

(No Model.)

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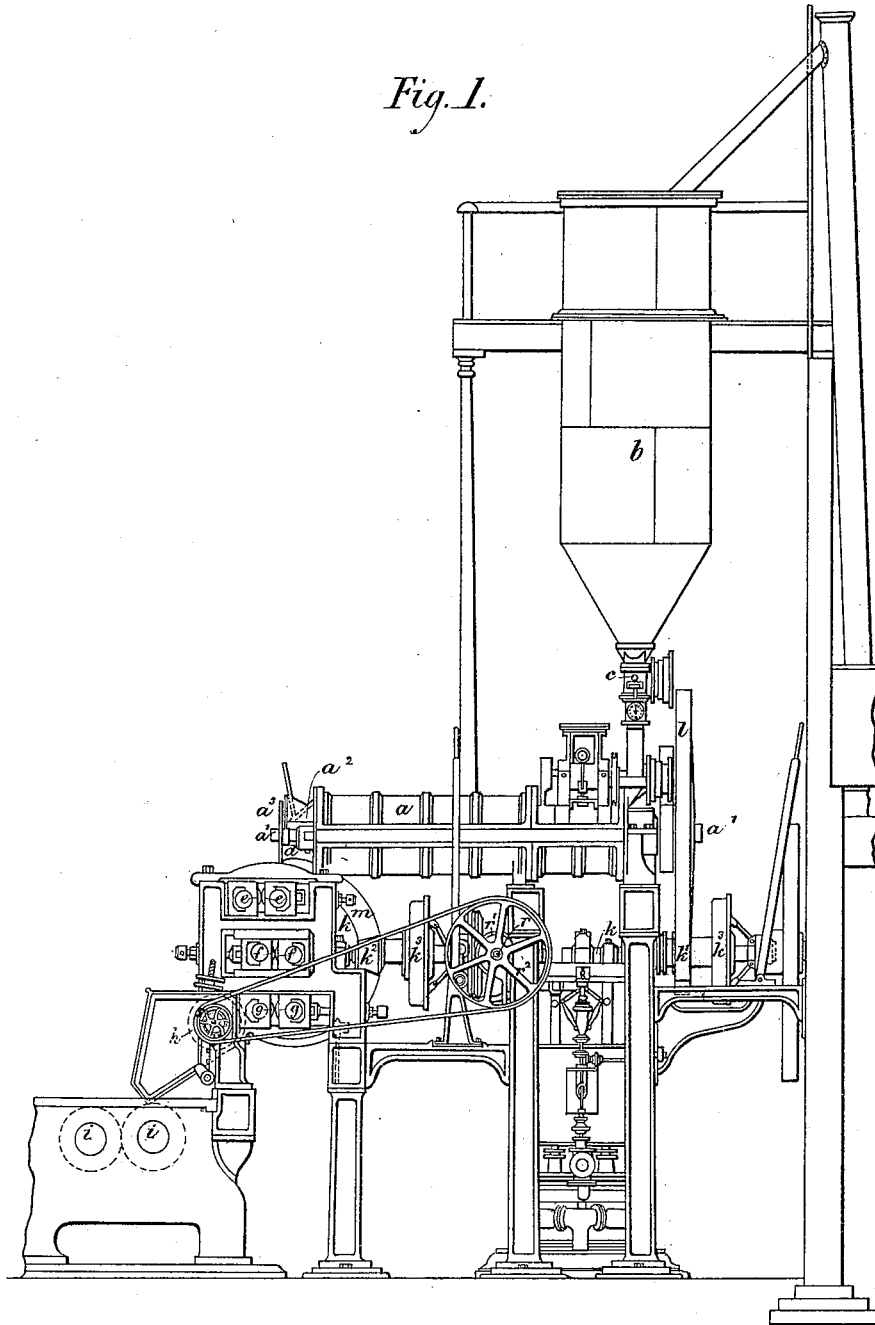
M. B. NAIRN.

MACHINERY FOR MANUFACTURE OF LINOLEUM.

No. 263,418.

Patented Aug. 29, 1882.

Fig. 1.



Witnesses:
Willie Holmes.
James Young.

Inventor:
M. B. Nairn
By attorneys
Bliss, Hopkins & Peyton.

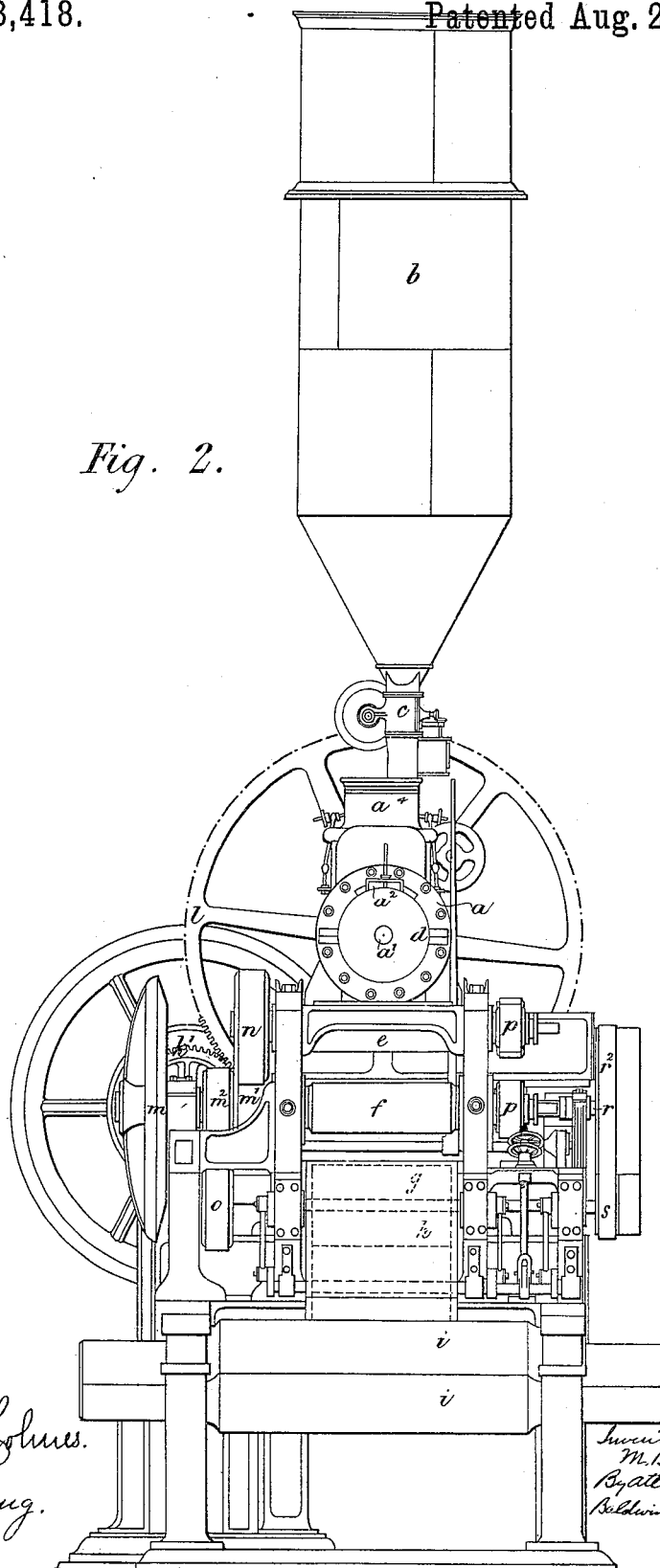
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Patented Aug. 29, 1882.

Fig. 2.



Witness:
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(No Model.)

3 Sheets—Sheet 3.

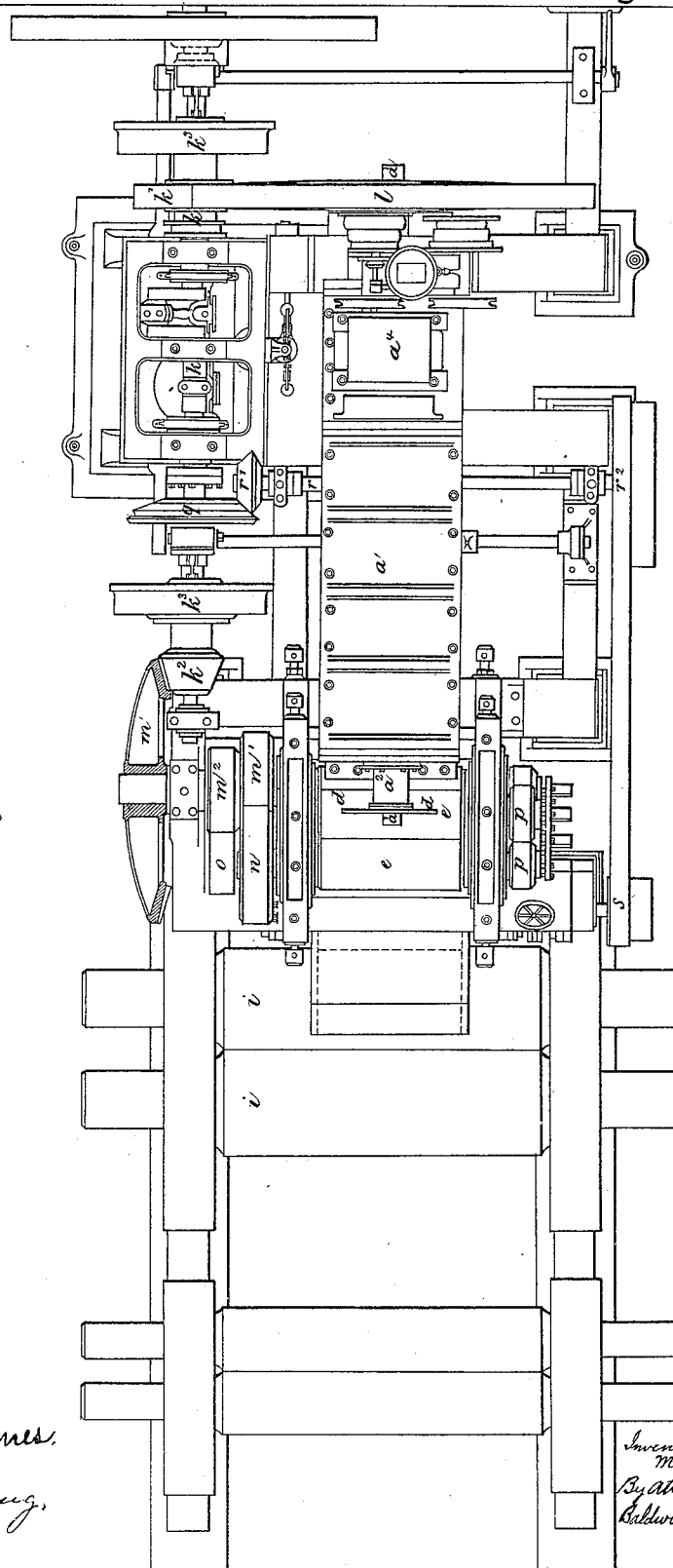
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Fig. 3.



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UNITED STATES PATENT OFFICE.

MICHAEL B. NAIRN, OF KIRKCALDY, COUNTY OF FIFE, SCOTLAND.

MACHINERY FOR THE MANUFACTURE OF LINOLEUM.

SPECIFICATION forming part of Letters Patent No. 263,418, dated August 29, 1882.

Application filed July 29, 1882. (No model.) Patented in England December 30, 1881, No. 5,725.

To all whom it may concern:

Be it known that I, MICHAEL BARKER NAIRN, a subject of the Queen of Great Britain, and a resident of Kirkcaldy, in the county of Fife, Scotland, have invented certain new and useful Improvements in Machinery for the Manufacture of Linoleum and like Fabrics, (for which I have received Letters Patent in Great Britain, No. 5,725, dated 30th December, 1881,) of which the following is a specification.

This invention has for its object improvements in machinery for the manufacture of linoleum and like fabrics.

Linoleum, as is well known, consists of a cement made from oil and other materials, which, when mixed with ground cork, is spread upon a woven fabric.

The machinery which I have designed for this manufacture contains a cylindrical mixer. The mixer is mounted horizontally and is traversed by a revolving axis. The axis is provided with arms which pass between other arms fixed within the cylinder. Over the mixer, at one end, is a bin containing ground cork. The material is supplied to the bin by an elevator, and is delivered at the bottom of the bin into the mixer. Between the bin and the mixer there is a revolving measure, which at each revolution passes a measured quantity of ground cork, also a slide or slide-valve to check the flow when necessary. The flow of the cork from the bin is insured by an agitator in the bin, consisting of a vertical rod to which a to-and-fro endwise movement is imparted. There is a bell in connection with the cork-measure, and when this bell sounds the workman throws a weighted slab of cement into the hopper of the mixer. The mixer is steam-jacketed, and in it the cement and the cork are worked up together. The revolving arms drive the material forward and cause it to be delivered through a mouth at the end of the mixer. In this mouth a door or flap is provided, which regulates the rate of delivery. It is pressed down by weights, and the regulation is effected by adding or removing some of the weights from time to time. The axis of the mixer is armed at the end where it projects outside the cylinder with knives, which, as the axis moves round, pass close in front of the delivery-mouth and cut off the material in slices. Beneath the mouth of the mixer there are arranged two or

more pairs of horizontal crushing or mixing rollers one below the other. The slices as they are cut off by the knives fall into the nip of the uppermost pair of rollers, and are crushed as they pass between them. The material being "doctored" off from these upper rollers falls to the nip of the pair below, and so afterward to the third pair. The rollers are heated by steam admitted within them. The material is allowed to adhere to one of the rollers of the bottom pair until it is taken off in small fragments by the teeth of a spiked drum, which is driven at a high velocity, and is adjustable to and from the roller.

The drum is inclosed in a casing which serves as a hopper, and from this the fragments are delivered to the nip of the spreading rolls, between which also the cloth to form the back of the linoleum fabric is led in the usual way. The motive power is derived from a steam-engine the crank-shaft of which lies horizontally by the side of but below the mixer. It has a toothed wheel and also a pinion loose upon it, but both capable of being held fast to the shaft by frictional clutches. The toothed wheel gears into a larger spur-wheel on the axis of the mixer, and the pinion, which is beveled, gears into a beveled wheel on a transverse horizontal axis. This axis passes through one of the middle pair of crushing or mixing rollers, and pinions gear it with the other roller of the pair. There are two other gear-wheels on the same axis, and these gear with corresponding wheels in connection with the upper and lower pairs of crushing or mixing rollers. A roller of each pair carries one of these wheels upon its axis, and is so driven, and the other roller is geared with the first by pinions. The crank-shaft of the engine also has a beveled wheel upon it, driving by a pinion a transverse horizontal shaft passing beneath the mixer. This shaft at its other end is provided with belt-pulleys, and an endless belt passing around them and also around another smaller pulley on the axis of the spiked roller imparts to the latter the high speed requisite for the separation of the material into fragments ready for spreading, as already described.

In order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is a side elevation, Fig. 2 is an end elevation, and Fig. 3 is a plan, of a machine constructed in accordance with my invention.

- 5 *a* is the horizontal mixer, and *a'* is the axis which passes through the mixer. These parts are provided with arms arranged in the usual manner, and by them the material is worked in its passage through the mixer.
- 10 *a*² is the mouth at which the material is delivered.
- a*³ is a door which obstructs the delivery more or less, according to the weight with which it is loaded.
- 15 *a*⁴ is a receiving-hopper for the slabs of cement. A pair of rollers in the hopper receive the slabs as they are thrown in. These rollers are geared together, and one of them is driven from the axis *a'* by a pair of spur-wheels. The
- 20 material as it is scraped from the surfaces of these rollers falls into the mixer.
- b* is a bin which is kept charged with ground cork.
- c* is a measurer consisting of a cylindrical
- 25 casing and an axis passing through it. The axis is furnished with radial partitions, which prevent the cork descending from the bin above to the trunk below, except as the axis in revolving carries it forward. The axis, by
- 30 means of a small beveled wheel, gives motion to the gear-wheels of a counter, and after any prearranged number of rotations causes a bell to be sounded.
- d d* are knives like those of a chaff-cutter.
- 35 They divide the material into slices as it leaves the mouth.
- e e* are an upper pair of crushing-rollers. The slices of material detached by the knives fall between these rollers. The surface speeds
- 40 of these rollers are different.
- f f* are another pair of crushing-rollers to which the material falls as it is scraped or doctored off the rollers *e e*. The rollers *f f* may also revolve at different surface speeds.
- 45 *g g* are a third pair of rollers. It is not essential that three pairs should be employed; but it tends to more perfect work. The material, after passing between these rollers, remains adhering to the front roller, being caused to

do so by a suitable regulation of the temperatures of the rollers, as is well understood.

h is a spiked drum driven at high speed, which tears the material in fragments from the surface of the front roller *g*.

i i are the rolls of the spreading-machine. This machine is of the ordinary construction, and only a portion of it is represented in the drawings.

k k is the crank-shaft of the driving-engine. It has upon it the toothed wheel *k'* and the beveled pinion *k*². *k*³ are the frictional clutches by which *k'* and *k*² are, when needed, locked fast upon the shaft *k*.

l is a large spur-wheel on the axis *a'* of the mixer and gearing with *k'*.

m is a beveled wheel on the axis of one of the rollers *f* and gearing with *k*². *m'* and *m*² are spur-wheels on the same axis.

n is a wheel in gear with *m'*. It is fast upon the neck of the front roller *e*.

o is a wheel in gear with *m*² and fast upon the neck of the front roller *g*.

p p are pinions by which the rollers *e e*, *f f*, and *g g* are geared together in pairs.

q is a beveled wheel upon the shaft *k*.

r is a shaft having a pinion, *r'*, upon it in gear with *q* and carrying the belt-pulley *r*².

s is a small belt-pulley driven by a belt from *r*². It is fast on the axis of the spiked drum *h*.

Having thus described the nature of my said invention and the manner of performing the same, I would have it understood that I claim—

1. The combination of the parts *a*, *a'*, *f*, *k*, *k'*, *k*², *l*, and *m*, substantially as described.

2. The combination of the parts *a*, *b*, and *c*, substantially as described.

3. The loaded door *a*³, obstructing the delivery of the material from the mixer *a*, substantially as described.

4. The knives *d*, cutting the material into slices as it issues from the mouth *a*², substantially as described.

5. The combination of crushing-rollers *e e*, *f f*, and *g g*, substantially as described.

MICHAEL BARKER NAIRN.

Witnesses:

ROBERT OSWALD,

FREDRIC CHARLES LOCKHART.