April 20 , 1926.

1,581,686

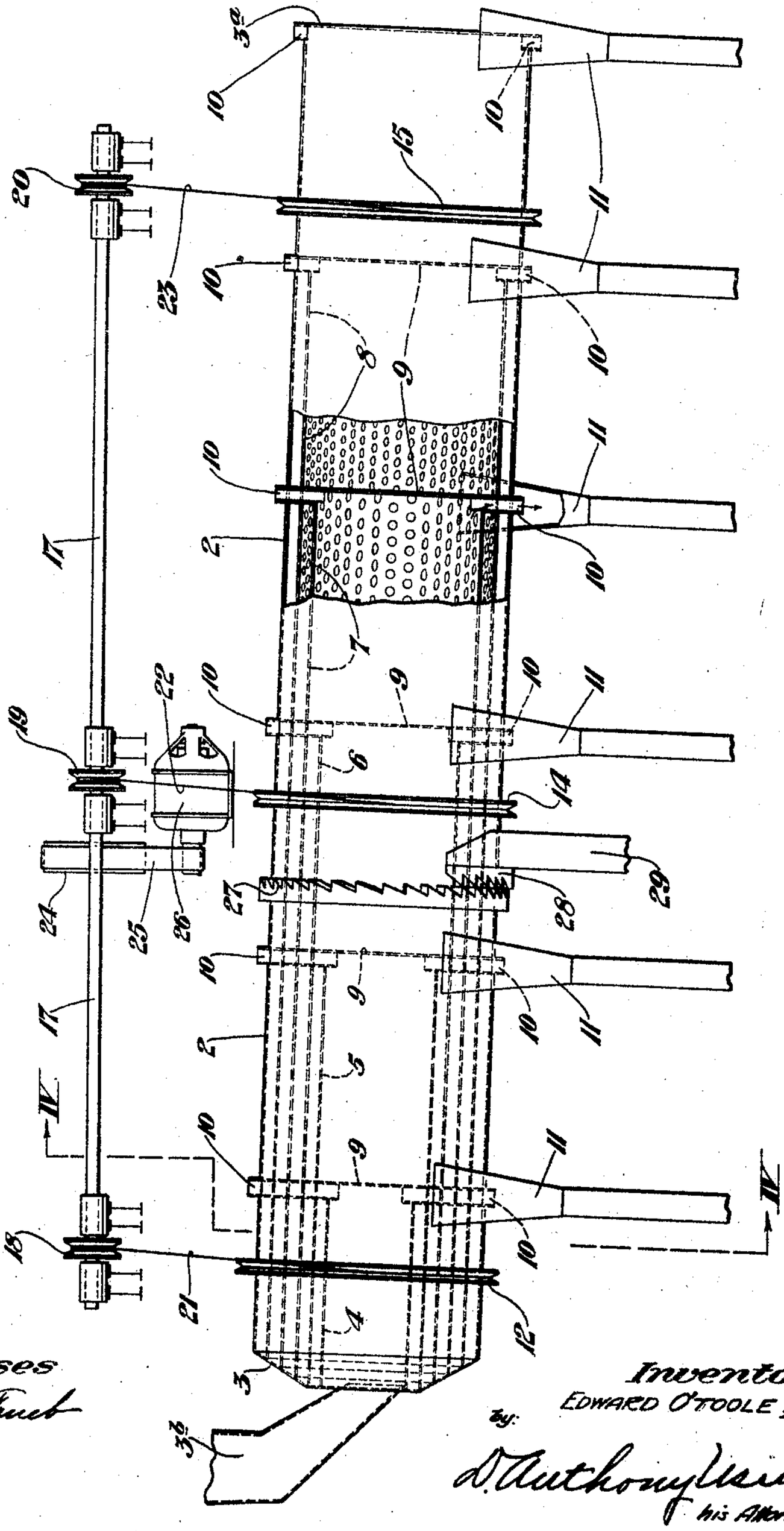
E. O'TOOLE

SCREEN

Filed July 30, 1923

3 Sheets-Sheet 1

Fig. 1.



Witnesses
Edwin Finch

Inventor:
EDWARD O'TOOLE,
by:
D. Anthony Jr.
his Attorney.

April 20, 1926. 1,581,686

E. O'TOOLE

SCREEN

Filed July 30, 1923 3 Sheets-Sheet 2

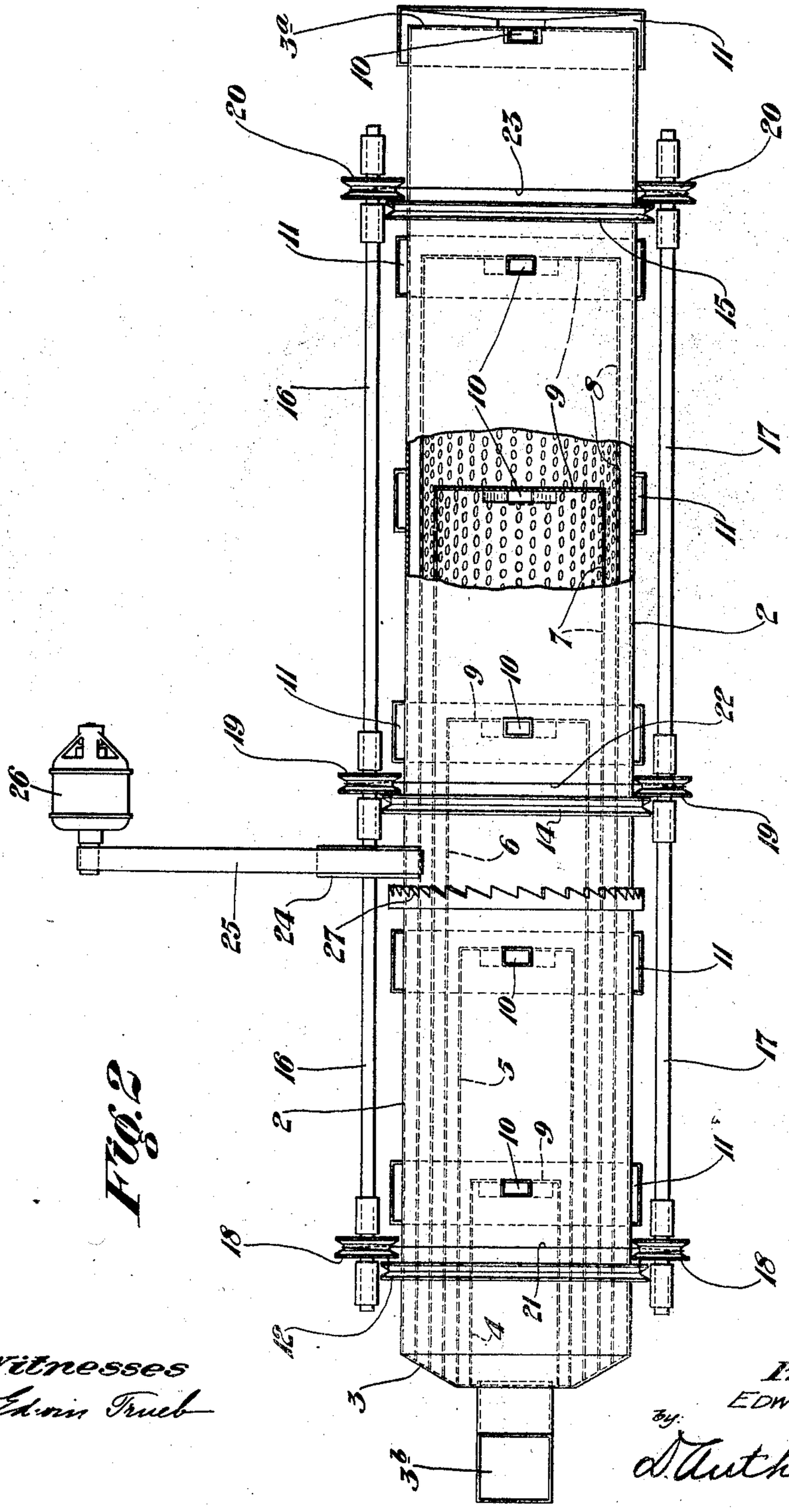


FIG. 2

Witnesses
Edwin Trueb

Inventor:
EDWARD O'TOOLE,
By:
A. Anthony Usina
his Attorney.

April 20, 1926.

E. O'TOOLE

1,581,686

SCREEN

Filed July 30, 1923

3 Sheets-Sheet 3

Fig. 4.

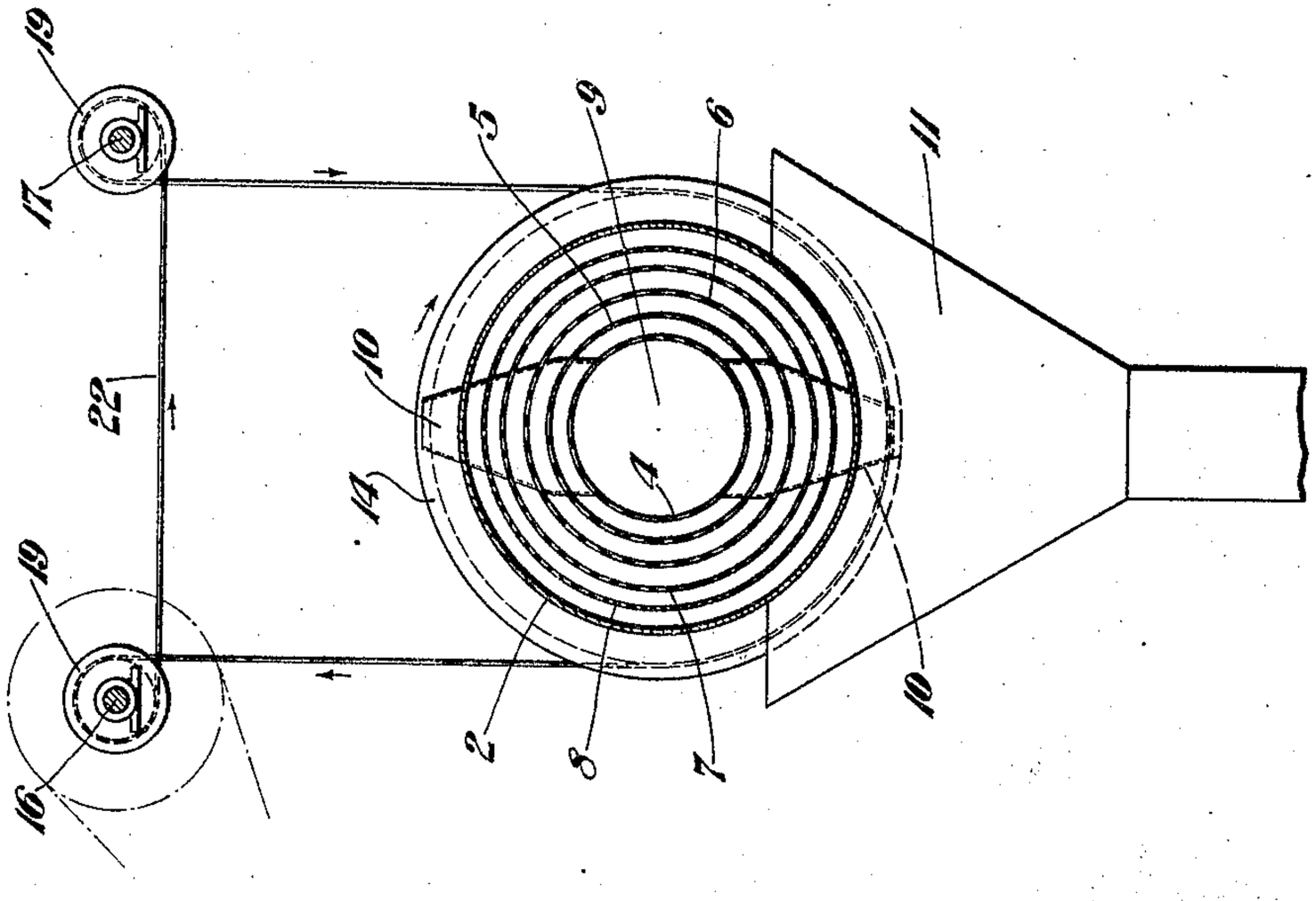
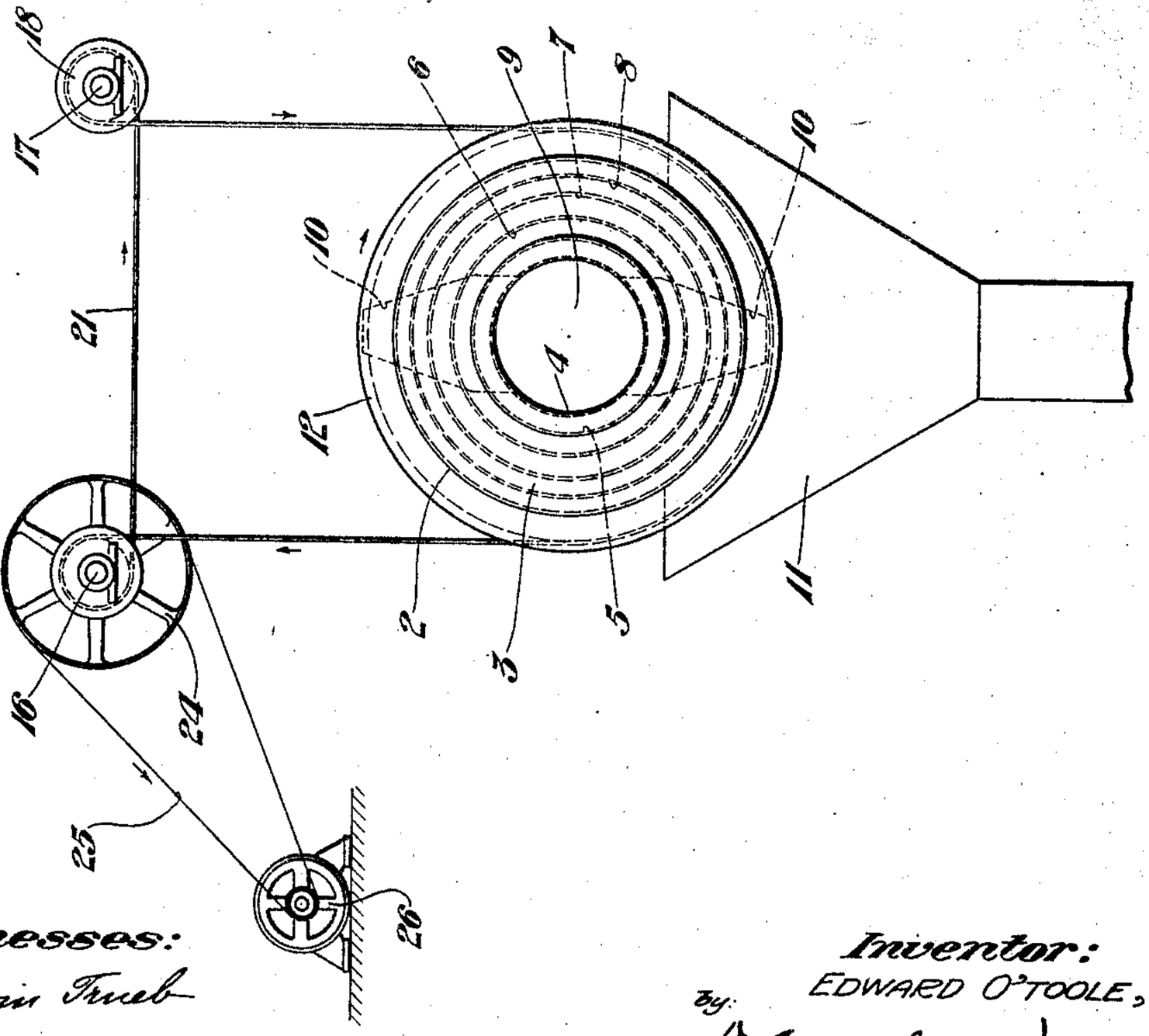


Fig. 3.



Witnesses:
Edwin Trueb

Inventor:
EDWARD O'TOOLE,
By: D. Authony Jr.
his Attorney.

Patented Apr. 20, 1926. 1,581,686

UNITED STATES PATENT OFFICE.

EDWARD O'TOOLE, OF GARY, WEST VIRGINIA.

SCREEN.

Application filed July 30, 1923. Serial No. 654,658.

To all whom it may concern:

Be it known that I, EDWARD O'TOOLE, a citizen of the United States, and resident of Gary, in the county of McDowell and State of West Virginia, have invented certain new and useful Improvements in Screens, of which the following is a specification.

This invention relates to screening or grading devices for screening or sizing coal, ore, and similar material, and while not limited thereto relates more particularly to a screening device employing a plurality of screens adapted to receive the material one from the other.

One object of the present invention is to provide a screening device of this class that will have a combined rotary and jigging motion and thereby cause a more thorough screening of the material being screened than screens of the prior art.

Another object is to provide an improved screening device having the novel construction and combination of parts hereinafter described and illustrated in the accompanying drawings.

In the drawings—

Figure 1 is a side elevation of a screening device constructed in accordance with my invention.

Figure 2 is a top plan thereof.

Figure 3 is an end elevation of the device of Figures 1 and 2.

Figure 4 is a sectional elevation on the lines IV—IV of Figure 2.

Referring more particularly to the drawings, the numeral 2 designates the tubular body portion of the device, which has its ends closed by heads 3 and 3^a, and is provided with an inlet hopper 3^b entering through the rear head 3. A plurality of tubular screens 4, 5, 6, 7, and 8 are arranged, one within the other, in spaced relation and axially of the body portion 2. The innermost screen 4 has the largest opening, and each successive screen has successively smaller openings therein so as to grade the material being screened. Each successive screen is longer than the one immediately within it and the forward end of each is closed by a wall 9 so as to prevent the material that fails to pass through the meshes from falling onto the next or smaller meshed screen.

Each screen and the portion of the body 2 beyond the foremost screen section, is provided with a plurality of outlet openings adjacent its forward end which communicate with suitable conduits 10 which extend outwardly through the body portion 2 and communicate with suitable hoppers 11 adapted to deliver the screened material to suitable cars, bins, or the like (not shown). The walls 9 and conduits 10 serve to trap the material separated by the respective screens, thereby preventing such material from travelling over the successively finer screens and becoming broken.

The body portion 2 is provided with a plurality of sheaves 12, 14, and 15, which are fixed around its periphery in spaced relation.

A pair of operating shafts 16 and 17 are supported above the screening device in any desired manner and each is provided with a plurality of power sheaves 18, 19, and 20. The shafts 16 and 17 are so positioned that their sheaves 18, 19, and 20 are slightly forward of the sheaves 12, 14, and 15 on the body 2. Suitable endless supporting and operating cables 21, 22 and 23 are trained under the sheaves 12, 14, and 15 and around the sheaves 18, 19, and 20, respectively, so as to support and rotate the screening device. The cables 21, 22, and 23 are progressively longer so as to support the device in a forwardly inclined position.

The shaft 16 is provided with a pulley 24 intermediate its ends which is connected by a belt 25 with a driving motor 26.

A toothed ring 27 is secured to the periphery of the body portion 2 intermediate its ends, and meshes with a fixed toothed segment 28 mounted on a post 29 or other fixed support. It will be readily understood that when the body portion 2 and ring 27 is rotated the teeth on the ring 27 will mesh and unmesh with the teeth on the segment 28, thereby causing a swinging reciprocatory or jigging movement of the complete screening mechanism, due to its flexible supporting members.

In operation the motor 26 is started and rotates the shafts 16 and 17, which in turn cause a rotation of the screening member due to the endless cables 21, 22, and 23, and as the screening member is rotated it is also reciprocated or jigged in a direction parallel to its axis of rotation due to the toothed ring and segment 27 and 28. After the apparatus is in motion, coal or other mate-

rial to be screened or sized is fed into the hopper 3b and falls into the innermost screen 4. As the apparatus continues its rotary and jigging motion all the material capable of passage through the meshes of the screen 4 will pass through to the screen 5, and all the material capable of passage through the meshes of the screen 5 will pass through to the screen 6, and so on until the finest material is delivered through the last screen onto the body or casing 2. As has been explained before, each screen progressing outwardly has a finer mesh but is of larger diameter and is longer than the preceding coarser screen, thus allowing for longer and greater contact of the material with the finer screens and causing a more thorough separation of the material.

The screening member being inclined forwardly, the material will progress toward the forward end of the several screens and will be discharged through the conduits 10 into the hoppers 11.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited thereto, since various modifications, that will readily suggest themselves to those skilled in the art, may be made without departing from the scope of my invention as defined in the appended claims.

I claim—

1. In a screening device for coal, ore and the like, having a tubular body portion enclosing a plurality of screening members, a plurality of sheaves on said body portion, a plurality of power sheaves mounted for rotation above said body, endless flexible driving and supporting members trained under the sheaves on said body portion and around the corresponding power sheaves, means for driving said power sheaves, a toothed ring secured around the outer periphehery of said body, and a toothed segment mounted on a fixed support separate from said body and engaging said toothed ring, whereby said body will be caused to jig or reciprocate during the rotation thereof.

2. A screening device for coal, ore and the like, comprising an imperforate outer tubular body portion, a plurality of tubular screen members rigidly mounted within said body portion and arranged one within the other in spaced relation, each successive screen outwardly being of a finer mesh than the one immediately within it, and each screen being of a greater length than the one immediately within it, said screens each having their forward ends closed by an imperforate wall and outlet conduits leading from suitable outlet openings adjacent the forward end of each of said screens, through which the screened material is delivered.

3. A screening device for coal, ore and the like, comprising an imperforate outer tubular body portion, a plurality of tubular screen members rigidly mounted within said body portion and arranged one within the other in spaced relation, each successive screen outwardly being of a finer mesh than the one immediately within it, and each screen being of a greater length than the one immediately within it, said screens each having their forward ends closed by an imperforate wall, outlet conduits leading from suitable outlet openings adjacent the forward end of each of said screens through which the screened material is delivered, and means for rotating said device.

In testimony whereof I have hereunto signed my name.

EDWARD O'TOOLE.