

A. MAGUIN.  
 ROOT CLEANING MACHINE.  
 APPLICATION FILED NOV. 4, 1909.

989,915.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 1.

FIG. 1—

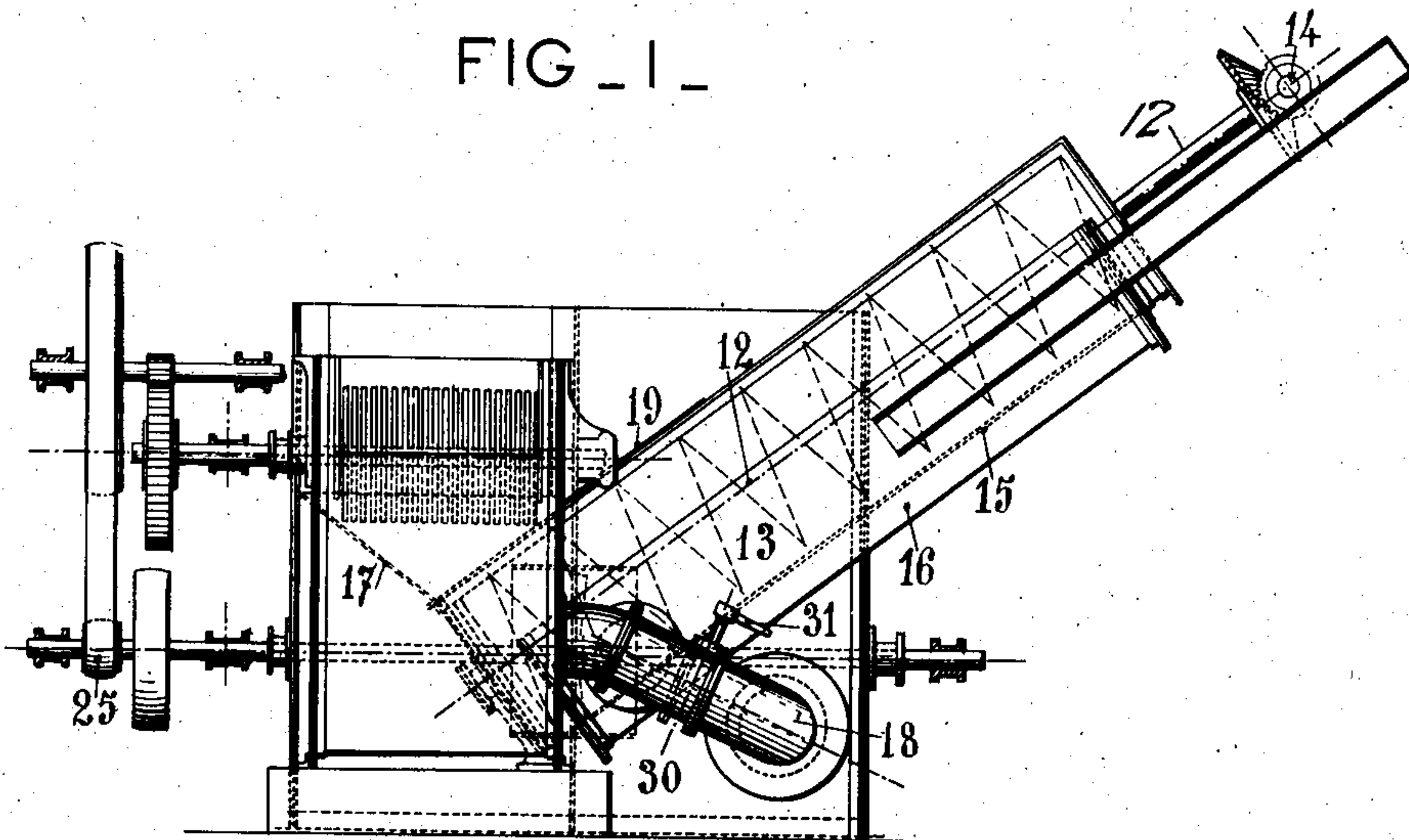
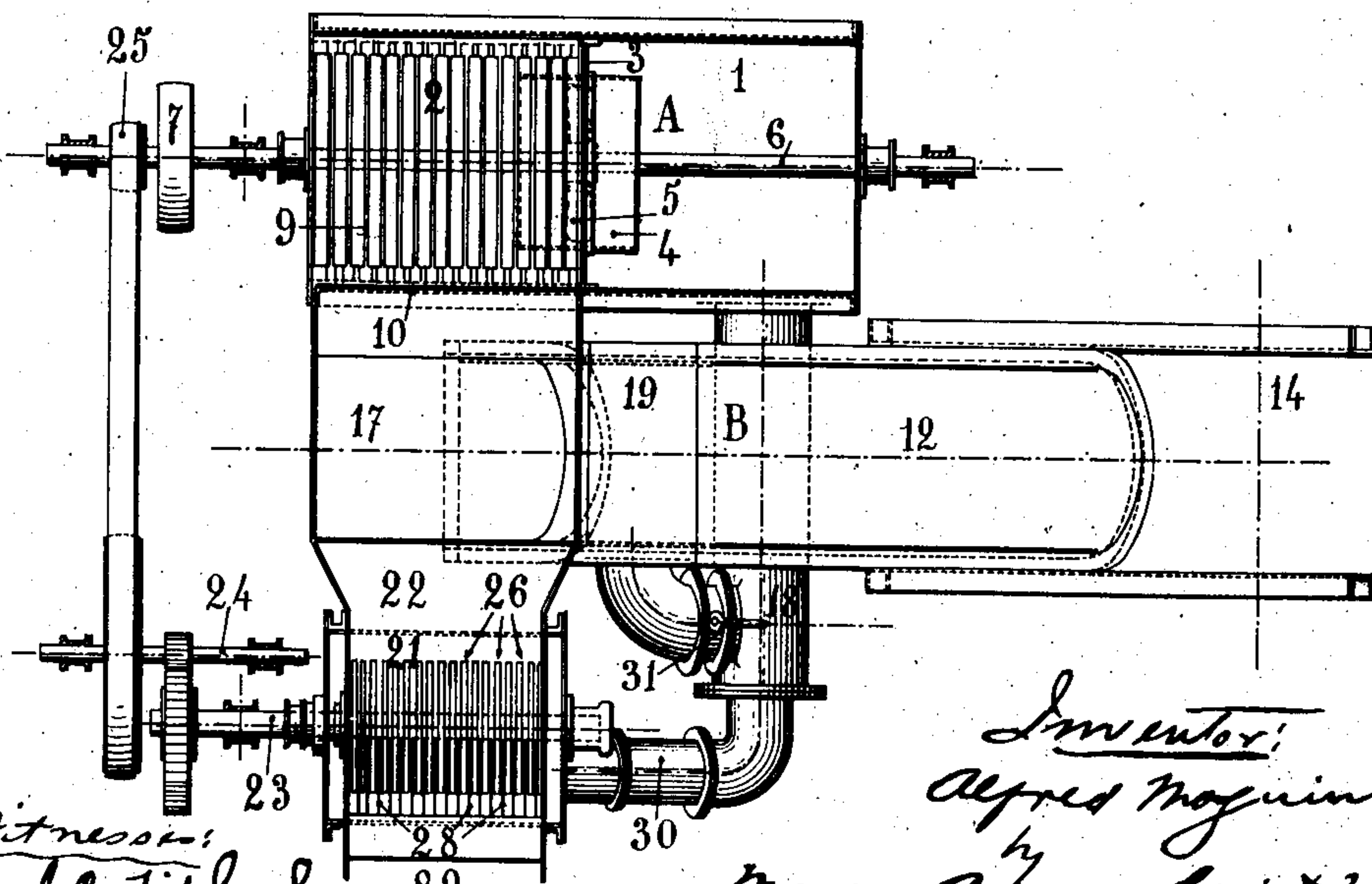


FIG. 2—



Witness:  
 Ruth C. Fitzhugh  
 Gustave R. Thompson

Inventor:  
 Alfred Maguin  
 by  
 Mauro. Cameron Lewis & Macie,  
 Attys.

A. MAGUIN.  
 ROOT CLEANING MACHINE.  
 APPLICATION FILED NOV. 4, 1909.

989,915.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 2.

FIG 3\_

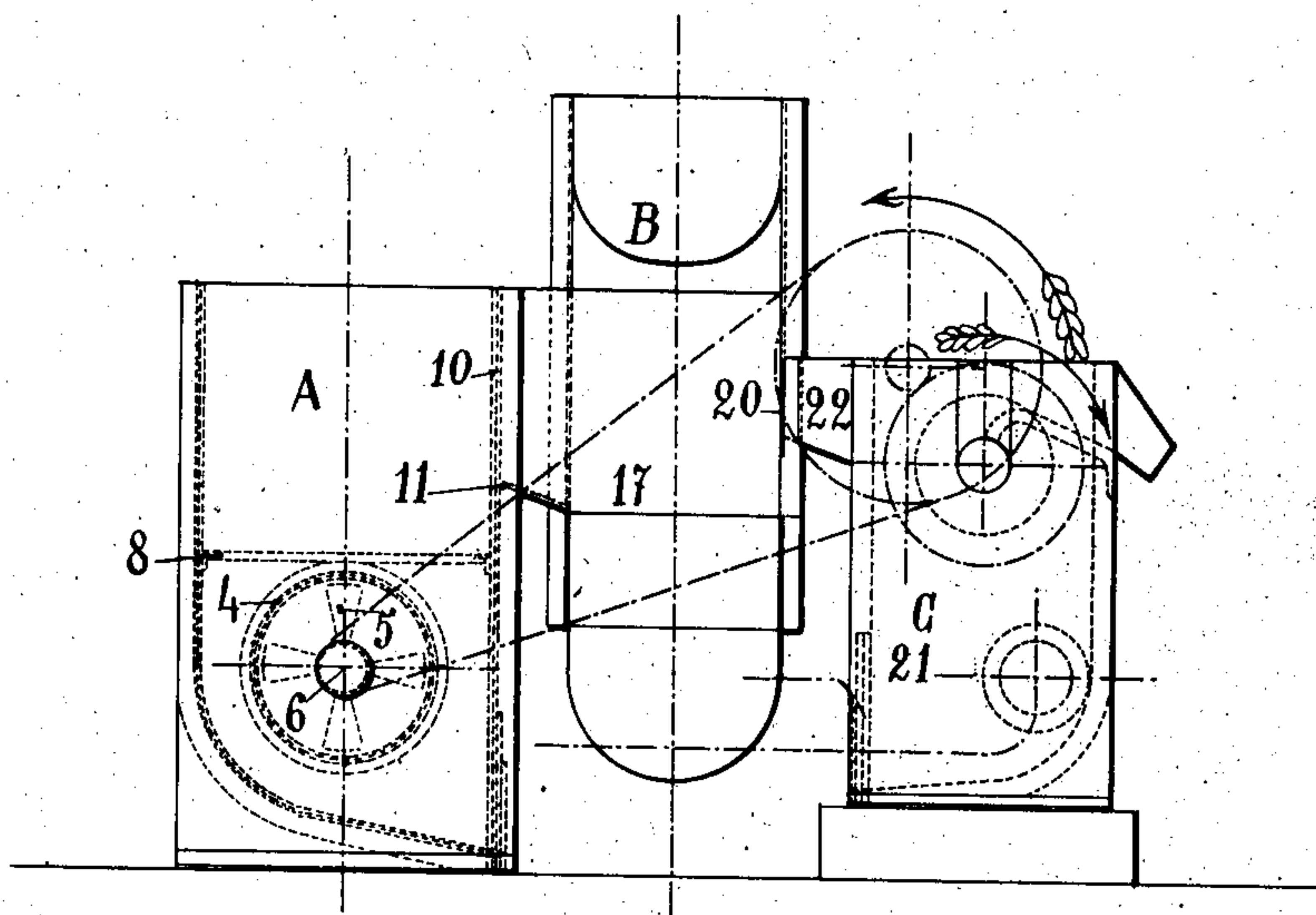
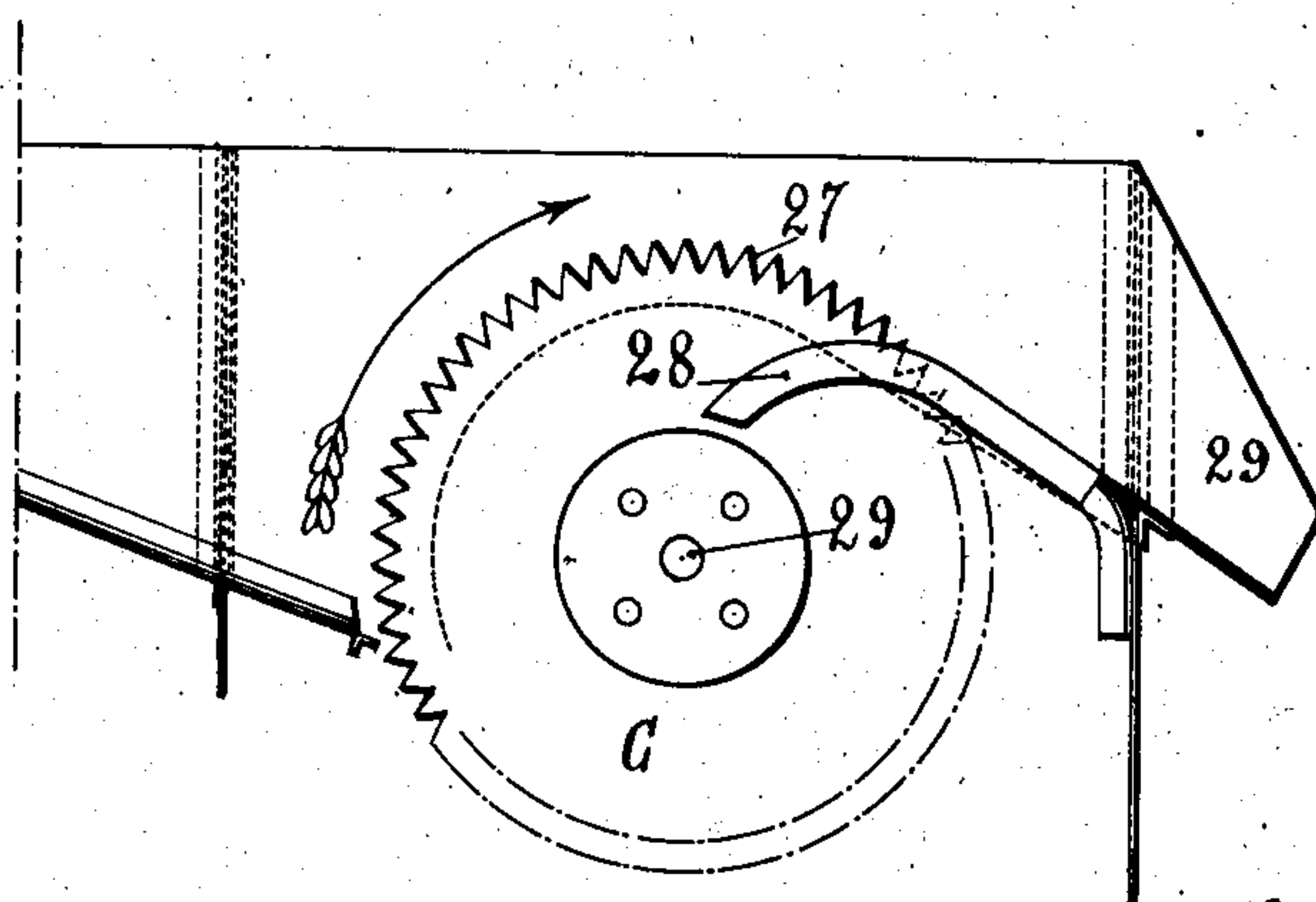


FIG 4\_



*Witnesses:*  
 Ruth C. Fitzhugh  
 Gustave R. Thompson

*Inventor:*  
 Alfred Maguin  
 Mauro, Cameron, Lewis & Massie  
 Attys.



# UNITED STATES PATENT OFFICE.

ALFRED MAGUIN, OF CHARMES, BY LA FÈRE, FRANCE, ASSIGNOR TO SOCIÉTÉ DUFLOS FRÈRES, OF VITRY EN ARTOIS, FRANCE, AND SOCIÉTÉ ANONYME DES ÉTABLISSEMENTS A. MAGUIN, OF CHARMES, AISNE, FRANCE.

## ROOT-CLEANING MACHINE.

989,915.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed November 4, 1909. Serial No. 526,297.

*To all whom it may concern:*

Be it known that I, ALFRED MAGUIN, a citizen of the Republic of France, and a resident of Charmes, by La Fère, Aisne, France, have invented a new and useful Root-Cleaning Machine, which machine is fully set forth in the following specification.

The present invention relates to a root-cleaning apparatus which has for its object to free beets or other roots employed in sugar-making or in distilling, from foreign bodies, the presence of which causes serious disturbances in the working of the factories. These foreign bodies are of various kinds:

First, stones, pieces of metal and other hard substances which are accidentally mixed with the roots at the time of loading upon the transporting vehicles. Such hard bodies when they reach the root-cutter along with the roots are the cause of serious damage to the parts of this machine, and so bring about more or less protracted stoppages.

Secondly, there are the ligneous and filamentary bodies, such as splinters of wood, weeds, root-leaves, wisps of straw, etc., the presence of which among the roots produces clogging of the blades serving for the cutting of the latter and necessitates their frequent dismounting, which entails loss of time and irregularity in the output of the root-cutter and therefore in the entire operation of the factory.

Lastly, the arrival at the root-cutter of any small rootlets which have been broken off in the washing apparatus or in the different stages of treatment to which the roots are subjected, result in a more or less abundant production of raspings or shavings prejudicial to the satisfactory carrying out of the operation of extracting the sugary material.

With the root-washing and stone-removing apparatus hitherto employed, there has been obtained a partial elimination of these various objectionable substances, but not a complete result. The apparatus which forms the subject of the present invention has been designed with a view to obtaining this complete elimination.

The accompanying drawings represent by way of example a construction for carrying out the invention.

Figure 1 is a vertical section of the ap-

paratus; Fig. 2 is a plan. Fig. 3 is an end view and Fig. 4 is a view on a larger scale of the device serving for the removal of the ligneous and fibrous bodies of low density and also of the small rootlets.

As will be seen from the drawings (Figs. 2 and 3) the apparatus consists of three different parts, A, B, C. In the part A are eliminated all hard bodies of density greater than that of water. The part B serves to remove the beets or large roots and to convey them to the root-cutter after they have been freed from all foreign bodies, light or heavy. Lastly, the part C serves for the removal of ligneous, fibrous bodies of low density and small rootlets while, however, allowing the water which is the only transporting medium employed in the apparatus, to return and complete its circulation.

The part A comprises a sheet-metal tank divided into two compartments or cells 1, 2 by a vertical partition 3. In the tank and at the lower part is placed a tube 4 of sheet-metal forming the casing of a screw propeller 5 carried by the shaft 6 which receives its movement from a suitable transmission by means of the pulley 7. In the cell 2 are placed at the level 8 (Fig. 3) the bars of a grill 9. The wall 10 of the cell 2 is cut away down to the point 11 to form a weir.

The tank being filled with water and the screw propeller given a suitable rotary movement, the water is drawn from the cell 1 into the cell 2 passing up through the grill 9 and then flowing over the weir 11 into the part B. The roots delivered in the cell 2 with all their accompanying impurities are taken up by the ascending current of water which they meet above the grill 9; owing to their density, which is nearly equal to that of water, and to their comparatively large bulk, they rise in the direction of the water current and pass with it into the part B. In this movement they have left behind all the bodies of small volume and greater density, which have fallen through the grill if their dimensions allow, or which remain above if their dimensions are greater than the intervals between the bars. All the floating bodies, wood, straw, leaves, weeds, particles of coke, etc., have been passed into B with the roots; it remains, therefore, to separate them from the latter. This pur-



pose is fulfilled by the apparatus B; this consists of an elevating screw of the form usually employed for the transport of the roots, but presenting certain special features.

5 The shaft 12 carrying the spirals 13 is operated by the shaft 14 receiving its movement from a transmission arranged in the most convenient manner in relation to the whole installation; the spiral-conveyer rotates in a perforated metal cylinder 15, in-  
10 closed in another reservoir 16 of impermeable metal forming a water-reservoir. A sheet-iron chute 17 connects the parts A and B, and a conduit 18 connects the reservoir 16  
15 of the part B to the cell 1 of the part A. A plate 19 covers a portion of the spiral conveyer shaft, in such a manner that the upper edge of this plate lies above the highest water level of the apparatus.

20 The roots carried forward with their light impurities by the water current produced in the part A by the propeller 5, descend with the water down the chute 17 into the trough of the conveyer. The roots are taken  
25 up by the spirals 13 and are raised by the latter to the point of delivery, while the floating bodies detach themselves from the beets moving in the open water and rise to the surface. A portion of the water de-  
30 livered from the cell 2 passes through the perforations of the cylinder 15 and returns by the conduit 18 to the suction compartment 1. The remainder of the water continues its movement over the weir 20  
35 formed in the wall of the chute 17 and passes into the third apparatus C, taking with it all the bodies floating on the surface and a certain variable quantity of any small root-  
40 lets detached from their mother roots by the washing action.

The apparatus C comprises a sheet-metal vessel 21 connected by the chute 22 to the preceding apparatus B. In the vessel 21 re-  
45 volves a shaft 23 operated by a pinion and gear-wheel and the intermediate shaft 24, receiving its movement from the pulley 25 secured upon the shaft 6. The shaft 23 serves as support to a drum formed of sheet-iron  
50 disks 26, held apart by washers so as to leave intermediate spaces of from 6 to 15 millimeters. The circumference of these disks is furnished with notches in the shape of saw  
55 teeth 27 (Fig. 4). Between the disks is placed a comb formed of curved plates 28, and fitted together so that each tooth corresponds to a space between two disks. This  
60 comb is fixed and its inclined outer portion is extended as a chute 29. A pipe 30 connects the vessel 21 to the conduit 18 which returns the water to the cell 1. The drum  
65 being set in slow rotary movement in the direction of the arrow, receives upon its periphery all the floating bodies and small rootlets carried along by the water coming from the part B and lifts these bodies over

until they meet with the teeth of the comb 28 which ejects them outwardly by the chute 29. The water delivered against the drum finds an ample passage through the metal  
70 disks in the space comprised between the edges of the chute 22 and of the distance pieces separating the disks. The spaces between the disks being constantly cleared by the teeth of the comb, offer to the water as  
75 regular as possible a passage, which is impossible to obtain with the arrangements hitherto employed. A regulating device 31 arranged between the reservoir 16 and the  
80 conduit 18 allows by being opened more or less, more or less water to be passed through the apparatus C before the return of the whole of the circulating water to the suc-  
85 tion compartment 1. By means of this regulation of the volumes of water passing through the apparatus B and C, the beet roots can be separated from rootlets of dif-  
90 ferent sizes. If the current flowing to C is weak, although sufficient to carry along floating bodies, only the smallest rootlets will be passed into this apparatus; if the speed of  
95 the current is slightly increased by suitably closing the cock 31 somewhat larger rootlets will be eliminated in their turn. Consequently, by varying the supplies of  
water by the cock 31, rootlets of any given  
size can be eliminated from the beets, which action affords for certain factories a very considerable advantage.

Having thus described my invention, what I claim as such and desire to secure by Let-  
10 ters Patent is:—

1. In a root-cleaning apparatus, a liquid holding receptacle provided with two parti-  
10 tions terminating below the top of the receptacle and dividing the receptacle into a preliminary washing compartment, a discharge compartment for floating refuse and an in-  
11 termediate root separating compartment, means for delivering liquid to the first named compartment to overflow into the  
succeeding compartments, a root conveyer having its receiving end in the intermediate  
12 compartment and below the normal liquid level therein, and means in the discharge  
11 compartment for removing floating refuse from the liquid.

2. In a root-cleaning apparatus, a liquid holding receptacle provided with partitions  
12 terminating below the top of the receptacle and dividing the receptacle into a preliminary root washing compartment, a dis-  
charge compartment for floating refuse and an intermediate root separating compart-  
12 ment, a conduit connecting the discharge compartment with the washing compart-  
12 ment and means in said conduit for circulating liquid through said system, a valved  
conduit connecting the intermediate com-  
13 partment with said conduit for deflecting flow of liquid from the discharge compart-



ment and a root conveyer having its receiving end in the intermediate compartment and below the normal liquid level therein, and means in the discharge compartment for removing floating refuse from the liquid.

3. In a root-cleaning apparatus, a liquid holding receptacle provided with a vertical partition dividing the same into a root washing compartment and a water reservoir, a screw propeller in said partition, an imperforate cylinder in communication with said washing chamber and said reservoir, a screw conveyer having a perforated casing located in said cylinder and a chute for directing bodies discharged from the washing chamber into said conveyer.

4. In a root-cleaning apparatus, comprising a plurality of liquid communicating compartments containing a liquid comprising a root cleaning compartment, a compartment for separating roots from floating refuse and a compartment for separating said floating refuse from the liquid, a horizontal grating in said first named compartment for separating bodies denser than the liquid from bodies lighter than said liquid, means for circulating said liquid through said compartments and root removing means and refuse removing means associated with said two last named compartments respectively.

5. In a root-cleaning apparatus, a receptacle adapted to contain a moving body of liquid, a revoluble shaft in said receptacle provided with a plurality of serrated disks equally spaced apart and a comb provided with curved teeth lying between said disks and coöperating with said teeth to remove

bodies floated into the path of said disks by the moving body of liquid.

6. A root-cleaning apparatus, comprising a water-tank, a vertical partition dividing said tank into two compartments, a screw propeller located in said partition, said propeller circulating water from the first to the second of said compartments of said tank, a horizontal grill in said second compartment, said grill being above the delivery of said screw-propeller and receiving the roots together with their accompanying impurities, a weir formed in a wall of said second compartment, a trough, a chute connecting said weir to said trough, a spiral elevator in said trough, said elevator collecting roots from said trough and delivering them at a higher level, a second weir on the side of said trough opposite to said second compartment, a vessel to which said second weir delivers, a drum rotating in said vessel, said drum consisting of a plurality of disks having saw-tooth peripheries and intermediate spacing means, a comb secured beside said drum, said comb having teeth fitting in the spaces between said disks, a chute delivering from the apparatus the material removed from said drum by said comb, and means for regulating the return flow of water from said trough and from said vessel to said first compartment of said water-tank.

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

ALFRED MAGUIN.

Witnesses:

DOUMÉ CASALONGA,  
MIGUEL ZEROLO.