T. LENNOX.

SHEARING MACHINE.

APPLICATION FILED JUNE 15, 1911.

1,020,508.

Patented Mar. 19, 1912

2 SHEETS—SHEET 1.

Fig. 1.

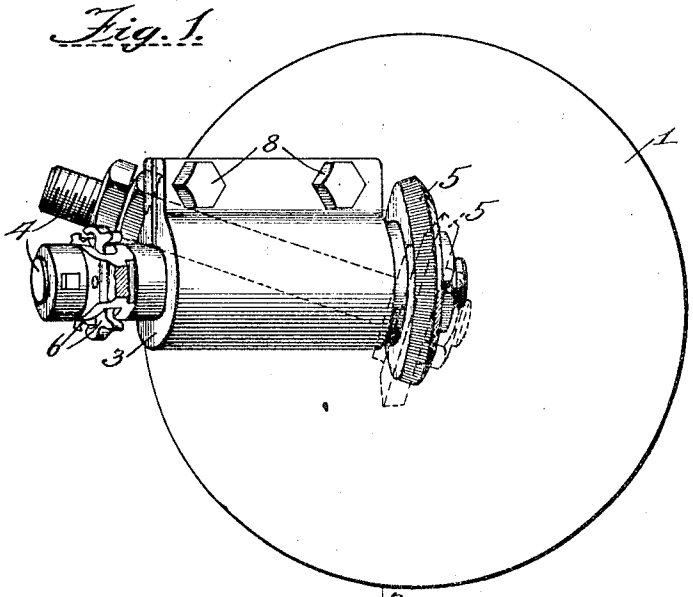
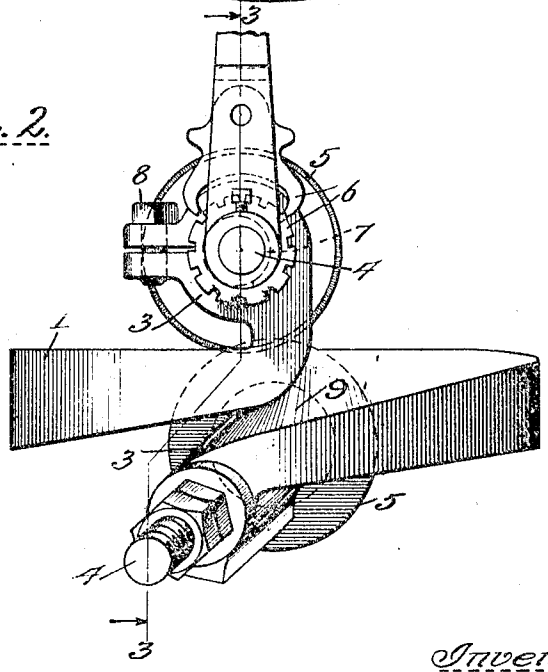


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

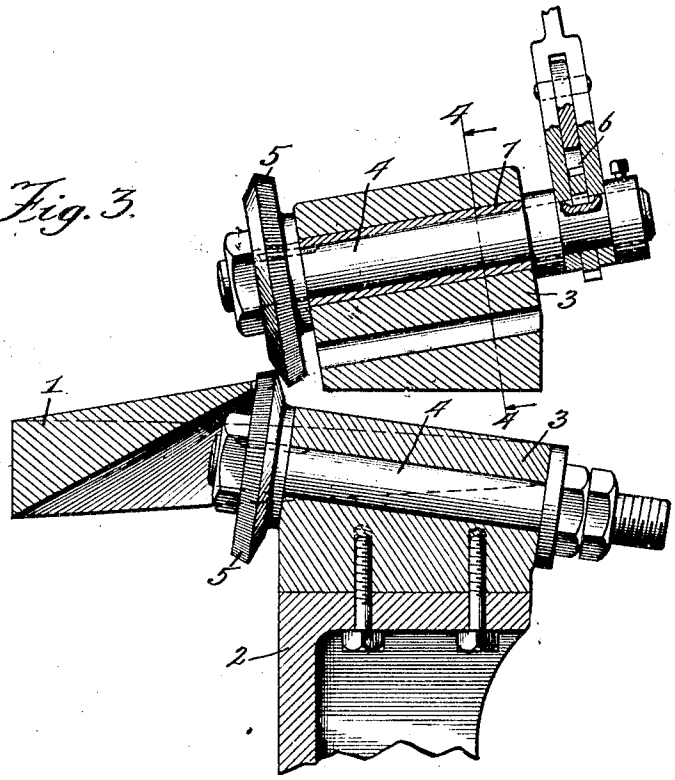
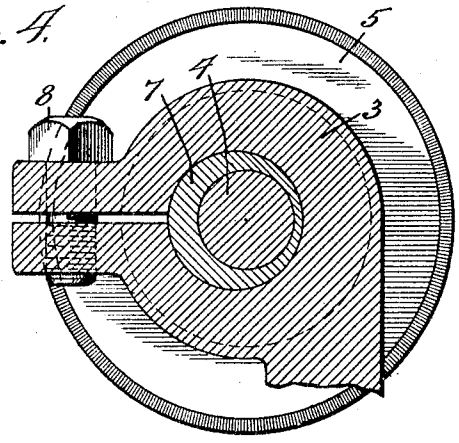


Fig. 4.



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UNITED STATES PATENT OFFICE.

TALBOT LENNOX, OF CHICAGO, ILLINOIS.

SHEARING-MACHINE.

1,020,508. Specification of Letters Patent. Patented Mar. 19, 1912.

Application filed June 15, 1911. Serial No. 633,394.

To all whom it may concern:

Be it known that I, TALBOT LENNOX, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Shearing-Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to shearing machines and has for its object the provision of a novel form of shearing machine in which a number of objections present in prior machines are eliminated.

The shearing machines to which my invention particularly relates are those which include co-acting roller cutters. Hitherto these roller cutters have been journaled upon the opposed ends of yokes. A shearing machine as thus hitherto constructed limited the size of the product and the shapes and extents of the patterns cut by the machine from sheet material. The machine of my invention removes or lessens these limitations and includes a plate, bearings upon opposite sides of the plate, and co-acting roller cutters rotatable upon said bearings and having their peripheries brought into close proximity to each other at one face of the plate.

My invention, as preferably practiced, includes a plate having one of its faces of helical formation and its other face adapted to support the material to be operated upon, bearings being preferably provided upon opposite sides of the plate, and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the axes of rotation of the cutters lying in intersecting planes, the plate being provided with a guiding surface for directing material operated upon from this latter face to the face of helical formation.

I will explain my invention more fully by reference to the accompanying drawings showing the preferred embodiment thereof in which—

Figure 1 is a plan view of my improved shearing machine; Fig. 2 is a side elevation taken in the direct line of axis of rotation of the upper roller cutter; Fig. 3 is a sectional view on line 3 3 of Fig. 2; and Fig. 4 is a sectional view of part of the mechanism on line 4 4 of Fig. 3.

Like parts are indicated by similar characters of reference throughout the different figures.

In the embodiment of the invention illustrated I have employed a plate 1 that is preferably horizontally disposed and is bolted upon its under side to any suitable form of support 2. The plate is of circular contour in plan and its bottom surface and its top surface are of helical formation, the slope of the under surface being sharper than the slope of the upper surface so as to make the plate thin at its central portion. The ends of the spiral plate are formed into journals 3, one upon the bottom side of the plate and the other upon the top side of the plate. These journals constitute bearings for shafts 4 that carry co-acting roller cutters 5 whose peripheries are in close proximity at the central portion of the plate where the bottom and top surfaces of the plate are closest. The axes of rotation of the shafts 4 desirably diverge from the roller cutters and desirably lie in intersecting planes, by which expression I mean that none of the planes in which the axes of rotation lie are co-incident, as I am aware that the axes of rotation of co-acting roller cutters have been angularly related to each other but these axes lie in the same plane. I do not herein claim axes of rotation that diverge and converge but I do consider it to be novel with me to dispose the axes of rotation in non-coincident and intersecting planes. The planes of rotation of the roller cutters are nearly perpendicular to the top or feeding surface of the plate. By the relative arrangement of the plate and the roller cutters that has been described, I am enabled to cut sheet material along sharper curves and angles than it was possible hitherto so to do with roller cutters of given diameters. One of the shafts 4, say the upper shaft, is positively driven as by means of ratchet mechanism 6.

Where light sheet metal is to be cut the roller cutters may be in contact in which case a similar rotation of the lower roller cutter will result. To provide for adjustment between the roller cutters to suit the different thicknesses of the sheet metal or other material to be cut, I provide a lining 7 for the upper journal, the bore of this lining being eccentric with respect to the sleeve containing it, the associate shaft 4 turning directly within the bore of the lin-

ing 7. This lining 7 may be turned in its containing sleeve and may be secured in any position to which it is turned by clamping bolts 8 that serve to clamp the sleeve containing the lining 7 upon said lining, this sleeve being longitudinally split for the purpose as indicated, the bolts 8 when loosened permitting the lining 7 to be turned for the purpose stated. A gap 9 intervenes between the overlapping ends of the spiral plate 1. As the shearing proceeds material that has been cut passes through the gap. The top wall of this gap affords a guiding surface for directing such material from the top or feeding side of the plate to the under side of the plate, the helical formation of the bottom face of the plate acting to dispose of the material without permitting it to return to the roller cutters.

By providing the plate 1 with the bearings 3 upon its opposite sides and by employing the guiding surface for directing material operated upon from the top surface to the bottom surface of the plate, all limitations as to the size of the sheet operated upon are removed and the machine is adapted to cut sheet material along lines of sharper curves and angles than was hitherto possible and I therefore consider the most important feature of my invention to reside in a mounting plate carrying bearings upon opposite sides thereof in which roller cutters are disposed in relation to cut sheet material passed between the roller cutters. With the machine of my invention it is possible to cut to the center of any size sheet in a large variety of curves including complete circles and reversed curves.

Having thus described my invention, I claim as new and desire to secure by Letters Patent the following:—

1. A shearing machine including a plate having one of its faces of helical formation and its other face adapted to support the material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the axes of rotation of the cutters lying in non-coincident and intersecting planes, the plate being provided with a guiding surface for directing material operated upon from the material supporting face to said face of helical formation.

2. A shearing machine including a plate having one of its faces of helical formation and its other face adapted to support the material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the plate being provided with a guiding surface for directing material operated upon from the material supporting face to said face of helical formation.

3. A shearing machine including a plate; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at one face of the plate, the axes of rotation of the cutters lying in non-coincident and intersecting planes, the plate being formed to have its opposite faces in close proximity, where the peripheries of the roller cutters are in close proximity, the plate being provided with a guiding surface for directing material operated upon from one side of the plate to the other.

4. A shearing machine including a plate having one of its faces adapted to support material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the plate being formed to have its opposite faces in close proximity where the peripheries of the roller cutters are in close proximity, the plate being provided with a guiding surface for directing material operated upon from one side of the plate to the other.

5. A shearing machine including a plate having one of its faces adapted to support material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the axes of rotation of the cutters lying in non-coincident and intersecting planes, the plate being provided with a guiding surface for directing material operated upon from one side of the plate to the other.

6. A shearing machine including a plate having one of its faces adapted to support material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the plate being provided with a guiding surface for directing material operated upon from one side of the plate to the other.

7. A shearing machine including a plate having one of its faces adapted to support material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate, the axes of rotation of the cutters lying in non-coincident and in-

tersecting planes, the plate being formed to have its opposite faces in close proximity where the peripheries of the roller cutters are in close proximity.

8. A shearing machine including a plate; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at one face of the plate, the plate being formed to have its opposite faces in close proximity where the peripheries of the roller cutters are in close proximity.

9. A shearing machine including a plate; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at one face of the plate, the axes of rotation of the cutters lying in non-coincident and intersecting planes.

10. A shearing machine including a plate having one of its faces adapted to support material operated upon; bearings upon opposite sides of and connected with the plate; and co-acting roller cutters rotatable upon said bearings and having their peripheries in close proximity at the material supporting face of the plate.

11. A shearing machine including a feed plate having one of its faces adapted to support material operated upon; and co-acting roller cutters having planes of rotation nearly perpendicular to the feeding surface of said plate and having their peripheries in close proximity at said feeding surface, the axes of rotation of the cutters lying in non-coincident and intersecting planes.

12. A shearing machine including a plate having one of its faces adapted to support material operated upon and co-acting roller cutters upon opposite sides of the plate and having their peripheries in close proximity at the material supporting face of the plate, the plate being provided with a guiding surface for directing material operated upon from one side of the plate to the other.

13. A shearing machine including a feed plate having one of its faces adapted to support the material operated upon; and co-acting roller cutters having their peripheries in close proximity at said face, the axes of rotation of the cutters lying in non-coincident and intersecting planes.

In witness whereof, I hereunto subscribe my name this 5th day of June A. D., 1911.

TALBOT LENNOX.

Witnesses:

G. L. CRAGG,

E. L. WHITE.