

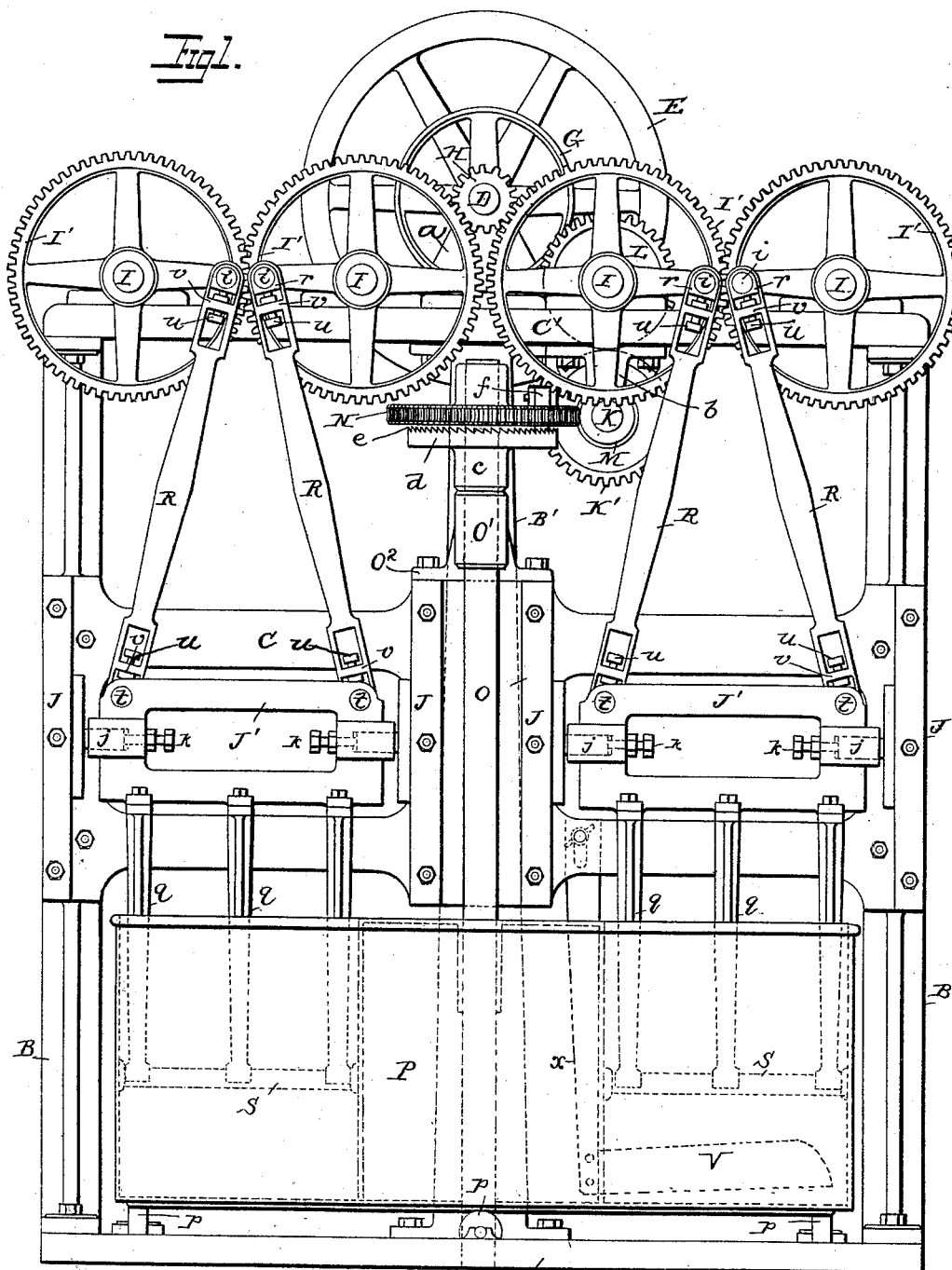
(No Model.)

2 Sheets—Sheet 1.

J. BERTELS.
MIXING AND KNEADING MACHINE.

No. 423,020.

Patented Mar. 11, 1890.



Witnesses
J. Hinkel Jr.
A. E. F. Fannmann.

A.
Inventor
Joseph Bertels
By his Attorneys
Foster & Freeman

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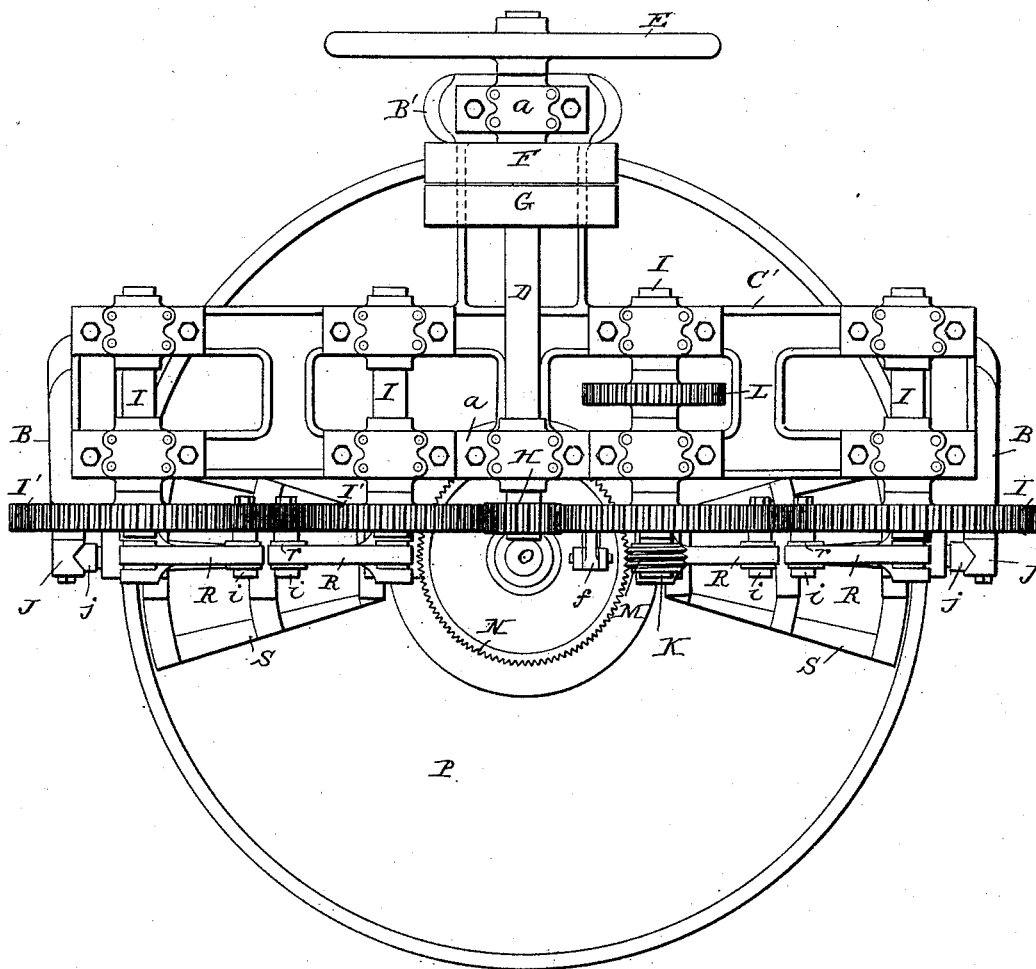
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Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH BERTELS, OF WORCESTER, MASSACHUSETTS.

MIXING AND KNEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 423,020, dated March 11, 1890.

Application filed August 28, 1889. Serial No. 322,215. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BERTELS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Mixing and Kneading Machines, of which the following is a specification.

My invention relates to that class of mixing or kneading machines in which vertically-reciprocating plungers are employed in connection with a rotating receptacle containing the material to be operated upon; and my invention consists in the construction herein-after set forth, whereby such machines are simplified and their capacity and efficiency greatly increased.

In the drawings, Figure 1 is a side elevation of a mixing or kneading machine embodying my invention, and Fig. 2 is a plan view thereof.

The main frame of the machine, which is preferably constructed of iron, is substantially rectangular in form and is composed of a base A, three standards B B B', rising therefrom, and cross-pieces C C', these parts being firmly bolted together to make a stout, rigid support for the operating mechanism. The cross-piece C connects the standards B B a suitable distance above the base A, while the cross-piece C' is of an approximately T shape and rests at its ends upon all the standards, the standard B' being located in rear of the others, as shown in Fig. 2.

In bearings provided at the upper end of brackets *a a*, secured centrally upon the cross-piece C', is journaled a driving-shaft D, on which are mounted, near its outer end, a balance-wheel E, a band-pulley F, and an idler G, as usual, a gear-wheel H being keyed on the opposite end of the shaft. Slightly below and on each side of the driving-shaft, in bearings on the upper cross-piece, are two parallel shafts I I, each carrying at its inner end a large gear-wheel I', the latter moving in unison, as they are of a uniform size and mesh with each other and with the gear H on the driving-shaft, as shown.

A counter-shaft K, supported in hangers *bb*, secured to the under side of the cross-piece C', carries a gear K', meshing with a

gear L, keyed on the shaft I immediately above; and also on the counter-shaft, at one side of the gear thereon, is a worm M, engaging a worm-wheel N, loosely mounted on a vertical shaft O, supported in a bearing O', carried by a bracket O², secured to the cross-piece C of the frame, a collar *c*, fixed to the shaft, preventing downward movement of the latter.

At the upper end of the collar *c* is an annular disk *d*, on the upper face of which are teeth *e*, adapted to be engaged by a pawl *f*, carried by and depending through an opening in the worm-wheel N, these parts thus constituting a clutch device by which the worm-wheel may be locked to the vertical shaft and communicate movement thereto. The arrangement of the clutch is such that the vertical shaft and its connected parts may be rotated freely by hand in one direction, the pawl riding over the teeth on the disk *d*; but when revolved in the opposite direction the parts of the clutch are locked together and can only be disengaged for independent movement by lifting the pawl and holding it above the teeth.

A circular or other suitable receptacle P of sufficient depth to receive the material to be treated, and preferably mounted on friction-rollers *p*, supported in recesses in the base of the machine, is provided with a central boss, into which the lower end of the vertical shaft extends, a key or other device locking the shaft and receptacle together.

Guided by vertical ways formed by plates J, bolted to the face of the cross-piece C of the frame, are slides J', the bearing-pieces *j* of which are adjustable to and from the guideways by screws *k*, and each slide is connected at *t t* by pitmen R R to wrist-pins *i* on the gear-wheels I' I'.

Immediately below the slides J' J', and connected thereto by bolts or hangers *g*, are plungers S S of any desired form, the plungers being preferably constructed of wood and projecting into the receptacle P beneath.

To vary the adjustment of the plungers, the ends of the pitmen are forked or slotted to receive rectangular bearing-blocks *r r*, in which work the studs *i i* and *t t* upon the gear-wheels and slides, as described, screws *u u*

passing through cross-pieces *v* in the forked ends of the pitmen and connected to the bearing-blocks, serving as a means of adjustment.

To facilitate the thorough mixing of the material in the revolving receptacle and to keep it from becoming packed therein, I employ a stirrer consisting of a blade *V*, preferably inclined and supported at the lower end of a pendent arm *z*, secured to the rear side of the cross-piece *C* of the frame, the arm being adjustably held to the cross-piece by a set-screw or otherwise.

In the operation of the machine power is imparted to the driving-shaft by a belt passing round the band-pulley thereon and to a suitable motor, as will be apparent, and as the shaft revolves the gear-wheel *H* on the end thereof communicates motion to the gear-wheels *I' I'*, thereby reciprocating the plungers within the receptacle below. As the counter-shaft *K* revolves through the medium of the gearing previously described, the worm on the counter-shaft meshes with the worm-wheel of the clutch device carried by the vertical shaft, rotating the latter and its connected receptacle and bringing every part of the mass of material therein under the action of the reciprocating plungers.

By adjusting the movable bearings of the pitmen the position of the plungers may be easily varied, according to the requirements of the amount or character of material operated on, and as the material is loosened and fresh portions thereof exposed to the plungers by the scraper *V*, as the receptacle revolves, a very rapid and thorough kneading and mixing of the material is accomplished.

Although I have shown and described two vertical plungers, it will be obvious that one only may in some instances be used with good effect.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. In a mixing and kneading machine, the combination, with a frame, of a receptacle, a slide on the frame carrying a plunger within the receptacle, two wheels mounted upon the frame, so as to rotate in unison and in opposite directions, and two pitmen, each connected with one of the wheels and to the

slide, whereby the upper ends of said pitmen are caused to approach and recede from each other simultaneously, substantially as described.

2. In a mixing and kneading machine, the combination, with the frame, of a receptacle, two pairs of intermeshing wheels of a uniform size upon the frame, a driving gear-wheel intermediate with and intermeshing with one of each of said pairs of wheels, and two slides, each carrying a plunger and each connected by two pitmen to one of said pairs of wheels, substantially as described.

3. In a mixing and kneading machine, the combination of the frame, the revolving receptacle mounted on rollers, the vertical shaft, the clutch thereon having a worm-wheel, a counter-shaft provided with a worm engaging the worm-wheel, reciprocating plungers, power-shaft, gearing engaging with the power and counter shafts, and adjustable connections between the gearing and plungers, substantially as described.

4. In a mixing and kneading machine, the combination, with the frame, of a power-shaft, wheels *I'*, moving in opposite directions and driven by said shaft, vertical plungers, each connected by two pitmen to two of the wheels *I'*, vertical shaft having a clutch thereon, receptacle carried by the latter shaft, and connections between the clutch and gearing, all substantially as described.

5. In a mixing and kneading machine, the combination, with a frame and a receptacle, of slides having plungers secured thereto, wheels on the frame, and pitmen connecting the wheels with the slides and having their ends forked or slotted and provided with a cross-piece in the forked portion, a movable bearing-block in the end of each pitman, and an adjusting-screw in each cross-piece engaging with the bearing-block, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

Witnesses:
 JOSE ERTELS.
 MIRICK F.
 BERNETT.