

No. 615,573.

Patented Dec. 6, 1898.

A. PIEPER.

APPARATUS FOR MANUFACTURING OBJECTS FROM COMPRESSIBLE MATERIAL, SUCH  
AS ASPHALT, &c.

(No Model.)

(Application filed May 4, 1898.)

3 Sheets—Sheet 1.

Fig. 1.

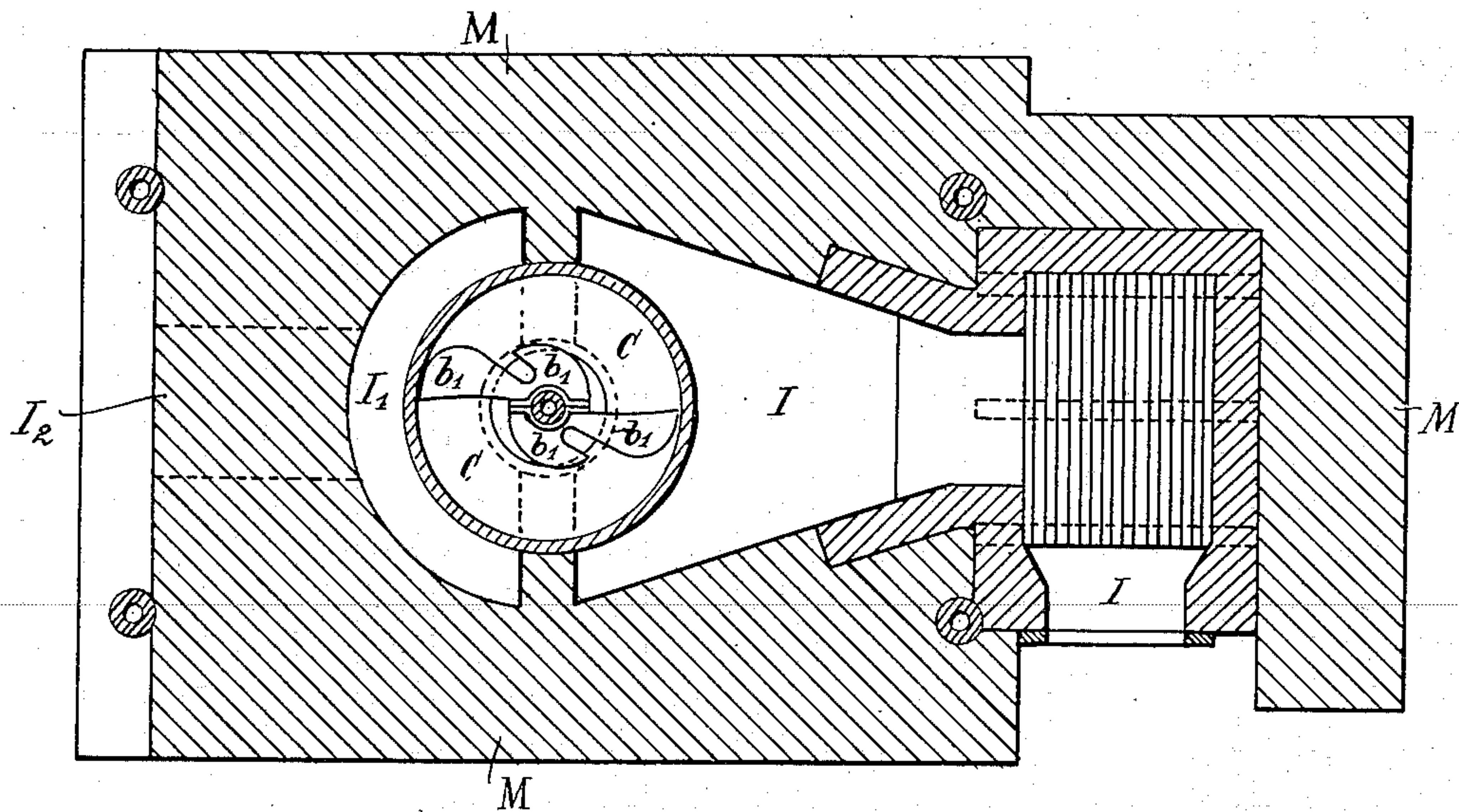
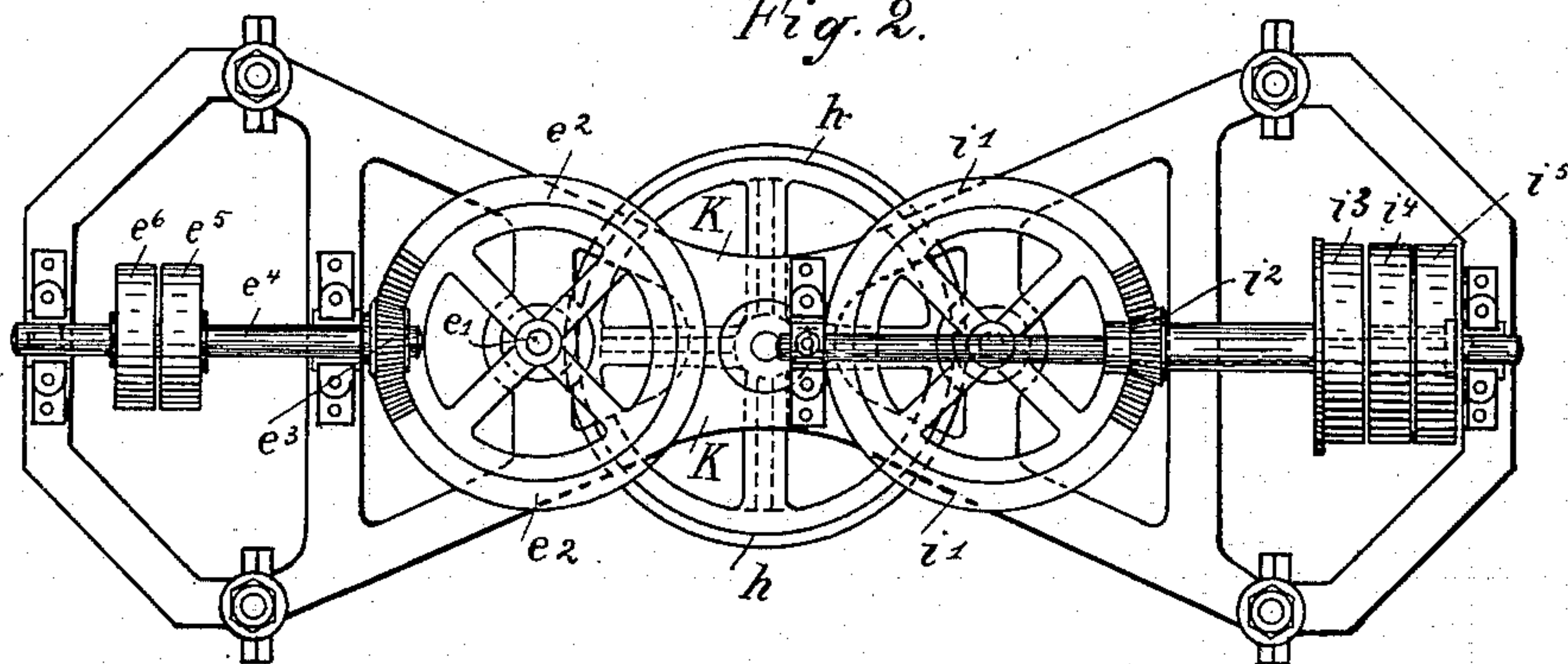


Fig. 2.



Witnesses:  
William Miller  
William Schuch

Inventor:  
Anton Pieper  
by his attorney  
Roeder & Briesend

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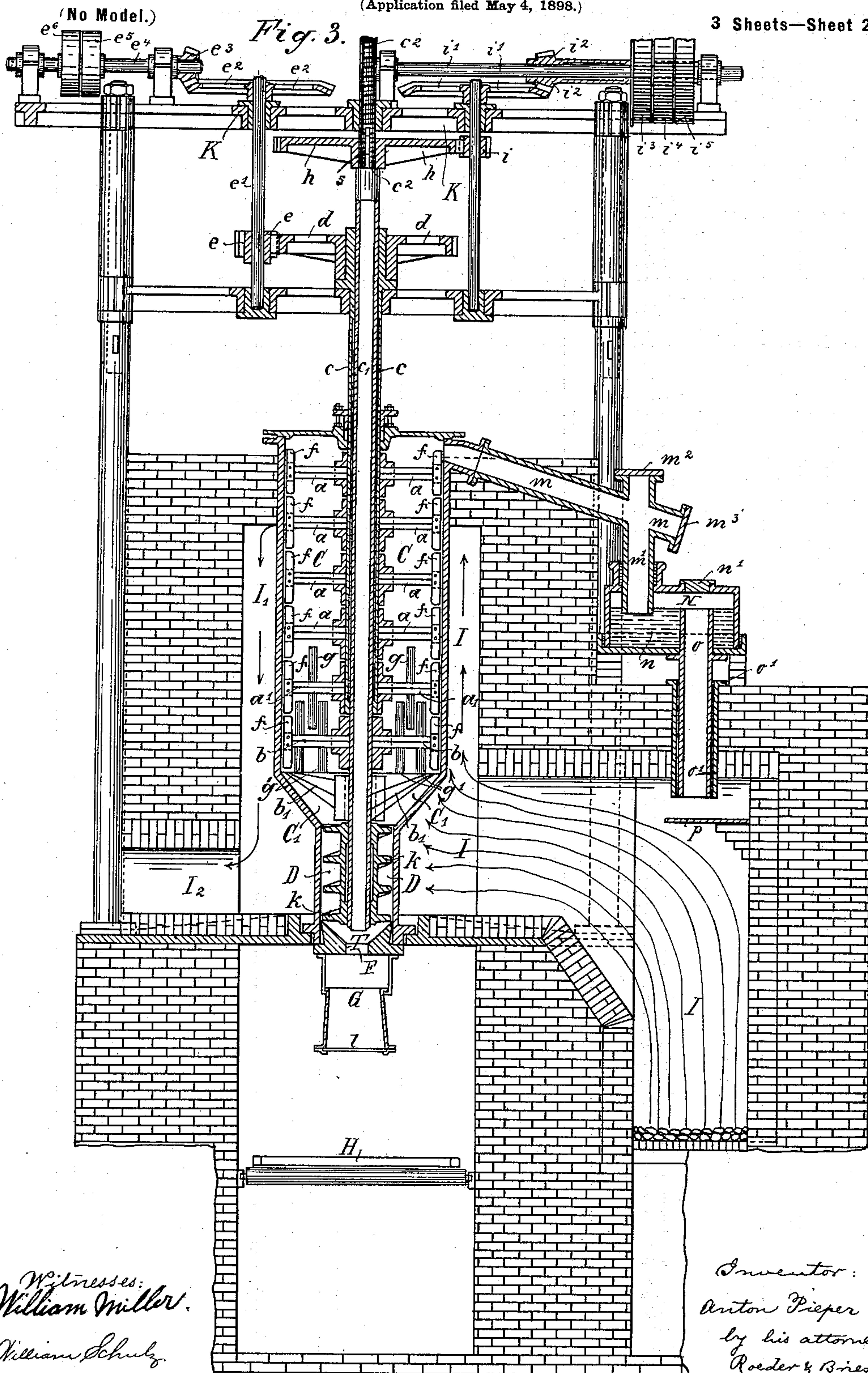
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Witnesses:  
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William Schulz.

Inventor:  
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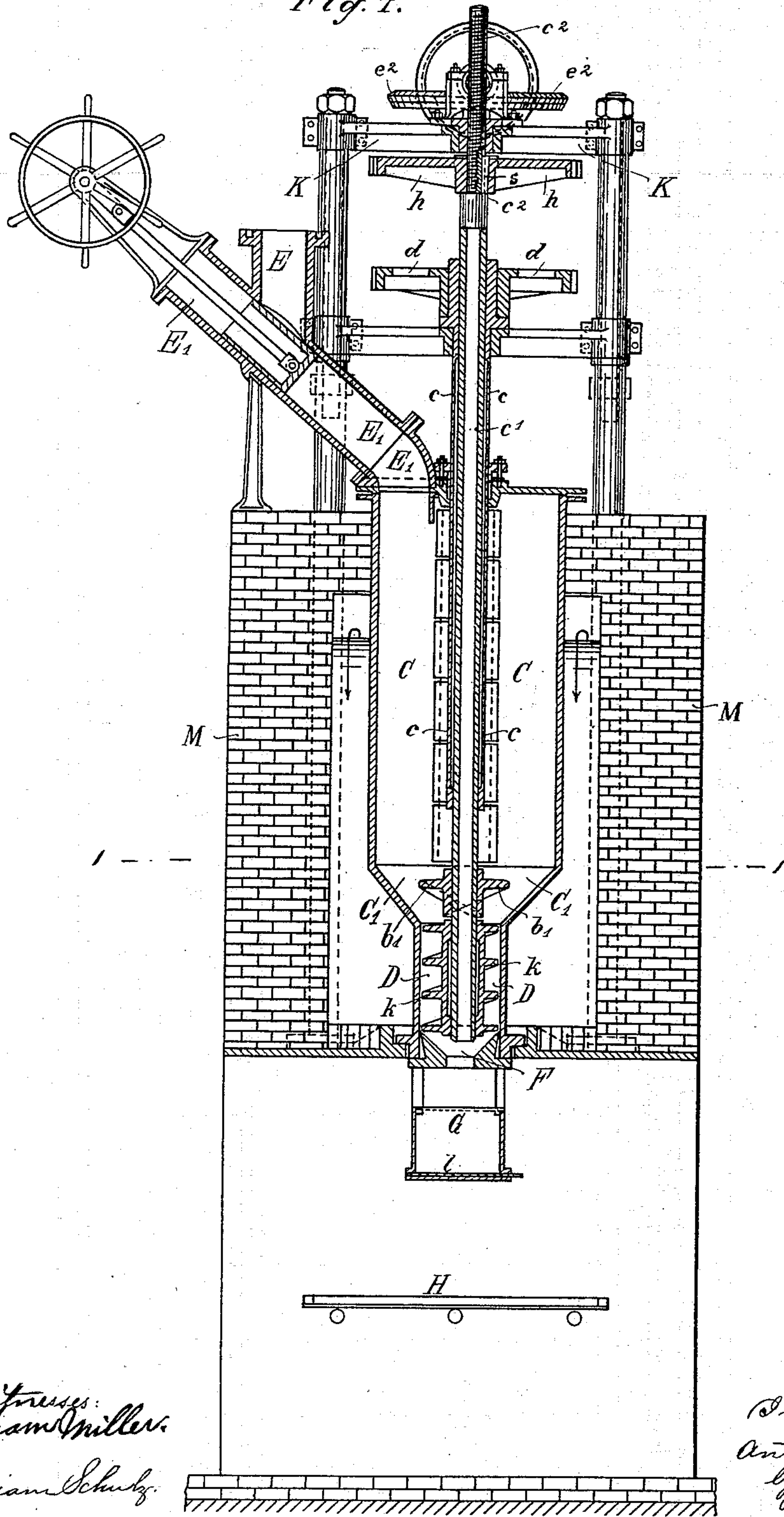
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3 Sheets—Sheet 3.

Fig. 4.



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# UNITED STATES PATENT OFFICE.

ANTON PIEPER, OF DÜLKEN, GERMANY.

APPARATUS FOR MANUFACTURING OBJECTS FROM COMPRESSIBLE MATERIAL, SUCH AS ASPHALT, &c.

SPECIFICATION forming part of Letters Patent No. 615,573, dated December 6, 1898.

Application filed May 4, 1898. Serial No. 679,741. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON PIEPER, a subject of the King of Prussia, Emperor of Germany, residing at Dülken, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Apparatus for the Manufacture of Objects from Compressible Material, Such as Asphalt and the Like, of which the following is a specification.

This invention relates to an apparatus by which materials previously heated in a closed retort to a liquid state are pressed into molds containing a core, which they penetrate and surround, thereby forming a solid whole.

My apparatus effects a more perfect kneading of the mass to be treated and permits the mixing-worm to be readily withdrawn and replaced for cleaning purposes.

In the accompanying drawings, Figure 1 is a horizontal section on line 1 1, Fig. 4; Fig. 2, a plan; Fig. 3, a vertical central section of the apparatus, and Fig. 4 a similar section taken at right angles to Fig. 3.

The letter C represents a retort of long and narrow shape set within masonry M and provided with upper wings *a* and *a'*, working independently of the lower ones, *b* and *b'*. The former are intended for the mixing of the material introduced into the apparatus, while the latter effect a thorough kneading of the mass already mixed and melted. Mixing-wings *a* and *a'* are attached to shaft *c* and rotated by means of a gearing consisting of spur-wheels *d* and *e*, shaft *e'*, bevel-wheels *e<sup>2</sup>* and *e<sup>3</sup>*, shaft *e<sup>4</sup>*, and pulleys *e<sup>5</sup>* *e<sup>6</sup>*, Fig. 3. The whole of the wings which revolve within the cylindrical part of retort C have their outer ends fitted with scrapers *f*, which are in close contact with the walls of the retort and clear the latter of the material setting thereon. These scrapers also assist the wing-arms in mixing the material while it is still in a flour-like condition. The farther the material sinks down toward the part of retort C which is heated to a temperature of about 200° centigrade by furnace I, having exit I<sup>2</sup>, the more heated it becomes, until it finally melts. The lower part of the retort is on this account fitted with another kind of wings—the so-called “kneading-wings.”

Both the lower pair of wings *a'*, attached to shaft *c*, and the two wings *b*, fixed onto

shaft *c'*, are provided with short vertical rods *g* and *g'*, which are so arranged that when the wings are rotated rods *g* pass between rods *g'* without coming in contact with them.

The inner shaft *c'* is rotated forward and backward by means of a gearing consisting of spur-wheels *h* and *i*, bevel-wheels *i'* and *i<sup>2</sup>*, and pulleys *i<sup>3</sup>*, *i<sup>4</sup>*, and *i<sup>5</sup>*, Fig. 3. The conically-shaped lower part C', Figs. 3 and 4, of retort C contains helically-shaped wings *b'*, attached to shaft *c'* and coming in close contact with the conical walls of the lower part C' of the retort, which they keep clean. The narrow cylindrical part D at the bottom of retort C contains a worm *k*, fixed to shaft *c'*.

When the flour-like material, together with a binder, such as tar or the like, is introduced into the charging-pipe E E' of the retort, it is first mixed by the upper wings *a* and descends gradually, while the already-treated material leaves the lower part of the retort, and being subjected to the heat of the gases in contact with the latter enters into a state of fusion. It is then kneaded by wings *a'* and *b* and fed down by the helically-shaped wings *b'* to worm *k*, which delivers the treated material through the outlet F into the collecting-box G, from which it is removed to undergo further treatment. The bottom of the collecting-box is closed by a slide *l*, which can be pulled out sufficiently to fully open said bottom and allow the treated mass to drop onto work-table H.

The treated material is divided into parts having a determined weight and introduced into the molds, wherein it is subjected to a pressure of three hundred kilograms per square centimeter (forty-two hundred and sixty pounds per square inch) by means of a hydraulic press or any other kind of press. The objects are removed from the molds and cooled in water, after which they are ready.

The worm *k*, Figs. 3 and 4, which is exposed to frequent stoppages on account of the viscous material sticking fast between the helical surfaces and the walls of its cylindrical casing, is so constructed that it can easily be pulled down out of the casing without having to be taken off from the shaft. To effect this, the inner shaft *c'*, to which the worm *k* is attached, has its upper end *c<sup>2</sup>* extended and provided with a screw-thread.



The hub of spur-wheel *h*, Figs. 3 and 4, is fitted internally with a female thread of equal pitch and form and a key *s*, which prevents it from revolving on *c*<sup>2</sup>. Consequently when wheel *h* revolves shaft *c*<sup>1</sup> also revolves.

If now worm *k* has to be withdrawn for the purpose of cleaning it, the bottom plate *T* is taken down and the coupling-key removed from wheel *h*. The latter, which, as already stated, is provided with a screw-thread, acts now as a nut and moves upward, owing to the reversal of motion, until it comes in contact with beam *K*, when it drives shaft *c*<sup>1</sup> by means of the screw-thread *c*<sup>2</sup>, provided on the end thereof, thus causing the worm *k* to move downward far enough past the bottom of its casing to allow of its being easily cleaned. When the cleaning is done, the shaft and worm are returned in a similar manner to their former position by means of wheel *h* and screw *c*<sup>2</sup>. For the purpose of leading away and at the same time utilizing the gases which are formed while the material is being heated in retort *C* a water-cistern *N* is provided. The pipe *m m'*, which leads away the gases, opens under the water-level of the cistern, so that a seal *n* is formed, which prevents a return of the ignited gases into the retort. That part of the evolved gases which condenses in the form of an oily liquid is led through a waste-pipe *o* onto the red-hot plate *p*, provided in furnace *I*, and being thereby ignited is utilized to heat the retort. The gases which do not condense are likewise led into the furnace by pipe *o* and consumed. The air required for the combustion of these gases is admitted through the annular space formed between pipe *o* and pipe *o'*, which surrounds it. For the purpose of cleaning pipes

*m m'* and *o*, Fig. 3, bolted covers *m*<sup>2</sup> *m*<sup>3</sup> and *n'* are provided, which can be removed when necessary.

What I claim is—

1. The combination of a retort with a pair of shafts, upper mixing-blades having scrapers secured to one of the shafts, and lower kneading-blades and a worm secured to the other shaft, substantially as specified.

2. The combination of a retort with a series of revoluble blades, a shaft having a threaded end, a worm secured to the shaft, a threaded gear-wheel engaging the threaded end of the shaft, means for driving said gear-wheel, and means for removably keying the gear-wheel to the shaft, substantially as specified.

3. The combination of a furnace with a retort, a series of revoluble blades within the retort, a cistern, a gas-pipe for connecting the retort with the cistern, and means for conveying the condensed gases through the cistern and into the furnace, substantially as specified.

4. The combination of a furnace with a retort, a series of revoluble blades within the retort, a cistern, a pipe for connecting the retort with the cistern, a condensed-gas-outlet pipe passing through the cistern into the furnace, a surrounding air-pipe, and a drip-plate within the furnace underneath the gas-outlet pipe, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ANTON PIEPER.

Witnesses:

H. F. EMIL HESS,  
WM. PLATT PHELPS.