

No. 620,786.

Patented Mar. 7, 1899.

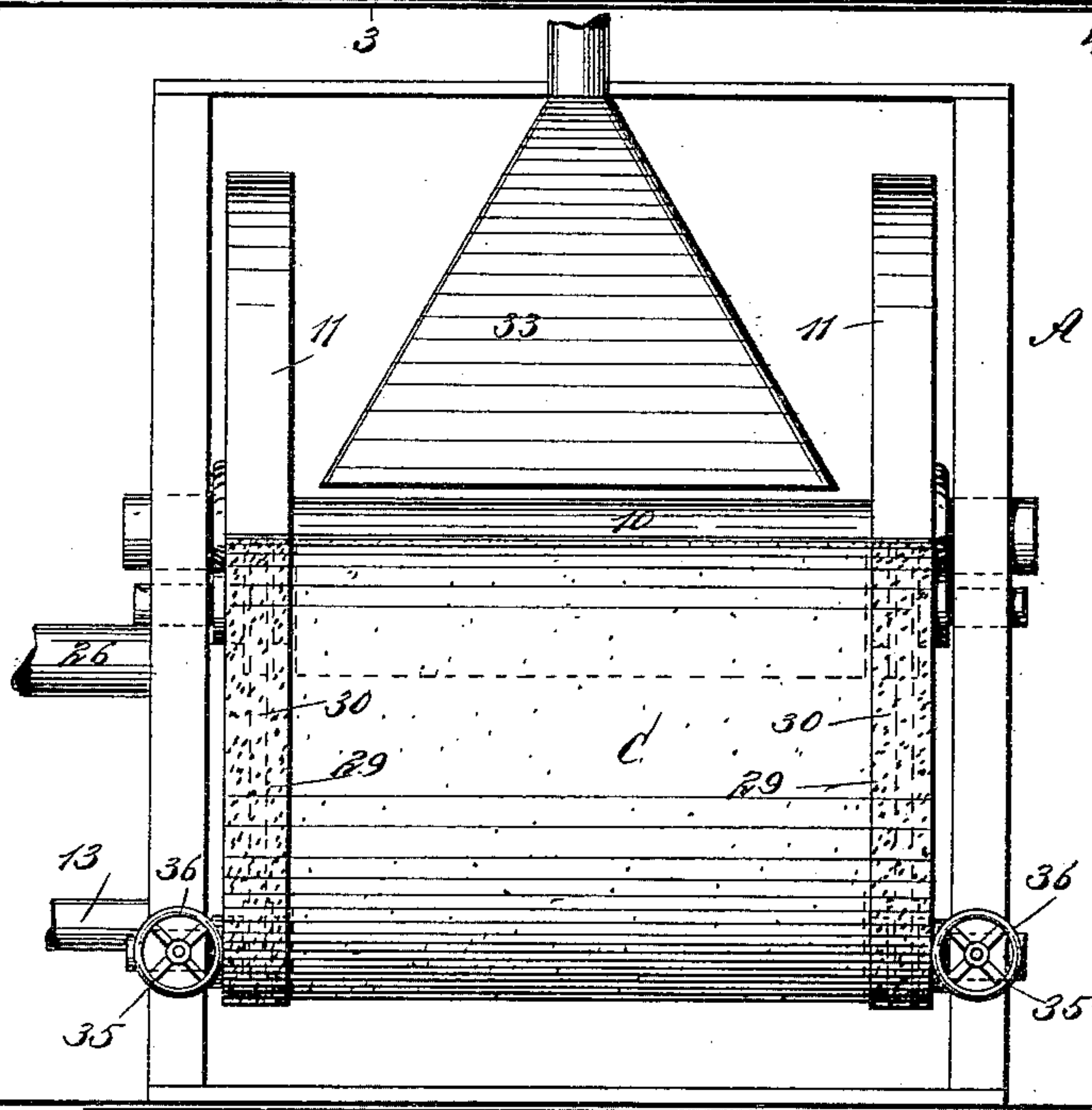
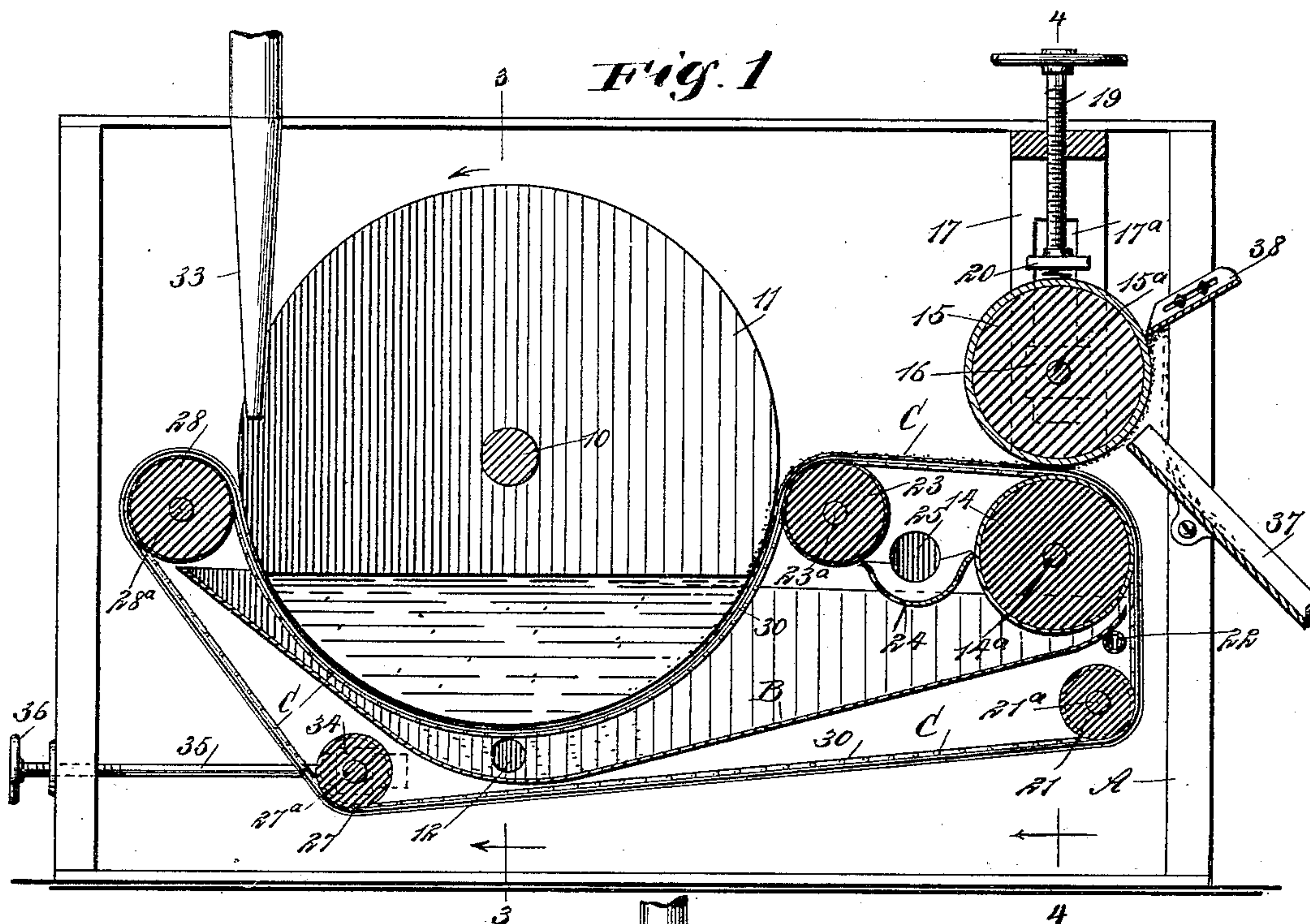
M. B. KOERPER & E. C. TALLEY.

MACHINE FOR FILTERING LIQUIDS.

(Application filed June 2, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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*Fig. 2*

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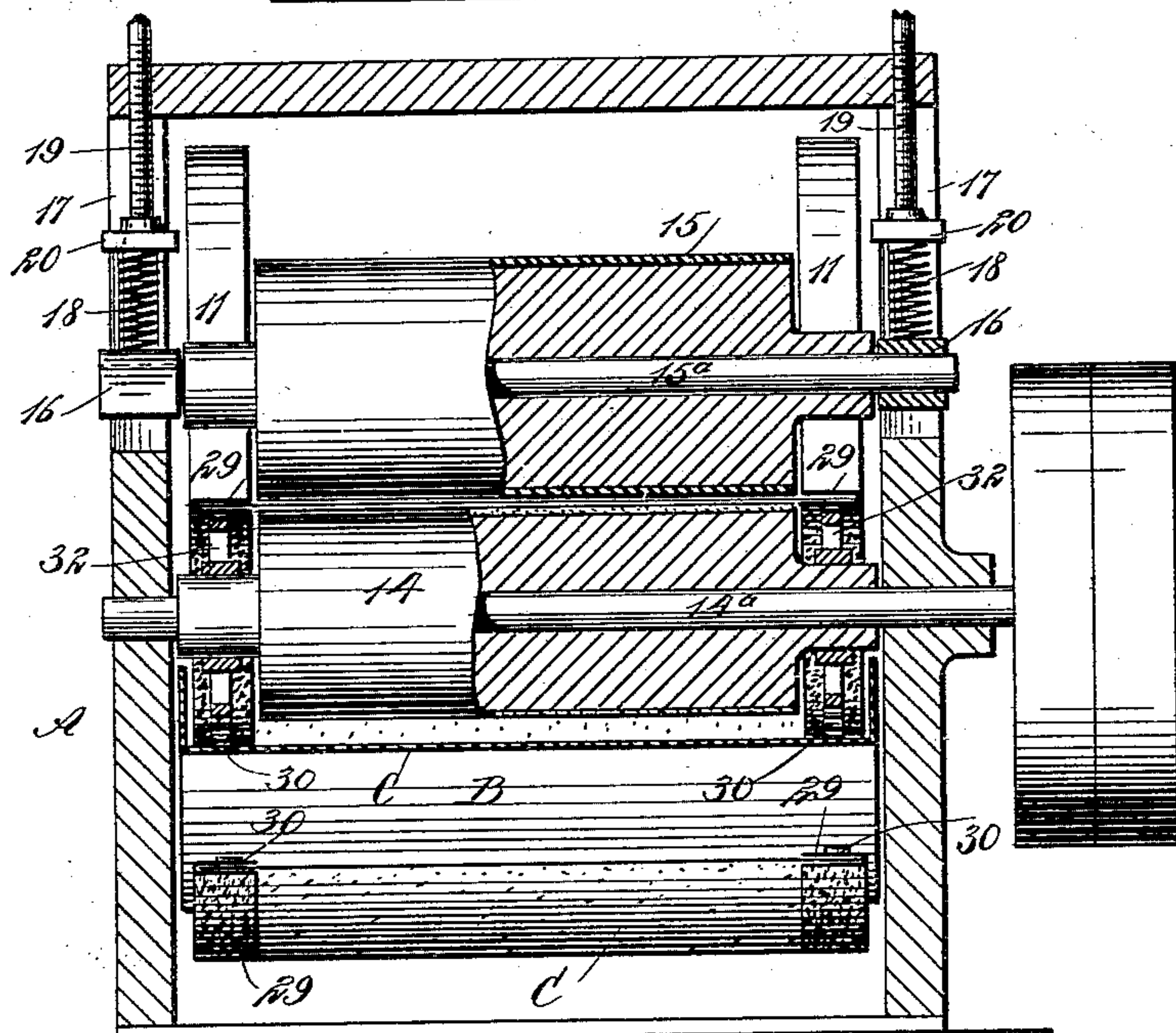
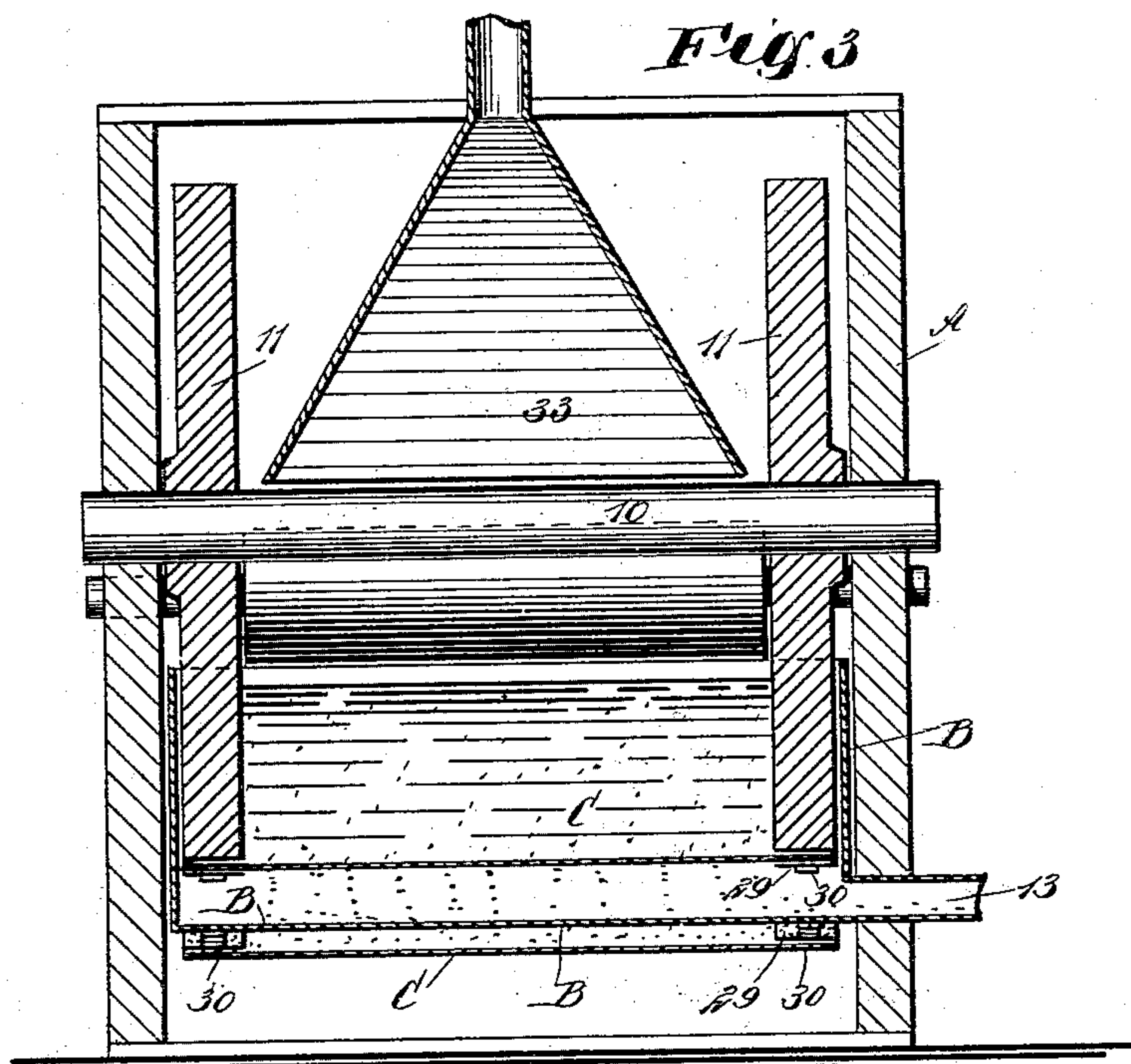
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2 Sheets—Sheet 2.



WITNESSES:

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*Fig 4*

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# UNITED STATES PATENT OFFICE.

MICKAEL B. KOERPER AND EDGAR C. TALLEY, OF WACO, TEXAS.

## MACHINE FOR FILTERING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 620,786, dated March 7, 1899.

Application filed June 2, 1898. Serial No. 682,382. (No model.)

*To all whom it may concern:*

Be it known that we, MICKAEL B. KOERPER and EDGAR C. TALLEY, of Waco, in the county of McLennan and State of Texas, have invented a new and Improved Machine for Filtering Liquids, of which the following is a full, clear, and exact description.

The object of our invention is to provide a machine for filtering oils and other liquids, so constructed that it will be simple and economic and wherein an endless filtering-belt will be employed and material be so delivered to the said belt as to materially promote cleansing of the belt.

A further object of the invention is to provide for the speedy and convenient separation of any foreign matter from the liquid without removing any portion of the machine and without necessitating the adjustment of parts of the machine, the filtered material being received and delivered at one part of the machine and the refuse matter discharged at another portion of the machine.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal vertical section through the machine. Fig. 2 is an end view of the machine. Fig. 3 is a transverse section on the line 3 3 of Fig. 1; and Fig. 4 is a section taken substantially on the line 4 4 of Fig. 1, parts of the end rolls only being in section.

A casing A is provided, comprising, preferably, two closed sides connected at the top and at the bottom, the casing being open at its ends. Near the center of the casing a shaft 10 is transversely mounted, which shaft is fixed and carries two disks 11, one being located near each side of the casing, as shown particularly in Fig. 3. A tank B is located below the disks, the disks extending into the said tank, and the bottom of the tank tapers from its ends to a point near the center, the deepest portion of the tank being that which is below the disks, as shown in Fig. 1. An opening 12 is made in a side of the tank at its

deeper portion, and near the bottom the said opening is surrounded by an exit-tube 13, since the filtered material received by the said tank will pass out through the pipe 13. A roll 14 is located above one end of the tank B, the roll being secured upon a shaft 14<sup>a</sup>, journaled in the sides of the casing. The roll 14 is provided, preferably, with a cover of a soft material. Above the roll 14 a second roll 15 is located, parallel with the roll 14. The roll 15 is shown larger than the roll 14 and is secured to a shaft 15<sup>a</sup>, the shaft being mounted in boxes 16, held to slide in slots 17<sup>a</sup> made in the vertical members of the yoke 17, the yoke extending from side to side of the machine. A spring 18 is located upon each box 16, and each spring is attached to or has bearing against a follower 20, attached to a screw 19, one of the said screws being carried up through a yoke near each end thereof. By this means the upper roll 15, which is adapted to take up the refuse matter, is adjusted to and from the roll 14.

A small roll 21 is located below the roll 14, the said roll 21 being secured upon the shaft 21<sup>a</sup>, journaled in the sides of the casing. The roll 14 is, however, partially within and partially above the tank B, while the smaller roll 21 is below the tank, and usually between the two rolls 14 and 21 a pipe 22 is introduced into the casing adapted to supply steam or air for the purpose of cleaning the filtering material when the character of the liquid to be filtered is very sticky. A roll 23 is located between the disks 11 and the roll 14, the roll 23 being secured upon the shaft 23<sup>a</sup>, mounted in the sides of the casing, and between the small roll 23 and the roll 14, which is the driving-roll, a trough 24 is horizontally located, adapted to receive any froth that may accumulate during filtration, since in the filtration of cotton-seed oil by our improved method the froth is very often present. This frothy matter finds an exit through a suitable outlet-opening 25 in a side of the casing, around which a pipe 26 is secured.

A small roll 27 is located below the tank B, between the deeper portion of the tank and the end farthest removed from the drive-roll 14. The roll 27 is secured upon the shaft 27<sup>a</sup>, and the said shaft is mounted in boxes 34, adjustable by means of set-screws 35, which are



passed out through the end portion of the casing and terminate in suitable hand-wheels 36, as shown in Figs. 1 and 2.

Above the end of the tank near which the roll 27 is placed another roll 28 is transversely located, being secured to the shaft 28<sup>a</sup>, which is journaled in the casing. The filtering material is in the form of an endless belt C, and the said filtering material may be paper, silk, bolting-cloth, or the equivalent, and the endless belt is made to pass over the driving-roll 14, the roll 23, the rolls 21 and 27, and around the roll 28 to an engagement with the lower portions of the disks 11. At each side edge of the filtering-belt a double thickness of material 29 is secured, one portion of the material extending over the top and the other across the bottom of the belt, as shown best in Fig. 4, and a chain belt 30 is secured to the inner face of the filtering-belt near its reinforced edges. The endless chain is adapted to engage with the teeth of sprocket-wheels 32, one of which wheels is secured upon the shaft of each of the rolls with the exception of the upper roll 15, the engagement of the chain belt with the sprocket-wheels being best shown in Fig. 4.

The liquid to be filtered is delivered to the upper surface of the filtering-belt between the disks 11 and near the roll 28, the delivery being made through the medium of a spout 33, having its lower or delivery end flaring or made so wide as to distribute the material transversely across the belt, thus spreading the material and promoting a quick filtration, and at the same time the impact of the liquid upon the belt will tend to clean the latter. By reinforcing the edges of the filtering-belt a tight and liquid-proof connection is effected between the said filtering-belt and the disks 11, the main portion of the filtering being accomplished between the disks. The refuse matter will be carried by the belt between the rolls 14 and 15, where the said material or matter will be compressed and flattened upon the discharge-roll 15, to be removed therefrom by a knife 38, whose cutting edge is brought quite close to the periphery of the roll 15, as shown in Fig. 1, and the material removed from the discharge-roll 15 will be conducted from the casing through the medium of a chute 37 or a like device.

As heretofore stated, the device is exceedingly simple, durable, and economic, and no portion of the machine after the parts have been once adjusted need be disturbed when material is to be filtered, and the endless filtering-belt renders the act of filtration uninterrupted during the time that the driving-roll 14 is in action.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a machine for filtering liquids, an endless filtering-belt, roll-supports for the said belt, and disks arranged at opposite sides of the belt for depressing the same between

sundry of the roll-supports, substantially as specified.

2. In a machine for filtering liquids, an endless filtering-belt, roll-supports for the said belt, an adjustable delivery-roll located above one of said supporting-rolls and adapted to receive the refuse matter from the belt, and a scraper for the delivery-roll, substantially as described.

3. In a machine for filtering liquids, an endless filtering-belt, supporting-rolls for the said belt, a driving-chain carried by the filtering-belt, sprocket-wheels carried by the supporting-rolls and arranged for engagement with the driving-chain, and a delivery-roll for the refuse matter located adjacent to one of the supporting-rolls, substantially as set forth.

4. In a machine for filtering liquids, the combination, with a tank, disks located above the said tank, and supporting-rolls located above and below the tank near opposite edges of the said disks, of an endless filtering-belt, a driving-chain carried by the filtering-belt, driving-sprockets carried by the supporting-rolls, a delivery-roll located above one of the supporting-rolls, and a scraper for the delivery-roll, as and for the purpose specified.

5. In a machine for filtering liquids, an endless filtering-belt, roll-supports for the said belt, disks spaced apart and having their lower portions in engagement with the said belt, a delivery-roll for the refuse matter located adjacent to one of said supporting-rolls and adjustable toward and from the same, the belt passing between the said delivery-roll and the said supporting-roll, and means for removing the refuse matter from the delivery-roll, substantially as described.

6. In a machine for filtering liquids, a tank, disks journaled above the tank at each side thereof and extending into the same, supporting-rolls located above the tank near opposite edges of the disks, supporting-rolls located below the tank, a driving-roll, a delivery-roll located above the driving-roll, an endless belt in engagement with the lower portion of the disks and passing over the supporting-rolls, and over the driving-roll, and between the latter and the delivery-roll, and a scraper for the delivery-roll, as and for the purpose specified.

7. In a machine for filtering liquids, an endless filtering-belt, roll-supports for the said belt, means for depressing the belt between sundry of the roll-supports, a delivery-roll located above one of the supporting-rolls, a scraper for the delivery-roll, and a blast-pipe adapted to supply steam or air for cleaning the filtering-belt, substantially as set forth.

8. In a machine for filtering liquids, a casing, a shaft mounted in the casing, disks carried by said shaft and located near opposite sides of the casing, a tank located below the disks and into which the said disks extend, an endless filtering-belt extending around the lower portions of the said disks, roll-supports for the said endless belt, an exit-tube



for the filtered material leading from the said tank, and a trough adapted to receive the accumulated froth and provided with an outlet-pipe, substantially as described.

5 9. In a machine for filtering liquids, an endless driving-belt, and a spout for the delivery of material to the belt, the said spout being of such width at its lower end as to extend across the belt nearly from edge to edge, as  
10 specified.

10. In a machine for filtering liquids, an endless filtering-belt, roll-supports for the said

belt, disks arranged at opposite sides of the belt for depressing the same between sundry of the roll-supports, and a spout for the delivery of material to the belt between the disks, the said spout having its delivery end extending across the belt, substantially as specified. 15

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Witnesses:

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