

No. 756,474.

PATENTED APR. 5, 1904.

W. CLASPER.
APPARATUS FOR THE MANUFACTURE OF SHEET IRON.

APPLICATION FILED JAN. 24, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 3

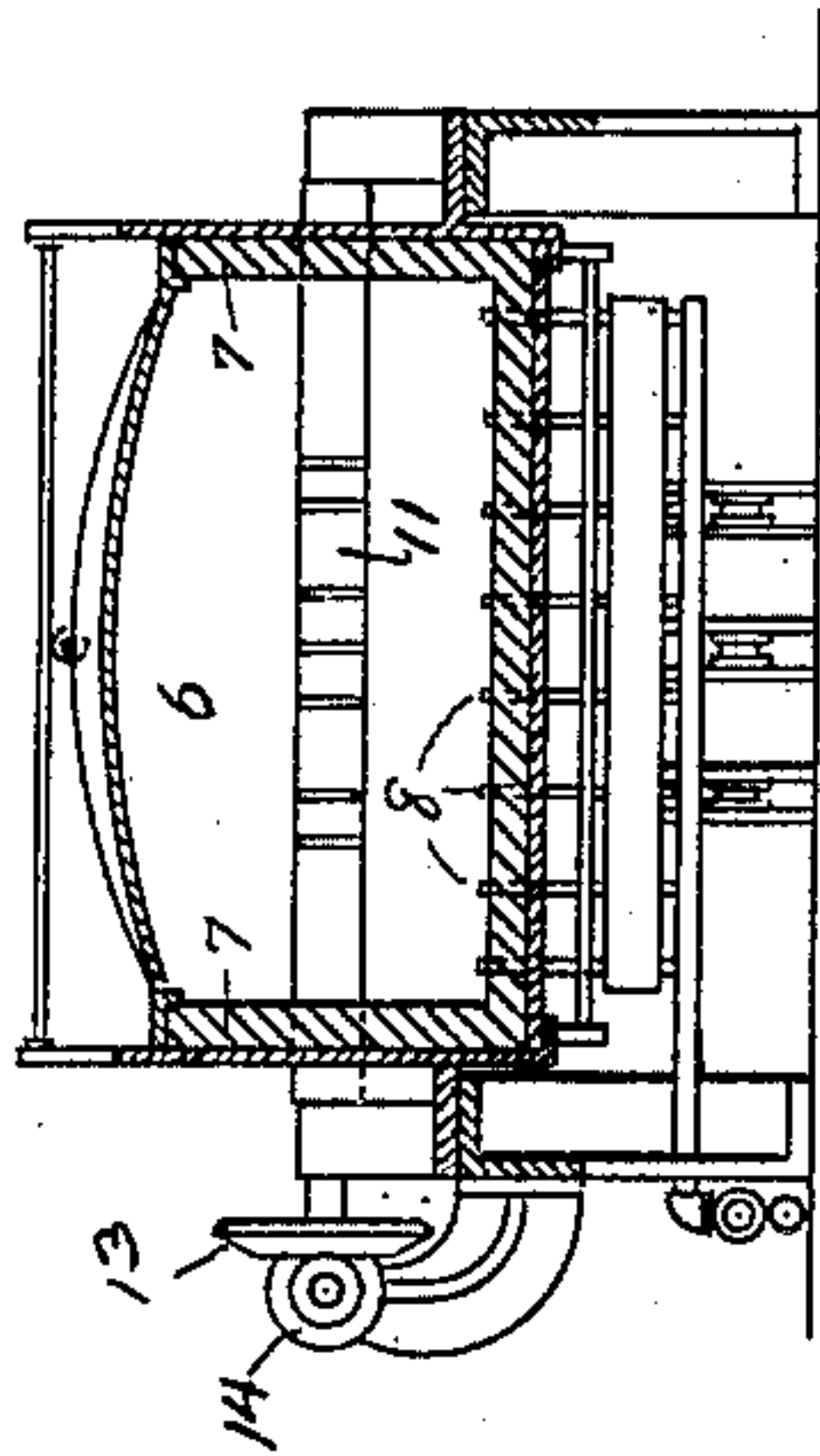


Fig. 1

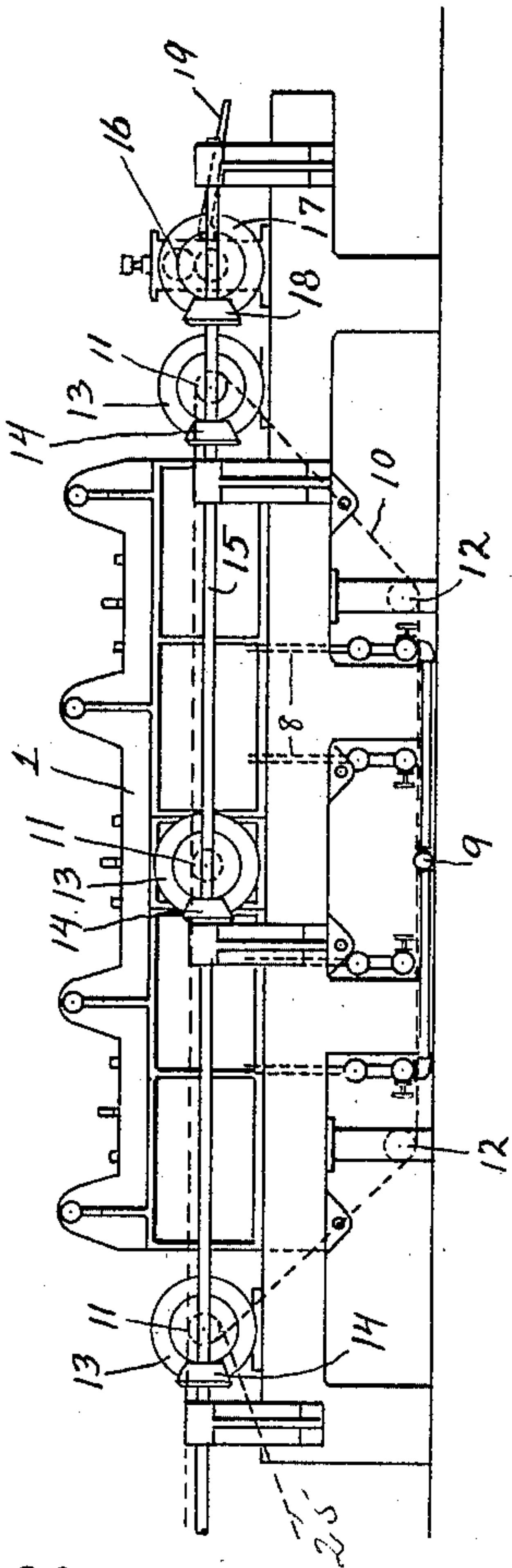
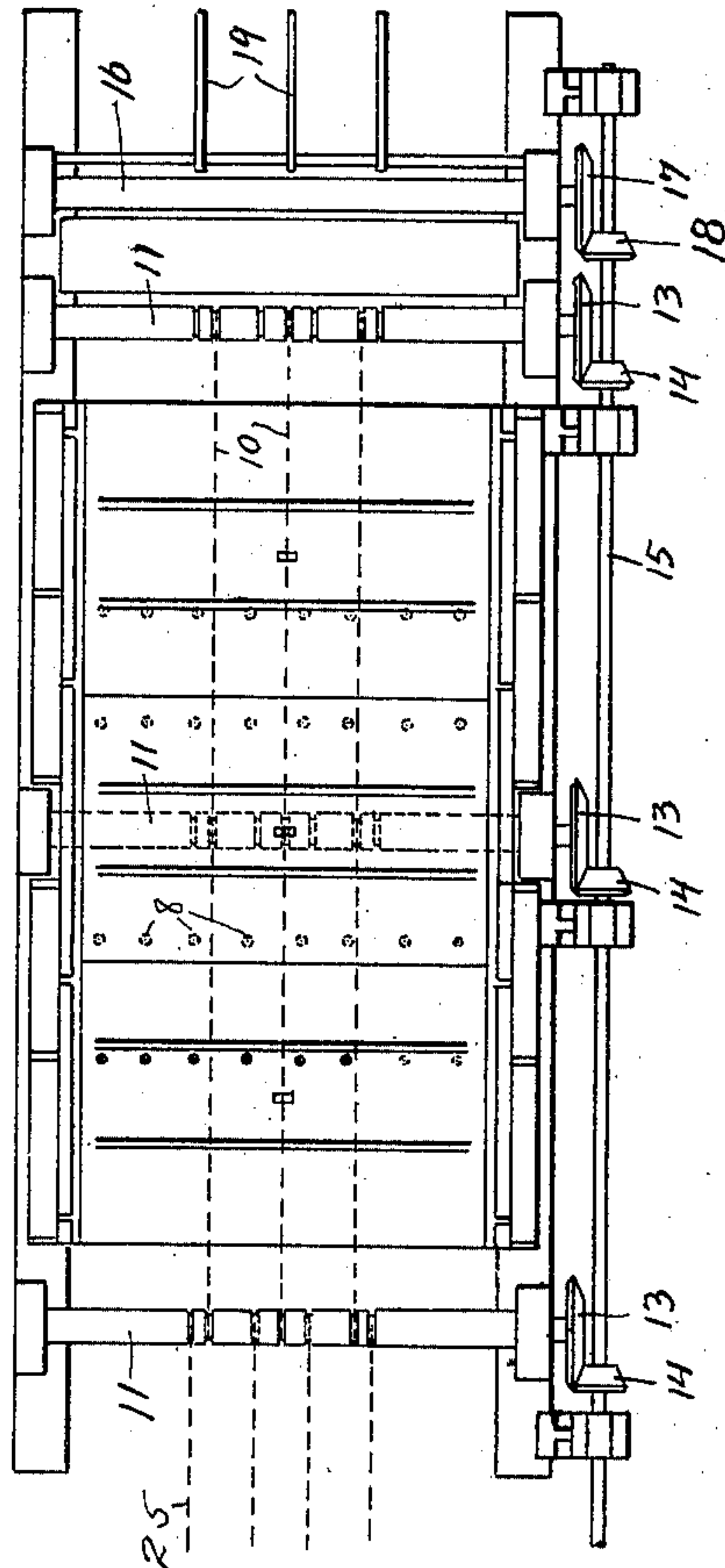


Fig. 2



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3 SHEETS—SHEET 2.

Fig: 1^a

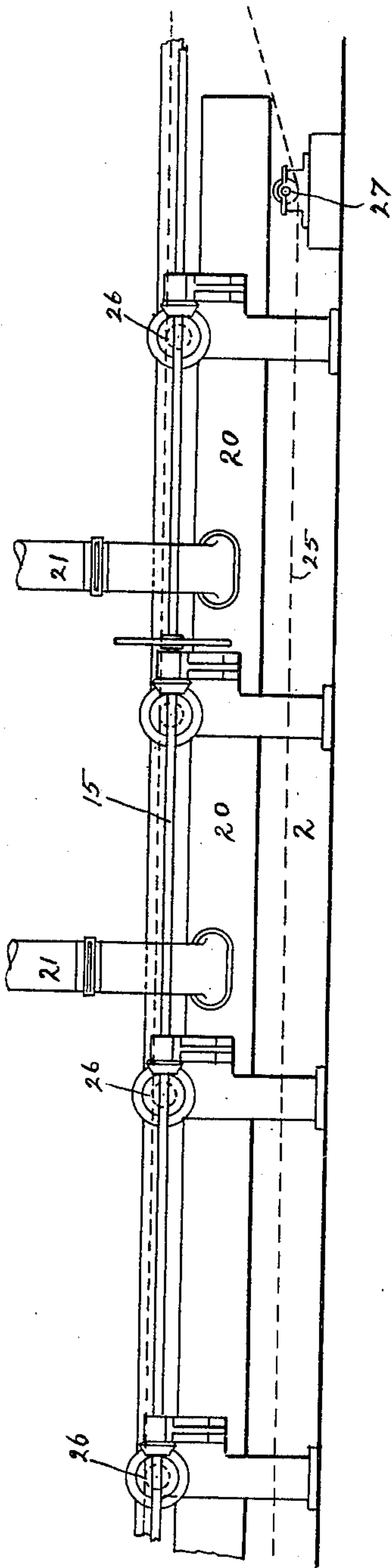
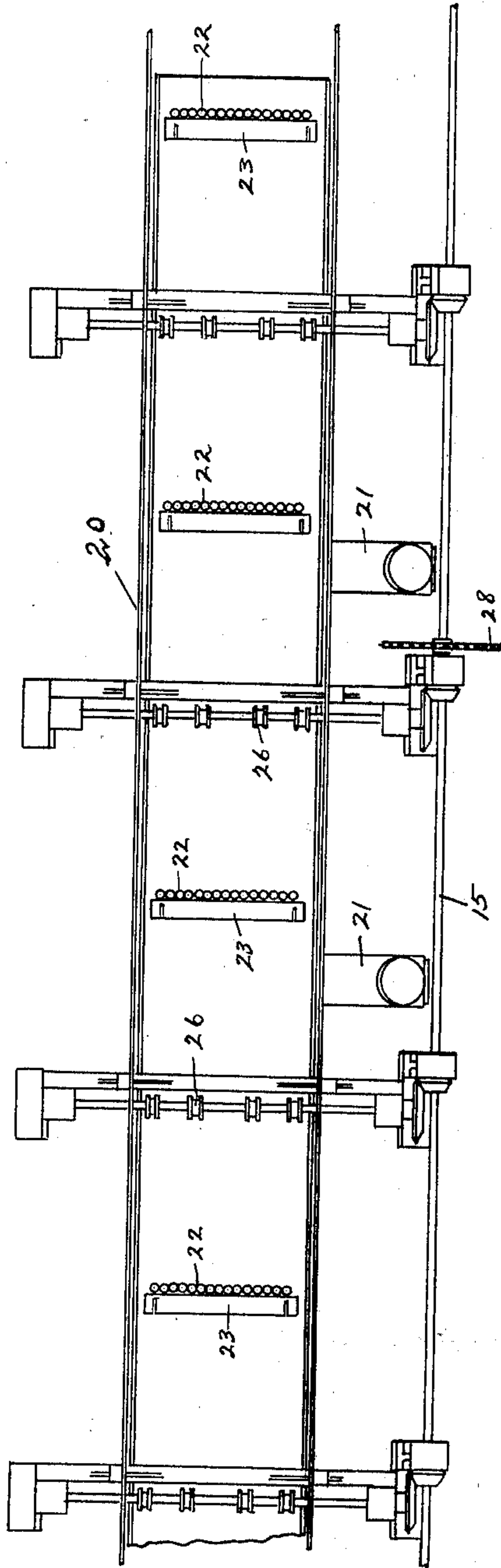


Fig: 2^a



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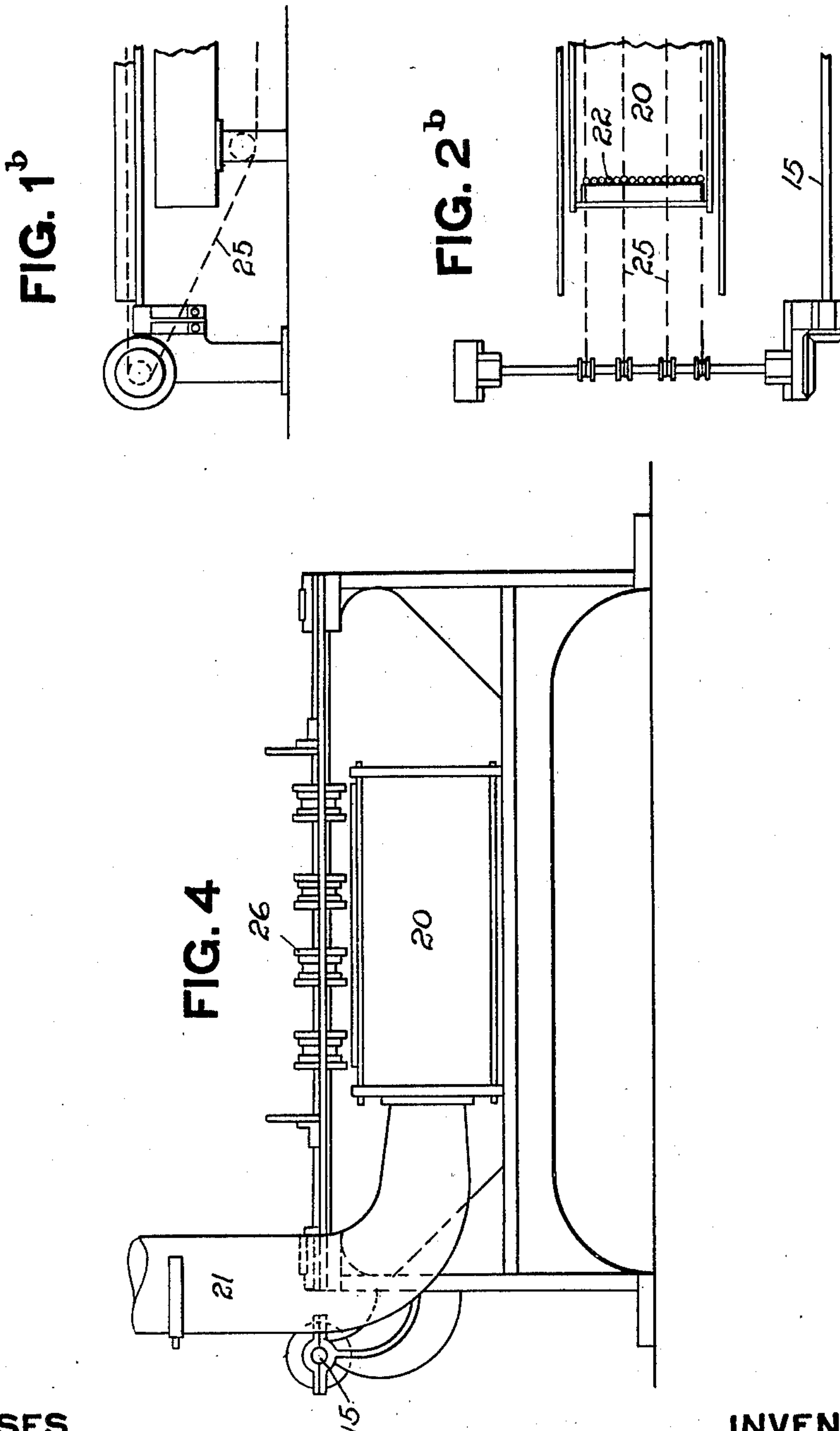
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NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES.

J. R. Keen
J. W. Winter

INVENTOR.

Walter Clasper,
By Harry J. Follen,
His Atty

UNITED STATES PATENT OFFICE.

WALTER CLASPER, OF McKEESPORT, PENNSYLVANIA.

APPARATUS FOR THE MANUFACTURE OF SHEET-IRON.

SPECIFICATION forming part of Letters Patent No. 756,474, dated April 5, 1904.

Application filed January 24, 1903. Serial No. 140,332. (No model.)

To all whom it may concern:

Be it known that I, WALTER CLASPER, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for the Manufacture of Sheet-Iron; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to apparatus for making blued sheet metal; and its principal object is to provide apparatus for this purpose whereby blued sheets of uniform color will be produced.

A further object is to provide apparatus whereby the sheets can be blued and afterward cleaned and dried in a progressive manner and with a minimum amount of labor.

In the manufacture of blued sheet-iron the ordinary mode of procedure is to roll the sheet-bar into sheets of the desired gage, which are then annealed in the usual way. The annealing process results in imparting a variety of colors to the sheets of the pile in the annealing-box, some sheets being much darker than others and seldom any one of the sheets being uniform over its entire surface, this being due to the limited amount of air which is in the box coming in contact with the exposed surfaces of the sheets and creeping in more or less between the sheets. The practice is to take the sheets after being annealed and again heat them to a suitable temperature in order to give the sheets a more uniform color, this heating taking place generally in packs or piles which are introduced into a suitable furnace. As the sheets are necessarily in contact, all portions of the surfaces of all of the sheets are not subjected to the same heat and atmospheric conditions, and as a consequence the sheets are not all uniform in color and few of the sheets are of uniform color over their entire surface.

The principal object of my invention is to provide apparatus wherein the foregoing defect is cured and whereby sheets of absolutely uniform color can be produced and with a minimum amount of labor and handling.

To this end the invention consists, generally stated, in providing a suitable heating chamber or furnace in which there is main-

tained a mild diffused heat sufficient to raise the sheets to a low cherry-red and apparatus for passing the sheets in single procession and progressively through said furnace or chamber, thereby insuring the subjection of each and every sheet to similar heat and atmospheric conditions and producing sheets of uniform color.

The invention also comprises mechanism for transferring the sheets in single procession and progressively from the bluing-furnace past suitable cooling apparatus, preferably air-blasts, whereby the sheets are slowly cooled.

The invention also comprises certain details of construction, which will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of one end of the apparatus. Fig. 1^a is a similar view of the middle portion of the apparatus. Fig. 1^b is a similar view of the other end of the apparatus. Figs. 2, 2^a, and 2^b are plan views of corresponding portions of the apparatus. Fig. 3 is a transverse section through the bluing-furnace, and Fig. 4 is a transverse section through the cooling-box.

The apparatus shown comprises a bluing-furnace 1, a cooling-box 2, and suitable conveying and feeding mechanisms for transferring the sheets progressively through the various parts of the apparatus.

The bluing-furnace comprises a furnace-chamber 6 of suitable height, width, and length to accommodate sheets of the desired dimensions and retain the same therein a sufficient length of time to properly heat the same. This furnace-chamber is shown as provided with a refractory lining 7 and is heated by means of gas-burners 8, projecting up through the bottom of the furnace. There are four rows of such burners shown—eight burners in each row—and they are connected by suitable pipes and valves to a gas-supply pipe 9. By means of these several rows of gas-burners a mild diffused heat can be created in said chamber, said heat being practically uniform in all parts of the chamber and not concentrated in any one point, so that the sheets when introduced in the chamber will

not be subjected to a concentrated or excessive heat, which would neutralize the effect of the previous annealing. The temperature maintained in the furnace is such as to raise the sheets to a low cherry-red heat. The sheets are introduced into said furnace singly, so that both faces thereof are exposed to exactly the same heat and atmospheric conditions, thus insuring a uniform color over the entire surface of the sheet. The sheets may be introduced into the furnace in any suitable way or by any suitable mechanism; but in order to secure uniformity for all sheets it is desirable that the sheets remain in the furnace a uniform length of time, and as a consequence I prefer to use power-actuated mechanism for introducing the sheets into the furnace and removing them therefrom, and for convenience of operation this mechanism is so arranged as to feed the sheets in a procession into the furnace and progressively through and out of the same. Suitable means for accomplishing this result are shown in the drawings, wherein a series of carrying-chains 10 are shown extending through the furnace and back underneath the same, being supported and driven from suitable rollers 11, one at each end of the furnace and one in the furnace, and being guided underneath the furnace by suitable guide-rollers 12. The rollers 11 are driven by any suitable mechanism—such, for instance, as the bevel-gears 13 on their outer ends, which are engaged by bevel-pinions 14 on a power-shaft 15, mounted in suitable bearings and extending longitudinally of the apparatus and driven by any suitable mechanism. In advance of the first roller 11 are a pair of positively-driven feeding-rollers 16, mounted in suitable bearings, and one of which is provided with a bevel-gear 17, meshing with a bevel-pinion 18 on the shaft 15. In advance of these rollers is a table 19, formed of a series of bars, as shown in Fig. 2, and preferably hinged, so that it can be swung up out of the way. The sheets to be blued are placed on this table and pushed singly into the feeding-rollers 16, which feed them forward and onto the carrying-chains 10, by which they are carried in a procession through the furnace, being heated therein to a low cherry-red. When the sheets emerge from the furnace, they are carried at once and progressively to the cooling mechanism. This may be of various constructions, that shown in the drawings comprising a long box 20, having one or more blast-pipes 21 connected thereto, through which the cold air is forced into said box. This box is practically rectangular in cross-section, having a flat upper face provided at intervals with rows of air-ports 22, through which the air is forced into contact with the sheets which are carried over said box. Slides 23, provided with slots through which pass securing-bolts, are mounted adjacent to each row of ports 22, so that these ports may be

uncovered more or less to regulate the amount of air flowing out of the same. The hot sheets coming from the bluing-furnace are carried in procession over this cooling-box and are subjected to blasts of cold air coming from the ports 22, so that the sheets are gradually and uniformly cooled, thus insuring a uniform coat of oxid over their entire surfaces. The sheets may be carried over this box by any suitable mechanism, and I have shown for this purpose a series of carrying-chains 25, passing over driving and supporting rollers 26, extending transversely across the top of the box, said chains passing back underneath the cooling-box, being guided by suitable rollers 27. The driving and supporting rollers 26 are driven by means of bevel-gearing from the shaft 15 exactly in the same manner as the guiding and supporting rollers 11 of the bluing-furnace are driven. This shaft 15 extends the full length of the bluing and cooling apparatus and may be driven in any manner—such, for instance, as a sprocket-chain connected to the sprocket-wheel 28. At the entrance end of the cooling-box the chains 25 pass over the same roller 11 that the chains 10 of the bluing-furnace pass over, this one roller being common to both sets of chains.

In the use of the apparatus described the annealed sheets are fed singly and in succession to the rollers 16, which feed the same onto the carrying-chains 10. By these the sheets are carried slowly through the bluing-furnace, wherein they are subjected to a mild diffused heat and raised to a dull cherry-red in color. Inasmuch as the sheets pass singly through said furnace, both surfaces of every sheet are subjected to exactly similar heat and atmospheric conditions, thus producing absolute uniformity in the color of the sheets. From the bluing-furnace the sheets are carried in single procession and progressively, by means of the chains 25, over the cooling-box 20 and are subjected at intervals to blasts of air emerging from the ports 22, thus being cooled slowly while being carried along. The sheets are then removed in any suitable way and will be found to be of absolutely uniform color.

The apparatus is so arranged that all of the carrying of the sheets is done mechanically and in a progressive manner through all parts of the apparatus, thus reducing the labor to a minimum, it being merely necessary to feed the sheets singly and in succession to the feeding-rollers 16.

The furnace shown and described herein is not claimed in this application, but is claimed in an application which is a division hereof filed November 7, 1903, Serial No. 180,216.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In apparatus for making blued sheet-iron, the combination of a heating-chamber, means for maintaining a uniform heat in said chamber, air-blast apparatus adjacent to said cham-

ber, and mechanism for carrying the sheets in single procession through said heating-chamber and to and past said air-blast mechanism.

2. Apparatus for making blued sheet-iron comprising heating apparatus, a cooling-box adjacent thereto, a series of air-vents in the upper face of said cooling-box, and mechanism for conveying the sheets through said heating apparatus and over said cooling-box.

10 3. Apparatus for making blued sheet-iron comprising a heating-chamber, a cooling-box

adjacent thereto, a series of air-vents at intervals through the top of said box, adjustable slides for said vents, and mechanism for carrying the sheets through said heating-chamber and over said cooling-box. 15

In testimony whereof I, the said WALTER CLASPER, have hereunto set my hand.

WALTER CLASPER.

Witnesses:

S. M. COOPER,

G. W. RODGERS.