No. 688,736. Patented Dec. 10, 1901.

F. W. HUESTIS.

MACHINE FOR MAKING NON-SLIPPING TREADS, PAVEMENTS. &c.

(Application filed Mar. 28, 1900.)

(No Model.) 3 Sheets—Sheet 1.

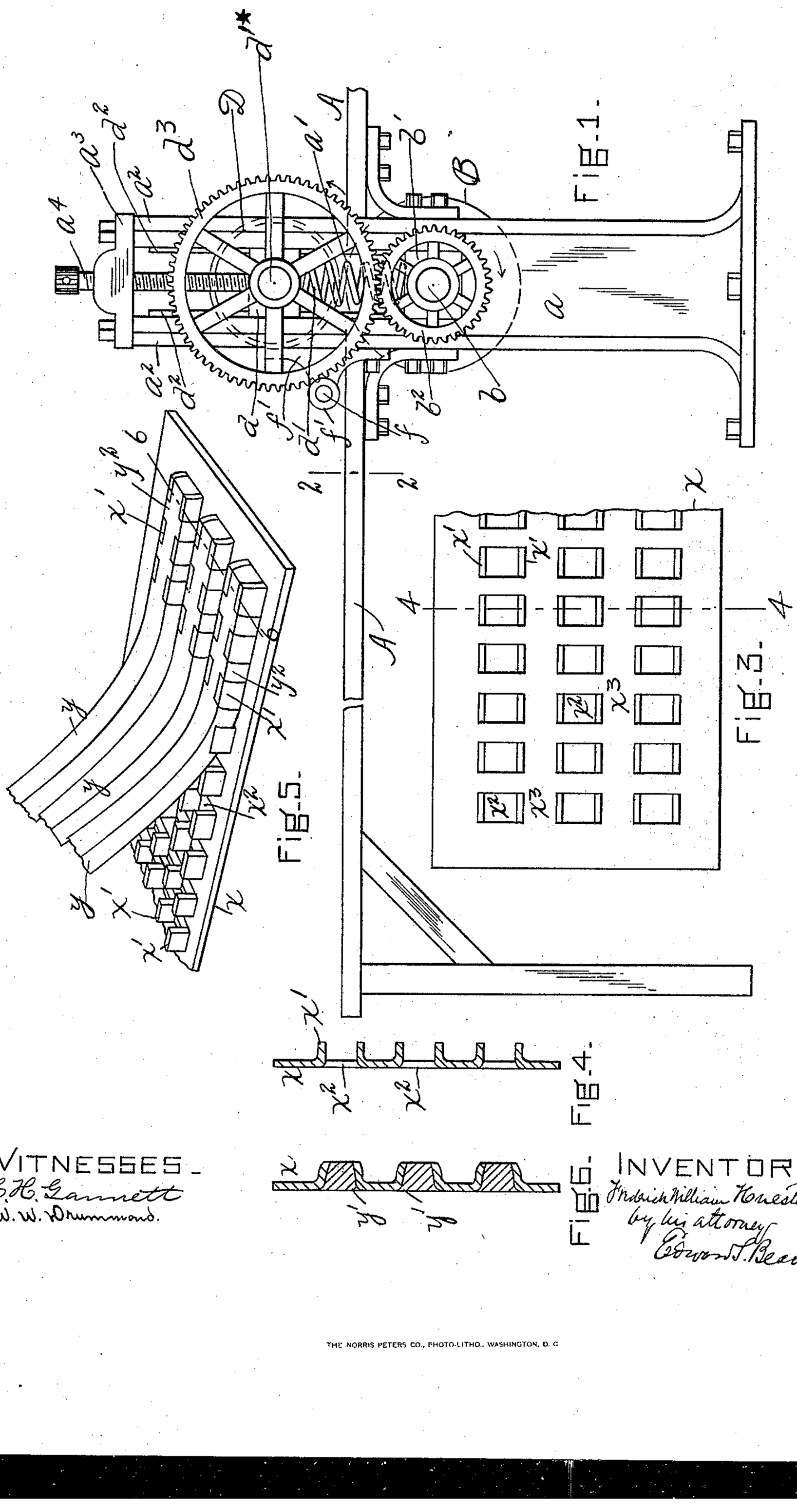

FIG. 1.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 2.

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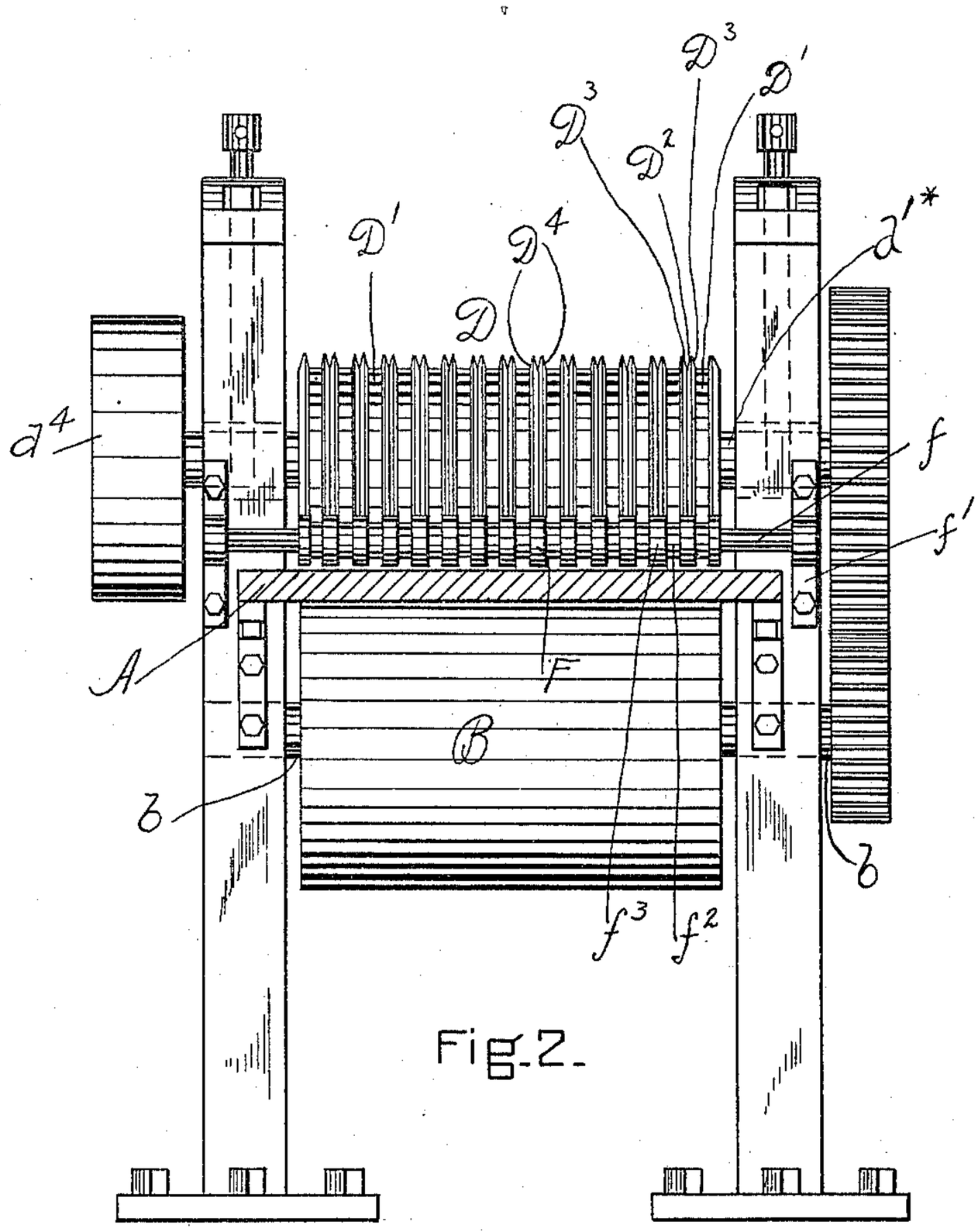

Fig. 2.

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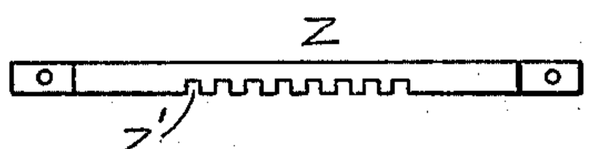

Fig. 7a.

Fig. 7.

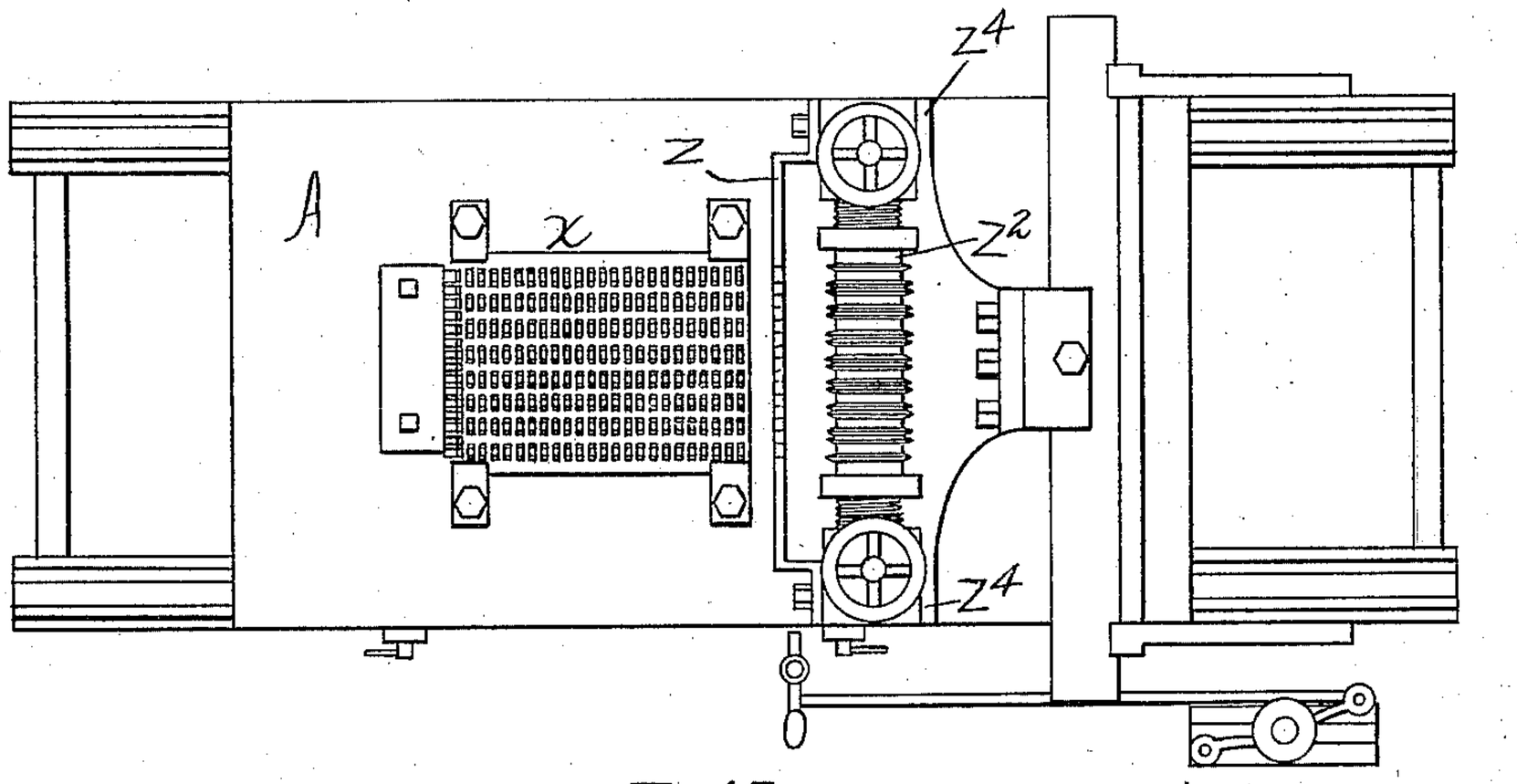

Fig. 8.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING NON-SLIPPING TREADS, PAVEMENTS, &c.

SPECIFICATION forming part of Letters Patent No. 688,736, dated December 10, 1901.

Application filed March 28, 1900. Serial No. 10,462. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM HUESTIS, a citizen of the United States, residing at Newtonville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Non-Slipping Treads, Pavements, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation, and Fig. 2 a front elevation, partly in section, on line 2 2 of Fig. 1, of one form of machine embodying my invention. Fig. 3 is a top plan view of one form of a sheet-metal base-plate operated upon in my machine. Fig. 4 is a sectional view on line 4 4 of Fig. 3. Fig. 5 is a perspective view showing a plurality of lead strips of a width and thickness required for combination with the base-plate, partially combined with the base-plate. Fig. 6 is a sectional view at line 6 6 of Fig. 5 of a combined base-plate and lead strips, this view illustrating the product of my new machine. Fig. 7 is a side elevation, and Fig. 8 a top plan view, of a modified form of machine embodying my invention. Fig. 7ª is a front elevation of the strip-guide detached.

The object of my invention is to produce a machine for the manufacture of what are commercially known as "non-slipping" treads, pavements, &c., and the machine here shown as an embodiment of my invention is made with particular reference to the manufacture of treads and the like set forth in United States Letters Patent No. 638,666, granted to me as assignor on December 5, 1899.

In the drawings illustrating the principle of my invention and the best mode now known to me of applying that principle, A is the table of the machine, and B is a roll constituting a movable work-support.

D is the pressing and molding roll.

Supporting-roll B is provided with journals b, mounted in suitable boxes b' of the machine-frame a, the periphery of the supporting-roll B lying in the recess a' of the work-support A and being about flush with the upper surface of the work-support. Frame a is bifurcated above the work-support A, the bifurcations a^2 being parallel and receiving between them the boxes d, in which the pressing and molding roll D is journaled, these boxes d being mounted on springs d', which slide in ways d^2 of the inner opposed and parallel sides of the bifurcations a^2. The springs d' conveniently rest on the upper surfaces of the boxes b'. The upper ends of the bifurcations a^2 are connected by a cross-piece a^3, in which the adjusting-screws a^4 are mounted, the inner ends of these adjusting-screws impinging the boxes d, and thus effecting means for adjusting the pressing and molding roll D toward the coöperating movable work-support, which is in the preferred construction in the form of a supporting roll or drum B, and against the springs d'. One of the journals d'^* of roll D is provided with a gear d^3, and the corresponding journal b of roll B is provided with a gear b^2, which meshes with gear d^3, so that the two rolls are driven together when power is applied to the pulley d^4 on the other end of the shaft of the pressing and molding roll D.

The machine is provided above table A and on its feed side with a recessed guide-roll F, the journals f of which are mounted in any suitable bearings f'—such, for example, as the brackets shown fast on the inner legs or bifurcations a^2 of the frame a.

The tread, pavement, or the like produced in this machine is made up of a hard-metal, preferably steel, plate x, which is provided on its upper side with a series of upwardly-projecting wear-points x'. These wear-points x' are arranged in parallel rows. Between each set of rows of wear-points x' the plate is formed with rows of perforations x^2, the plate being preferably imperforate, as shown along the lanes or spaces x^3, that alternate with the rows of perforations. The purpose of the machine is to combine a plurality of lead strips y simultaneously with the plate by pressing the strips simultaneously through the perforations x^2 (so as to anchor the lead on the back or under side of the plate) and molding the strips and upturned wear-points together, trimming the opposed edges of the lead strips so as to leave the lines or spaces x^3, where the plate is imperforate, free and clear of lead.

The pressing and molding roll D is provided with circumferential and alternating pressing-surfaces D′ and projecting disks D². The pressing and molding surfaces D′ by pressing the soft-metal or lead strips *y* between upturned wear-points *x′* of the base-plate on roll B force portions of the soft strip *y* through the perforations x^2 and cause the soft lead to expand and anchor itself at *y′* on the back of the plate, at the same time forcing the soft metal outwardly between the opposed narrow edges of the projections or wear-points, as shown at y^2 in Fig. 5, where end portions of several strips are shown molded into permanent union with the base-plate. Thus the lead strips are transformed in shape by pressure and anchored in place on the back of the strips and compacted between the opposed wide surfaces of the wear-points and also compacted between the opposed thin edges of the wear-points, which would remain in that vertical position were it not for the preferred molding effect wrought by the sides of the disks D² as they pass between the upturned wear-points along the lines where no lead is to be mounted. The action of the pressing-surfaces D′ tends to cause the lead to bulge out between the wear-points into vacant spaces or lanes x^3, and the disks D², which are of a greater diameter than the pressing-surfaces D′, pass through these lanes x^3, the peripheral edges D³ of the disks D² forming cutting edges, which cut off the outwardly-bulging or laterally-projecting portions of the soft metal, while the outer marginal and circumferential inclines D⁴ of the disks D² smooth the lateral surfaces of the projecting lead between the wear-points, curving the lead slightly inwardly and upwardly between the wear-points, and at the same time slightly canting the free end portions of the wear-points inwardly, as illustrated in Figs. 5 and 6. Each disk D² is preferably formed with two cutting edges D³, one for each side of each vacant lane of the base-plate of the tread, and with two molding or smoothing inclines D⁴, one for each side of each vacant lane.

The roll D may be made, of course, in many different ways; but for cheapness of construction I prefer to make the bearing-surfaces D′ of annuli, each of which has a flat peripheral surface and a bore of sufficient diameter to fit the shaft *d′*. The disks D² are each preferably made of two annuli having an internal bore sufficient to fit the shaft *d′**. The guide-roll F is similarly made of a shaft *f* and a series of disks of different diameters f^2 f^3, mounted on and rotating said shaft. These disks may have flat peripheral surfaces, as shown, and they are alternately disposed on the shaft, so that the larger or projecting disks f^3 travel in the lanes or vacant spaces x^3 of the base-plate, the edges of each lead strip being laterally guided by the projecting side edges of the disks f^3 and controlled across their tops by the flat peripheries of the smaller disks f^2 between the larger projecting disks f^3. The disks f^2 and f^3 form alternating indentations and projections.

The base-plate being mounted on table A in such position that the larger disks f^3 will run along the vacant lanes of the base-plate and the free ends of the desired number of lead strips being mounted between the lateral edges of the disks f^3 and in line with the rows of perforations x^2 between the upturned wear-points *x′* rotation of the coöperating rolls B and D after the adjacent ends of the base-plate and therewith-assembled strips have been pushed between the rolls, so that they nip the work, feeds the work forward, and the strip and plate are molded together. The cutting edges D³ of disks D² are each mounted in a vertical plane corresponding with that of one of the larger disks f^3 on the guide-roll F, and each pressing-surface D′ is mounted in the plane of the smaller disk f^2 on the guide-roll F. By means of this machine a plurality of lead strips are simultaneously molded and combined with a hard-metal base-plate, and the pavement or tread already patented by my said patent is very speedily and economically manufactured. By the action of this machine the lead strips are each transformed by pressure into an anchored non-slipping filling, and the sheet-metal plate in respect of the upturned wear-points is also transformed by pressure into a plate having a plurality of wear-points, the upper surfaces of which are flush with the anchored lead and also curved slightly inwardly, so as to form projecting surfaces for the upper outward corners of the anchored lead and to form upwardly and outwardly flaring grooves or lanes on the surface of the finished tread, whereby the escape and displacement of dirt are more readily effected than would be the case were the upturned wear-points left vertical.

The apparatus herein set forth may be used in practicing the method set forth in my allowed application, Serial No. 10,461, of even date herewith.

In Figs. 7, 7ª, and 8, showing a modification, the work-support A is the reciprocating bed of an ordinary planer and constitutes the movable work-support of this form of machine. The guide instead of being an intermittently-recessed roll, as in the preferred form, is a stationary transverse bar *z*, having a series of recesses *z′* along its lower edge, these recesses being adapted to receive the lead strips. The pressing and molding roll z^2 is mounted in a bracket z^3, fast to the vertical uprights z^4. It is not intended that roll z^2 be driven by belt or gearings on its journals, for the roll will rotate when the combined tread-plate and lead strips are carried underneath it by the reciprocation of the bed A. I have therefore used this modified construction with good results and illustrate it here for the purpose of showing that the horizontal reciprocating bed of the planer is the mechanical equivalent of the work-sup-

port and supporting-roll of the preferred form of my machine. In Fig. 8 I show a plate *x* clamped in place on the bed of the machine. The construction of reciprocating planers is so well known that it is unnecessary to illustrate the subordinate mechanisms thereof, which will be readily understood by all skilled mechanics from what is shown in Figs. 7 and 8.

What I claim is—

In a machine for making so-called "non-slipping" treads, paving and the like, the combination of a cylindrical supporting-roll suitably mounted in the machine-frame; a table provided with a recess extending across the same and up through which the periphery of said supporting-roll slightly projects; a presser-roll lying above, and out of contact with, said supporting-roll, said presser-roll having recessed strip-pressing surfaces which alternate with projecting disks; a projecting disk bearing at each side of a strip-pressing surface, and having two cutting peripheral edges, one at each side of the projecting disk; a guide-roll located above said table and provided with collars, the recesses formed thereby being in alinement with the recesses in the presser-roll; means for elastically mounting and adjusting the presser-roll relatively to the supporting-roll; and means for operatively connecting said presser-roll and said supporting-roll.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK WILLIAM HUESTIS.

Witnesses:

EDWARD S. BEACH,

E. A. ALLEN.