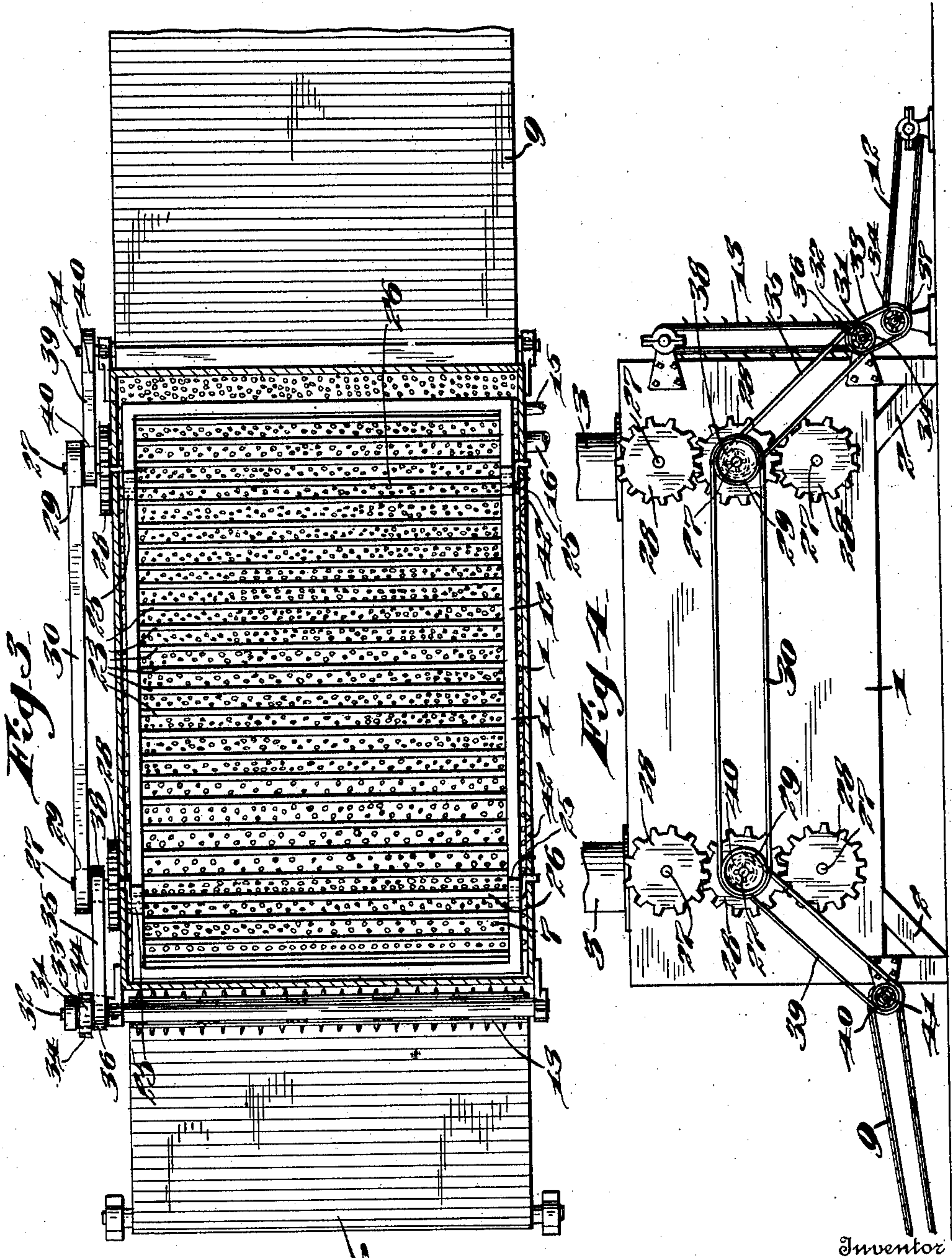


J. M. SPENCER.
WOOL DRYING APPARATUS.
APPLICATION FILED JULY 14, 1910.

983,577.

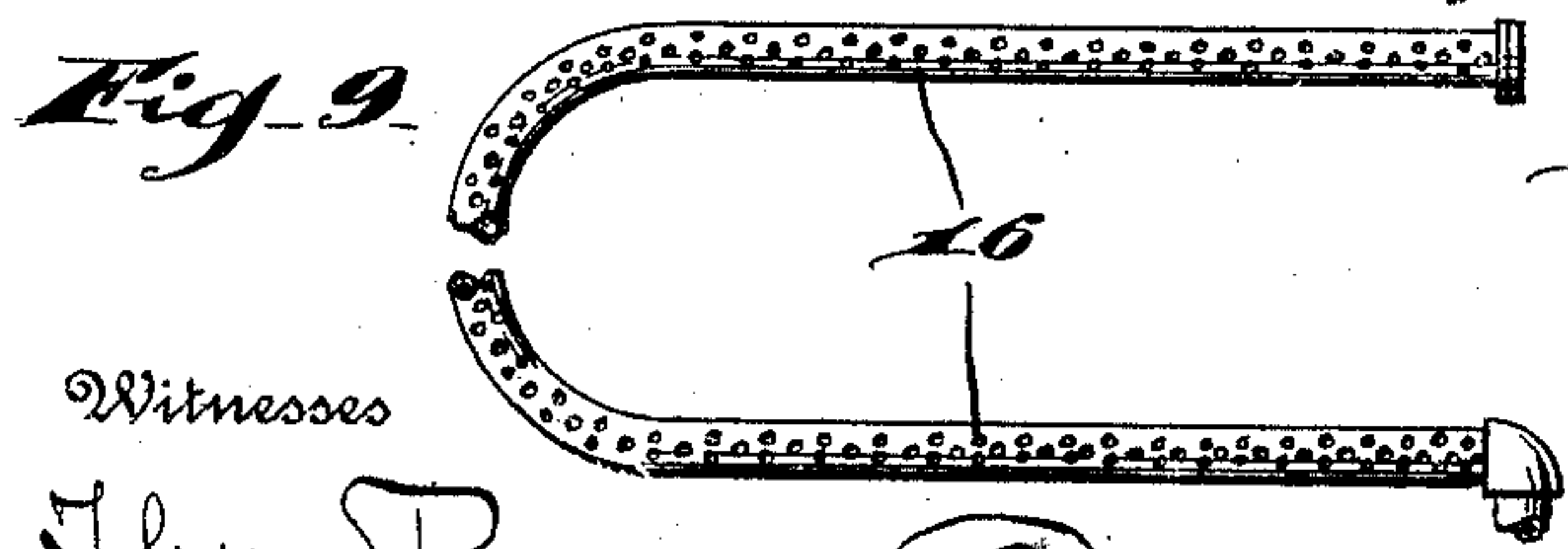
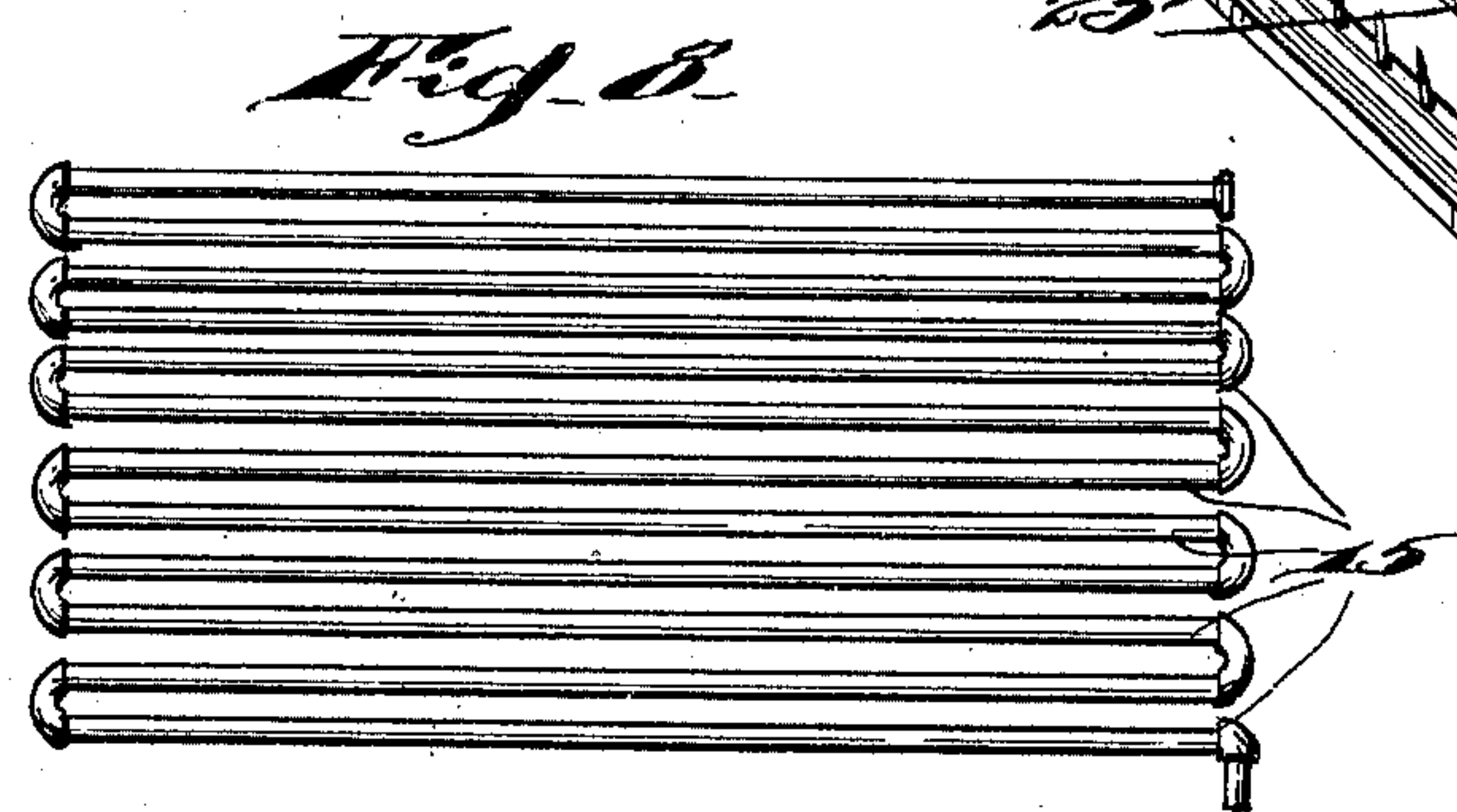
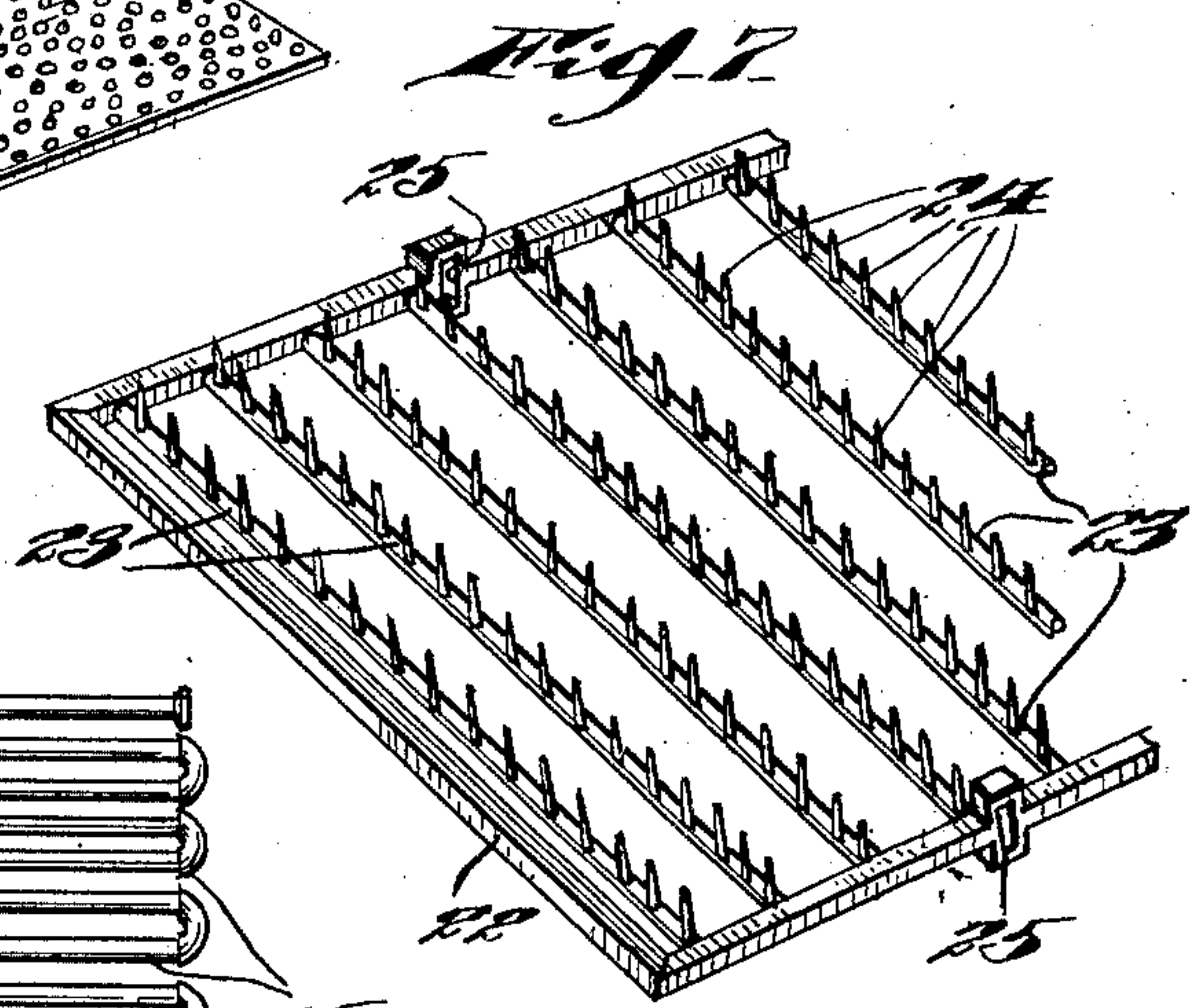
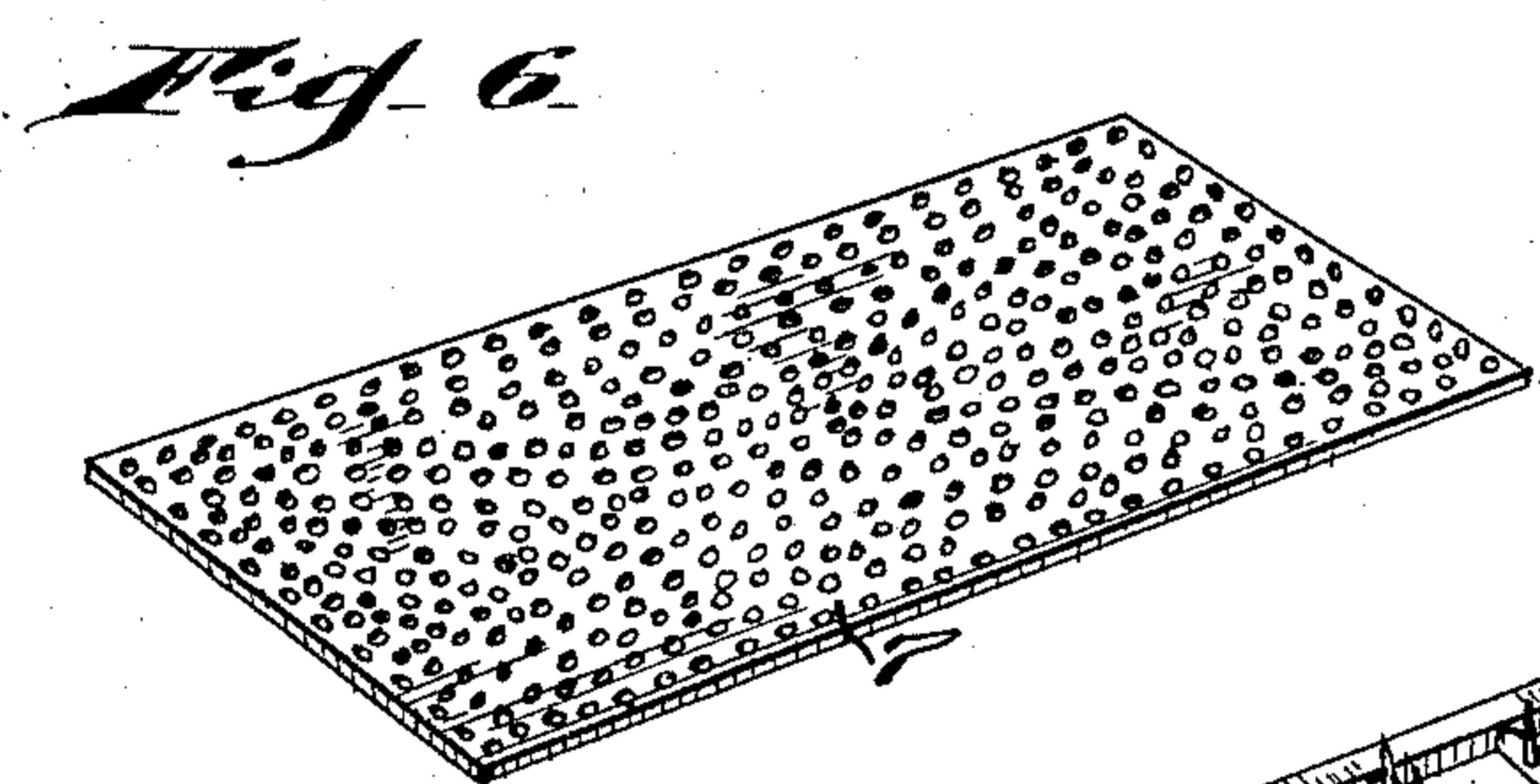
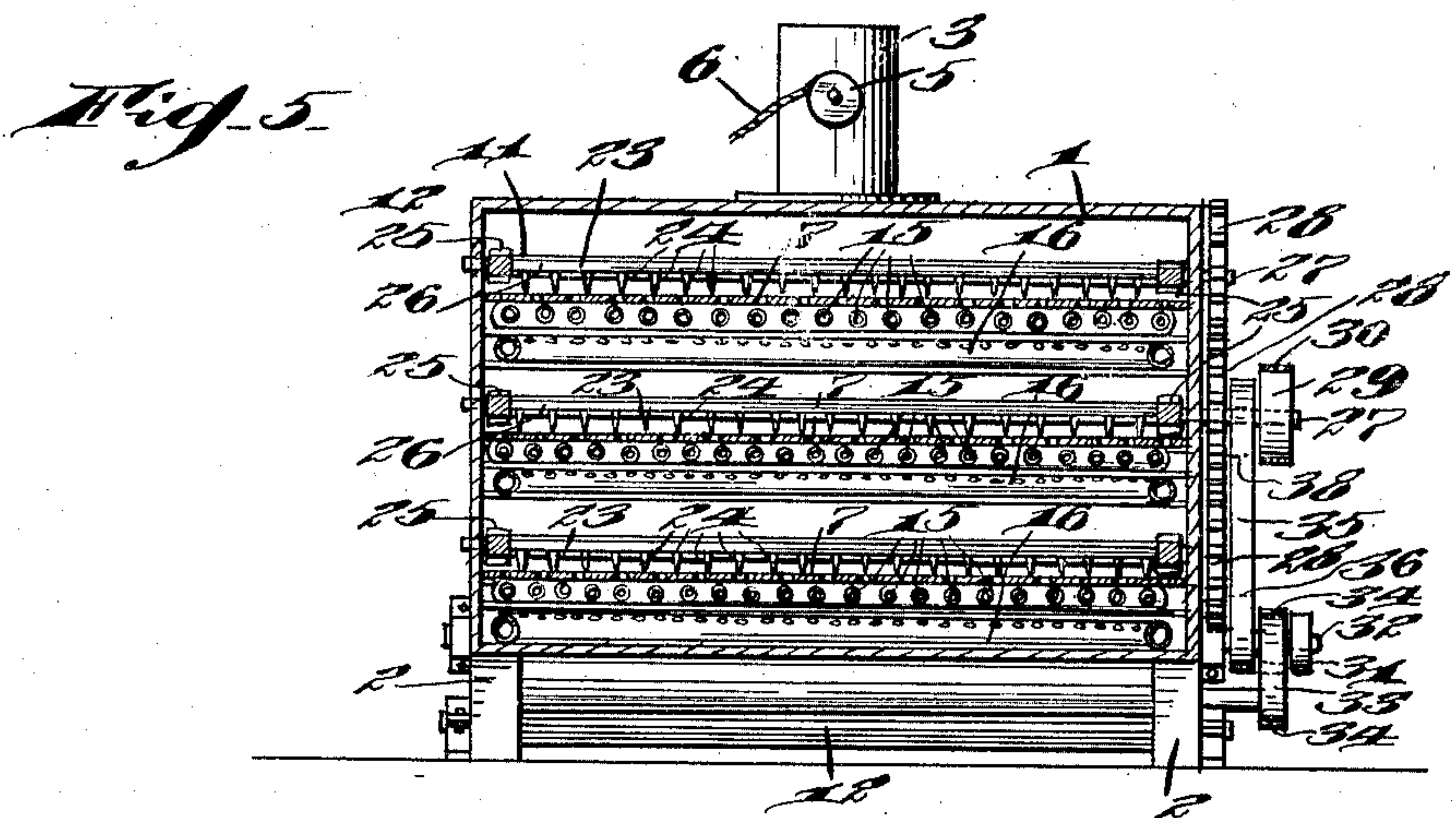
Patented Feb. 7, 1911.

3 SHEETS—SHEET 2.



Witnesses
Thos. Premanan.
R. H. Krenkel.

Joseph M. Spencer,
By Joshua R. Potter,
Attorney



Witnesses
Thos. Krausman,
R. V. Krenkel.

Inventor
Joseph M. Spencer,
By Joshua R. Potts,
Attorney

UNITED STATES PATENT OFFICE.

JOSEPH M. SPENCER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO JOHN J. SWEENEY, OF PHILADELPHIA, PENNSYLVANIA.

WOOL-DRYING APPARATUS.

983,577.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed July 14, 1910. Serial No. 571,893.

To all whom it may concern:

Be it known that I, JOSEPH M. SPENCER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Wool-Drying Apparatus, of which the following is a specification.

My invention relates to improvements in wool drying apparatus, the object of the invention being to subject the wool in a thin layer, moved step by step, to the action of heat and air currents to thoroughly dry and calcine the wool.

A further object is to provide an apparatus of this character which economizes space, with improved means for transmitting to the wool a step by step feed over perforated plates, beneath which steam coils and perforated air pipes are provided so that the air is forced up through the steam coils and through perforations in the plates to thoroughly subject the wool to the steam heated air, and perfectly dry the same before it emerges from the apparatus.

A further object is to provide improved toothed rakes which act as propellers, and which are given a desired movement to move the wool a predetermined distance at each operation of the rakes.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1, is a view in longitudinal section illustrating my improvements. Fig. 2, is a view in side elevation. Fig. 3, is a sectional plan view. Fig. 4, is a view in side elevation of the opposite side to that shown in Fig. 2. Fig. 5, is a view in vertical cross section. Fig. 6, is a detail view of one of the plate sections. Fig. 7, is a fragmentary view of one end of one of the rakes shown in an inverted position. Fig. 8, is a plan view of one of the steam coils. Fig. 9, is a broken plan view of one of the air pipes. Fig. 10, is an enlarged view in cross section through the air pipe, and Fig. 11, is a broken detail view illustrating one of the crank shafts.

1, represents a rectangular box or casing mounted on suitable supports 2, and provided in its top with outlet flues 3 controlled

by dampers 4, the latter operated by pulleys 5 around which ropes 6 are positioned, and extend to any convenient point in easy reach of the operator.

Inside of box or casing 1, three parallel horizontal perforated plates 7 are fixed, the upper plate extending from the left hand end of the casing shown in Fig. 1 to a point removed from the right hand end of the casing, the next plate below extending from the right hand end of the casing to a point removed from the left hand end of the casing, while the lowest plate extends throughout the length of the casing, preferably through an outlet 8 so as to deposit the wool on a conveyer 9. The upper plate communicates with an inlet 10, and by means of this arrangement of plates, a continuous path is provided for the wool, which travels from left to right along the uppermost plate 7 in Fig. 1, thence downward upon the second plate 7, thence from right to left along the second plate 7, thence down upon the lowest plate 7, and thence from left to right onto the conveyer 9, this movement of the wool being controlled by improved rakes 11, which will be more fully hereinafter described.

12, is a feeding apron which feeds the wool horizontally to a vertically positioned toothed conveyer 13, the teeth of which pick up the uniform quantity of wool from the conveyer 12, and carry it up to inlet 10, where a brush 14 is provided to clear the teeth and deposit the wool on the upper plate 7.

Below each of the plates 7, is a steam coil 15, and below each steam coil is an air pipe 16, this steam coil and air pipe being illustrated more particularly in Figs. 8, and 9. The steam coils are connected by branch pipes 17 with a steam supply pipe 18, the latter having a valve 19 therein to control the flow of steam to the coils.

The air pipes 16 are all connected to a common supply pipe 20, having a blower 21 therein to force the air into and through the pipes 17, said pipes 17 being closed at their ends and perforated throughout their upper faces so that the air is forced upwardly through the steam coils to be highly heated before passing through perforated plates and the wool, and escaping through the flues 3.

Each rake 11 above referred to comprises a rectangular frame 22 which is connected

by transverse rods 23, each rod having a series of downwardly projecting teeth 24 of a uniform length and sufficiently sharp to engage the wool and move it along the plates as the frame is moved. Each frame is provided at opposite sides at two points, with yokes 25 to receive a crank 26 of crank shafts 27, said cranks being preferably mounted in sliding boxes 28 in the frame, so that as these shafts revolve, the frames will be given a movement along the plates in contact with the wool thereon, then elevated to free the teeth of the wool, then moved backward and again down on the wool, thence again forwardly, and so on to give to the wool an intermittent step by step feed along the perforated plates, and advancing the wool from plate to plate as above explained.

The shafts 27 are turned by intermeshing gears 28, and on two of these shafts, pulleys 29 are provided and connected by an endless belt 30 so as to compel all of the shafts to move simultaneously and uniformly, it being understood, of course, that the intermediate rake moves in an exactly opposite direction to the movement imparted to the upper and lower rakes.

A drive pulley 31 is provided on the shaft 32 at one end of the conveyer 13, and a belt 33 connects pulleys 34 on this shaft and on the shaft 37 of conveyer 12, while a belt 35 connects a pulley 36 on the shaft 32 with a pulley 38 on one of the shafts 27, on which one of the pulleys 29 is fixed.

A belt 39 connects pulleys 40 on one of the shafts 27 with a shaft 41 of conveyer 9, while of course, the invention is not limited to any particular arrangement of pulleys and belting for transmitting motion, I have illustrated one arrangement of parts capable of carrying out my invention.

One side of casing 1 is provided with doors 42 normally closed, and which when opened permit access to the interior of the casing so as to clear the perforations in the plates or to get at the interior of the apparatus for cleaning and repairing.

It will be noted that with the arrangement of parts shown and described, the wool is given a long step by step feed through the apparatus, and is subjected to the currents of heated air continuously from its entrance to its exit, the feed of the wool by the movement of the rakes being properly proportioned so as to give to the wool the maximum of heat and air currents to thoroughly dry the same before passing through the outlet 8 onto the conveyer 9.

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not limit myself to the precise details set forth but consider myself at liberty to make such changes and

alterations as fairly fall within the spirit and scope of the appended claims.

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

1. In an apparatus of the character described, the combination with a casing, of a plurality of superposed parallel perforated plates, said plates terminating short of alternate ends of the casing forming a continuous passage for wool from the plates above to those below, rakes above the plates, means for moving the rakes to move the wool over the plates, steam pipes below the perforated plate and means directing air into the space below the steam pipes compelling the passage of heated air up through the perforated plates, substantially as described.

2. In an apparatus of the character described, the combination with a casing, of a plurality of superposed parallel perforated plates, said plates terminating short of alternate ends of the casing forming a continuous passage for wool from the plates above to those below, steam coils below each plate, and means for moving the wool over the plates, said means comprising a reciprocating frame, a plurality of rakes in said frame having depending teeth, yokes at the sides of said frame, sliding blocks in said yokes, cranks connected with said blocks and means for driving said cranks, said cranks having a greater radius than the length of the yokes whereby said frame and rakes are lifted at each return stroke, substantially as described.

3. In an apparatus of the character described, the combination with a casing, of a plurality of superposed parallel perforated plates, said plates terminating short of alternate ends of the casing forming a continuous passage for wool from the plates above to those below, steam coils below each plate, perforated air pipes below the steam coils, and means for moving the wool over plates, substantially as described.

4. In an apparatus of the character described, the combination with a casing, of a plurality of superposed parallel perforated plates, said plates terminating short of alternate ends of the casing forming a continuous passage for wool from the plates above to those below, a steam coil below each plate, a perforated air pipe below each steam coil, a blower forcing air through said air pipes, and toothed rakes above each plate, substantially as described.

5. In an apparatus of the character described, the combination with a casing, of a plurality of superposed parallel perforated plates, said plates terminating short of alternate ends of the casing forming a continuous passage of wool from the plates above to those below, a conveyer for feeding wool to the apparatus, a toothed conveyer constructed to take the wool from the first-mentioned

conveyer and deposit it on the uppermost plate, flues on the top of the casing, dampers in said flues, rakes above each of said plates, steam coils below each of said plates, and 5 perforated air pipes below each of said coils, substantially as described.

6. In an apparatus of the character described, the combination with a casing, of a plurality of superposed parallel perforated 10 plates, said plates terminating short of alternate ends of the casing forming a continuous passage of wool from the plates above to those below, a conveyer for feeding wool to the apparatus, a toothed conveyer constructed to take the wool from the first- 15

mentioned conveyer and deposit it on the uppermost plate, flues on the top of the casing, dampers in said flues, rakes above each of said plates, steam coils below each of said plates, perforated air pipes below each of said coils, and doors in one side of the casing located adjacent the respective plates, 20 substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 25 two subscribing witnesses.

JOSEPH M. SPENCER.

Witnesses:

JOHN J. SWEENEY,
R. H. KRENKEL.