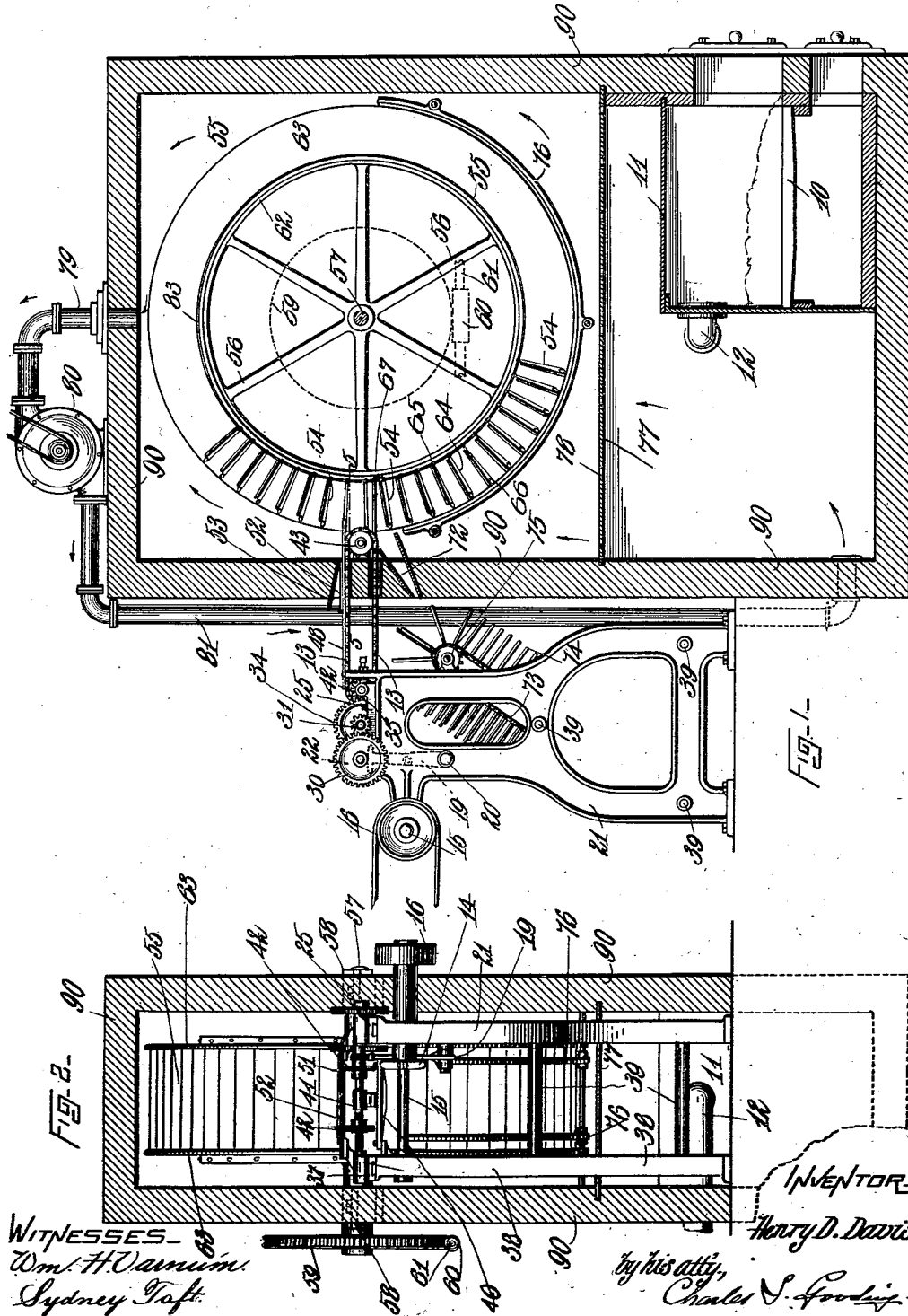
H. D. DAVIS.

DRYING OVEN WITH AUTOMATIC FEED AND DELIVERY.

(Application filed July 21, 1899.)

(No Model.)

4 Sheets—Sheet 1.



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4 Sheets—Sheet 2.

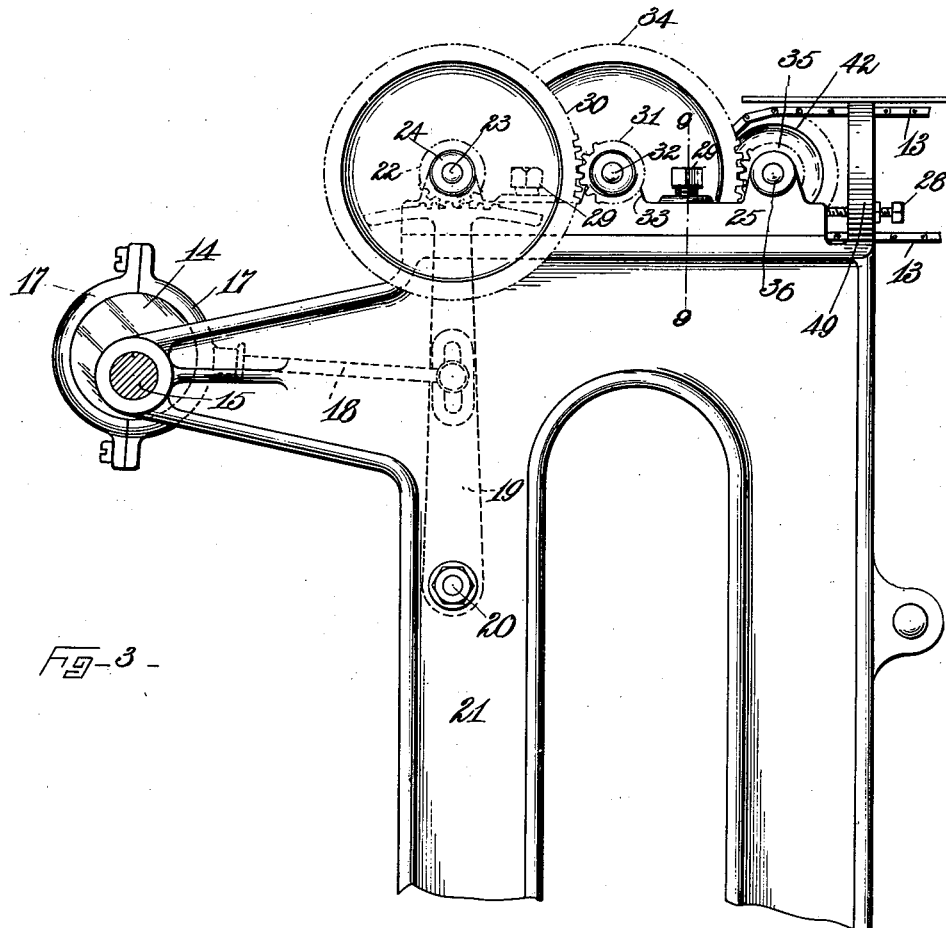


FIG-3 -

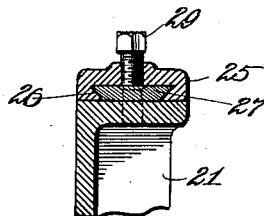


FIG-9 -

WITNESSES -

Wm. H. Varnum.

Sydney Taft

INVENTOR -

Henry D. Davis,

by his atty.,

Charles J. Gooding.

No. 648,684.

Patented May 1, 1900.

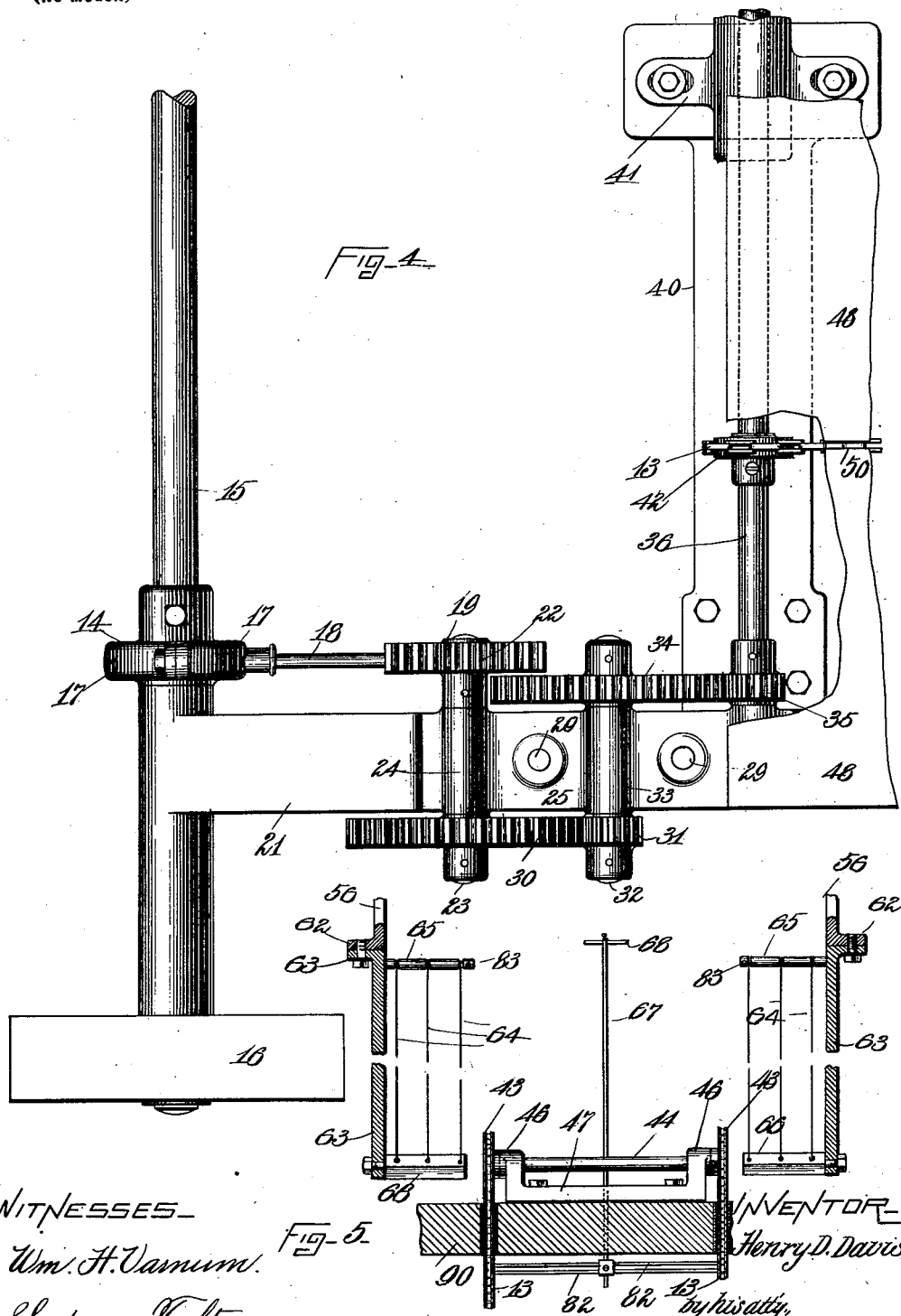
H. D. DAVIS.

DRYING OVEN WITH AUTOMATIC FEED AND DELIVERY.

(Application filed July 21, 1899.)

4 Sheets—Sheet 3.

(No Model.)



WITNESSES—

Wm. H. Varnum.

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Fig. 5

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Henry D. Davis,

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Charles S. Gooding.

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(No Model.)

4 Sheets—Sheet 4.

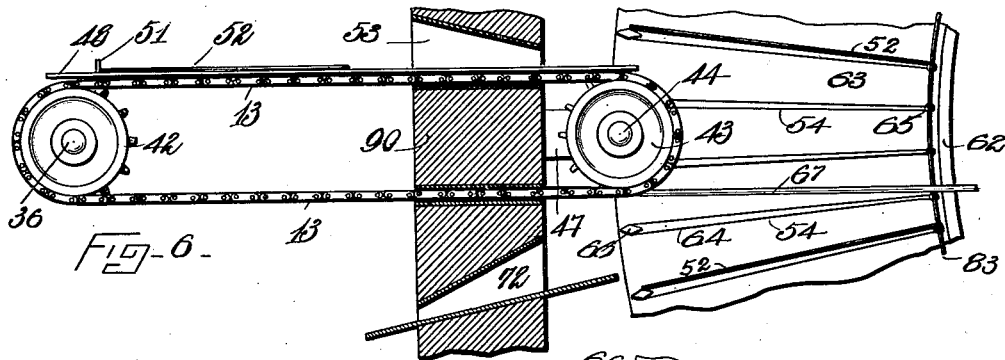


Fig-6-

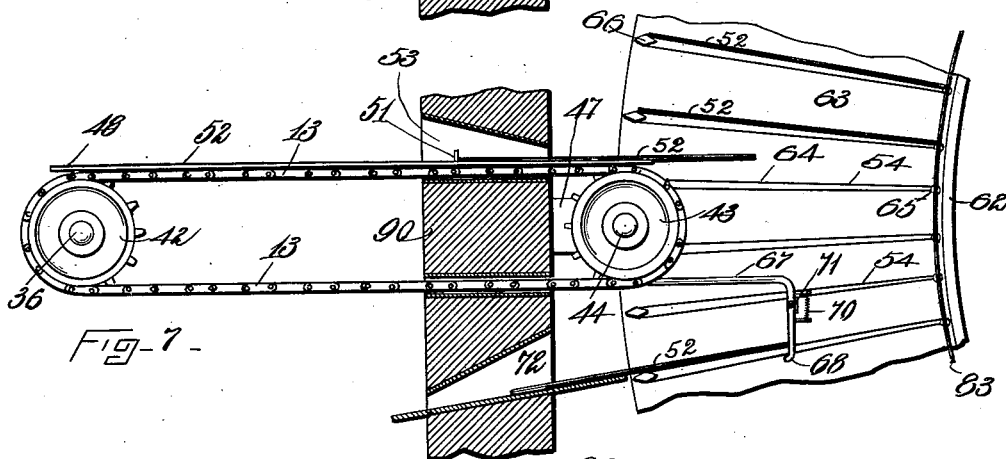


Fig-7-

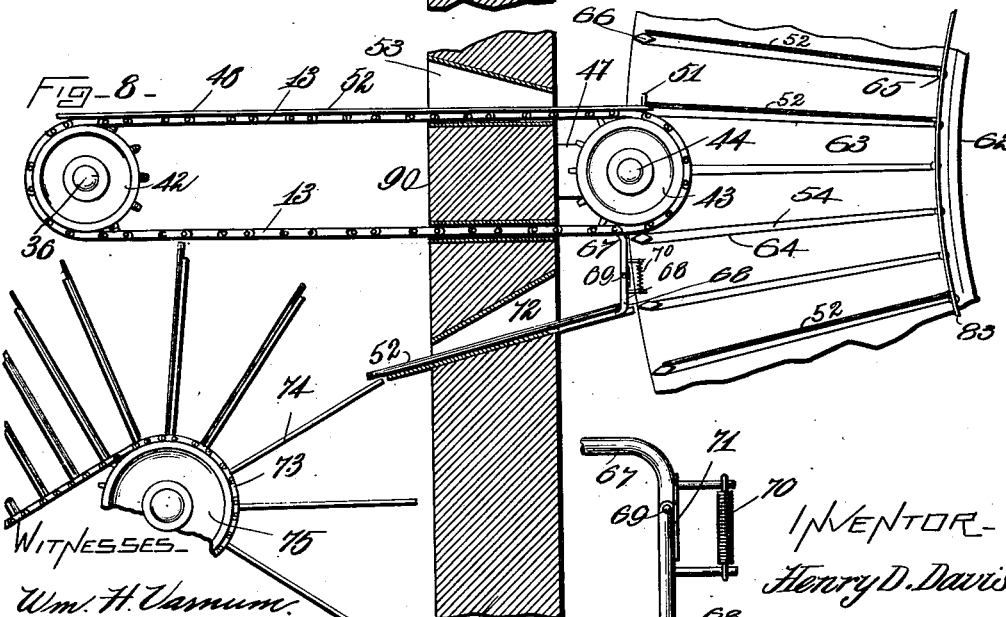
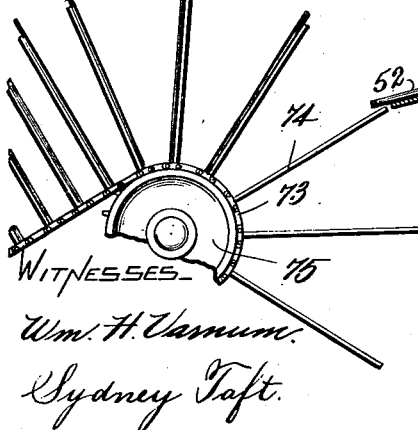


Fig-8-



WITNESSES-

Wm. H. Varnum.

Sydney Taft.

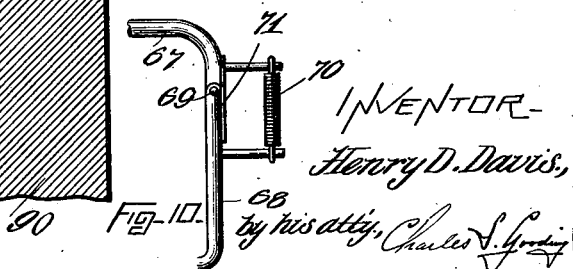


Fig-10-

# UNITED STATES PATENT OFFICE.

HENRY D. DAVIS, OF EASTPORT, MAINE.

## DRYING-OVEN WITH AUTOMATIC FEED AND DELIVERY.

SPECIFICATION forming part of Letters Patent No. 648,684, dated May 1, 1900.

Application filed July 21, 1899. Serial No. 724,724. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY D. DAVIS, a citizen of the United States, residing at Eastport, in the county of Washington and State of Maine, have invented new and useful Improvements in an Automatic Feed for Baking-Ovens, of which the following is a specification.

The object of this invention is to provide an automatic feed for ovens for baking lacquered and printed tin, whereby a saving of time and expense may be attained.

In ovens as at present constructed the tin is placed on a rack and pushed into the oven on a turn-table. To do this, it is necessary to open a door to admit the rack and also to take the same out of the oven. This necessitates loss of time and also cools off the oven. The present method necessitates the employment of a man to load the racks and also one to unload the same. In my improved device the sheets are fed into and out of the oven automatically and without any loss of heat and time.

The capacity of my improved oven for baking lacquered and printed tin is four times as great as that of the ovens above referred to, in which the tin is placed on a rack and pushed into the oven on a turn-table.

The invention consists in a rotary wheel for carrying the tin sheets, said wheel being inclosed in a kiln or oven.

The invention further consists in the automatic feeding mechanism for feeding the sheets of tin into the oven upon the wheel and for removing the said sheets of tin from the wheel and oven.

Referring to the drawings, Figure 1 is a sectional elevation of my improved oven and automatic feeding mechanism. Fig. 2 is a side elevation of the feeding device with the oven-walls in section and the air pump and pipes removed. Fig. 3 is a side elevation of a portion of the feed mechanism. Fig. 4 is a plan view of the same. Fig. 5 is a detail longitudinal section taken on line 5 5, Fig. 1. Figs. 6, 7, and 8 are diagram views illustrating the manner of feeding the tin sheets into and out of the oven. Fig. 9 is a transverse section, line 9 9, Fig. 3. Fig. 10 is an enlarged detail of a portion of the plate-removing arm with the finger pivoted thereon.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 90 is a rectangular baking oven or kiln. The fire is built on the grate-bars 10 of the stove or furnace 11, and the gases and smoke pass out of the furnace through the smoke-pipe 12.

The sheets of printed and lacquered tin are taken one at a time and placed upon a table 48, supported upon arms 49 upon the side frames 21 and 38. Said table has two longitudinal slots 50 50 therein, through which project fingers 51 51, fast to the sprocket-chains 13 13, and said sprocket-chains are given a reciprocating motion by means of an eccentric 14, fast to a shaft 15, said shaft being rotated by a pulley 16. The eccentric 14 is connected by an eccentric-strap 17 and eccentric-rod 18 to a segmental gear-lever 19, pivoted at 20 to the side frame 21. The segmental gear-lever 19 meshes a pinion 22, fast to a shaft 23, which turns in a bearing 24 upon the adjustable slide 25. The slide 25 is dovetailed at 26 and slides on guide 27, fast to the frame 21, being adjusted longitudinally by the screw 28 and clamped to the frame after being adjusted by the set-screws 29. A gear 30, fast to the shaft 23, meshes a pinion 31, fast to a shaft 32, which has a bearing 33 on the adjustable slide 25. A gear 34, fast to shaft 32, meshes a pinion 35, fast to the shaft 36, which shaft 36 has bearings in the adjustable slide 25 on the side frame 21 and also in a similar slide 37, adjustable upon the side frame 38, which is formed similar to the side frame 21 and connected thereto by stay-rods 39 and a brace 40, and said shaft 36 is supported midway between the side frames 21 and 38 by a box 41, adjustable upon the brace 40. The shaft 36 has two sprocket-wheels 42 42 fast thereto, imparting a reciprocating motion through the train of gearing hereinbefore described from the eccentric 14 to the sprocket-chains 13 13, which pass from the sprocket-wheels 42 to another pair of sprocket-wheels 43, fast to a shaft 44, which turns in bearings 46 upon the bracket 47, fast to the inner face of one side of the oven 90. It will be seen that each sheet of tin 52 as it is placed upon the table 48 will be carried forward by the fingers 51 upon the sprocket-chains 13 and through the opening 53 in the

side of the oven 90. The sheets of tin are carried by the sprocket-chains 13 into the oven 90 and laid one by one on shelves 54 on the rotary wheel 55. The wheel 55 as a whole consists of two flanged wheels 56 56, both fast to a shaft 57, and the shaft 57 has bearings at 58 in the walls of the oven 90 and is rotated by a worm-gear 59, which meshes a worm 60, said worm being rotated by suitable mechanism, such as a pulley fast to the shaft 61, to which said worm is also fastened. The wheels 56 each have a flange 62, to which is bolted the flanged ring 63, said ring having a series of shelves 54 thereon. The shelves 54 are made by stretching wires 64 from the cylindrical pins 65 to the diamond-shaped guide-pins 66, both the pins 65 and 66 being fast to the ring 63. This construction of the shelves 54 makes a shelf which touches very little of the tin sheet, leaving the surface of said sheet fully exposed to the hot air. The diamond-shaped guide-pins 66 prevent the edge of the sheet as it is being fed into or out of the oven from catching on said pins, more especially in the case of sheets having warped or turned-up edges.

The sheets of tin when pushed onto the shelves 54 are prevented from being moved too far toward the center of the wheel 55 through momentum by the guard-wires 83 83, which extend in a circle around the wheel at the inner end of said shelves.

The tin sheets are removed from the rotary wheel 55 by a hook-shaped arm 67, and said arm is attached to the lower side of the sprocket-chains 13 by cross-rods 82, connecting said chains, Fig. 5, and has a finger 68, pivoted at 69 to the arm 67. A spring 70 draws the finger 68 against the stop 71 upon the arm 67. When the arm 67 is carried to the right, Figs. 6, 7, and 8, if the finger 68 strikes one of the tin plates 52 upon the wheel 55 it will yield until it passes by said plate toward the center of the wheel. The spring 70 will then draw the finger 68 against the stop 71, and upon its return movement the finger will catch the tin plate 52 and draw it out of the wheel, Fig. 7, through the opening 72, Fig. 8, and into the conveyer-chain 73, which consists of a series of shelves 74, fast to a pair of sprocket-chains which pass around sprocket-wheels 75 and are so timed with relation to the wheel 55 that as the tin sheets are drawn out of the oven, as hereinbefore described, they are deposited one by one upon the chain conveyer 73 and thence carried away to any desired distance.

Beneath the wheel 56 are a pair of semicylindrical flanges 76, fast to the side of the oven 90, which prevent the sheets of tin from dropping out of the wheel 55 as the latter revolves.

A plate 77, perforated at 78 78, shields the tin plates upon the wheel 55 from the direct radiation of heat from the furnace 11, but allows a current of heated air to pass through

said perforations 78, up through the wheel 55, and around all the tin plates carried thereon and out through the pipe 79, being forced by the blower 80 through the pipe 81, through the oven 90, and pipe 79 over and over again, thus continually utilizing the heated air.

The operation of the device as a whole is as follows: The sheets of lacquered and printed tin 52 are placed upon the table 48 one by one and are carried forward by the fingers 51 upon the sprocket-chains 13 through the opening 53 into the oven 90 and laid upon the shelves 54 on the wheel 55, and the wheel 55, slowly rotating, carries said tin plates around through the heated air in the oven 90 until said sheets are drawn off the shelves 54 out through the opening 72 and onto the conveyer-chain 73 by the hook-arm 67 and spring-finger 68, and thence the tin plates are carried by said conveyer-chain to any desired locality.

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

1. A baking-oven, a rotatory wheel inclosed within said oven and means for rotating said wheel; in combination with sprocket-chains 13 having fingers 51 attached thereto, sprocket-wheels 42, 43, and mechanism for imparting a reciprocating motion to said sprocket-chains.

2. A baking-oven, a rotatory wheel inclosed within said oven, and means for rotating said wheel, in combination with sprocket-chains 13, having an arm 67 attached thereto, sprocket-wheels 42, 43, and mechanism for imparting a reciprocating motion to said sprocket-chains.

3. A baking-oven, a rotatory wheel inclosed within said oven, and means for rotating said wheel in combination with one or more sprocket-chains 13 having fingers 51 and an arm 67 attached thereto, sprocket-wheels 42, 43, and mechanism for rotating said sprocket-wheels.

4. In combination with a baking-oven, a rotatory wheel, having a series of shelves extending radially from the periphery of said wheel toward the center thereof, each shelf being divided into two parts by a space extending from the periphery toward the center of said wheel, in combination with sprocket-chains 13 having fingers 51 attached thereto, sprocket-wheels 42, 43, and mechanism for imparting a reciprocating motion to said sprocket-chains.

5. In combination with an oven for baking sheets of decorated metal, a rotatory wheel having a series of shelves extending radially from the periphery of said wheel toward the center thereof, each shelf being divided into two parts by a space extending from the periphery toward the center of said wheel, said shelves consisting of diamond-shaped guide-pins 66, connected by support-wires 64 to pins 65, said pins 66 and 65 being fast to rings 63,

on the wheel 55, and parallel to the axis thereof, substantially as described for the purpose specified.

6. In combination with an oven for baking  
5 sheets of decorated metal; a rotary wheel having a series of shelves extending radially from the periphery of said wheel toward the center thereof, a guard-wire extending around the wheel in a circle at the inner ends of said  
10 shelves, each shelf being divided into two parts by a space extending from the periphery toward the center of said wheel; said shelves consisting of diamond-shaped guide-pins 66 connected by support-wires 64 to pins  
15 65, said pins 66 and 65, being fast to rings 63, on the wheel 55, and parallel to the axis thereof, substantially as described for the purpose specified.

7. A baking-oven, a rotatory wheel inclosed  
20 within said oven and means for rotating said wheel, in combination with sprocket-chains 13, having an arm 67 attached thereto, said arm having a spring-finger 68 pivoted thereon, sprocket-wheels 42, 43, and mechanism  
25 for rotating said sprocket-wheels so as to move the chains alternately in opposite directions.

8. In combination with a baking-oven, a rotatory wheel, having a series of shelves extending radially from the periphery of said  
30 wheel toward the center thereof, each shelf being divided into two parts by a space extending from the periphery toward the center of said wheel and adapted to support sheets of decorated metal, an arm 67 having a spring-

finger 68 pivoted thereto, mechanism for imparting a reciprocating motion to said arm, and removing said sheets of decorated metal from said shelves.

9. In combination with a baking-oven, a rotatory wheel, having a series of shelves extending radially from the periphery of said wheel toward the center thereof, each shelf being divided into two parts by a space extending from the periphery toward the center of said wheel, in combination with sprocket-chains 13, having an arm 67 attached thereto, sprocket-wheels 42, 43, and mechanism for imparting a reciprocating motion to said sprocket-chains.

10. In combination with a baking-oven, a rotatory wheel, having a series of shelves extending radially from the periphery of said wheel toward the center thereof, each shelf being divided into two parts by a space extending from the periphery toward the center of said wheel, in combination with one or more sprocket-chains 13 having fingers 51 and an arm 67 attached thereto, sprocket-wheels 42, 43, and mechanism for rotating said sprocket-wheels.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY D. DAVIS.

Witnesses:

CHARLES S. GOODING,  
WM. H. VARNUM.