

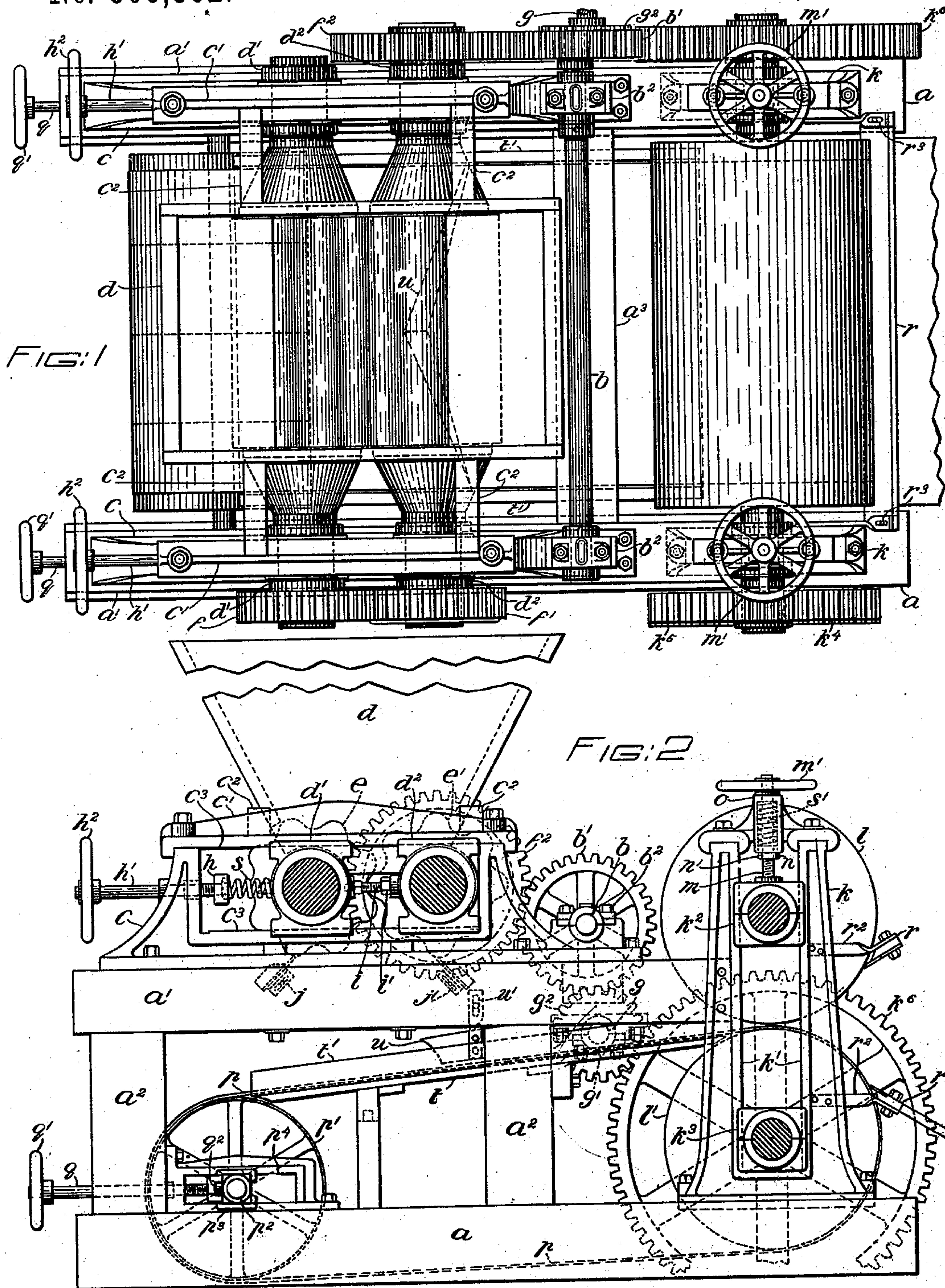
(No Model.)

N. DOWLING.

APPARATUS FOR PULPING AND COMPRESSING GARBAGE, &c.

No. 506,362.

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WITNESSES:  
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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR PULPING AND COMPRESSING GARBAGE, &c.

SPECIFICATION forming part of Letters Patent No. 506,362, dated October 10, 1893.

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*To all whom it may concern:*

Be it known that I, NORTH DOWLING, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Pulping and Compressing Garbage or Refuse Matter, of which the following is a specification.

10 My invention relates to apparatus for treating garbage or refuse matter; and it relates more particularly to that type of such apparatus which is employed for compressing and pulping garbage preparatory to its incineration.

15 The principal objects of my invention are, first, to provide a simple, reliable, durable and comparatively inexpensive apparatus for compressing and pulping garbage; second, to provide the working parts of such an apparatus with adjustments, whereby the same may be adapted for the successful treatment of different kinds of garbage or of garbage in different states or conditions; and, third, to provide compact and reliable devices for transferring the partially treated garbage from one portion of the machine and for properly presenting the same for treatment by other portions thereof.

30 My invention consists of an apparatus for pulping and compressing garbage, comprising a hopper for receiving and feeding the garbage, a pair of positively driven spring controlled squeeze rolls having intermeshing fluted or corrugated surfaces, a pair of positively driven spring controlled calender rolls, a conveyer for receiving the material discharged from the fluted rolls and for conducting the same between the calender rolls, and an adjustable evener for distributing the material upon the conveyer prior to its delivery between the calender rolls.

45 My invention further consists of the improvements in machines for pulping and compressing garbage hereinafter described and claimed.

50 The nature, characteristic features and scope of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a top or plan view of an apparatus for pulping and compressing garbage embodying features of my invention; and Fig. 2 is a side elevational view partly in section of the same.

In the drawings, the base-pieces *a*, top pieces *a'*, uprights *a<sup>2</sup>*, and tie-piece *a<sup>3</sup>*, constitute the main frame of the machine.

*b*, is a counter-shaft provided with a gear-wheel *b'*, and revolubly supported in bearings or boxes *b<sup>2</sup>*, formed integral with brackets *c*, bolted or otherwise secured to place upon the top-pieces *a'*.

*c'*, are bridges bolted or otherwise secured to place on top of the brackets *c*, and provided with cross-bars *c<sup>2</sup>*, that carry the feed hopper *d*. The brackets *c*, and bridges *c'*, are provided respectively with webs or feathers *c<sup>3</sup>*, that constitute ways or guides upon which journal blocks *d'* and *d<sup>2</sup>*, are afforded a range of movement.

*e* and *e'*, are squeeze rolls revolubly supported by the journal blocks *d'* and *d<sup>2</sup>*, and provided with intermeshing fluted or corrugated surfaces. These squeeze rolls are geared together by means of intermeshing spur-wheels *f* and *f'*, Fig. 1, and the squeeze roll *e'*, is also provided with a gear-wheel *f<sup>2</sup>*, meshing with the gear *b'*, on the counter-shaft *b*.

*g*, is a main driving-shaft revolubly supported in hangers *g'*, bolted or otherwise secured to the under sides of the top-pieces *a'*, and provided with tight and loose pulleys, not shown, and with a pinion *g<sup>2</sup>*, meshing with the gear-wheel *b'*, so that the revolution of the main driving-shaft *g*, acting through the instrumentality of the pinion *g<sup>2</sup>*, and the gear-wheels *b'* and *f<sup>2</sup>*, causes the squeeze-roll *e'*, to be driven with a positive motion, and this motion of the squeeze-roll *e'*, is imparted to the squeeze-roll *e<sup>2</sup>*, by means of spur-wheels *f'* and *f*. In use it is important that the squeeze-rolls *e* and *e'*, should be afforded a slight range of motion in order to permit of the passage of unusually large or hard objects between them. This result is accomplished by means of spiral-springs *s*, fitted at one of their respective extremities onto projections on the boxes *d'*, and at the other of their extremities into caps *h*, revolubly connected with one of the respective extremities



of the set-screws  $h'$ . These set-screws work in nuts formed integral with or secured to the brackets  $c$ , and are provided with hand-wheels  $h^2$ , by means of which the force exerted by the springs  $s$ , upon the boxes  $d'$ , may be increased or diminished. The material that passes between the squeeze-rolls  $e$  and  $e'$ , usually contains some solid matter and consequently it is necessary to provide means for maintaining a small space between the peripheries of the same. This result is accomplished by means of set-screws  $i$ , interposed between the boxes  $d'$  and  $d^2$ , and provided with jam-nuts  $i'$ , so that the space between the squeeze-rolls  $e$  and  $e'$ , may be increased or diminished by means of the set-screws  $i$ , in order to accommodate the same for the successful treatment of garbage or other matter containing different quantities of solid matter; it being understood that the jam-nuts  $i'$ , afford means for preventing the set-screws  $i$ , from slipping after the squeeze-rolls have been adjusted.

$j$  and  $j'$ , are scrapers or doctor plates adapted to remove any material that may adhere to the squeeze rolls  $e$  and  $e'$ , and connected with the top pieces  $a'$ , by means of set-screws working in suitable slots in the end plates thereof, so that the doctor plates or scrapers  $j$  and  $j'$ , may be readily adjusted in respect to the surfaces of the squeeze-rolls  $e$  and  $e'$ .

$k$ , are standards rigidly secured to the base-pieces  $a$ , and to the top-pieces  $a'$ , and provided with ways  $k'$ , in which journal-blocks  $k^2$  and  $k^3$ , are afforded a range of play.

$l$  and  $l'$ , are calender-rolls journaled in the blocks  $k^2$  and  $k^3$ , and geared together by means of spur-wheels  $k^4$  and  $k^5$ , Fig. 1. One of these calender-rolls  $l'$ , is driven by a gear-wheel  $k^6$ , meshing with the pinion  $g^2$ , of the driving-shaft  $g$ , so that the revolution of the driving-shaft  $g$ , acting through the instrumentality of the pinion  $g^2$ , and gear-wheel  $k^6$ , imparts motion to the calender-roll  $l'$ , and the motion of the latter is imparted through the instrumentality of the gear-wheels  $k^4$  and  $k^5$ , to the calender roll  $l$ .

$m$ , are set-screws provided with hand-wheels  $m'$ , and having their respective extremities resting upon the journal-blocks  $k^2$ . These set-screws  $m$ , engage nuts  $n$ , provided with feathers  $n'$ , working in suitable grooves cut or otherwise formed in the lower portions of yokes  $o$ , secured to the standards  $k$ .

$s'$ , are spiral-springs interposed between the nuts  $n$ , and the upper portions of the yokes  $o$ , and adapted to permit of the shifting of the bearing blocks  $k^2$ , of the calender roll  $l$ , in order to permit of the passage of the material between the calender rolls. The tension of the springs  $s'$ , may be increased or diminished by turning the hand-wheels  $m'$ , in one direction or the other, whereby the nuts  $n$ , are shifted on the set-screws  $m'$ ; it being understood that feathers  $n'$ , prevent rotation of the nuts  $n$ .

$p$ , is an endless belt or conveyer traveling

around the calender roll  $l'$ , and around a series of pulleys  $p'$ , mounted upon a shaft  $p^2$ , journaled in blocks  $p^3$ , afforded a range of movement in guides  $p^4$ , secured to the base-pieces  $a$ , and to one set of uprights  $a^2$ .

$q$ , are set-screws working in nuts in the guides  $p^4$ , and provided with hand-wheels  $q'$ , and with collars  $q^2$ , working in yokes secured to the blocks  $p^3$ , so that the hand-wheels  $q'$ , afford means for tightening the endless belt or conveyer  $p$ .

$r$  and  $r'$ , are doctor-plates or scrapers adapted to remove any material that may adhere to the calender-roll  $l$ , and endless-belt or conveyer  $p$ , and connected with brackets  $r^2$ , by means of bolts working in slots  $r^3$ , Fig. 1, so that the doctor-plates or scrapers may be readily adjusted.

$t$ , is a platform adapted to support the upper portion of the belt or conveyer  $p$ , and provided with side-rails  $t'$ , for preventing material deposited from the squeeze rolls  $e$  and  $e'$ , from falling off at the sides or edges of the belt or conveyer  $p$ .

$u$ , is a V-shaped evener adapted to distribute the material deposited upon the belt or conveyer  $p$ , toward the side rails  $t'$ , and evenly over the same, so that it may be properly presented between the calender rolls  $l$  and  $l'$ . This evener  $u$ , is preferably connected to the main-frame of the machine by means of bolts working in slots  $u'$ , in the hangers that carry the evener, so that the latter may be adjusted in respect to the belt or conveyer in order to insure a proper distribution of the material being carried thereon.

The mode of operation of the hereinabove described apparatus, is as follows:—The garbage having been drained and disinfected or in its normal condition, is introduced into the hopper  $d$ , and passes between the fluted or corrugated surfaces of the squeeze rolls  $e$  and  $e'$ . These rolls serve to pulp and squeeze the garbage and deliver it upon the endless belt or conveyer  $p$ . The latter carries the partially squeezed and pulped material toward the calender rolls  $l$  and  $l'$ . However, before the material is delivered to the calender-rolls  $l$  and  $l'$ , the evener  $u$ , spreads it uniformly over the belt or conveyer  $p$ . The even and uniform mass is then carried by the belt or conveyer  $p$ , between the calender rolls  $l$  and  $l'$ , and the latter serve to complete the pulping and squeezing operations, so that garbage is delivered from the calender rolls  $l$  and  $l'$ , in a thoroughly pulped and squeezed condition and may be readily incinerated or otherwise disposed of. It may be remarked that any liquid that is squeezed out of the garbage during the above described treatment may be permitted to fall into a suitable receptacle at the base of the main frame and from which it may be drained off and disinfected.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—



1. An apparatus for pulping and compress-  
ing garbage, comprising a main-frame pro-  
vided with base and top pieces, brackets car-  
ried by said top pieces and provided with  
5 ways, standards secured to the base-pieces, a  
hopper carried by said brackets, squeeze-  
rolls journaled in blocks working in said  
ways, calender-rolls journaled in blocks work-  
ing in ways in said standards, a conveyer for  
10 receiving the material discharged from the  
squeeze-rolls and for conducting the same  
between the calender-rolls, an evener for  
distributing the material upon the conveyer,  
and means for driving said rolls and convey-  
15 er, substantially as and for the purposes set  
forth.

2. In an apparatus for pulping and com-  
pressing garbage, comprising a main-frame  
provided with base and top pieces, squeeze-  
20 rolls having intermeshing fluted or corru-  
gated surfaces journaled in blocks adjustably

carried by brackets mounted on the top-  
pieces, a hopper supported by said brackets,  
calender-rolls journaled in spring controlled  
adjustable blocks carried by standards mount- 25  
ed on the bottom pieces, a conveyer for re-  
ceiving the material discharged from the  
squeeze-rolls and for conducting the same be-  
tween the calender-rolls, a platform having  
side rails, a V-shaped evener for distributing 30  
the material upon the conveyer toward said  
side-rails and means for driving said rolls and  
conveyer, substantially as and for the pur-  
poses set forth.

In testimony whereof I have hereunto set 35  
my signature in the presence of two subscrib-  
ing witnesses.

NORTH DOWLING.

Witnesses:

THOMAS M. SMITH,  
RICHARD C. MAXWELL.