

(No Model.)

2 Sheets—Sheet 1.

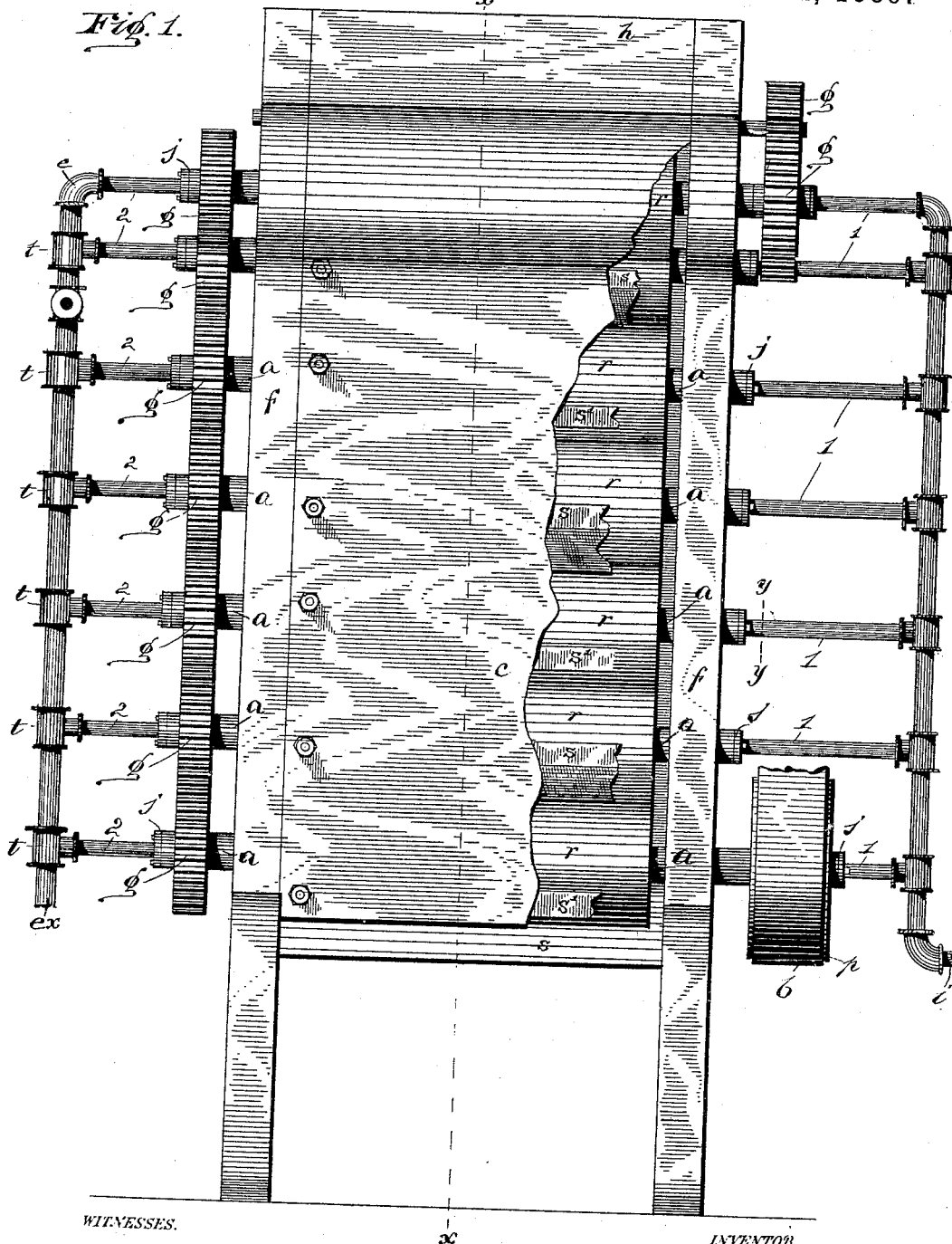
W. R. FEE.

HEATING AND CRUSHING ROLLS FOR OIL PRESSES.

No. 418,116.

Patented Dec. 24, 1889.

*Fig. 1.*



WITNESSES.

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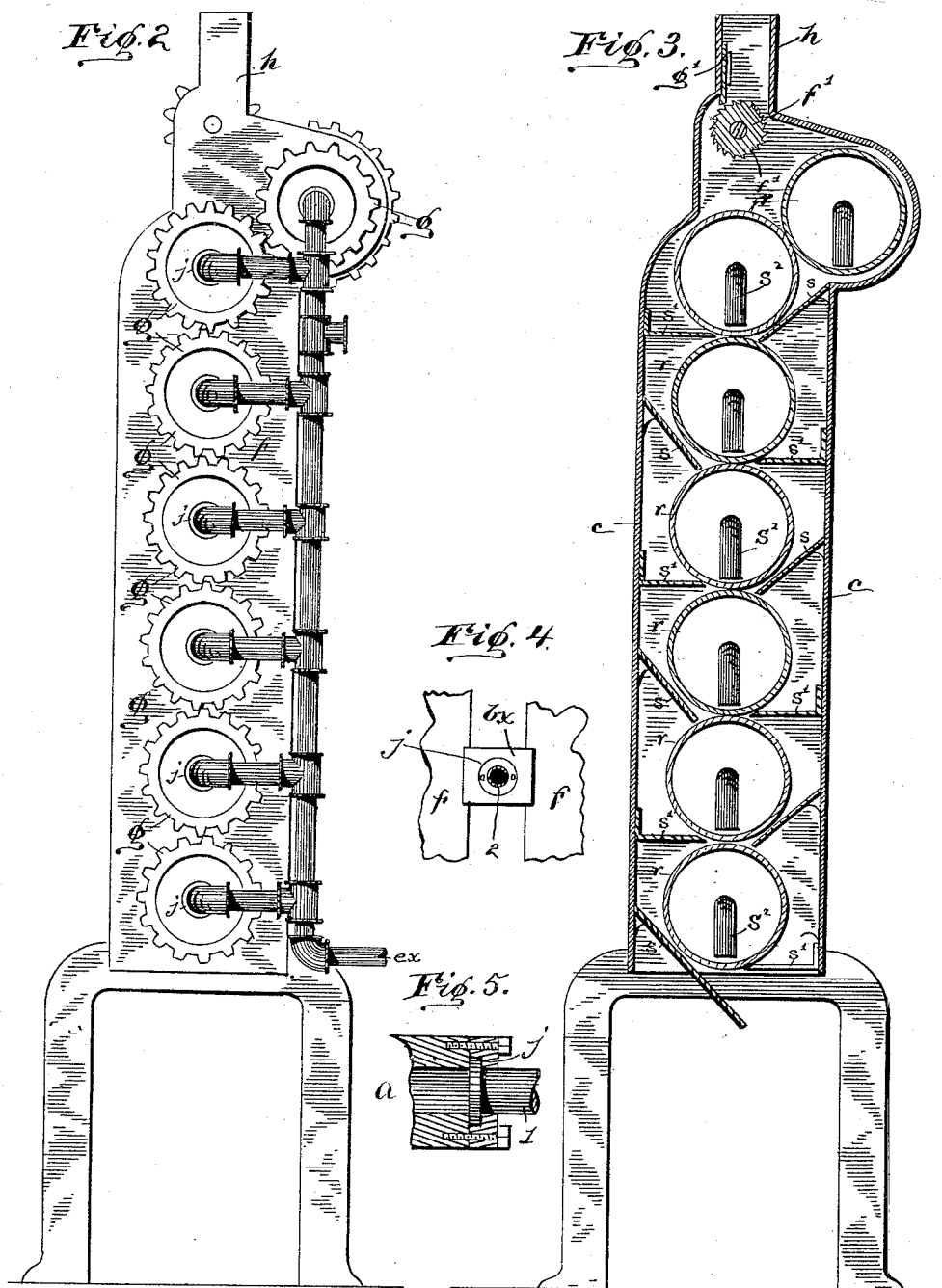
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# UNITED STATES PATENT OFFICE.

WILLIAM R. FEE, OF CINCINNATI, OHIO, ASSIGNOR TO THE EDINBURG  
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## HEATING AND CRUSHING ROLLS FOR OIL-PRESSES.

SPECIFICATION forming part of Letters Patent No. 418,116, dated December 24, 1889.

Application filed February 26, 1889. Serial No. 301,277. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. FEE, of Cincinnati, county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Heating and Crushing Rolls for Oil-Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters and figures refer to like parts.

My invention relates to the construction of machines for simultaneously heating and crushing seeds of various kinds, especially cotton-seed, as a preliminary operation to pressing them for obtaining oil, and will be understood from the following description.

In the drawings, Figure 1 is a front view of my device, a part of the casing and shelves being broken away, showing the interior arrangement of the rolls. Fig. 2 is a view of the exhaust end of the machine. Fig. 3 is a vertical section on the line *xx*, Fig. 1. Fig. 4 is an end view on the line *yy*, Fig. 1, showing how the boxing is mounted in the slot of the frame. Fig. 5 is a longitudinal sectional view of a convenient form of the joint *j*, drawn on an enlarged scale.

In detail, *f* is the frame-work, each side composed of an upright having a central vertical slot, as indicated in Fig. 4. In this slot are set the boxings *bx*, in which are journaled the axles of the cylindrical rolls *r*, preferably set one above the other, in the manner indicated in Fig. 3, the upper roll being set at an angle for convenience in dropping the seed directly between it and the roll next below. In the sides of the case are fixed the inclined shelves *s* and horizontal shelves *s'*.

*h* is the hopper, having a sliding gate *g'* in its side to regulate the amount of material that is delivered to the feed-wheel *f'*, the latter being mounted on an axle having bearings in the sides of the case, one end carrying a pinion which engages with a similar pinion on the axle of the roll below it. The gate *g'* can be moved up or down at the pleasure of the operator, cutting off or enlarging the space between the side of the hopper and the teeth of the feed-wheel. The material as thus fed through the hopper falls upon the feed-wheel, is carried down by its

revolution and thrown between the first set of rolls, and after passing these it falls upon the inclined shelf on the one side and the horizontal shelf on the other and is carried between the next pair of rolls, and so on until it is finally delivered by the lowest inclined shelf into a receptacle beneath the frame-work. These rolls, as has been said, are mounted on stub-axles *a*, which are journaled in bearings connected to the frame-work, and are hollow, and connected with these stub-axles *a* are rotary joints *j*, a convenient form of which is shown in detail in Fig. 5. To the outer ends of these joints are connected on one side pipes 1, which are connected in turn by T's with a vertical steam-inlet pipe *i*. On the opposite end of the axles, outside the case, are mounted a series of pinions *g*, which engage with each other and assist in steadying and maintaining the movement of the rolls. Outside these gears are similar rotatable joints *j*, and these are connected by pipes 2, which lead into the main exhaust-pipe *ex* through T's *t*.

*p* is a pulley mounted on one of the axles of the lower roll, and *b* is the belt for driving the mechanism.

The rolls *r* are hollow, and at each end is a bent siphon-pipe *s<sup>2</sup>*, as shown in Fig. 3, connected to the inner end of the hollow axle of the rolls, its other end extending downward, for taking up and carrying off any water that may accumulate in the rolls from condensation. Steam being admitted to the inlet-pipe *i* passes up through the connecting-pipes 1 into the interior of the hollow cylindrical rolls *r* and heats them, and its circulation through the rolls carries off any water through the siphon-pipes. The steam is exhausted at the opposite ends of the rolls through these hollow stub-axles *a* into and out of the exhaust-pipe *ex*. An additional pinion is mounted on the axle of the upper roll, which engages with a similar pinion mounted on the axle of the feed-wheel for driving the latter. When the rolls are heated to a sufficient degree, power is applied, the rolls revolve, the cotton or other seed is delivered to the hopper, passes downward through the series of rolls, and is heated, so that the oil-cells are repeatedly expanded and crushed between

the heated rolls, until, after a series of reductions and continued heatings and expansions of the meal, it is passed down below into the receptacle beneath the frame.

5 The boxings in which are journaled the axles of the rolls are set into the long slot of the frame, as shown in Fig. 4, and the rolls, resting one upon another, are thus allowed a vertical up and down movement; but on account of the length of the pipes that connect  
10 the axles with the inlet and exhaust steam-pipes this vertical movement will not be so great as to loosen any of the joints of the pipes. If it should become necessary in any  
15 case, flexible couplings may be used between the T's of the inlet and exhaust pipes or between the rotatable joints *j* and the T's of the steam and exhaust pipes; but after several trials it is found that this vertical movement  
20 of the rolls up and down in the slot of the frame is not so great as to affect the tightness of the joints when metal connections are used.

I am aware that rolls have been used for  
25 crushing seeds and other material, and I am aware that devices have been used for heating the product; but I am not aware that any machine has heretofore been constructed, known, or used wherein the operation of  
30 crushing and heating seed is performed simultaneously by hollow rolls having interior chambers to which steam and heated vapor are supplied in the manner herein described.

What I claim as my invention, and desire  
35 to secure by Letters Patent, is the following:

1. A machine for crushing oil-bearing seeds, comprising a series of hollow rolls set one above the other in an inclosing-case, and a series of shelves connected to the frame-work  
40 and located between each adjacent pair of rolls for carrying down the product, these rolls being journaled in boxes loosely set in the frame-work, the boxings being provided with rotatable joints and connections with  
45 steam inlet and exhaust pipes, substantially as shown and described.

2. A mechanism for crushing oil-bearing seeds, comprising an inclosing-case, a series of hollow rolls mounted therein one above an-

other, rotatable joints connected to the boxings  
50 of such journals, a steam-inlet pipe connected to such rotatable joint on one side and an exhaust-pipe connected to a similar joint on the other side, and inclined and horizontal shelves connected to the inside of such case for carrying  
55 downward the product successively between adjacent rolls, the interior of such rolls forming a steam-chamber and provided with siphon-pipes at one or both ends of it for carrying off the condensed steam, with means  
60 for driving the roll mechanism, substantially as shown and described.

3. A mechanism for crushing oil-bearing seeds, comprising an outer case having a hopper at its upper end, a feed-wheel below such  
65 hopper, a series of hollow cylindrical rolls journaled in the sides of such case one above another, their boxings connected with rotary joints, which are in turn connected on one side to a steam-inlet pipe and on the other to  
70 an exhaust-pipe, a series of shelves connected to the inner sides of the case for carrying the crushed meal successively between the adjacent pairs of rolls, and a series of geared pinions mounted upon the axles of the rolls for steady-  
75 ing and maintaining their motion, with means for heating and revolving the rolls, all combined substantially as shown and described.

4. In a seed-crushing machine, a series of rolls having interior heating-chambers carried on hollow axles connected therewith and  
80 mounted one above another in a frame-work, a series of shelves connected thereto and located between each pair of rolls for feeding the material thereto, and inlet and exhaust pipes  
85 for conveying and discharging the heating-body to and from such chambers through such axles and connected to the latter by rotatable joints, with means for revolving the mechanism, all combined substantially as  
90 shown and described.

In witness whereof I have hereunto set my hand this 19th day of February, 1889.

WILLIAM R. FEE.

Witnesses:

C. P. JACOBS,  
E. B. GRIFFITH.