SHEET. 1.

ARTHUR L. LANSING, ASSR. ETC.,

RAMMING MACHINE FOR WOODEN AND OTHER PAVEMENTS.

109745

PATENTED NOV 29 1870

FIG. 1.

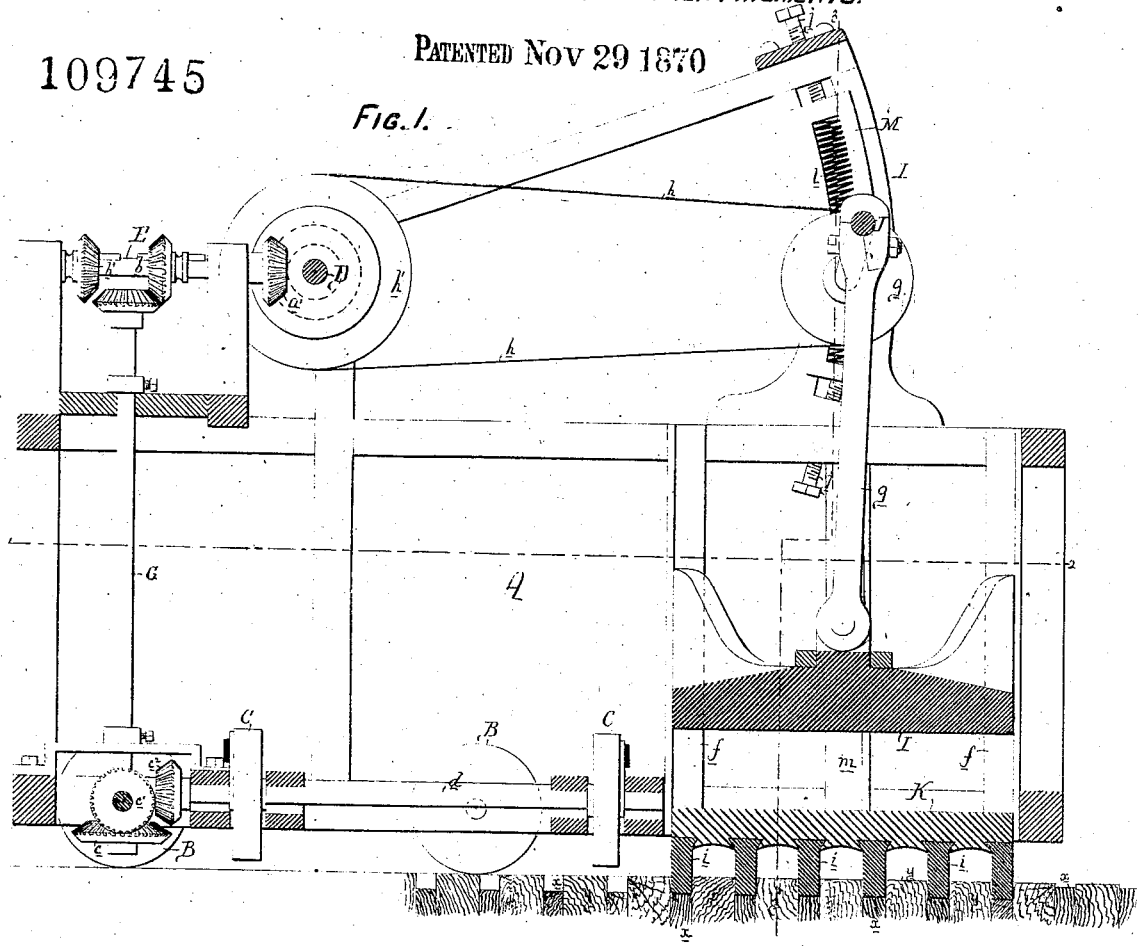
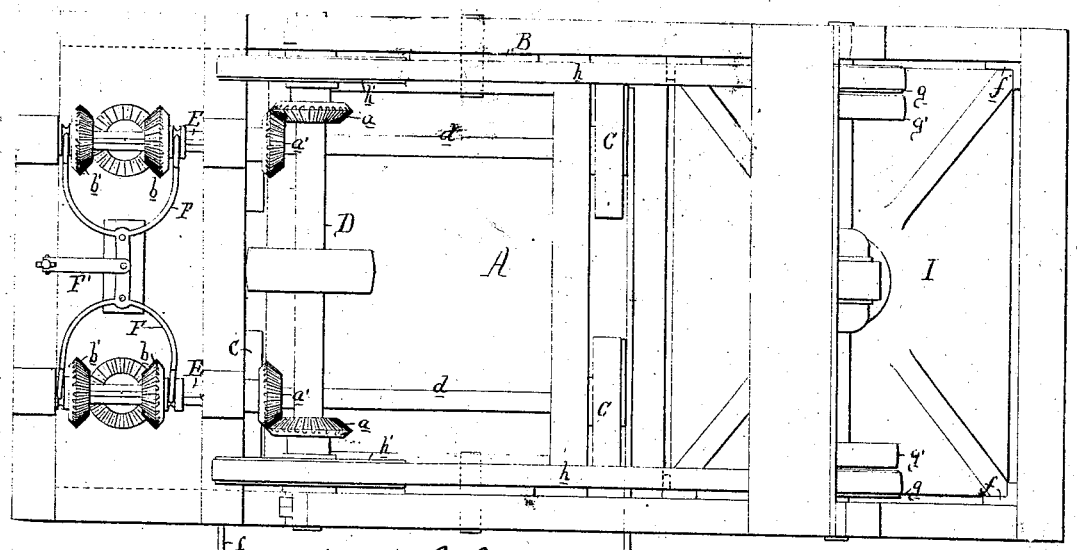


FIG. 2.



WITNESSES { Wm. A. Steel.
Jno. B. Harding.

Arthur L. Lansing
by his Attys
Howson and Sons

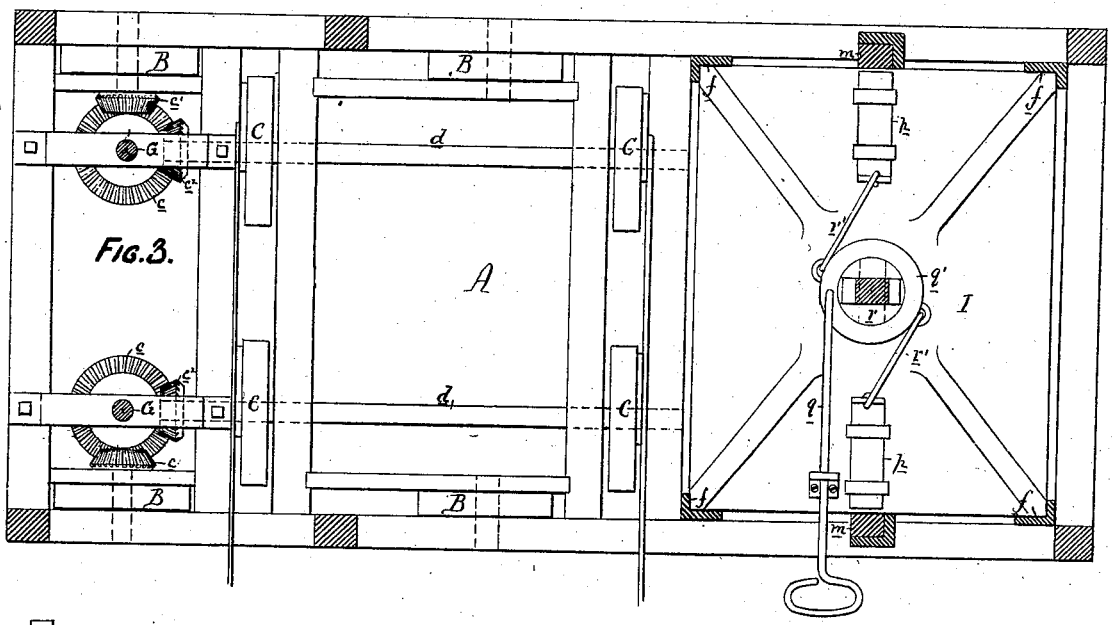


FIG. 3.

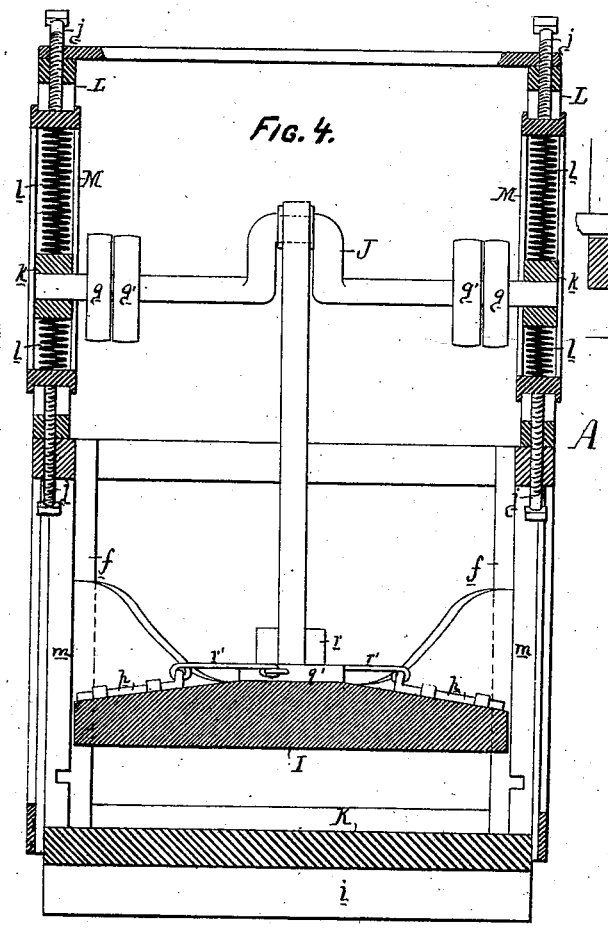


FIG. 4.

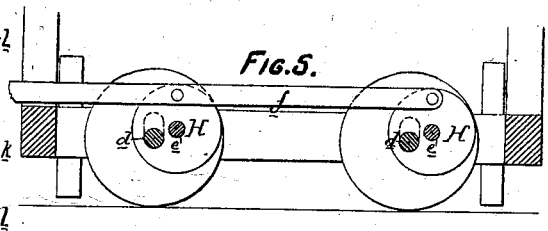


FIG. 5.

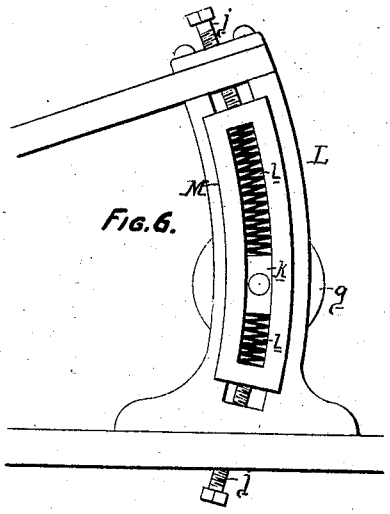


FIG. 6.

WITNESSES { Wm. A. Steel.
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United States Patent Office.

ARTHUR LIVINGSTON LANSING, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HENRY SEYMOUR LANSING, OF SAME PLACE.

Letters Patent No. 109,745, dated November 29, 1870.

IMPROVEMENT IN RAMMING-MACHINES FOR WOOD AND OTHER PAVEMENTS.

The Schedule referred to in these Letters Patent and making part of the same.

I, ARTHUR LIVINGSTON LANSING, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented a Ramming-Machine for Wooden and other Pavements, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of a ramming-machine, fully described hereafter, which has been designed especially for ramming the wedges of the "Stow foundation pavement." It can be used, however, for ramming the blocks or fillings of any wooden pavement, and, on being slightly modified, might also be adapted to the ramming of cobble, granite, or other stone pavement.

Description of the Accompanying Drawing.

Figure 1, sheet 1, is a vertical sectional view of my ramming-machine for wooden and other pavements;

Figure 2, a plan view of the same;

Figure 3, sheet 2, a sectional plan on the line 1 2, fig. 1;

Figure 4, a transverse vertical section on the line 3 4, fig. 1; and

Figures 5 and 6, detached views, illustrating parts of the machine.

General Description.

The frame A of the machine, of wood or metal, is strongly put together, and is mounted upon two sets of wheels, B and C, placed at right angles to each other, and arranged, as hereafter described, to support the machine alternately, the latter resting upon the wheels B when it is to be moved longitudinally, and upon the wheels C when it is to be moved transversely.

The several parts of the machine, as well as the supporting-wheels, are intended to be driven by a steam-engine, which is mounted upon the frame A, the motion being, in the first place, imparted to a driving-shaft, D, which turns in suitable bearings in the upper part of the frame.

The driving-shaft is furnished with two bevel-wheels, *a a*, which gear into bevel-wheels *a' a'* of two shafts, E E.

Each of the latter is provided with two bevel-wheels, *b b'*, arranged to slide on the shaft, but prevented from turning independently of the same.

The sliding motion is communicated simultaneously to the two sets of wheels *b b'* by means of clutch-levers F F, operated by a rod, F'; and the object of the arrangement is to enable the direction of the motion imparted to vertical shafts G G by the said bevel-wheels to be changed at pleasure.

Each shaft G is furnished at its lower end with a bevel-wheel, *c*, which gears into a bevel-wheel, c^1, of the spindle, to which one of the propelling-wheels B is fixed; and the said bevel-wheel *c* gears, also, under the circumstances described hereafter, into a bevel-wheel, c^2, of the spindle *d*, to which the transverse propelling-wheels C are hung.

The spindles of the wheels B are hung directly to the frame A, so that the bevel-wheels c^1 remain constantly in gear with the wheels *c* of the upright shafts G; but, as the transverse wheels C, with their spindles, require to be raised or lowered, according as the machine is to be supported upon them or upon the longitudinal wheels B, it follows that their cog-wheels c^2 must be thrown out of gear when the said transverse wheels are raised.

The raising and lowering of the transverse wheels is effected by means of the arrangement shown in fig. 5. This consists of disks or plates H, hung to the frame A at points, *e*, eccentric to the spindles *d* of the said wheels, and having slotted openings, through which the spindles pass.

The plates H are operated, simultaneously, by means of rods *f*, which are pushed inward when the wheels C are to be raised, and drawn outward when the said wheels are to be lowered, and the wheels B consequently raised.

The hammer or ram I, by which the wedges *x* are driven down between the blocks *y* of the pavement, is arranged to slide between vertical guides *f* of the frame of the machine, the said ram receiving its motion, through the medium of a connecting-rod, *g*, from a crank-shaft, J, which has two sets of fast-and-loose pulleys, *g g'*, connected, by chain-belts *h*, with pulleys *h'* on the driving-shaft D.

The ram I does not act directly upon the wedges *x* of the pavement, but through the medium of a heavy cast-iron swage, K, also arranged to glide in the guides *f* of the frame, and having, on its under side, a number of wrought-iron projections or ribs, *i*, adapted to the spaces between the blocks.

In order to prevent injury to the machine in case the ram should meet with any undue resistance in striking the swage, it is necessary that the crank-shaft J should have adjustable bearings, capable of yielding vertically to a limited extent when the blow is struck. To effect this object, and also to prevent the shaft, when adjusted, from being thrown out of gear with the driving-shaft, segmental guides L, secured to or forming part of the frame A, and formed on a curve described from the center of the said driving-shaft, are employed.

Frames M, rendered vertically adjustable by set-screws *j*, are arranged within each of the segmental guides, and in these frames are arranged to slide the boxes *k*, in which the crank-shaft J turns, the said boxes being maintained in position, both above and below, by strong spiral springs *l*, which permit the necessary vertical yielding of the crank-shaft.

In order to enable the swage K to be raised from the spaces between the blocks of the pavement when the machine is to be moved, the said swage is provided with arms *m*, which project upward to a point above the upper face of the ram. These arms are notched on their inner edges, as best observed in figs. 3 and 4, in order to admit the ends of bolts *p*, arranged to slide on the upper face of the ram, the said bolts being operated simultaneously, in the present instance, by a rod, *q*, attached to a loose collar, *q'*, which turns on the stem *r* of the ram, and which is connected to the bolts by links *r'*.

When the bolts are inserted into the notches of the arms *m* of the swage, the latter must be lifted with the ram, and when the swage is to be again used, the bolts can be withdrawn and the said swage permitted to fall by its own weight.

Operation.

The machine having been moved to the desired position upon the pavement, the bolts *p* are withdrawn from the notches in the arms of the ram, and the latter is permitted to fall until its ribs or projections *i* enter the spaces between the blocks and rest upon the wedges to be forced down. The propelling-wheels are then thrown out of gear, and the wheels C are raised or lowered, as the case may be, until they are on the same level as the wheels B, they being then secured in this position, in order that the machine may rest upon both sets of wheels and be thus supported with perfect steadiness. The belts are then shifted from the loose onto the fast pulleys of the crank-shaft J, when a rapid vertical reciprocating motion will be imparted to the ram, the latter dealing a succession of blows upon the upper face of the swage; and forcing the ribs *i* of the same, and, consequently, the wedges, downward into the spaces between the blocks.

The arrangement of the sliding boxes *k* and spiral springs *l* permits the crank-shaft and ram to become gradually depressed and follow the swage as it is caused to descend.

The boxes M can also be adjusted, from time to time, by means of their set-screws *j*, when it is necessary to change the position of the crank-shaft in order to render the blows of the ram more effective.

After ramming down a row of wedges, the swage is connected to the ram by means of the bolts *p*, and is raised with the same, the crank-shaft being then thrown out of gear, and the ram and swage maintained in their raised position by any suitable arrangement of catches. The machine is then moved, either longitudinally or transversely, to the required distance, by causing it to rest upon the proper set of propelling-wheels, and throwing the latter into gear, as before described; and, when brought to a proper position, the machine is again steadied, as before, and the operation of ramming resumed.

The ribs *i* might be cast in one piece with the swage, but I prefer to make them of wrought-iron, as before mentioned. In some cases, however—as, for instance, in ramming stone pavements or wooden pavements differing from the "Stow"—the ribs on the under side of the swage might be altogether dispensed with, or be made of a shape differing from that described. In other instances, also, it might be found advisable to strike the blocks with the ram directly without the intervention of a swage; but I prefer to employ the latter.

Claims.

1. A portable ramming-machine for wooden and other pavements, consisting, mainly, of a frame, A, supported upon two sets of adjustable propelling-wheels, B and C, arranged at right angles to each other and carrying a weighted and guided ram, I, to which a vertical reciprocating motion is imparted.

2. The ram I, connected to and operated by a crank-shaft, J, the bearings of which are adjustable and capable of yielding vertically.

3. The said bearings or boxes *k* of the crank-shaft, arranged to slide in adjustable segmental frames M, and maintained in a proper position in the said frames between strong spiral springs *l*.

4. The frames M, adapted to and rendered adjustable, by set-screws or otherwise, in segmental guides L, secured to or forming a part of the frame of the machine, and formed on a curve described from the center of the driving-shaft.

5. The combination of the ram I, operated substantially as described, with a swage, K, arranged beneath the ram, as specified.

6. The said swage, having projections or ribs *i* on its under side, adapted to the spaces between the blocks of a "Stow" or other pavement.

7. The said swage, adapted to guides in the frame of the machine, and capable of being connected to and raised with the ram, as set forth.

8. The disks H, hung to the frame of the machine, attached to the spindles of the propelling-wheels C, and connected together by rods *f*, so that they can be operated simultaneously, in the manner and for the purpose specified.

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

ARTHUR LIVINGSTON LANSING.

Witnesses:

WM. A. STEEL,

HARRY SMITH.