(No Model.)

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J. KELLOGG.

HYDRAULIC PRESS.

No. 261,097. Patented July 11, 1882.

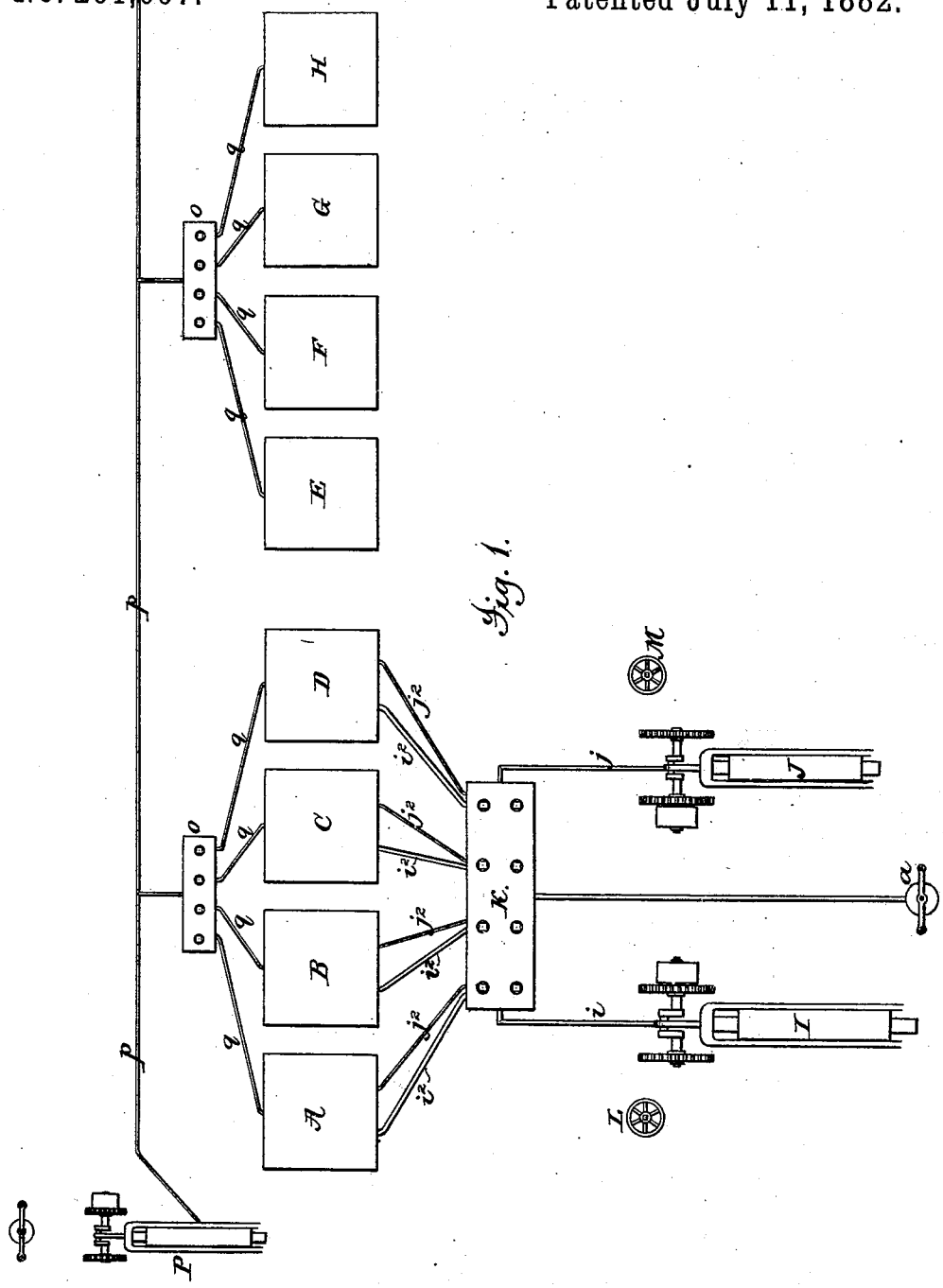

Fig. 1.

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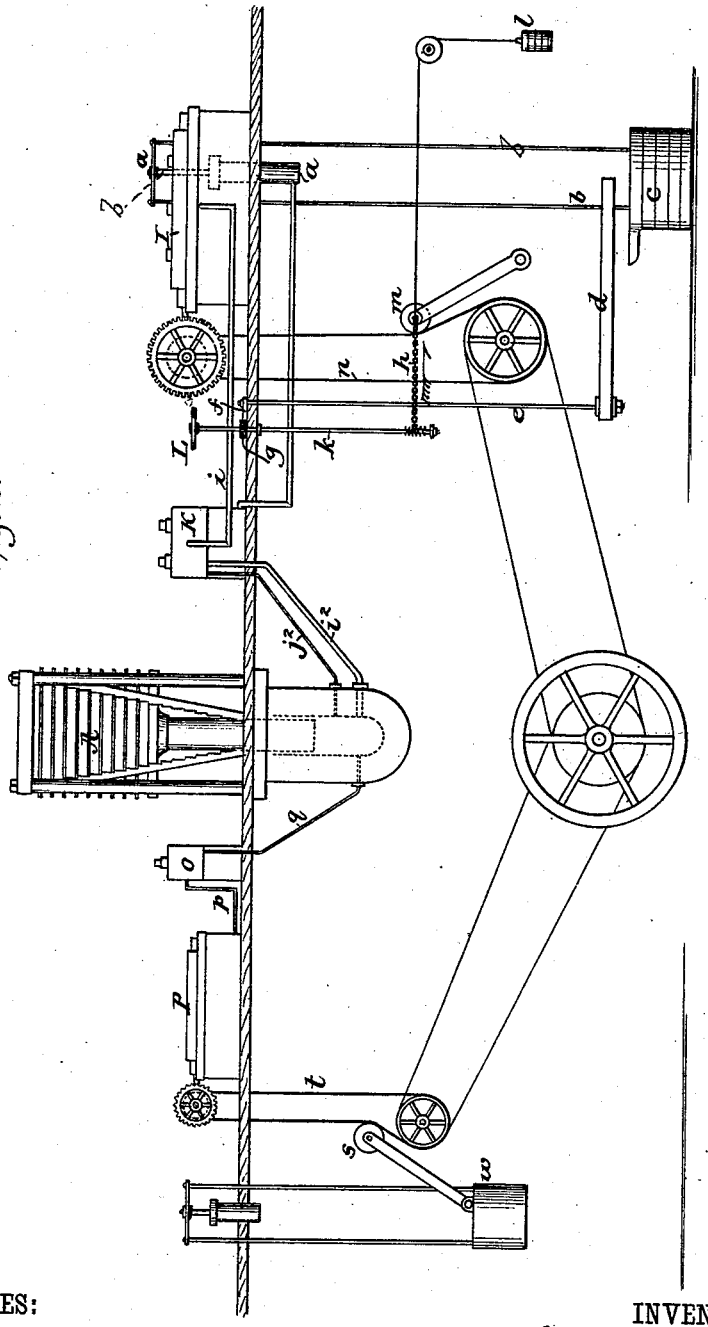
Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN KELLOGG, OF AMSTERDAM, NEW YORK.

HYDRAULIC PRESS.

SPECIFICATION forming part of Letters Patent No. 261,097, dated July 11, 1882.

Application filed March 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN KELLOGG, of Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Hydraulic Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to a new and useful improvement in the art of expressing oil from seed and in a novel contrivance or apparatus therefor, as will all be hereinafter more fully explained and specifically claimed.

Previous to my invention it has been customary in the art of manufacturing oil—such, for instance, as linseed-oil—by expressing it from the ground or crushed seed, to subject the seed, after the latter has been treated by the crushing-rolls and tempering-stones (or other devices for reducing the seed to the proper condition) to severe pressure in hydraulic presses; and in the pressing thus of the material in such presses it has been common, prior to my invention, to compress the seed to a maximum extent and then let the press stand for some time—say about twenty minutes, more or less—with the platens subjected to this maximum pressure, in order to give time for the complete exudence of the oil from the material under pressure; but I have found by experience and practice that in this method of pressing out the oil in hydraulic presses as heretofore operated the maximum pressure is not maintained during the period in which the material is left under pressure, as just above mentioned, first, because as the oil runs out of the seed there is of course less bulk of material left between the platens; and, second, because in practice, when the pump of a hydraulic press stops running and the pressure is attempted to be maintained, there will always be more or less relaxment, owing, probably, to slight leakage, &c., and this is the more observable the higher the degree of pressure attained to.

I have discovered and reduced to a tangible condition a valuable improvement, which is based on the idea of subjecting the material in the press to further pressure during the period in which heretofore it has been left merely confined between the platens, which had been left at the points to which they had been forced previous to cutting off the action of the pumps, and I have carried out this idea in practice by means simple and effective in the application thereof to the heretofore-used apparatus or machinery for expressing oil from seed.

To enable those skilled in the art to which my invention appertains to fully understand and practice the same, I will now proceed to more fully explain my said invention, as I have up to this time successfully practiced it, referring by letters to the accompanying drawings, which form part of this specification.

In the drawings I have not attempted to show the detailed construction of the presses, their pumps, and other devices which are not peculiar to my invention, but have merely illustrated such parts of the machinery used, and shown perfectly how and by what means I carry out the novel mode of pressing the seed, hereinbefore pointed out as forming the novel feature in my method of and machinery for extracting the oil from the seed.

Figure 1 is a plan view, showing two sets of presses and the usual system of pumps applied to or combined with each set, and also showing an auxiliary automatic pump which I have added and combined with all the sets of presses, and by the use of which, provided with means for keeping it always in a condition to maintain pressure, I am enabled to carry out my novel method of working the presses.

Although I have shown but two sets of presses, (comprising eight,) it will be understood, of course, that there may be any desired number of sets; and though I have shown only the two pumps usually combined with one set of four presses, it will be understood, of course, that there is to be a similar pair of pumps to each set of presses.

Fig. 2 is a sort of sectional elevation, showing more particularly the arrangement, with the presses, of the usual pair of pumps to each set and the auxiliary automatic pump which I have applied to the series of sets.

In the two figures the same parts will be found designated by the same letter of reference.

A, B, C, and D represent four hydraulic presses of the usual or most approved con-

struction, composing what I call a "set;" and E, F, G, and H represent four similar presses composing another set. There may be any number of such sets, according to the capacity of the mill or establishment.

As is usual, each set is provided with two pumps, I and J, (see Fig. 1,) one of which, I, having a comparatively large piston and being adapted to run comparatively fast, is employed to "take up the slack," as it is called—that is, to rapidly move together the platens of the press up to the points at which a severe pressure is needed and a slower movement to force out all the oil possible, while the other pump, J, has a much smaller piston, and is adapted to work slower and apply to the press the maximum pressure usually employed to finish the compressing of the seed and hold the seed under compression while all the oil obtainable runs out of the cakes.

K is what is usually called a "way-block"—that is, a channeled-out block or strong chest—with the interior ways of which each of the pumps I and J is connected, (one by the pipe *i* and the other by *j*, as shown,) and which in turn has its ways communicating by two series of pipes, i^2 i^2 i^2 i^2 and j^2 j^2 j^2 j^2, with all the presses of one set. Said way-block is provided in the well-known manner with valves or cock-plugs for opening and closing the communications between each of said presses and each of said pressure-creating pumps at pleasure.

At L and M are located the usual hand-wheels, by the use of which the operator sets into motion respectively the pumps I and J, said pumps being each automatically stopped by the action of devices connected therewith and with the "safety-valves" thereof.

The means for the starting thus of the pumps by the operative and for their automatic stoppage need not be elaborately explained herein, as it forms no part of my invention.

It will be best understood by reference to Fig. 2, wherein *a* represents the safety-valve, the piston-rod *b* of which is provided with a dog, *c*, that strikes against the lifter-bar *d* of the pawl-shaft *e* at the proper time, and, lifting the pawl *f* out of engagement with the ratchet-wheel *g*, allows the chain *h* (which had been previously wound up on the lower end of the shaft *k*) to be unwound by the gravity of a weight, *l*. As the chain is thus drawn along (in the direction indicated by the arrow at Fig. 2) a tightener, *m*, which had been drawn up against the driving-belt *n* of the pump, is removed from the belt, which then ceases to drive the pump.

The apparatus or machinery so far described is well known, and its operation as heretofore used need not be particularly explained.

Those skilled in the art will understand that, as usual, in the use of this part of the apparatus the seed, having been properly prepared and placed in the textile envelopes or cloths, is placed between the several platens of the presses of a set in rotation—that is, first in A, then in B, and so on; that as soon as press A has been charged or supplied with seed the operator turns hand-wheel L and applies pump I to the press, the proper cocks or valves in the way-block K being open; that as soon as the platens shall have moved to the proper extent under the action of pump I said pump will be automatically thrown out of gear, and that the other pump, J, is then applied to the press, moving the platens with a slower speed but greater pressure up to the usual maximum pressure—say about three thousand pounds to the inch—and that when the maximum degree of pressure to and final position of the platens shall have been reached this pump J is also automatically thrown out of gear, and that in the usual manner these pumps I and J are in like manner successively applied to each press of the set. Instead, however, of allowing each press in succession to stand the usual time, (for the purpose of drawing out under compression all the oil,) as has heretofore been the practice, I apply to each press a hydraulic pressure derived from a source independent of both pumps (I and J) and always in readiness for instant application to any one or more of all the presses in all the sets in the following manner and by the means I will now refer to.

P is a pump capable of getting up and maintaining a pressure equal to the greatest degree to be used on the presses, said pump being connected, by a pipe, *p*, and suitable branches from the latter, with all the presses of the sets through the media of one way-block O to each set of presses and pipes *q q q q*, connecting said way-block with the presses, as shown. (See Fig. 1.)

The blocks O are of course each provided with suitable valves or cocks, by means of which the operative can at pleasure open and close the communication between any particular press and the pipe *p* of pump P. This auxiliary pump P, unlike the pumps I and J, is never in a dormant condition—that is to say, though its piston is not always moving, it is always exerting the maximum force, so as to maintain at all times a given pressure in the pipe *p*, which pipe may, so to speak, be tapped at any and all times for the purpose of applying such maximum pressure (for a longer or shorter period, as may be required) to any one or more of all the presses in the mill.

The means which I have so far employed for rendering the pump P continuous in its effect and automatic as to the movements of its piston will be seen at the left-hand side of Fig. 2, and may be thus described: Projecting from the weighted piston of the safety-valve of this pump P is an idler, *s*, which whenever said piston descends to a certain point, comes against the driving-belt *t* and causes the latter to run the pump, and whenever the safety-valve piston shall have been forced up far enough to let the belt *t* run too slack to trans-

mit the necessary power and motion to the gears of the pump the latter will stop running and remain at rest until by the redescent (or sinking down again) of the safety-valve piston the said idler *s* again starts the pump.

It will of course be understood that the weight *w* of this safety-valve (unlike that of the safety-valves of the other commonly-used pumps) never comes to a resting-place, and that therefore the fluid in the pipe *p* and pump P is always under pressure.

In working the presses according to my new method and with the means shown for supplying an auxiliary and ever-ready source of maximum pressure, the operator, as each press of a set has the platens run up to the maximum point by the pump J, opens the communication (by a valve in the way-block O) between that press and the pipe *p*, thus permitting said press to receive a pressure-supply through its branch pipe *q*, (see Fig. 2,) and such pressure is kept on at the will of the operator; and so any number of presses which may have been operated to the standing-point are supplied with a maximum and steadily-supplied pressure from this source.

I have found that by this method, and with a degree of pressure in pipe *p* about equal to that created by the pump J, the platens will be caused to further move together to a considerable extent after the cutting off of the pressure from J and during the time which, according to previous practice, the platens merely remained stationary while the oil was draining out or exuding from the seed.

The advantage of this novel method of working the presses is, it will be seen, that a much larger quantity of oil is derived (with the same maximum pressure applied) than it was possible to obtain under the old process or mode of treatment; and it will be understood that so far as this novel mode or method of pressing the seed may be concerned it is not material whether the particular contrivance I have devised for the purpose explained be employed or some other means for creating and keeping ready for use in any one or more of thepresses the ever-ready auxiliary hydraulic pressure referred to—the gist of my invention with reference to the improvement in the art of pressing out the oil resting in the idea of having combined with the presses a constant source of supply of fluid-pressure equal to the requirements stated, which pressure-supply can be communicated at the pleasure of the operative with any one or more presses of one or more sets, as circumstances may require.

What I therefore claim as new, and desire to secure by Letters Patent, is—

1. As an improvement in the art of pressing oil from seed, subjecting the material under treatment in the press to an active pressure, of the proper (maximum) degree during the time in which it has heretofore been left standing in the press subject to the degeneration of a previously-created pressure, all substantially as set forth.

2. As a novel means for applying an active maximum pressure to one or more of a series of presses after the movements of the platens to the full extent effected by the usual pumps, the combination, with one or more of such presses and the pump or pumps usually connected therewith, of an auxiliary pump which is constantly operative to keep up a given degree of pressure in the press or presses with which it may be put in connection, all substantially as set forth.

In witness whereof I have hereunto set my hand this 1st day of March, 1882.

JOHN KELLOGG.

In presence of—

W. L. VAN DENBERGH,

MARTIN L. STOVER.