No. 863,885. PATENTED AUG. 20, 1907.

P. SCHNEIDER & K. SOHLER.

OIL PRESS.

APPLICATION FILED JAN. 9, 1907.

4 SHEETS—SHEET 1.

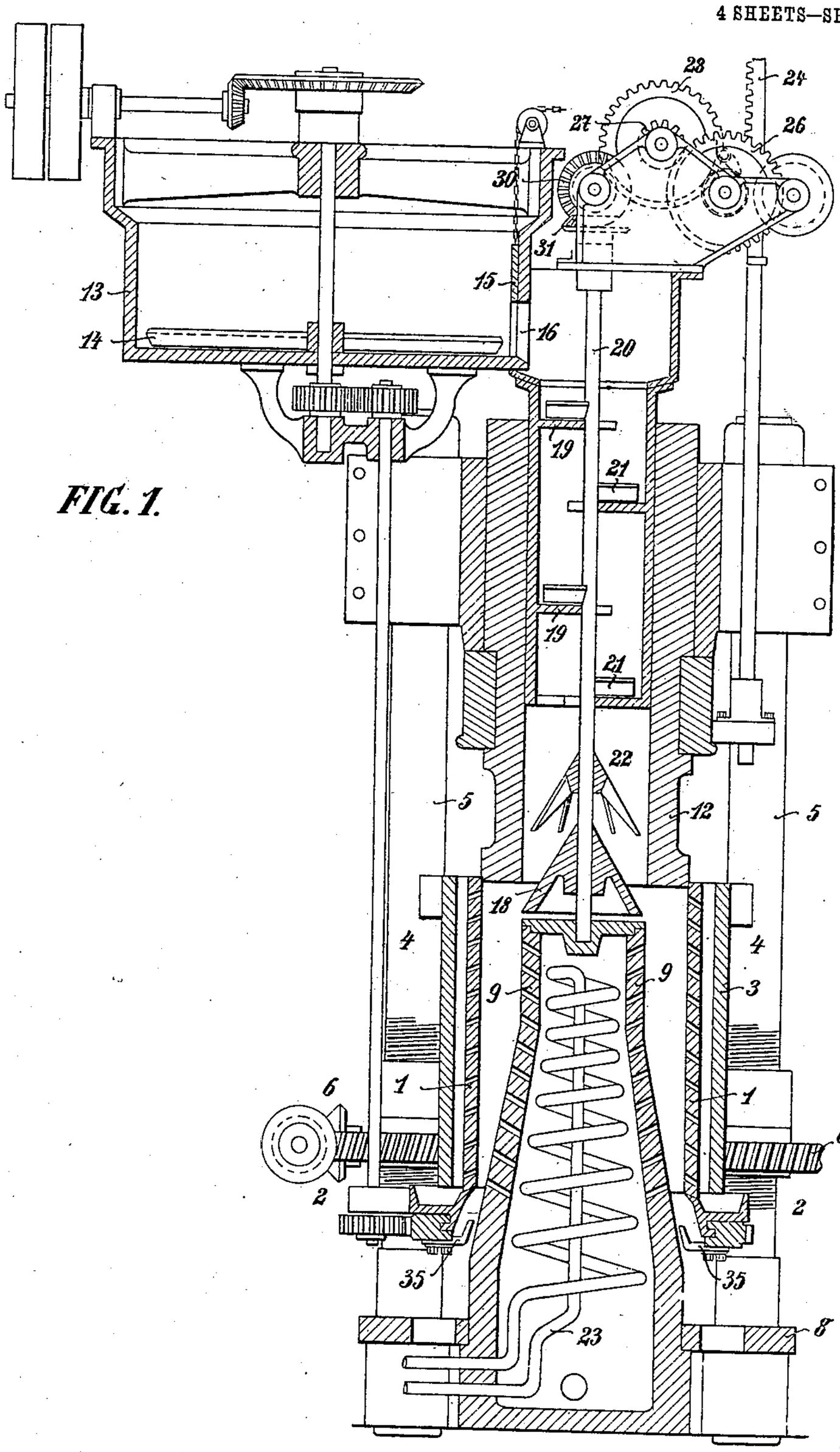


FIG. 1.

Witnesses:
Emil Bönnelycke
Jos. F. Collins.

Inventors:
Philipp Schneider
and
Karl Sohler
By Knight Bros
Attorneys

No. 863,885. PATENTED AUG. 20, 1907.

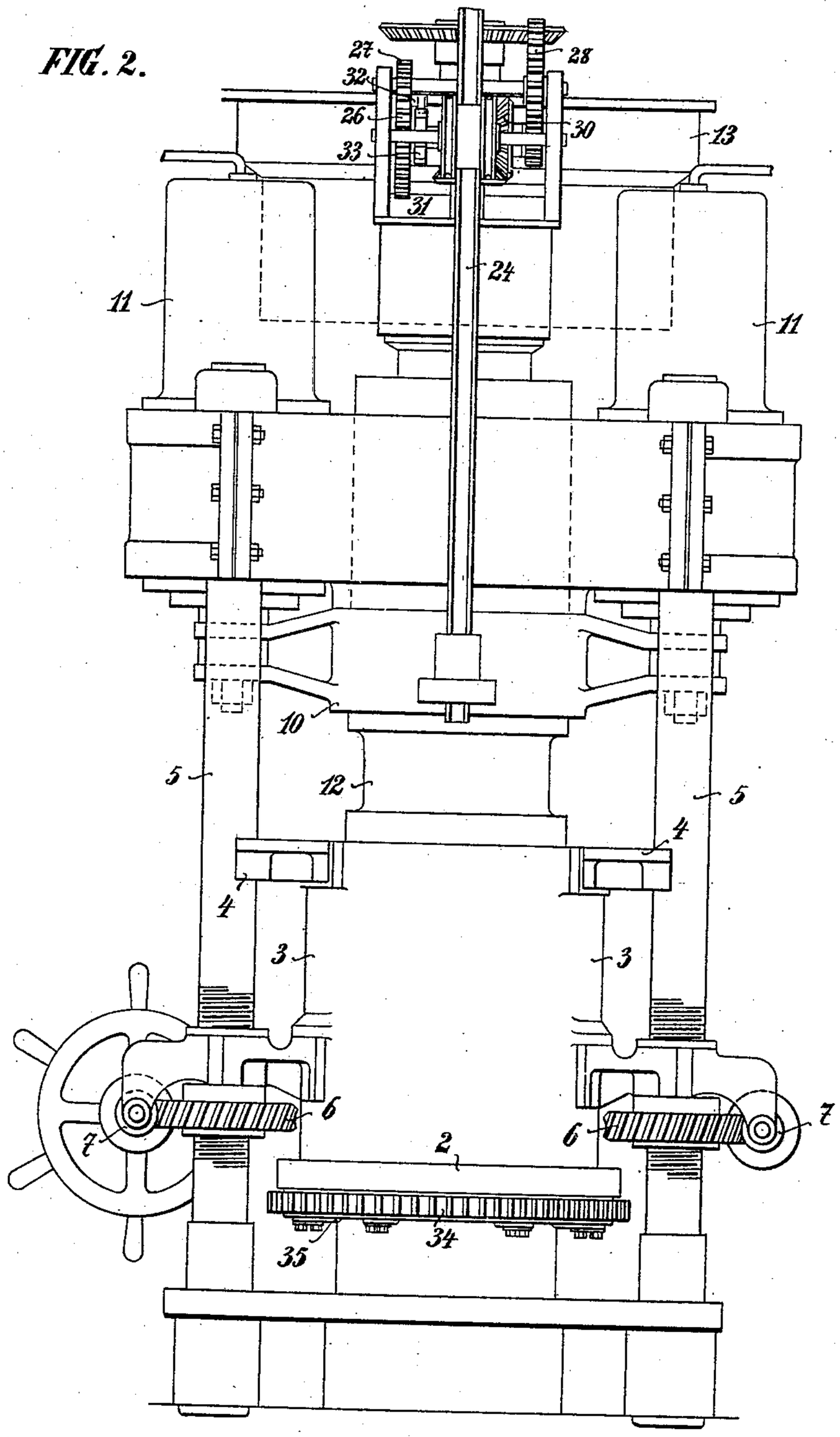
P. SCHNEIDER & K. SOHLER.

OIL PRESS.

APPLICATION FILED JAN. 9, 1907.

4 SHEETS—SHEET 2.

FIG. 2.



Witnesses:

Emil Baumgarten

Jos. F. Collins.

Inventors:

Philipp Schneider

and

Karl Sohler

by Knight Bros

Attorneys.

No. 863,885. PATENTED AUG. 20, 1907.

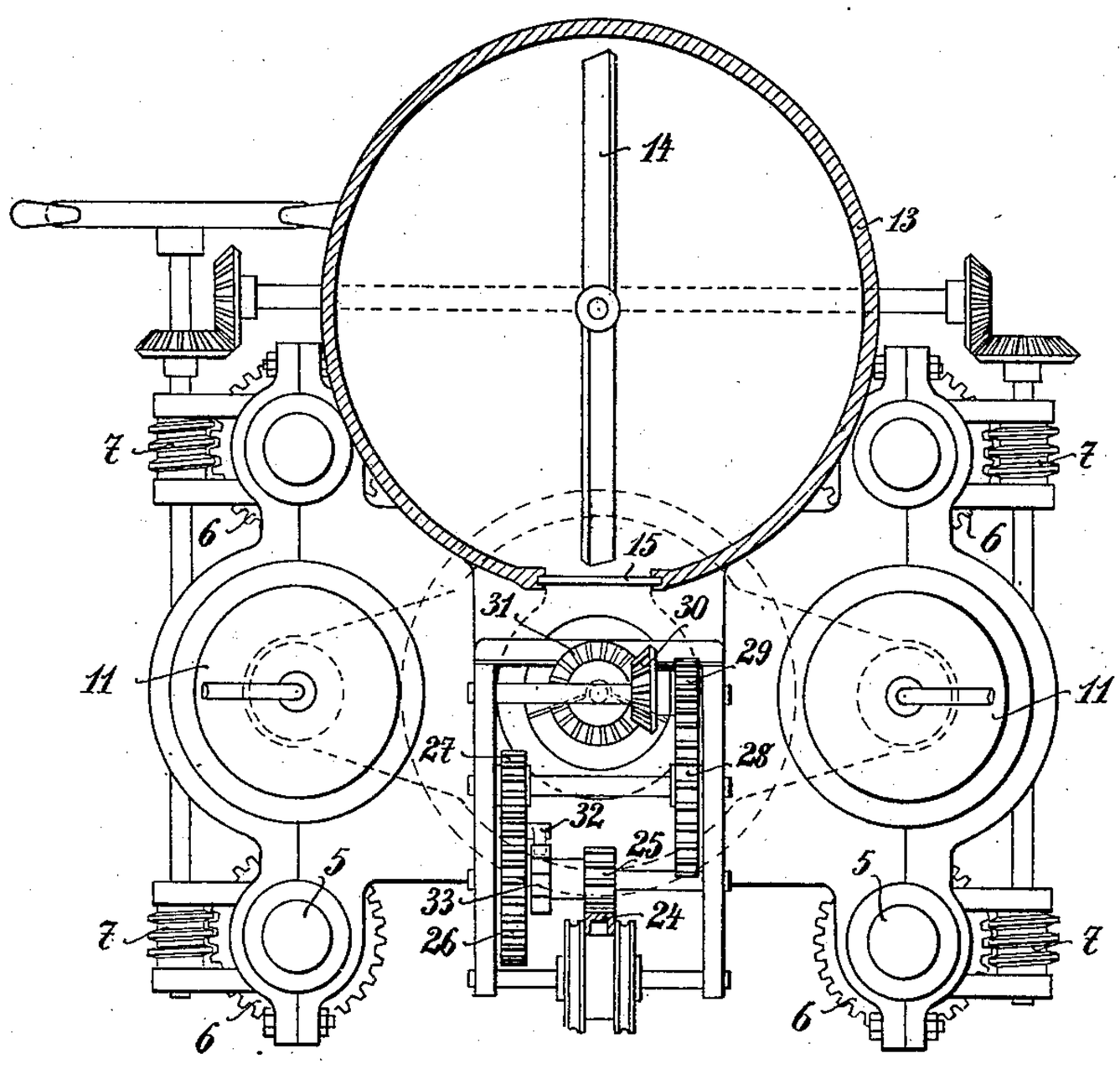
P. SCHNEIDER & K. SOHLER.

OIL PRESS.

APPLICATION FILED JAN. 9, 1907.

4 SHEETS—SHEET 3.

FIG. 3.



Witnesses:
Emil Bimelyche
Jos. F. Collins.

Inventors:
Philipp Schneider
and
Karl Sohler
By Knight Bros
Attorneys

No. 863,885. PATENTED AUG. 20, 1907.

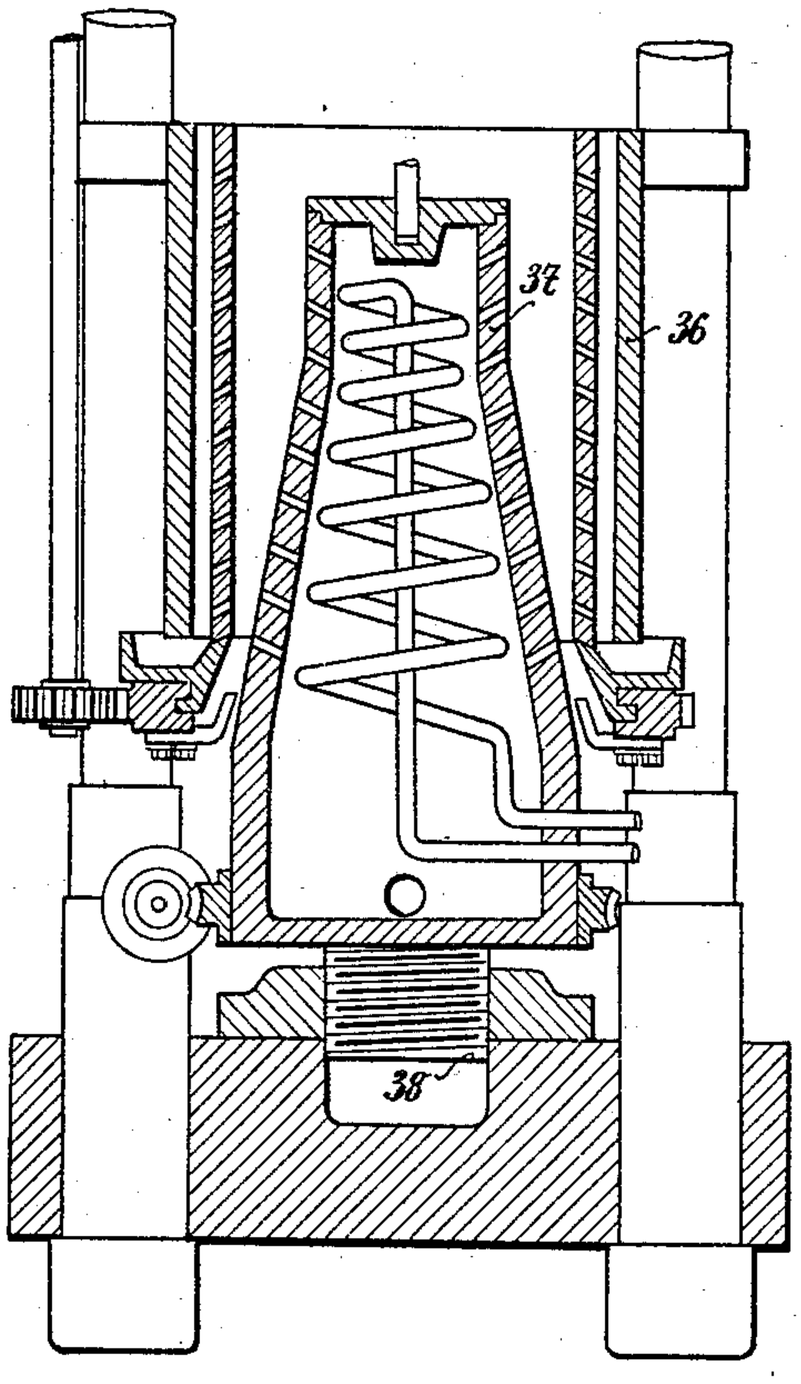
P. SCHNEIDER & K. SOHLER.

OIL PRESS.

APPLICATION FILED JAN. 9, 1907.

4 SHEETS—SHEET 4.

FIG. 4.



Witnesses:

Emil Baumbecke

Jos. H. Collins.

Inventors:

Philipp Schneider

and

Karl Sohler

By Knight Bros

Attorneys.

UNITED STATES PATENT OFFICE.

PHILIPP SCHNEIDER, OF EBERSTADT, AND KARL SOHLER, OF MAGDEBURG, GERMANY; SAID SOHLER ASSIGNOR TO FRIED. KRUPP AKTIENGESELLSCHAFT GRUSONWERK, OF MAGDEBURG-BUCKAU, GERMANY.

OIL-PRESS.

No. 863,885. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed January 9, 1907. Serial No. 351,480.

To all whom it may concern:

Be it known that we, PHILIPP SCHNEIDER, a subject of the Kingdom of Prussia, and a resident of Eberstadt, Grand Duchy of Hesse, Empire of Germany, and KARL SOHLER, a subject of the King of Wurtemberg, Empire of Germany, and a resident of Magdeburg, Kingdom of Prussia, Empire of Germany, have invented new and useful Improvements in Oil-Presses, of which the following is a specification.

This invention relates to oil presses of the general class in which the material to be pressed is charged into the annular space of a press cylinder formed by an outer and an inner strainer, and is compressed by a uniformly displaced annular piston so that each charge of material to be pressed is repeatedly exposed to the pressure, the oil pressed out being able to flow both outwards and inwards through the perforations of the strainers.

Presses of this kind (such as are for example disclosed in the specification of German Patent No. 62534) have heretofore operated in such a manner, that the inner strainer (which is cylindrical in the path of the piston, and conical below and has its lower end fitting closely against the outer strainer) has been displaced in opposition to the press piston by a yielding device (a hydraulic piston subjected to accumulator pressure) for the purpose of producing the counter pressure necessary for the pressing operation, until the predominant power of the press piston again presses the material and the inner strainer downwards and after the uncovering of an annular opening permits a portion of the material which has been freed from oil to fall out. As the counter pressure is produced by a yielding device set for a given maximum pressure, speedy adjustment to correspond to the properties of the material to be pressed is difficult. In addition to this there is the defect that when the press piston yields with the inner strainer, the material being pressed rises, thereby necessitating useless work for overcoming friction and increasing the wear of the outer strainer. Further, the hydraulic apparatus required for producing the counter pressure increases the cost of the plant.

Now in accordance with the present invention, the outer strainer and the inner strainer remain stationary during the pressing operation the annular opening remains open during the pressing and the counter pressure is produced merely by the friction of the material being pressed, on the walls of the strainers, this friction occurring in the lower conical portion of the annular space and the annular opening. In order to render it possible to adjust the counter pressure conveniently and in accordance with the properties of the material to be pressed, the area of the annular opening is adapted to be varied by making one of the two strainers adjustable *i. e.* capable of axial displacement relatively to the other.

In the accompanying drawing Figure 1 shows the improved oil press in longitudinal section, Fig. 2 in side elevation and Fig. 3 in sectional plan; in this press the outer strainer is adjustable and the inner strainer is fixed. Fig. 4 shows a longitudinal section of another embodiment in which the inner strainer is adjustable and the outer strainer is fixed.

The outer strainer 1 which is provided below with the collecting channel 2, forms part of the press cylinder 3 in the known manner. This cylinder is guided on the columns 5 by the lugs 4 and may be adjusted vertically by means of worm wheels 6 and worms 7, the said worm wheels being mounted on the columns which are provided with screw threads. Other appropriate means may however be adopted for adjusting the outer strainer. The inner strainer 9 which is cylindrical or tapered at its upper part and flares outwards at its lower part, is firmly fixed to the base plate 8. A crosshead 10 connects the pistons of the two hydraulic cylinders 11 one with the other and surrounds the annular piston 12 which fits snugly in the annular part of the strainer chamber between the two strainers. The material to be pressed is supplied from the reservoir 13 in which a scraper 14 rotates and forces the material through an opening 16, into the charging pipe 17, the said opening being capable of adjustment by means of a slide 15.

If the material to be pressed were to fall freely into the charging pipe and through this into the strainer chamber, it might descend with such force on to the distributing cone 18 arranged above the inner strainer that it would stop access to the strainer chamber. In order to obviate this, baffle plates 19 are provided in the charging pipe; these baffle plates are staggered and leave free only a portion of the cross-section of the pipe 3. A rotary shaft 20 carries scrapers 21 contiguous to the baffle plates, said scrapers operating to throw the material from one plate to another, so that it only falls through a small height into the strainer chamber. Uniform distribution of the material is obtained by the agitator blades 22.

Before the first pressing operation takes place the annular discharge opening at the lower end of the outer strainer and between the outer and the inner strainers is adjusted to as small an area as possible in order to prevent the first charge of material from passing through the discharge opening, this charge reaching the discharge opening without pressure and serving to produce the counter pressure for the next charge. The area of the annular discharge opening should not be further adjusted to correspond with the properties of the material being treated until the material has been sufficiently compressed at the discharge opening and until the heat

resulting from the pressing has attained its normal temperature. Oil-containing seed has its capacity of being compressed depending on the heating and, therefore, also on the pressure required for the pressing, which pressure depends on the adjustment of the area of the discharge opening. The area of the discharge opening must, therefore, be varied until the material in its normal condition passes out of the discharge opening substantially free of oil.

The aforesaid annular piston instead of being operated hydraulically may be driven by crank gearing or in any other appropriate manner.

As the quantity and quality of the oil obtained depends largely upon the pressing temperature, the inner strainer 9 is preferably provided with a heating device. The device for this purpose, which is represented in Fig. 1, is a tubular coil 23 through which hot water or steam flows. The heating of the inner strainer has the advantage that the material being treated is first brought to the appropriate temperature directly in that part of the press where it is no longer in contact with the air. In addition to this the inner strainer is better protected from radiation than the outer strainer (which may likewise be heated if desired) owing both to its smaller dimensions and to the material being pressed.

The quantity of material supplied by the charging apparatus must be rendered dependent upon the travel of the annular piston if the press is to operate efficiently. If the charging apparatus were driven by means of belts for example, and depended not upon the length of the stroke of the piston but say upon the duration of the stroke, it might happen, owing to poor efficiency of the hydraulic press pump, that is to say the long time period of the stroke, that the charging apparatus would supply an excessive quantity of material to the strainer. If on the other hand the belt should slip, the strainer would not receive a sufficient charge during the pressure period. To this end the cross head 10 is provided with a rod 24 whose upper end is formed as a rack which during the upward movement of the press piston rotates the scraper shaft 20 by means of the gear wheels 25, 26, 27, 28, 29, 30 and 31. During the descent of the press piston, pawl mechanism 32, 33, interposed between the wheels 25 and 26 is released so that the scraper shaft remains stationary.

In order to permit of conveniently discharging the residue from the pressing operations, it is advisable to break up the material issuing from the annular space as much as possible. To this end one or more scrapers 35 are mounted on a ring 34 rotating around the axis of the strainer. The disintegrated material which is thus removed is carried away in any appropriate manner.

In the arrangement illustrated in Fig. 4 the outer strainer 36 is fixed, while the inner strainer 37 is capable of vertical adjustment for the purpose of regulating the area of the annular space by means of a screw threaded spindle 38 arranged at its bottom and working in the base plate.

Claims:

1. The combination of the stationary outer strainer, the stationary inner strainer arranged within the outer strainer and spaced therefrom to form an annular discharge opening, said inner strainer having its upper part extending parallel to the outer strainer and provided with straining perforations and having its lower part directed towards the outer strainer and provided with straining perforations, and means for expressing the material in the space between said strainers.

2. The combination of the stationary outer strainer, the stationary inner strainer arranged within the outer strainer and spaced therefrom to form an annular discharge opening, one of said strainers having its upper part extending parallel to the other strainer and having its lower part directed towards the other strainer and provided with straining perforations, and an annular piston mounted to reciprocate in the space between the upper parts of the strainers for expressing the material in the space between said strainers.

3. The combination of the stationary outer strainer, the stationary inner strainer arranged within the outer strainer and spaced therefrom to form an annular discharge opening, one of said strainers having its lower part directed towards and extending beyond the lower part of the other strainer, and means for adjusting one of said strainers axially relatively to the other to vary the area of the discharge opening.

4. The combination of the stationary outer strainer, the stationary inner strainer arranged within the outer strainer and having a conical lower part provided with straining perforations and spaced from the outer strainer to form an annular discharge opening, and means for adjusting said outer strainer axially, relatively to the inner strainer to vary the area of the discharge opening.

5. The combination of the outer strainer, the inner strainer arranged within the outer strainer and spaced therefrom, the annular piston arranged to move into and out of the space between the strainers, and means for feeding the material through the piston to the space between the strainers.

6. The combination of the outer strainer, the inner strainer arranged within the outer strainer and spaced therefrom, the annular piston arranged to move into and out of the space between the strainers, means for feeding the material to the space between the strainers, and a connection between the piston and the feeding means whereby the feeding means operates only during the outward movement of the piston.

7. The combination of the outer strainer, the inner strainer arranged within the outer strainer and spaced therefrom, the annular piston arranged to move into and out of the space between the strainers and means for feeding the material through the piston to the space between the strainers; said means comprising a feed pipe extending into the piston and provided with staggered baffle plates, and scrapers rotating above the baffle plates for feeding the material from one baffle plate to another.

8. The combination of the stationary outer strainer, the stationary inner strainer arranged within the outer strainer and spaced therefrom to form an annular discharge opening between the lower ends of the strainers, and scraping means rotating relatively to the strainers and arranged at the discharge opening and adapted to break up the residue from the pressing operations.

9. The combination with the outer strainer, and the inner strainer arranged within the outer strainer and spaced therefrom to form a chamber in which the material is pressed, of a heating apparatus arranged within the inner strainer and constructed to prevent contact of the heating medium with the material or the oil and with the walls of the inner strainer.

10. In an oil press the combination of an outer strainer, an inner strainer arranged within said outer strainer and spaced therefrom to form a chamber for receiving the material to be pressed, an annular piston mounted to reciprocate in the chamber between the strainers for expressing the material therein, and a heat radiating apparatus arranged within the inner strainer in spaced relation to the walls of said inner strainer.

The foregoing specification signed at Mannheim this sixth day of December, 1906.

PHILIPP SCHNEIDER.
KARL SOHLER.

In presence of—
H. W. HARRIS,
JOS. H. LEUTE.