

Aug. 28, 1934.

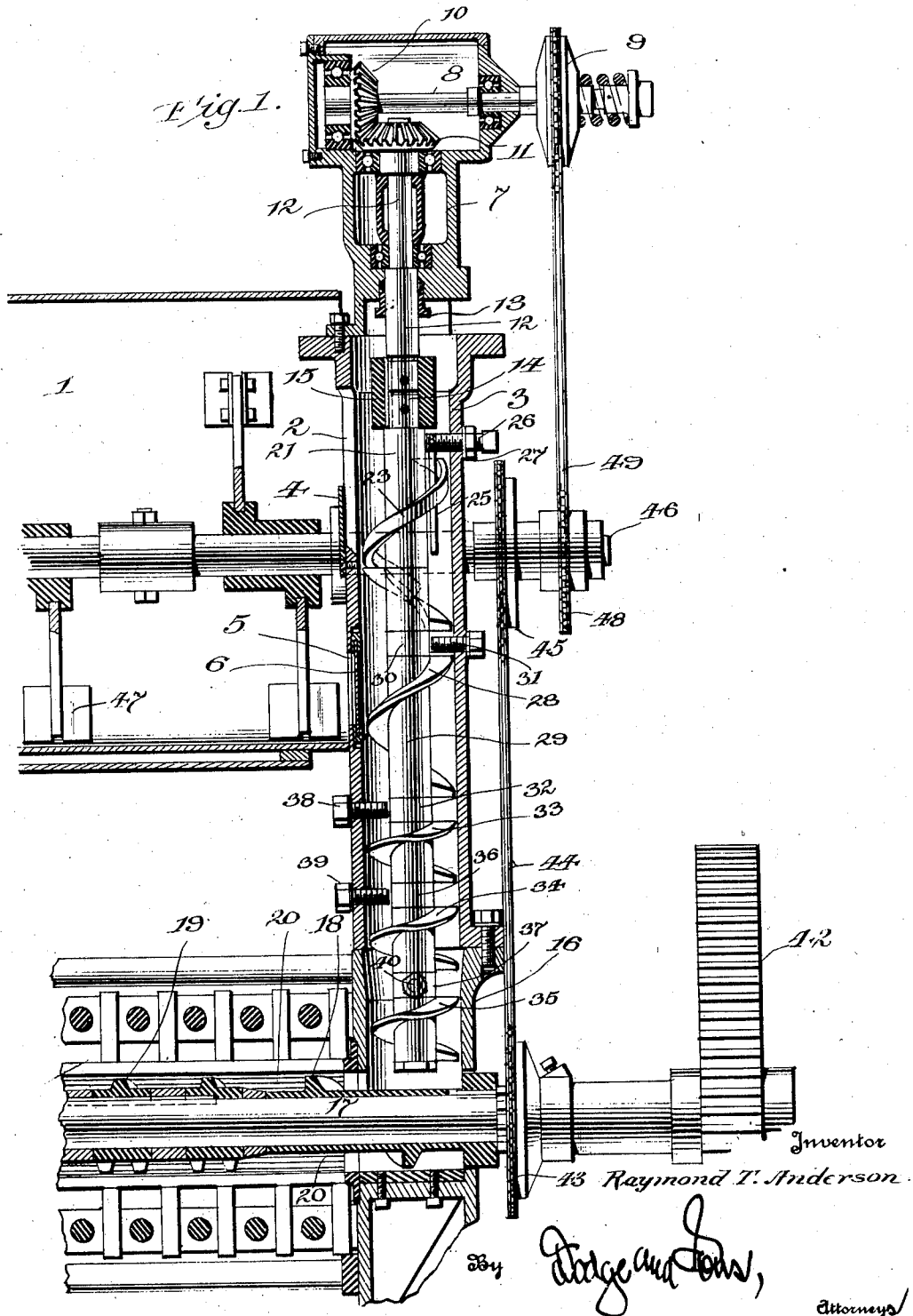
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FEEDING MECHANISM FOR PRESSES

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2 Sheets-Sheet 1



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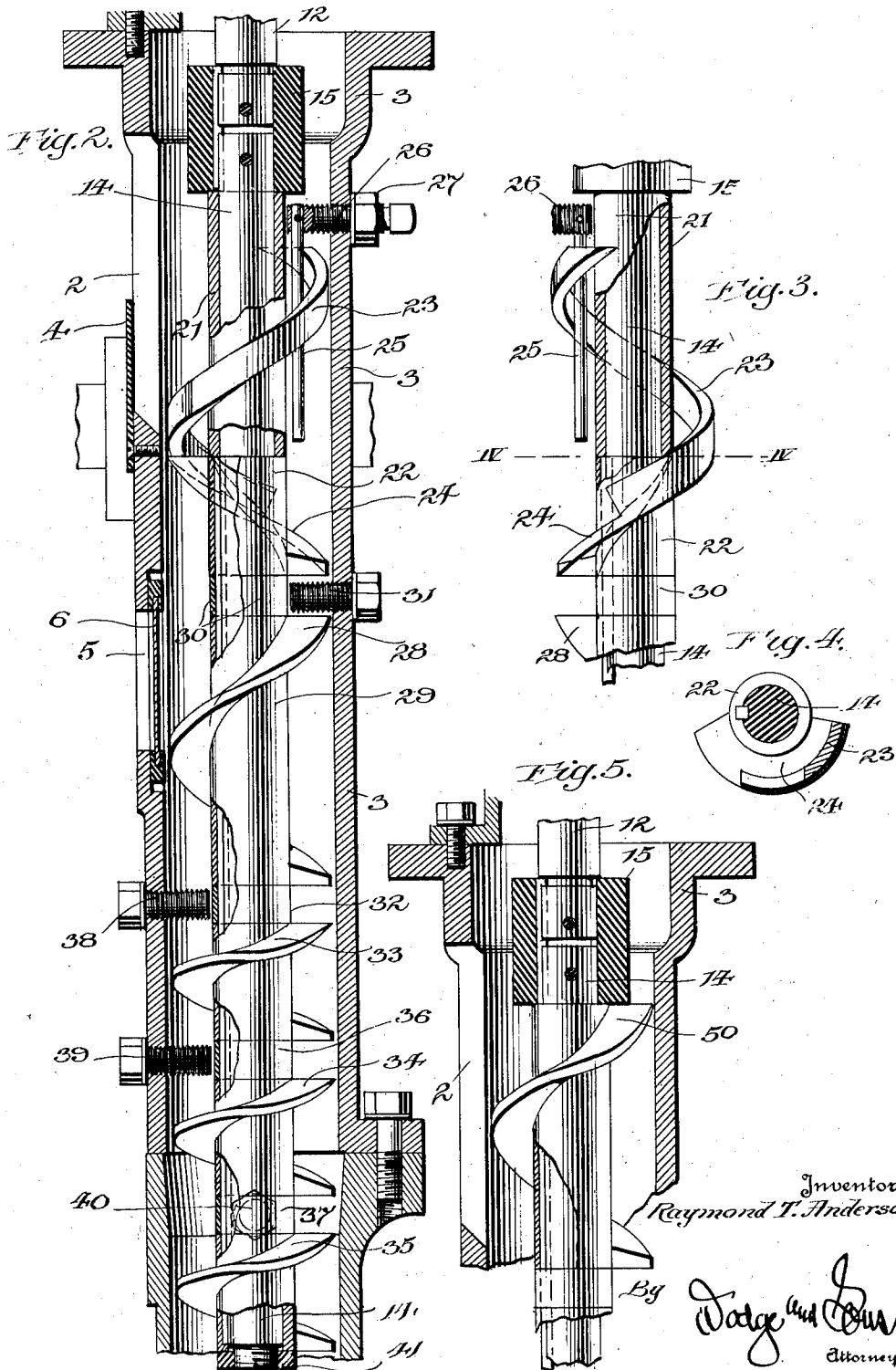
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UNITED STATES PATENT OFFICE

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FEEDING MECHANISM FOR PRESSES

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10 Claims. (Cl. 100—48)

This invention pertains to presses and relates more particularly to the means employed for feeding materials of different kinds to the pressing mechanism proper.

6 The main object of the invention is to provide means at the upper portion of the vertically disposed feeding mechanism which will act to force the material downwardly which, at such time, is in a relatively non-compacted condition, combined with means in the lower portion and adjacent the intake of the pressing mechanism which acts to exert an increasing degree of pressure upon the material until it is finally discharged into the press proper.

15 A further object of the invention is to provide means for preventing rotation of the material with the feeding devices and thus insure a downward movement and a partial compression of the material as it is moved toward and into the press intake. The provision of such means is particularly advantageous where the material undergoing treatment is a ground, slightly moist and heated material, such materials having a tendency to stick to the rotating feeding elements and to the wall of the associated hopper or chute thereby cutting down the proper feed of the material in the hopper and the intake of further material.

The invention is illustrated in the annexed drawings wherein,

30 Figure 1 is a vertical sectional view of the feed hopper, a tempering apparatus which discharges into the upper end thereof and a portion of a press into which the material is fed.

35 Figure 2 an enlarged vertical sectional view of the hopper and the feeding devices,

Figure 3 a vertical sectional elevation illustrating the upper spiral feeding element and illustrating more particularly the manner in which it is secured to its supporting sleeve,

40 Figure 4 a transverse horizontal sectional view taken on the line IV—IV of Figure 3, and

Figure 5 a vertical sectional view of the upper part of the hopper and a modified form of feeding element therein.

45 Referring first to Figures 1 to 4, 1 denotes generally a tempering apparatus which may be of any form but preferably follows the structure disclosed in Letters Patent to F. B. Anderson numbered 1,132,421.

50 The material undergoing treatment normally passes through an opening 2 formed in the adjacent wall of the vertically disposed tubular chute 3. A dam 4 controls the out-flow of material from the tempering apparatus and, as will be ap-

preciated, the higher the upper edge of the dam the greater the length of period the material will undergo the tempering action at a given rate of feed.

A second opening 5, normally closed by a gate 6, affords means for fully discharging the tempering apparatus when necessary.

Secured upon the upper end of the chute 3 is a housing or casting 7 into the upper end of which extends a horizontally disposed shaft 8 upon the outwardly extending end whereof is a driving member 9, designed to slip or to break its shear pin when too great a load is placed upon shaft 8 by the feeding elements shortly to be described.

Shaft 8 carries a bevel gear 10 which meshes with a similar gear 11, which latter is secured to the upper end of a vertically disposed stub shaft 12, the lower end whereof extends into the upper portion of the chute 3. A stuffing gland 13 is mounted in the lower end of casting 7 and prevents leakage of oil from the housing or casting around the shaft 12.

A second shaft 14 extends downwardly through the chute, the upper end of the shaft, as well as the lower end of shaft 12, being splined to a connecting sleeve 15, the ends of the shafts being likewise pinned to the sleeve as shown in Figure 2.

The lower end of chute 3 is in alignment with and secured to the hopper 16 of the press which may be of any approved form but preferably of that type wherein a shaft 17 carries a feed worm 18 and a plurality of separated worms 19. The latter and the inner end of worm 18 are surrounded by a series of separated bars 20 which form the shell of the press. Such construction is well known and is set forth in Patent Number 829,315 to V. D. Anderson.

Mounted upon the upper end of shaft 14 below the coupling sleeve 15 is a spacing sleeve 21 and below said sleeve is a second sleeve 22. Said latter sleeve is keyed to the shaft so that it is forced to rotate therewith and forms the support for an open spiral 23 which has a relatively quick pitch as compared to some of the feeding elements hereinafter to be referred to. This open spiral is welded to a flange 24 extending outwardly from the sleeve 22, the flange taking the same curvature as the spiral.

Associated with the upper portion of the spiral and located intermediate it and the sleeve 21 is a finger or rod 25 which stands in spaced relation to said elements and acts to stir up the material which is fed inwardly through the opening 2. As above noted, where the material is of a sticky

nature it will tend to adhere to the wall of the chute 3 as well as to the sleeve 21 and spiral 23. The finger standing between the spiral and the sleeve tends to break up such adhesion between said elements and spiral, the outer face of which works close to the inner face of the chute and clears the chute of any adherent material. The rod 25 extends through a screw 26 which passes inwardly through the wall of the chute 3 and is pinned to the screw. The screw, and consequently the rod, may be adjusted by turning the screw in or out and will be held in place by a lock nut as 27. It will of course be understood that the rod 25 must be disconnected from the screw 26 prior to inward or outward adjustment of the latter and after which the rod is replaced and the connecting pin inserted to maintain the rod in position.

The lower portion of the flange 24 extends downwardly below the spiral, as best shown in Figure 3, and stands in practical alignment with the upper end of a worm 28 welded to or formed upon a sleeve 29. A short collar, as 30, is placed between the sleeve 22 and the sleeve 29. The lower end of the member 24 and the upper end of the spiral 28 are spaced apart and a machine screw 31 extends inwardly between the space thus formed. Said screw tends to prevent rotation of the material within the chute and thus permits the spirals 23 and 28 to force the material downward.

Surrounding the shaft 14 below the sleeve 29 is a second short spacer sleeve 32 and below said sleeve there is mounted a spiral 33 the pitch whereof is materially less than that of the spirals heretofore referred to. Other spirals 34 and 35 spaced apart at their adjacent ends, and the former spaced from the spiral 33, are secured to the shaft with intermediate spacing collars as 36 and 37. Machine screws 38, 39 and 40 are located in the spaces formed between the spirals 33, 34 and 35, respectively.

The lower end of the shaft 14 is provided with a left hand thread and a nut 41 is mounted thereon and acts to hold the various collars and associated elements in proper position upon the shaft 14.

Motion is imparted to the shaft 17 through any suitable source of power as for instance a driven gear 42. A sprocket wheel 43 secured to the outward portion of the shaft 17 transmits motion through a chain 44 to a sprocket wheel 45 mounted upon a shaft 46. This shaft imparts motion to the paddles 47 mounted within the tempering apparatus 1. There is also secured to the shaft 46 a second sprocket wheel 48 about which, and the frictional driving element 9, there passes a chain 49.

In Figure 5 a slight modification is shown wherein instead of employing the upper open spiral, as 23, a closed quick pitch spiral 50 is substituted. This latter is stronger than the former and with certain materials may be advantageously employed. The remainder of the structure is otherwise the same as heretofore described. This arrangement is especially applicable when pressing bones or hard chunky materials as such materials tend to destroy the spiral and the stationary finger or rod. Due to the weight and size of the pieces there is no choking up at this point in the chute because the pieces will naturally gravitate.

Pressure exerted by the spirals and worms may, of course, be regulated by adjustment of the friction drive 9. So too the member 9 will pre-

vent breakage of the feeding mechanism in case extraneous matter, such as a piece of iron, should accidentally be introduced in the chute.

What is claimed is:

1. In combination with a press, a chute communicating with and discharging directly into the intake end of the press; means for introducing material into the chute at or adjacent its upper end; and means located within and coacting with the chute at the intake of the press for forcing material downwardly through the chute and directly into the press and simultaneously placing it under compression.
2. In combination with a press, a feed chute associated therewith and having a feed opening in its side wall; means for conditioning the material to be treated and feeding it through said opening; means mounted within the chute for forcing the material to be treated by the press downwardly through the chute; and means for preventing rotative movement of the material being fed, said means being associated with the feeding means.
3. In combination with a press; a chute for delivering material to be treated thereto; a rotatable shaft in the chute; force feeding means for the material at the upper end of the shaft; said means comprising an open spiral; and a vertically extending fixed rod standing within and lying adjacent to the spiral.
4. In combination with a press, a chute for delivering material to be treated thereto; a rotatable shaft in the chute; force feeding means for the material at the upper end of the shaft, said means comprising an open spiral; a member adjustably mounted in the side of the chute at a point above the upper end of the spiral; and a rod extending downwardly from said member and standing within and lying adjacent to the spiral.
5. In combination with a press; a chute discharging into the press; means for heating the material to be treated and delivering it through an opening formed in the upper portion of the chute; a rotatable shaft in the chute; a plurality of feed worms carried by and rotatable with the shaft, the adjacent ends of the worms being separated and the edges of the worms extending outwardly into close proximity with the wall of the chute; and means secured to the shell and extending inwardly between the spaced ends of the worms for arresting rotative movement of the material being fed by the worms.
6. In combination with a press; a chute for discharging the material into the press; a shaft mounted within and extending longitudinally of the chute; means for driving the shaft; an open spiral element extending about the upper portion of the shaft and in spaced relation thereto; a sleeve secured to the shaft; and a spiral flange secured to said sleeve and the lower end of the spiral for supporting the latter.
7. In combination with a press; a chute for discharging material thereto; a rotatable shaft in the chute; an open quick pitch spiral associated with the upper end of the shaft and rotatable therewith; a closed spiral of quick pitch located below the open spiral; and a plurality of worms mounted upon and supported by the lower portion of the shaft, said worms being of relatively low pitch.
8. In combination with a press, a chute discharging into the press; means for delivering the material to be treated into the upper portion of the chute; a rotatable shaft in the chute; a plurality of feed worms carried by and rotatable with

the shaft, the adjacent ends of the worms being separated and the edges of the worms extending outwardly into close proximity with the wall of the chute; and means secured to the shell and
5 extending inwardly between the spaced ends of the worms for arresting rotative movement of the material being fed by the worms.

9. In combination with a press, a chute discharging into the press; means for heating the
10 material to be pressed; means for delivering the material from the heating means to the upper portion of the chute; a shaft rotatably mounted within the chute; a plurality of separated worms secured to and rotatable with the shaft, the
15 worms extending outwardly into close proximity with the inner face of the shaft; and means carried by the chute and extending inwardly be-

tween the adjacent worms, said means acting to arrest rotative movement of the material being fed and compressed by the worms.

10. In combination with a continuously operating mechanical press, a chute communicating
80 with and discharging directly into the intake of the press; a rotatable shaft extending longitudinally of the chute; a series of separated worms or flights mounted upon and rotating with said shaft and co-acting directly with the chute at
85 least adjacent the intake end of the press, said worms compressing the material undergoing treatment and forcing the material thus compressed and while in a compressed condition, di-
90 rectly into the press from the chute.

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