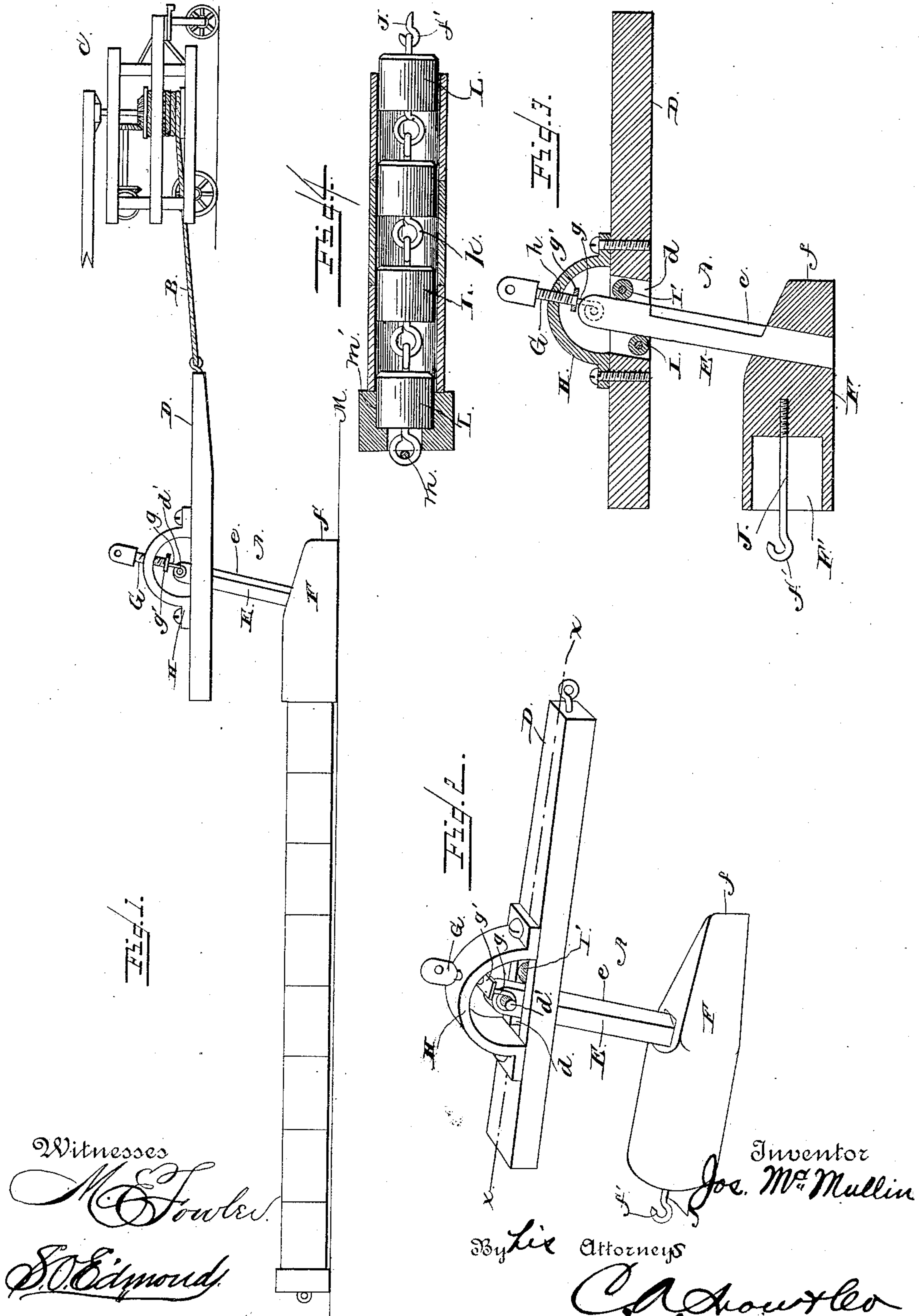


(No Model.)

J. McMULLIN.
TILE LAYING MACHINE.

No. 354,429.

Patented Dec. 14, 1886.



UNITED STATES PATENT OFFICE.

JOSEPH McMULLIN, OF CASEY, IOWA.

TILE-LAYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 354,429, dated December 14, 1886.

Application filed September 1, 1886. Serial No. 212,403. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH McMULLIN, a citizen of the United States, residing at Casey, in the county of Guthrie and State of Iowa, have invented a new and useful Improvement in Tile-Laying Machines, of which the following is a specification.

My invention relates to improvements in tile-laying-machines; and it consists of the peculiar combination and novel construction and arrangement of the various parts for service, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

The object of my invention is to provide an improved tile-laying machine of simple and cheap construction which shall displace a minimum quantity of earth during the operations of laying the tile, and thereby render the apparatus more easy to operate, to provide an improved pliable or yielding carrier for the drain-tiles which shall be capable of swerving from one side to the other in order to avoid obstructions in its path, and to provide improved means for adjusting the share and cutter vertically during the progress of the machine, so that the tiles can be laid on a level and the apparatus can accommodate itself to uneven surfaces of the ground.

In the drawings hereto annexed, Figure 1 is an elevation of my improved tile-laying apparatus, showing it connected with a capstan for drawing it along. Fig. 2 is an enlarged perspective view of the plow proper. Fig. 3 is a vertical central sectional view through the plow on the line xx of Fig. 2. Fig. 4 is a vertical longitudinal sectional view through the cable and carriers, together with the tiles on the latter, in order to show the position of the tiles.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the plow of my improved tile-laying machine, which is connected by a chain or cable, B, with a capstan or other source of power, C, so that the plow and the devices connected therewith and operated thereby are drawn along, the capstan or other power machine being of any approved pattern; but as this mechanism does not form a part of my present improvements, I have

not deemed it necessary to more fully describe the same herein.

The plow A of my improved tile-laying machine has a beam, D, to the front end of which the cable B is connected, and this beam is provided at or near its rear end with a longitudinal slot, d , through which passes the vertically-disposed cutter or standard E. This cutter or standard E is arranged at a slightly inclined position, and the front edge thereof is beveled or inclined on opposite sides to form a sharpened cutting-edge e , which will readily penetrate the earth as the plow is drawn along by the capstan or other power machine C. This standard or cutter is capable of a vertical adjustment, in order to raise or lower the foot or share F, that is affixed to the lower extremity thereof, and adapt the latter to enter the earth to a greater or less degree. The upper end of this vertically-adjustable cutter-standard is provided with laterally-projecting pins or studs d' , to which are connected the lower ends of links or rods g , which are secured at their opposite upper ends to a follower plate or disk, g' , which has a transverse opening through which passes the lower end of an elevating-screw, G. The lower end of this elevating-screw carries the follower plate or disk in its adjustments, and the upper end of the said screw has an enlarged head, which is to be grasped and operated by hand. The said screw works in a threaded opening, h , formed transversely through a yoke or support, H, that is rigidly secured upon the upper side of the beam of the plow A, and straddles the upper end of the vertically-adjustable cutter-standard.

I I' designate friction-rollers, which are journaled on suitable shafts, i , that are secured in the sides of the slot d of the beam D, and these friction-rollers are arranged in the said slot and on opposite sides of the cutter-standard, so that the latter will impinge against the rollers in its adjustment, which thereby hold the standard out of contact with the sides of the slot and insure the easy and rapid adjustment thereof when the elevating-screw is operated, as will be very readily understood.

The foot or share F of the plow A is made substantially circular in form at its rear end,

and it is tapered and inclined at its front end to provide a sharpened cutting-edge, f , which will readily penetrate the earth when the plow is drawn along. The rear end of this foot or share is made of a size in cross-section equal to the diameter of the tiles that are to be laid, and the said rear end of the foot is chambered or hollowed out to form a chamber, F' , into which the first drain-tile of the series that are to be laid is fitted or placed, as presently described.

J designates a draft-link, which is rigidly secured in the closed end of the chamber F' of the share or foot, and this draft-link projects rearwardly from the closed end of the chamber and beyond the rear end of the share or foot, where it is provided with a hook or eye, f' , to which is connected the forward end of a chain or cable, K , which carries the blocks or supports L for the drain-tiles. This chain or cable is made flexible, so that it will swerve to one side or the other and accommodate itself to the direction which the plow is drawn along, whereby the tiles can be laid in straight, curved, or angular lines, as may be desired or necessary, according to the nature of the ground or the place where the tiles are to be laid. The blocks L for the drain-tiles are made cylindrical or of other desired form to correspond with the shape of the tiles to be laid, and these carriers are affixed to the chain or cable so that they always occupy the same relative position to the said cable. The blocks are arranged out of contact with each other at their contiguous edges so as to leave intermediate spaces, whereby they are free to accommodate themselves to the direction assumed by the chain or cable, as will be very readily understood.

This being the construction of my improved drain-tile-laying machine, the operation thereof is as follows: The tiles that are to be laid are first placed upon the blocks of the chain or cable, the latter being detached from the foot or share for this purpose. The blocks or supports L for the tiles are of slightly smaller diameter than the tiles, so that the blocks will readily and freely pass out of the tiles after the latter have been laid. After the tiles have been properly fitted on the blocks or supports a stop, M , is adjusted on the extreme rear end of the cable, and held in place thereon by a transverse pin, m , which is passed through one of the links of the chain or cable and bears against the said stop. The stop is provided with a chamber or recess, m' , in which fits the rear end of the last block or support of the series carried by the chain or cable, and the stop is of greater diameter than the combined diameter of the last block of the series and the tile thereon, so that the tiles will be prevented from slipping off the blocks when the machine is drawn through the earth in order to lay the tiles. The chain or cable is connected to the draft-link of the foot or plow after the tiles

and stop are secured thereon, and the cable B is then connected to the plow-beam. Power is now exerted by the capstan on the cable to draw the plow and cable along to the required distance until all of the tiles are properly laid, a hole or opening having been first dug into the earth to the proper depth to permit the share or foot of the plow and the cable, with the tiles, to enter the earth to the proper depth. After the tiles have all been properly laid, the key is removed to permit the detachment of the stop, and the plow is again drawn along by the capstan to withdraw the blocks or supports L from the tiles that have been laid. A new section of chain or cable, with the tiles thereon, is connected to the rear end of the first section that has just laid its tiles, the stop again secured to the rear end of the new section of chain or cable, and the plow again drawn along to lay the tiles of the second section of the cable. This operation is repeated until the desired length of line of tiles has been laid, or until the plow reaches the capstan, when the latter is moved or adjusted to a new position to adapt the apparatus for service. The share and cutter-standard of the plow enter the earth to the proper depth, which can be regulated by adjusting the screw, and the depth to which the share enters the earth can be varied while the plow is in transit by simply turning the screw, this latter operation not being interfered with by the forward progress of the plow.

A drain-tile-laying machine constructed in accordance with my invention is capable of laying a very great number of tiles in a short time and displace a comparatively small quantity of earth, so that the plow is capable of operation at a less expenditure of labor and power.

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

1. In a drain-tile-laying machine, the combination of a slotted plow-beam, a vertically-adjustable cutter-standard passing through the slot of the beam, a yoke carried by the beam, an elevating-screw working in the yoke and connected with the standard, a share or foot affixed to the standard, and the chain or cable having the blocks and connected to the share or foot, substantially as described.

2. In a drain-tile-laying machine, the combination of a slotted plow-beam, a vertically-adjustable cutter-standard passing through the slot of the beam, a yoke secured to the beam and straddling the upper end of the standard, an elevating-screw working in the yoke, a follower plate or disk carried by the screw, the links intermediate of the follower-plate and the standard, a share or foot secured to the standard, and a chain or cable connected to the foot and having the blocks, substantially as described.

3. In a drain-tile-laying machine, the com-

5 bination of the slotted plow-beam, the vertically-adjustable cutter-standard passing through the slot of the beam, the friction-rollers located on opposite sides of the standard and housed within the slot of the beam, an elevating-screw connected to the standard, a foot or share carried by the standard, and a chain or cable connected to the foot and having the blocks, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOSEPH McMULLIN.

Witnesses:

W. C. SMITH,
JOHN ADRES.