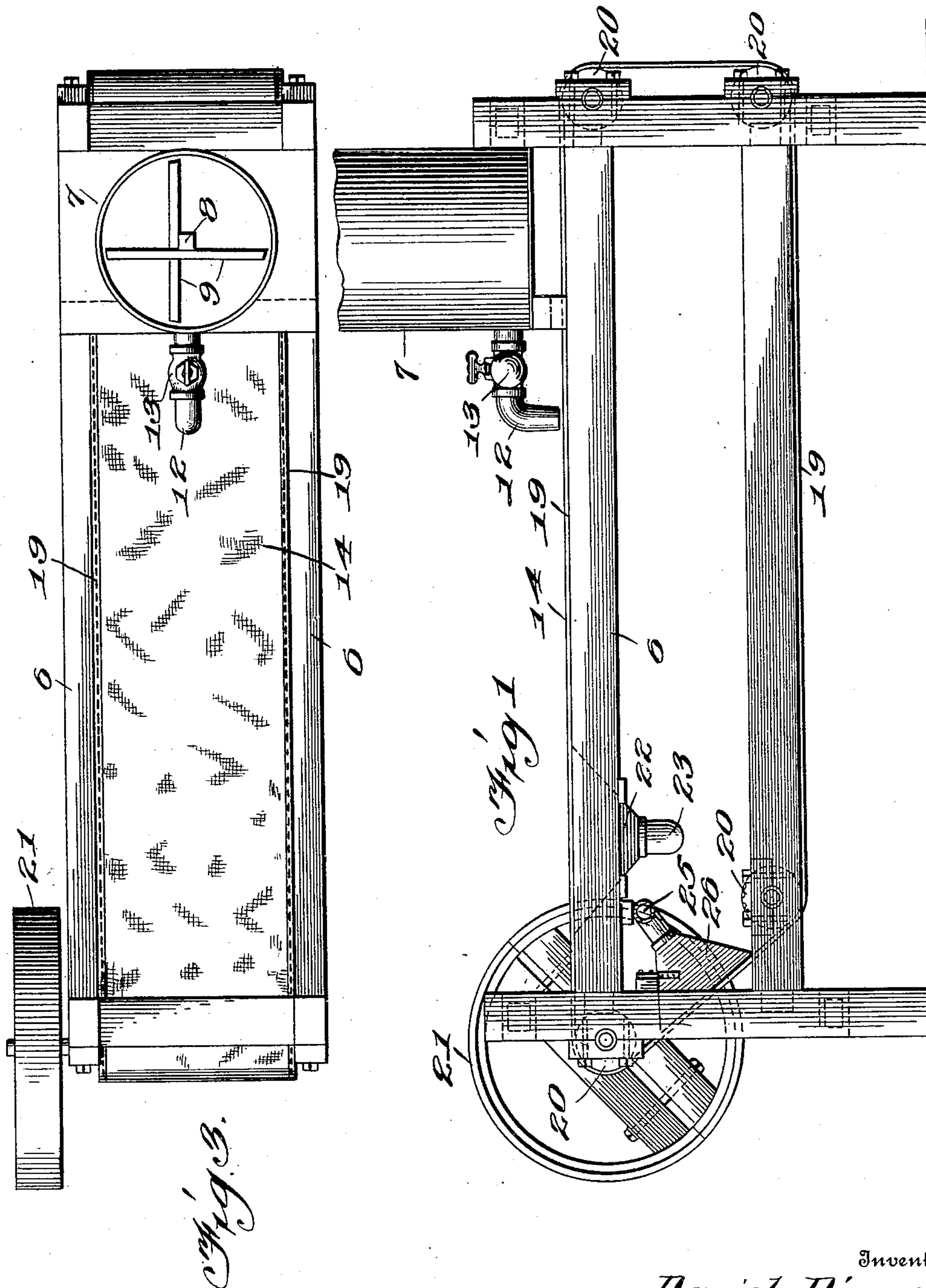


D. DIVER.  
 FILTERING APPARATUS.  
 APPLICATION FILED AUG. 3, 1908.

935,359.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 1.



Witnesses

*John D. Thomas*  
*Arthur Wesley*

Inventor

*Daniel Diver.*

By

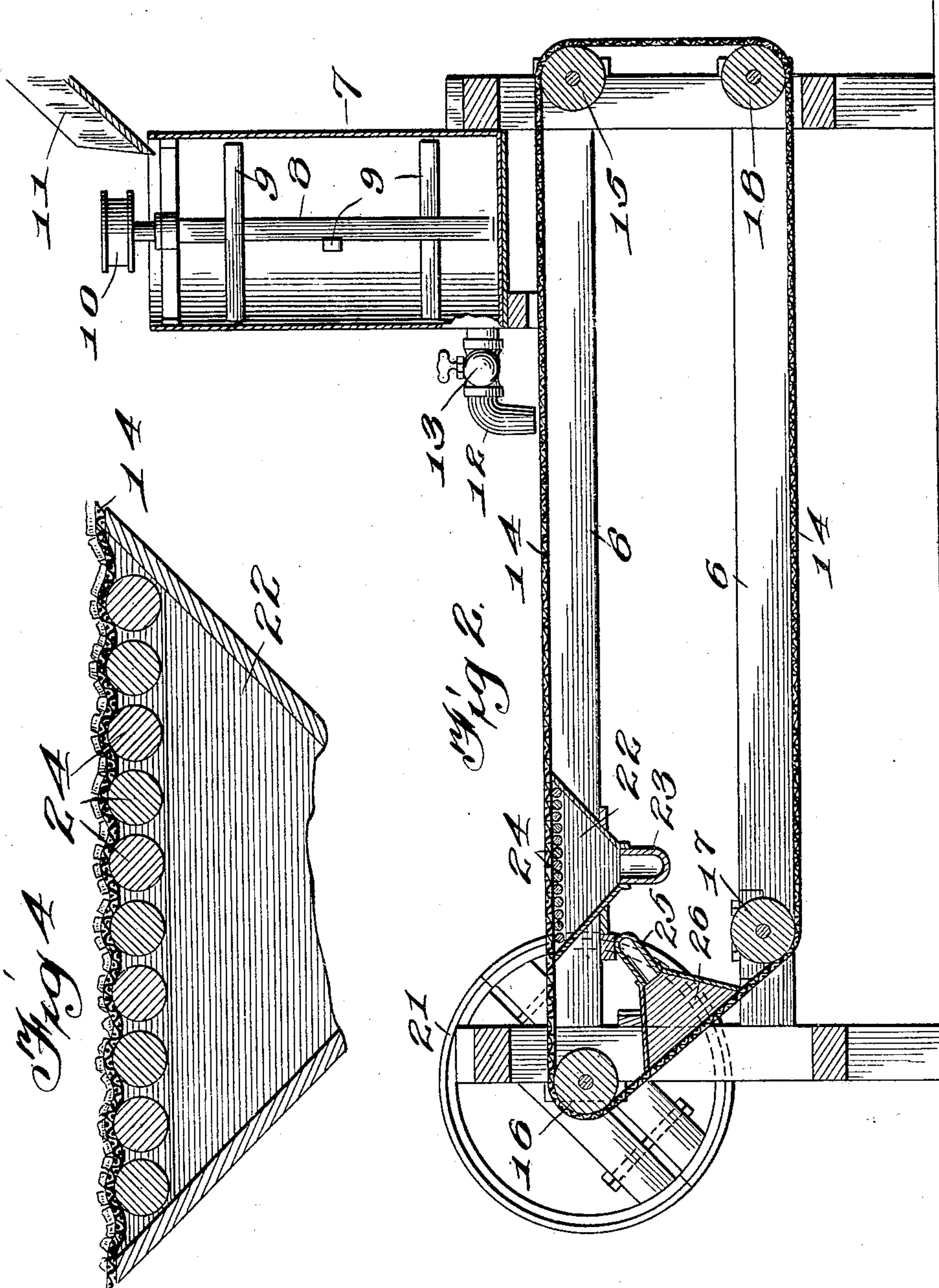
*Geo. E. Tew*

Attorney

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Witnesses  
*Geo. E. Shaw*  
*Arthur Wesley*

Inventor  
*Daniel Diver*

By *Geo. E. Shaw*  
 Attorney



# UNITED STATES PATENT OFFICE.

DANIEL DIVER, OF DEERFIELD, MICHIGAN.

## FILTERING APPARATUS.

935,359.

Specification of Letters Patent.

Patented Sept. 28, 1909.

Application filed August 3, 1908. Serial No. 446,679.

*To all whom it may concern:*

Be it known that I, DANIEL DIVER, a citizen of the United States, residing at Deerfield, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Filtering Apparatus, of which the following is a specification.

This invention is a drying and filtering apparatus particularly adapted for the purpose of drawing water from marl, clay, sand, and similar substances, and has for its object to provide an improved device of the kind, in which suction is utilized for the purpose of drawing out the water from the solid constituents of the material. The material is carried on an endless apron or sieve which passes over a suction box into which the water is drawn. The material is then separated from a screen by means of an air blast at the delivery end of the machine.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the machine; Fig. 2 is a longitudinal vertical section; Fig. 3 is a top plan view; Fig. 4 is a detail in section, enlarged, of the suction box.

Referring specifically to the drawings, 6 indicates a wooden or other frame of proper size and shape to support the parts to be hereinafter described. Mounted upon the front end of this frame is an agitator tank 7 having within the same a rotary beater comprising a shaft 8 with projecting arms 9, and this beater may be driven by power applied to a belt wheel 10 at the top of the shaft. The material is flowed into the beater through a pipe 11 or the like, and it flows from the same through a pipe 12 controlled by a valve 13. The frame supports an endless apron, filter or sieve 14 which may be made of woven wire or other fabric and which passes around rollers 15, 16, 17 and 18, properly supported in bearings on the machine. At each edge of the screen or apron it is attached to sprocket chains 19 which pass around sprocket wheels 20 on the shafts of each of the four rollers referred to above. The apron is thereby driven, power being applied to a belt wheel 21 on the shaft of the roller 16. Near the end of its upper run the sieve or apron passes over a flared suction box 22 which has a pipe 23

leading therefrom to any suitable exhaust apparatus. The top of this box consists of or is formed with a plurality of small rollers 24 which are placed a slight distance apart, and the screen 14 rests upon and passes over these rollers, and is sufficiently slack to bend over or upon the rollers, as shown in Fig. 4, and in this action the rollers give a certain amount of vibration or movement to the apron which prevents the packing or settling of the mass. In other words, the vibration breaks or loosens up the mass so that air can be drawn through the same, carrying with it any liquid or moisture which has failed to previously run off through the sieve. After passing the end roller 16 the sieve travels downwardly at an inclination to the bottom roller 17, and the solid matter remaining on the sieve is either dropped therefrom, or is blown off by means of a blast of air delivered from a pipe 25 with a flared nozzle or mouth 26. The rollers 24 are mounted in suitable bearings in the side pieces of the suction box and they revolve freely as the apron with the material thereon passes over the same.

The raw material entering the agitator 7 is thoroughly mixed by the beater arms and flows therefrom onto the endless apron, most of the water escaping through the apron before it reaches the suction box. On reaching this box and passing over the same, the suction removes the remaining moisture and leaves the material in a substantially dry state, the rollers acting, as previously stated, to prevent the formation of a solid or impenetrable mass, which permits the air to flow in through the material, carrying with it the water or moisture remaining therein, and on reaching the end of the table the matter is practically dry and will drop or can be blown off as described.

The apparatus will be found very effective as a means for drying and filtering marl, clays, and similar materials. Naturally the speed of the apron will be varied according to the necessities of the case; to produce the result desired.

I claim:

1. In a filter, the combination of a traveling sieve to carry the mass, and a suction box thereunder, having at the top a series of

rollers over which the sieve passes, the sieve being sufficiently slack where it passes over the rollers to allow the sieve to bend upon each roller and loosen or break the mass.

- 5 2. In an apparatus of the kind described, the combination with a traveling foraminous carrier, and a suction box thereunder, of means to agitate that portion of the carrier over the box, to break or loosen the mass

thereon, so that air can be drawn through 10 the same.

In testimony whereof, I affix my signature in presence of two witnesses.

DANIEL DIVER.

Witnesses:

ELIZABETH J. PRICE,  
SOPHIE C. GATZKE.