(No Model.)

W. WHEELER.

DRAIN TILE CUTTING MACHINE.

No. 245,681. Patented Aug. 16, 1881.

Fig. 1.

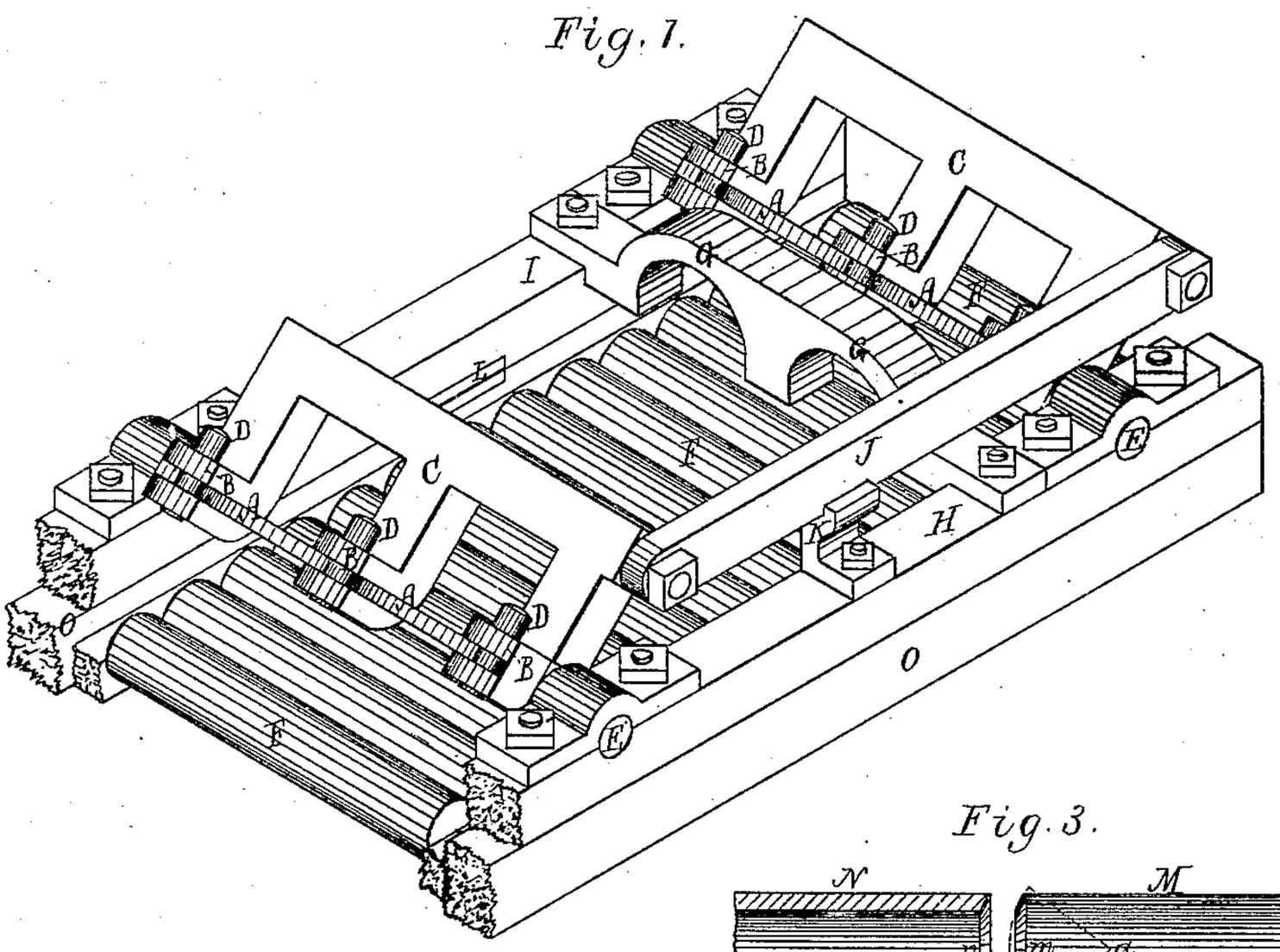


Fig. 3.

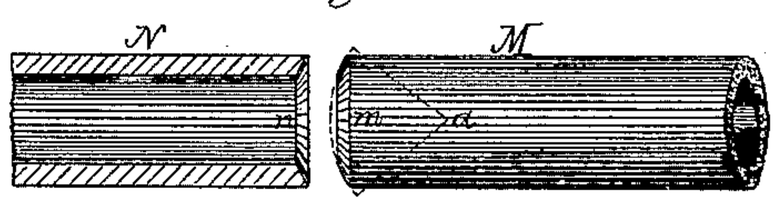
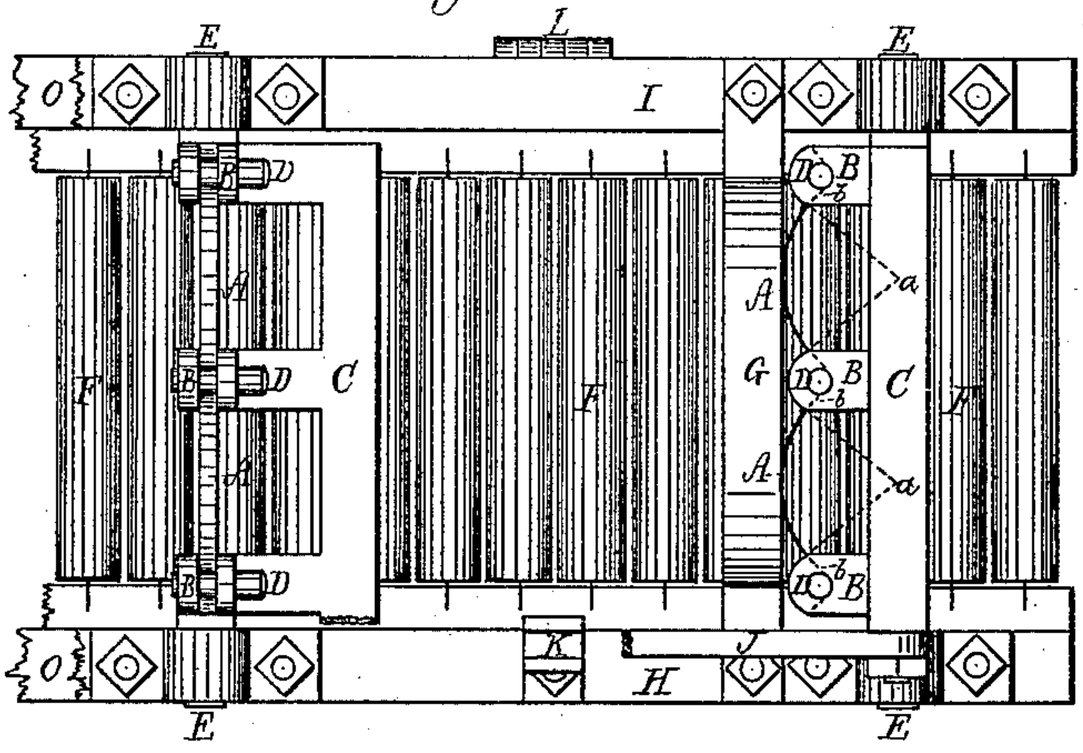


Fig. 2



Witnesses.

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DRAIN-TILE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 245,681, dated August 16, 1881.

Application filed June 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WHEELER, of Concord, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Drain-Tile-Cutting Machines; and I do hereby declare the following to be a description of the invention, reference being had to the accompanying drawings, which form part of this specification.

It is the object of this invention to provide a drain-tile cutter by means of which the tube or pipe of clay issuing from the dod or annular die of a drain-tile machine will be cut into suitable lengths in such manner as to form upon one of the ends of each length or section a spherically-beveled convex surface, and upon the other end a correspondingly spherically-beveled concave surface, the said beveled surfaces being so formed and related that the convex end of one section may fit into the concave end of another section, and forming a close joint without the necessity of a sleeve or collar to maintain the adjoining sections in their due relations. To effect this result I use a cutter consisting of a flat narrow wire or ribbon of metal bent to a circular curve described about a point in the line of the axis of the tube of clay to be cut thereby. In cutting the tile the curved wire or blade is caused to turn or rock about the said point with a radius equal to that of the curvature of the said wire or blade—in other words, the blade turns at a right angle to the plane of its curvature about an axis passing through the point from which its curvature is described.

Figure 1 is an isometric projection of my invention, adapted for cutting two lines of tubing or tiles at once in two or more parts. Fig. 2 is a plan view of the same, in which the two cutting-blades and their rocking frames or carriers are shown as disconnected from each other and lying in different positions. Fig. 3 shows the beveled forms given to the joining ends of two of the tiles or pipes by the use of this invention.

The cutting blades or wires (represented at A A) are bent in the form of circular curves or arcs, whose centers, *a a*, are shown in Fig. 2. Each blade or wire is set in suitable slots or mortises formed in the ends of arms B B B of a carrier or rocking frame, C, and held securely therein by means of the clamping-pins D, inserted in such arms. The beds or bottoms of the said slots or mortises I prefer to have formed so as to aid in giving the desired curvature to the blade A A, such being as shown by dotted lines at *b b b* in Fig. 2.

The carrier or rocking frame C is provided with the pivots or journals E E, the common axes of which pass through the centers *a a* of the curves of the blade A A; hence it is clear that the surface described by turning either of the blades A A about the produced axis of the journals E E will be part of that of a sphere. The axes of the journals E E are adjusted at a height above the rollers F F F which is equal to the radius of the tile. The tile or tube is carried forward on the said rollers equidistant from and between two next adjacent of the arms B; hence the axis of the said journals produced intersects in either of the centers *a* of one of the tubes or tiles to be cut. The intersection of the cylindrical bodies of said tiles with the surfaces described by the turning of the blades A A, as related above, will form spherical annular surfaces or zones, whose axes are coincident with the axes of the tiles cut by the blades; hence, also, when a tube is separated by one of the blades, one of the end sections of it formed by the blade in going through the tube transversely will present a convex and the other a concave spherical zone, and therefore the two end sections will be beveled in opposite directions, whereby one may be fitted into the other, so as to cause the two lengths of tile to form a continuous tubular conduit, with a close joint between them.

In Fig. 3 M represents a longitudinal elevation of a portion of the tile, cut as above described, convexly beveled at the end, as shown at *m*. In the same figure N shows a longitudinal section of a contiguous portion of the clay tubing, one end of which has been formed with a correspondingly-concaved bevel, as shown at *n*.

I prefer to cut the plastic tile ordinarily by an upward stroke of the cutting-wire A A, in order to avoid such injury to the form of the tile as would result from adding to the pressure of a downward stroke the weight of the tile itself, as it rests upon the rollers in a soft pliable state. In order still further to preserve

the desired form of the tile while it is being cut, I fix directly in front of each cutting blade or wire a counter-support, G G, provided with semicircular or other suitable openings or archways, through which the plastic tube of clay passes, and against the lower curved surface of which it presses while being cut by an upward stroke, as already described. The arched counter-support G G serves also to join and hold in position the parts H and I of the frame which supports the rocking frames or blade-carriers C C′.

When but one length of the finished clay-tile is to be cut off at a time, the form thereof can be almost perfectly preserved against the pressure of the cutting-wire by causing the cut to be made close up to the die, or to the core of the die, used in making the tube for this purpose. The core of the die, and even the other part of the die also, may be extended from the tile-machine so as to reach very nearly to the point where the cut is to be made, thus sustaining the bore in the plastic material against the danger of collapsing under the pressure of the blade. The outer end of the die and its core in such case may even be formed into such a spherical section as that described by the blade working in combination therewith, and the said blade may be made to operate in close sliding contact with the spherically-formed end of said die and core, whereby the tube of clay will be sheared off in suitable lengths.

Any derangement of form in the tiles produced by the machine may be corrected, as in other cases, by subsequent rolling, preferably after they are partially dried.

When two or more rocking frames or blade-carriers are to be used, they may be united by a connecting-rod, J, so that all of them may be operated simultaneously at a single stroke.

In order that the rocking movement of the blades A A and the carriers C C may be confined within suitable limits, and that the carriers may not fall upon and deform the tile, a crutch or prop, K, fastened to the frame H, and arranged as shown, is provided. Upon such crutch the connecting-rod J rests at each of the termini or limits of the range of movement allotted to the carrier C. When but one carrier is used the same result may be secured by fixing or providing at and upon one end of the said carrier a projecting pin or stop, which shall meet and come into contact with the upper surface of the journal-box in which said carrier turns, or with the frame H, at each limit of motion of the carrier.

The frame H, carrying the various parts of the above-described apparatus, rests upon a frame, O, in which the rollers F F F are mounted. The two frames may be connected by means of suitable hinges, (one of which is shown at L,) so as to admit of the upper frame, H, together with the parts attached thereto, being raised relatively to the lower frame, whereby the removal of the tiles after cutting through them may be facilitated or effected.

It will be seen that this contrivance may be used for cutting and in the manufacture of drain-tile of whatever form of cross-section, although it is especially adapted for round or cylindrical tile, with special reference to which it has been described herein, and which in the usual form, as hereinbefore made, require to be laid with collars or sleeves, in order to make a permanent and reliable drain or tile conduit. When round tiles are to be made and cut in this manner, the pipe, on issuing from the die, should be carried forward on a series of rollers having hollowed surfaces along the path of said pipe, in order better to maintain its form and to keep it in proper position for cutting.

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

1. A tile or pipe cutting machine consisting not only of means or mechanism for sustaining a tile or pipe to be cut transversely, but of one or more curved blades and a frame or carrier supporting such blade or blades, and adapted to turn on one axis intersecting and at right angles with the axis of the tube to be cut, whereby, when such tube is severed by one of such blades, one end of one section of such tube shall be concave and the next adjacent end of the other section shall be correspondingly convex, all substantially as and for the purpose specified.

2. The blade-sustaining rocking frame C, having its arms B recessed, and provided with one or more curved blades, A, and clamp-pins D, arranged in the said arms, substantially as set forth.

3. The combination of the arched counter-support G, the pipe-supporter or series of rollers F and their sustaining-frame O, with the rocker-frame C, provided with one or more curved blades, A, arranged as set forth, all being adapted and to operate substantially as and for the purpose specified.

4. The combination of the pipe-supporter or series of rollers F and their supporting-frame O with the two curved blade-carriers C and their connecting-bar J, all being arranged and adapted substantially as set forth.

5. The combination of the pipe-supporter or series of rollers F and their supporting-frame O with the frame H, (hinged to such frame O,) and with one or more blade-carriers, C, pivoted to such frame H, and each provided with one or more curved blades, as and for the purpose and to operate as specified.

6. The combination of the frame O and its series of rollers F, the frame H, arched supporter G, and the two blade-carrying frames C, connected by a bar, J, and provided with arched or curved blades, all being arranged and adapted substantially and to operate as and for the purpose set forth.

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