

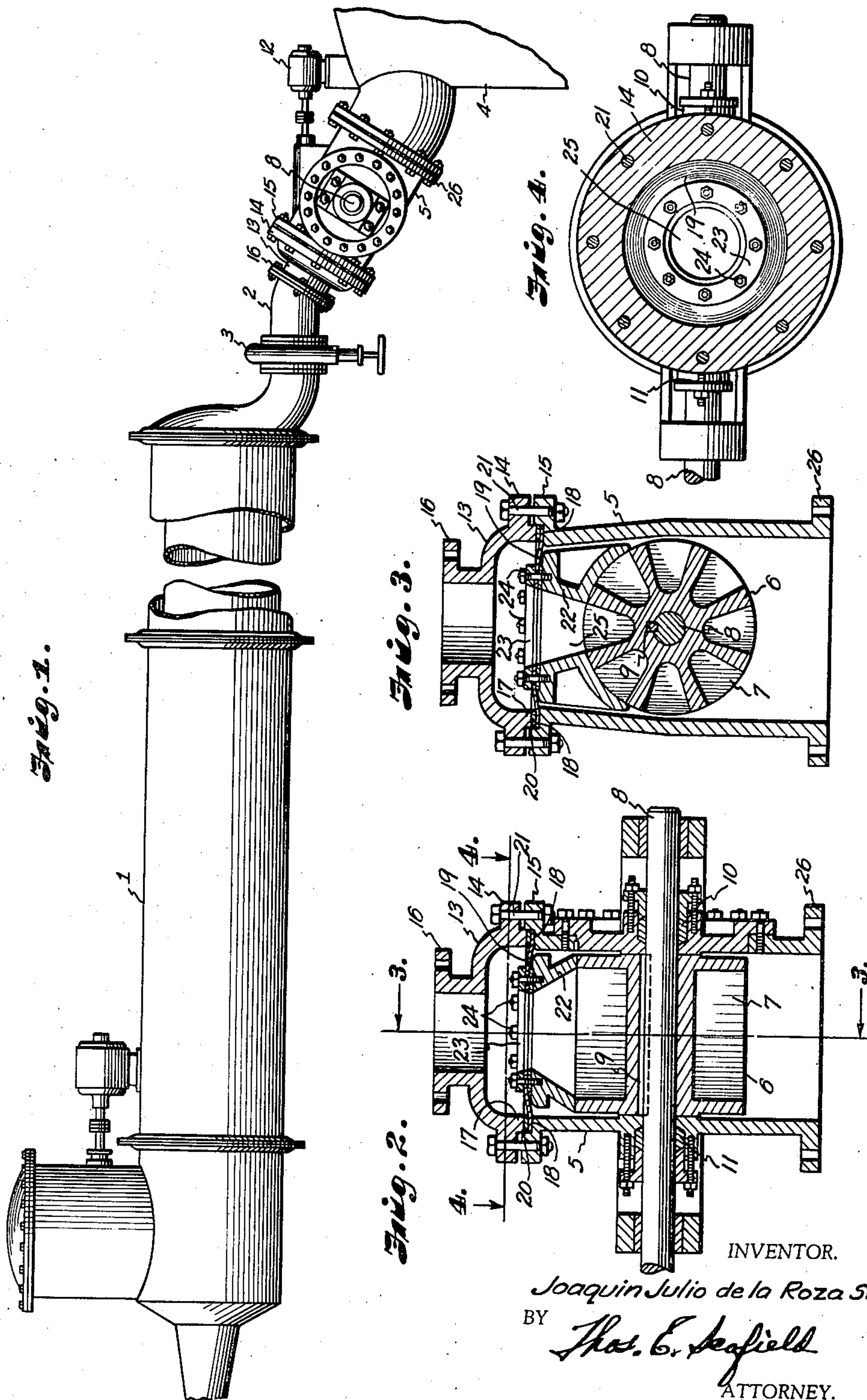
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DIGESTING APPARATUS

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DIGESTING APPARATUS

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3 Claims. (Cl. 92—7)

My invention relates to digesting apparatus and more particularly to a novel volumetric discharge valve for a digester.

In my co-pending application, Serial Number 690,406, dated September 21, 1933, I have shown a novel process of continuous digesting of cellulose bearing material employing a volumetric discharge valve. In order to maintain a seal between the rotor of the discharge valve and its seat it is necessary to accurately adjust the rotor. Wear on the rotor bearings and between the rotor valve and its seat necessitates frequent adjustments in order that the pressure may be maintained within the digesting zone and to prevent leakage.

One object of my invention is to provide a volumetric discharge valve construction which will maintain a seal without the necessity of frequent adjustments.

Another object of my invention is to provide a discharge valve which will be self-adjusting to a certain degree for longer wear.

Other and further objects of my invention will appear in the following description.

In the accompanying drawing which forms part of the instant specification and which is to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

Figure 1 is an elevation of a digester fitted with a valve of my invention.

Figure 2 is a sectional elevation of one form of volumetric discharge valve embodying my invention.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

In general my invention contemplates the provision of a rotor containing a plurality of buckets adapted to receive digested materials and discharge them into a blow pit or the like. A saddle is fitted to ride the rotor. The saddle is flexibly supported by means of a diaphragm made of suitable material possessing great strength and flexibility, such as chrome nickel steel or the like. The diaphragm is firmly secured at its periphery and carries the saddle. The construction is such that the saddle is free to move in the direction of flexing of the diaphragm but is precluded from movement in the plane of the diaphragm. In this wise the saddle is enabled to move while riding the rotor and maintaining a seal. In the assembly the diaphragm is placed under a slight tension and acts as a spring, forcing the saddle on its seat. The amount of initial distortion will gov-

ern the limits in which the saddle will accommodate itself for wear either between the rotor valve and its seat or at the rotor bearings.

More particularly referring now to the drawing, a digester 1 is provided with an outlet duct 2 controlled by a shutoff valve 3 and by the volumetric discharge valve of my invention which is interposed in the outlet duct between the digester 1 and the blow pit 4. The valve comprises a valve body 5 in which a rotor 6, provided with any desired number of buckets 7, is rotatably mounted. The rotor 6 is keyed to shaft 8 by means of key 9. Stuffing boxes 10 and 11 are provided where the shaft 8 passes through the valve body 5. The shaft 8 is driven by a motor 12 by any suitable connection such as, for example, gearing. The valve body 5 is provided with a cap member 13 having a flange 14. The valve body 5 is provided with a flange 15. A flanged connection 16 of the cap member 13 is adapted to be connected to a corresponding flange in the outlet duct of the digester. Adjacent flange 14 of the cap member 13, I provide a peripheral bore 17 adapted to seat in a peripheral rabbit 18 adjacent flange 15. Mounted between bore 17 and rabbit 18, I position a flexible diaphragm 19. The diaphragm may be made of any suitable material having great strength and flexibility. A gasket 20 is provided to insure a tight joint. The cap member is secured to the body member by means of bolts 21. It will be seen that the diaphragm 19 will be securely clamped between the cap member 13 and the body member 5. The diaphragm is provided with a centrally disposed opening of any suitable shape. Clamped to the diaphragm in alignment with the opening I provide a saddle 22 which is clamped to the diaphragm by means of a clamping ring 23 and suitable bolts 24, as can readily be seen by reference to the drawing. The saddle 22 is provided with a passage or port 25. The exit end of the passage 25 is of such dimension that it will substantially be aligned with the buckets 7. The mounting of the saddle is such that the diaphragm is initially flexed so that it will pass the saddle against the rotor 6, forming a seal. The outlet port of the valve is provided with a flange 26 which is adapted to be secured to a similar flange on a pipe or duct leading to a blow pit or any other suitable place.

In operation the rotor is turned by the motor 12. This brings respective buckets 7 in successive alignment with the passage 25 of the saddle 22. As each bucket fills with digested material

the rotor in turning moves the bucket under the lip 27 of the saddle, thus sealing the bucket filled with digested material. As the rotation continues, the contents of the bucket will be
 5 dumped, the bucket traveling around to be again filled. Inasmuch as the volume of the buckets is known, the speed of rotation will be an accurate means of controlling the volume of digested material discharged from the digesting zone.

10 It will be obvious that I have accomplished the objects of my invention. I have provided a novel volumetric discharge valve which will at all times maintain a perfect seal between the digester and the blow pit. The valve will com-
 15 pensate for normal wear. The sharp corners of the buckets and the saddle at the point of contact act as a shears, preventing material from lodging between the rotor and the saddle, thus enabling a tight seal to be maintained.

20 The assembly is such that it may be easily inspected, repaired and cleaned and need not be carefully adjusted or the adjustments changed frequently as is the case with an ordinary volumetric discharge valve.

25 It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of my claims. It is further
 30 obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It

is, therefore, to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. In combination with a digester for fibrous material, an outlet duct for the digested material, a valve body, a rotor mounted for rotation in said valve body, said rotor being formed with a bucket, a saddle embracing said rotor, said saddle being formed with a port adapted to provide communication between said outlet duct and said bucket and means for flexibly mounting said saddle.

2. In combination with a digester having an outlet duct for the digested material, a valve in said outlet duct comprising a rotor formed with buckets, a saddle adapted to ride on said rotor, said saddle being formed with a port adapted to provide communication between said digester and said buckets, and means for flexibly supporting said saddle.

3. A volumetric discharge valve for a digester including in combination a valve body, a rotor, buckets formed in said rotor adapted to receive digested material, an inlet port for the valve, a saddle, a passage formed in said saddle providing communication between said inlet port and said buckets, and means for flexibly supporting said saddle in contact with said rotor.

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