No. 619,086. Patented Feb. 7, 1899.

G. A. OHL, JR.

MACHINE FOR MAKING SHEET METAL LATH.

(Application filed Mar. 25, 1898.)

(No Model.)

2 Sheets—Sheet 1.

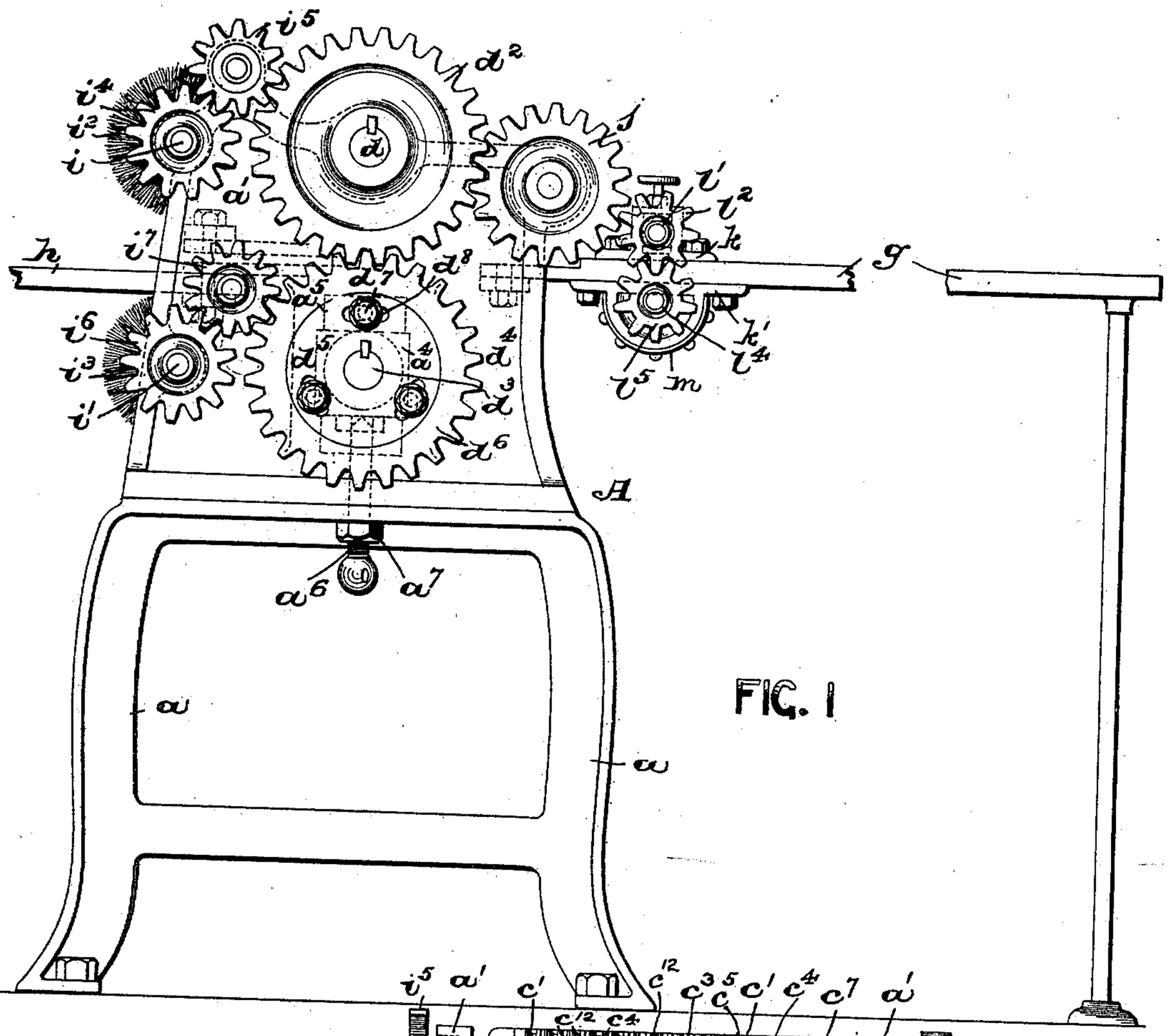

FIG. 1

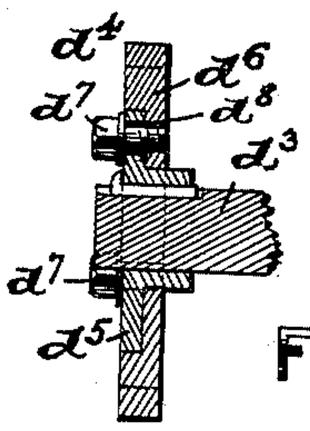

FIG. 3

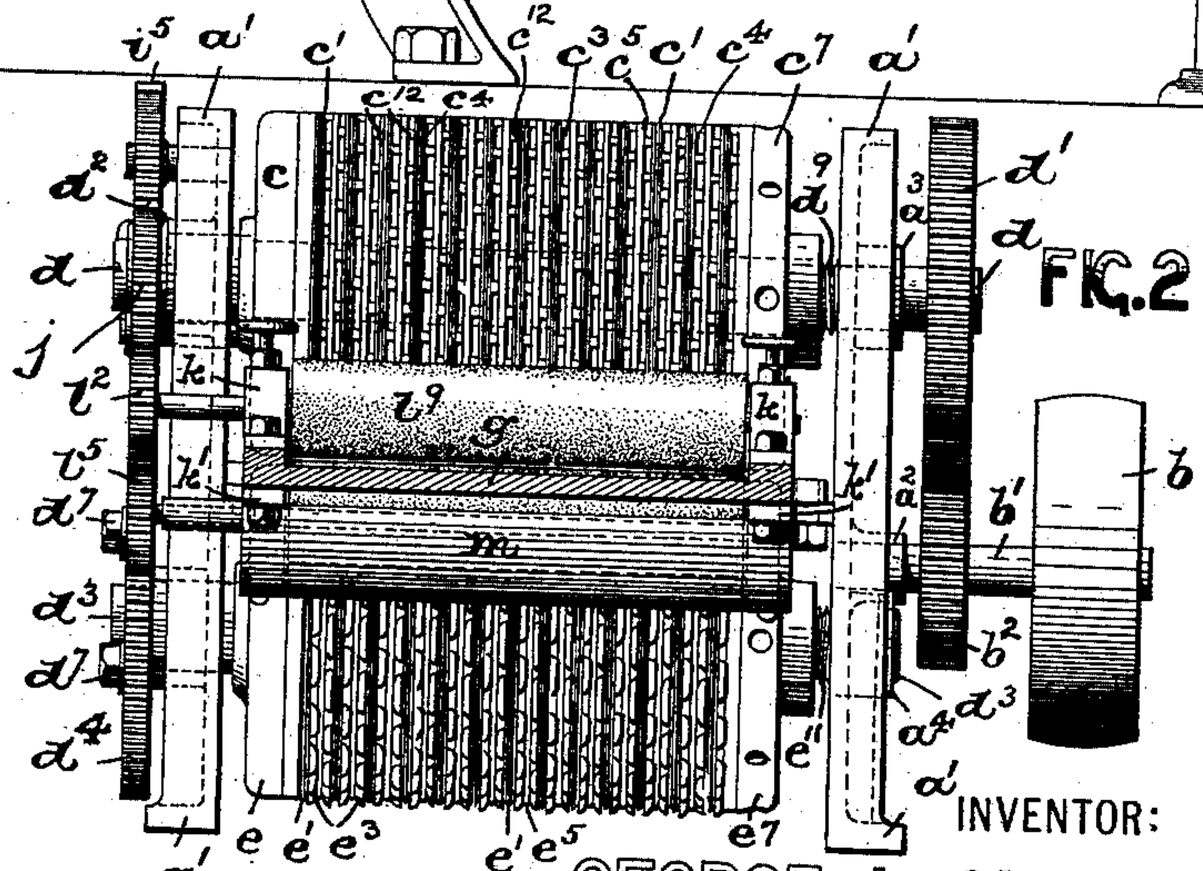

FIG. 2

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MACHINE FOR MAKING SHEET METAL LATH.

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(No Model.) 2 Sheets—Sheet 2.

FIG. 4

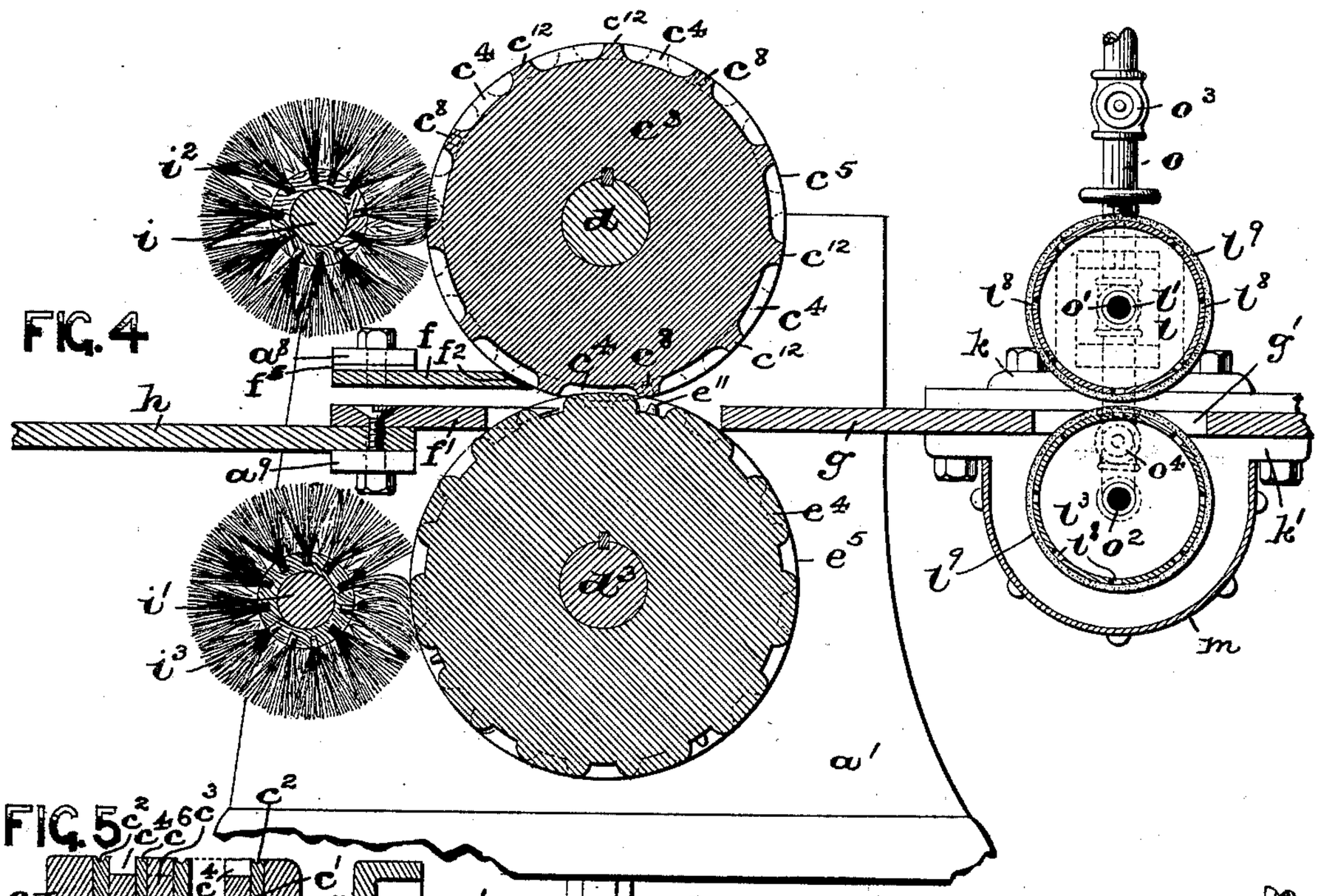


FIG. 5

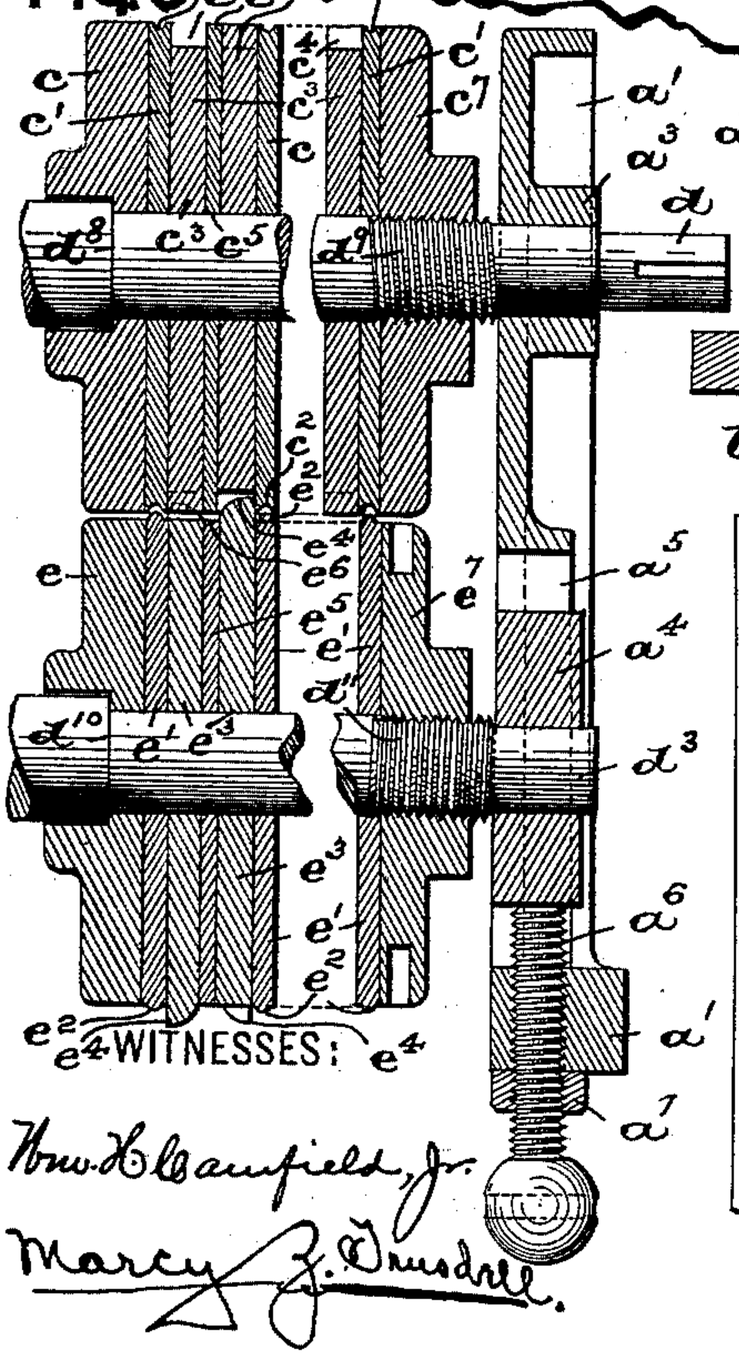


FIG. 6

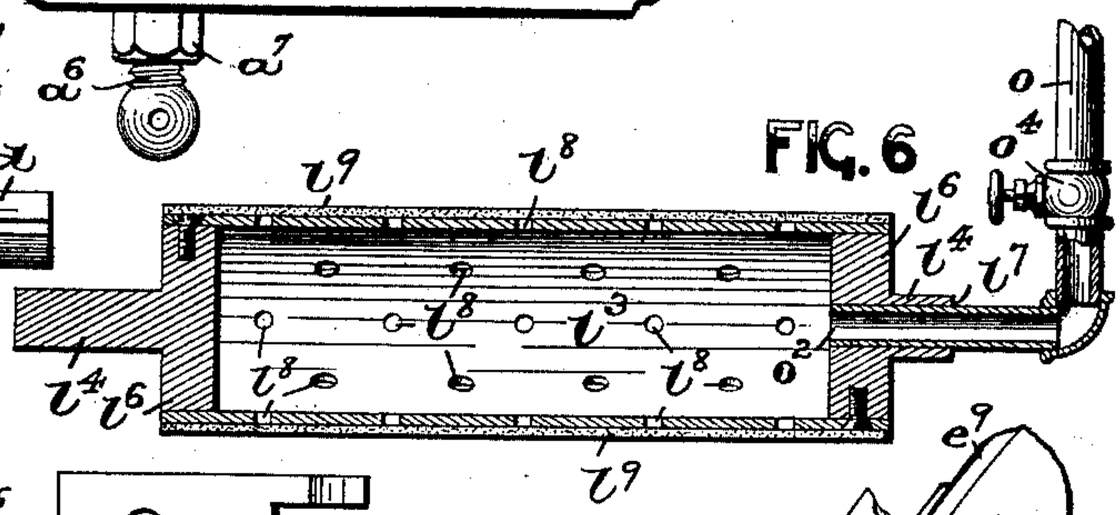


FIG. 7

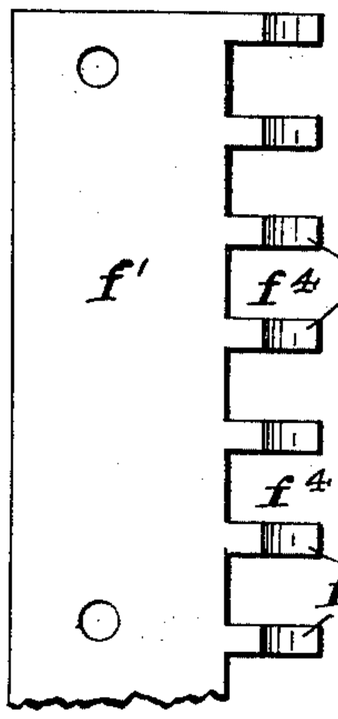
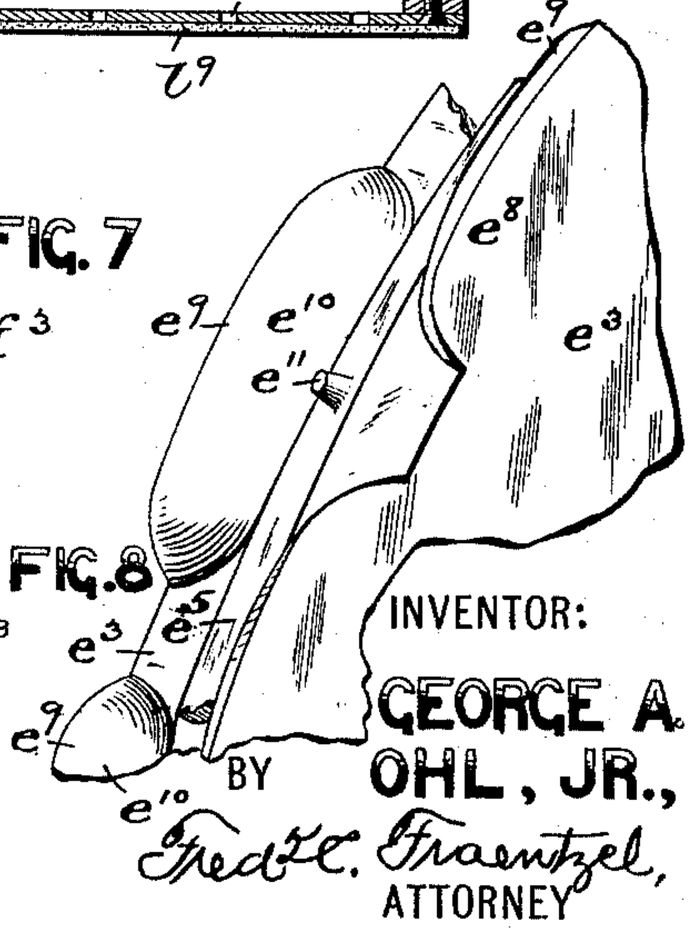


FIG. 8



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UNITED STATES PATENT OFFICE.

GEORGE A. OHL, JR., OF NEWARK, NEW JERSEY.

MACHINE FOR MAKING SHEET-METAL LATH.

SPECIFICATION forming part of Letters Patent No. 619,086, dated February 7, 1899.

Application filed March 25, 1898. Serial No. 675,068. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. OHL, Jr., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Making Sheet-Metal Lath; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates particularly to a novel construction of machine for the manufacture of sheet-metal lathing, which I term "pocket-lath," and the construction of which is illustrated and described in an application for Letters Patent of the United States filed by myself contemporaneously herewith and serially numbered 675,067; and the invention has for its primary objects to provide a machine of this character for making such construction of pocket-lath, said machine comprising suitably-arranged rolls, one having annular rows of recessed portions or depressions and supports and the other having annular rows of cutters of a peculiar shape to shear portions of the metal sheets which are passed between the rolls by forming longitudinal slits and adjacent to one side of each slit throwing or forcing out the metal by elongating the same, and thereby forming mortar or filling retaining pockets in the metal sheet.

A further object is to provide a machine for making sheet-metal lath, comprising rolls, certain rolls having punch-receiving recesses and other rolls having an arrangement of punches for piercing the metal sheet at intervals and forming holes therein for fastening nails or other suitable fastening means.

Other objects of this invention are to provide a novel mechanism for feeding a lubricant or other liquid in contact with the metal sheet and with the cutters or dies, and also a novel means for brushing or cleaning the rolls.

With these ends in view the invention consists in the novel construction of lath-making machine set forth in the accompanying specification and in such novel arrangements and combinations of parts, as well as in the details of the construction thereof, all of which will be hereinafter fully described, and finally embodied in the clauses of the claim.

The invention is illustrated in the accompanying sheets of drawings, in which—

Figure 1 is a side elevation of the machine embodying the principles of this invention. Fig. 2 is a front elevation of the feeding-rolls, the lubricating mechanism, and means for operating the several parts of the machine, the front table of the machine being represented in horizontal cross-section; and Fig. 3 is a vertical section of an adjustable gear employed in connection with the machine. Fig. 4 is a longitudinal vertical section of a portion of the machine-frame, illustrating more clearly in connection therewith the arrangement of the upper and lower feeding and punching rolls and also an arrangement of lubricant or liquid feeding rolls. Fig. 5 is a vertical section of the upper and lower rolls for feeding and punching the metal, illustrating one arrangement of disks, some provided with the annular rows of depressions or recesses and intermediate supports and some being provided with cutters and intermediate plane disks, said view also representing in vertical section an arrangement of adjustable bearings for raising or lowering the lower roll to produce pockets in the metal sheet of varying depths. Fig. 6 is a longitudinal vertical section of one of a pair of lubricant or liquid feeding rolls to be used in the machine. Fig. 7 is a bottom view of a plate for guiding the metal sheet as it passes from the back of the feeding-rolls. Fig. 8 is a perspective view of portions of the punching and shearing disks, illustrating more in detail the shape of the cutters for shearing the metal.

Similar letters of reference are employed in all of the above-described views to indicate corresponding parts.

In said drawings, A indicates the complete machine, comprising the usual supports a, on which are arranged the respective bearing-frames a', in which are the several bearings for the respective shafts or journals for the main driving-pulley b and the upper and lower feeding-rolls. One of said frames a', as will be seen from Fig. 2, has a bearing a^2, in which is rotatively arranged a journal b'

for the driving-pulley b. Said journal b' has a pinion b^2, which meshes with a gear d' on a shaft or journal d, rotatively arranged in bearings a^3 in the frames a'. Said shaft carries between the two frames a' the several disks of the upper feeding-roll and is provided with a gear d^2 at its opposite end, as illustrated in Fig. 1. In vertical alinement with the bearings a^3 in the two frames a' are vertically-adjustable bearings a^4, arranged to be moved up or down in certain guide portions a^5 in said frames by suitable screws a^6, having jam-nuts a^7 for locking and holding said bearings in their adjusted positions. Rotatively arranged in said adjustable bearings a^4 is a shaft or journal d^3, which is actuated by an adjustable gear d^4 in operative mesh with the gear of the driver-shaft d. Said gear d^4 consists, essentially, of a small disk d^5, which is keyed or otherwise fastened to the end of the shaft d^3, and concentrically arranged on the peripheral edge of said disk d^5 is a toothed ring d^6, the teeth of which are in operative mesh with the teeth of the upper gear d^2 on the shaft d. The said ring d^6 is slidably connected with the disk d^5 by means of bolts d^7, which are passed through slots d^8 in the disk d^5 and are screwed into the said ring d^6, as clearly illustrated in Figs. 1 and 3. It will thus be seen that when the bolts d^7 are loosened the said bearings a^4 can be adjusted, and thereby by the sliding arrangement of the ring d^6 the teeth on said ring and those on the gear-wheel can be brought into their proper mesh without danger of breaking the teeth or the jamming of the other parts of the machine.

The upper feed-roll comprises a number of disks, the first disk c to the extreme left of the drawings in Fig. 5 fitting against a shoulder d^8 on the shaft d. Then there is a narrow disk c', provided with an annular groove c^2, then a disk c^3, having an annular row of depressions or recesses c^4 and intermediately-arranged supports c^{12}, (see Fig. 4,) then a disk c^5, having a plain cylindrical surface c^6, then another disk c^3, having annular depressions c^4, then another disk c', having an annular groove c^2, and so on. This arrangement of disks, which are all of the same diameters, is followed out until a screw portion d^9 on said shaft d is reached, on which there is a disk c^7, which is screwed up tight against the last disk c' to hold all the said disks in their operative positions on said shaft d. The lower feed-roll comprises a similar arrangement of disks, the first disk c to the extreme left of the drawings in said Fig. 5 fitting against a shoulder d^{10} on the journal or shaft d^3. Then there is a narrow disk e', provided with an annular bead e^2, coöperating with the groove c^2 in the disk c'. Then there is a disk e^3, having annular rows of cutters e^4 corresponding in number to the number of depressions c^4 in the disks c^3, then a disk e^5, having a plain cylindrical surface e^6, then another disk e^3, having cutters e^4, then another disk e', having a bead e^2, and so on. This arrangement of disks is followed out until a screw portion d^{11} on the shaft d^3 is reached, on which there is a disk e^7, which is screwed up tight against the last disk e' to hold all the said disks in their operative positions on said shaft d^3, the disks of the upper roll cooperating with the respective disks of the lower roll, as will be clearly evident from an inspection of Figs. 4 and 5.

The cutters on the disks e^3 are of a peculiar shape, each cutter having a flat surface e^8, a sharp cutting or knife edge e^9 for shearing the metal sheet, and a rounded surface e^{10}, which as soon as the edge e^9 shears the metal sheet passing been the feed-rolls will force the metal adjacent to one side of every slit in the sheet into the corresponding depressions c^4 in the disk c^3 of the upper roll, thereby elongating the metal at these points and forming pockets in the metal sheet without in the least shortening the entire length of the sheet. As has been stated, each disk c^3 has between each pair of depressions or recesses c^4 an intermediate support c^{12} for the metal sheet during its passage between the two feed-rolls, which prevents the tearing or breaking of the metal during the operations of forming the pockets and causes the cutters to make a clean cut or shear, and especially after the cutters have become dull it still results in the production of a perfect cut.

If desired, some of the disks of the lower roll may be provided with punching-studs e^{11}, which fit into correspondingly-arranged holes c^8 in some of the disks of the upper roll (indicated in dotted outline in Fig. 4,) to cut perforations in the metal sheet for the reception of nails or other suitable means employed in securing the completed lath to the studding of the wall before applying the filling or plaster to the lath.

The metal sheet to be formed into a lath is placed upon a front table g in front of the two feed-rolls and is pushed between the cooperating surfaces of the disks comprising said rolls. The metal lath thus being formed passes from the opposite sides of the two rolls between a pair of guide-plates f and f', secured on lugs a^8 and a^9, respectively, said lugs extending from the inner surfaces of the frames a', as illustrated in said Fig. 4. Secured to said lugs a^9 is a rear table h, which receives the finished lath as it passes from between the feed-rolls.

The upper guide-plate f has a chisel-shaped edge f^2, preferably ⌒-shaped in cross-section, which is in very close proximity to the peripheral surfaces of the disks on the upper feed-roll, while the lower guide-plate f' has a series of fingers f^3, preferably ⌒-shaped in cross-section, said fingers being in close proximity to the peripheral surfaces of the disks on the lower feed-roll, the spaces f^4 between said fingers f^3 permitting the passage of the cutters e^4 between said fingers, as will be understood. When said plates f and f' are in

the positions indicated in said Fig. 4, the sheet or lath will pass between them and will be retained perfectly straight; but when it is desired to produce a curved lath a plate f^5 is placed between the upper guide f and the lug a^8 on each side of the machine to thereby raise the said plate f, and the result will be that the metal lath as it comes from the rolls will become curved. Of course any other adjusting means in place of the plates f^5 for raising or lowering said guide-plate f may be employed, if desired.

Arranged in suitable bearings in the frames a' are the shafts i and i', having brushing-rolls i^2 and i^3, respectively, for cleaning the disks of the respective feed-rolls and keeping them free from the scale from the metal sheets passed between the rolls. The upper shaft i is operated by a gear i^4 and an idler i^5 from the gear d^2 on the shaft d, and the lower shaft i' is operated by a gear i^6 and an idler i^7 from the gear d^4 on the shaft d^3.

To lubricate the metal sheet before it is passed between the feed-rolls or to force any other liquid upon the metal sheet to coat the same and prevent it from corroding, I have secured in suitable positions at the sides of the front table g a pair of bearings k and k'. Rotatively arranged in the upper bearings k are the journals l' of a hollow cylinder l, one of the journals l' having a gear l^2 in mesh with an idler j, which is engaged by the gear-wheel d^2 on the shaft d. Rotatively arranged in the lower bearings k' are the journals l^4 of a similar hollow cylinder l^3, one of the journals of said cylinder l^3 having a gear l^5 in mesh with said gear l^2, operated from said idler j, as clearly illustrated in Fig. 1. Both said cylinders l and l^3 have their ends closed by disk portions l^6, connected with the journals; but the disk in one end of each cylinder l and l^3 has an opening or duct l^7, in which are arranged the ends o' and o^2 of a pipe o for conveying the liquid or lubricant into the interior of the respective cylinders l and l^3. In the cylindrical shell of each cylinder are suitably-disposed holes or perforations l^8, and each shell is covered with a piece of felt or other suitable fabric l^9, through which the liquid or lubricant oozes and thereby coats the surfaces of the metal sheet passing between said cylinders l and l^3 and before entering between the upper and lower feed-rolls of the machine. Said pipes o' and o^2 are connected with the pipe o by means of suitable connections, and a pair of valves o^3 and o^4 may be placed in the pipe o, whereby both cylinders l and l^3 can be supplied with liquid at the same time or whereby by closing the lower valve o^4 the supply of liquid can be entirely shut off from the lower cylinder l^3. The upper surface of the lower cylinder l^3 projects through an opening g' in the table g, and secured to the bearings k' is a metal plate m, which forms a receptacle to catch the drippings from the lower cylinder l^3 and prevents such drippings from dropping upon the floor.

Of course it will be evident that the feed-pipes to the cylinders l and l^3 may be differently arranged, so that the lower cylinder l^3 may be fed without feeding the upper cylinder l, or vice versa.

I am aware that changes may be made in the several arrangements and combinations of the parts of the machine herein set forth, as well as in the details of the construction thereof, without departing from the scope of my present invention. Hence I do not limit myself to the exact arrangements and combinations of parts, nor to the details of the construction thereof as herein described, and illustrated in the accompanying drawings.

Having thus described my invention, what I claim is—

1. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating said rolls, and means for feeding a lubricant or other liquid in contact with the surface of the metal sheet just prior to passing between said feed-rolls, and a pair of oppositely-placed guide-plates, one provided with a chisel-shaped edge f^2 in close proximity with the upper feed-roll, and the other having chisel-shaped fingers in close proximity to the lower punching-roll and also having spaces between said fingers to permit the passage of the cutters on said punching-roll between said fingers, substantially as and for the purposes set forth.

2. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating said rolls, and means for feeding a lubricant or other liquid in contact with the surface of the metal sheet just prior to passing between said feed-rolls, consisting, essentially, of a hollow cylinder having journals rotatively arranged in bearings on the machine, the shell of said cylinder having perforations, a flexible material or fabric over said shell, and a pipe extending into one end of said cylinder, substantially as and for the purposes set forth.

3. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating said rolls, a feeding-table g, and means thereon for feeding a lubricant or other liquid in contact with the surfaces of the metal sheet just prior to passing between said feed-rolls, and a pair of oppositely-placed guide-plates, one provided with a chisel-shaped edge f^2 in close proximity with the upper feed-roll, and the other having chisel-shaped fingers in close proximity to the lower punching-roll and also having spaces between said fingers to permit the passage of the cutters on said punching-roll between said fingers, substantially as and for the purposes set forth.

4. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating said rolls, a feeding-table g, and means thereon for feeding a lubricant or other liquid in contact with the surfaces of the metal sheet just prior to passing between said feed-rolls, consisting, essentially, of a pair of hollow cylinders having journals rotatively arranged in bearings on said table, the shell of each cylinder having perforations, a flexible material or fabric over the cylindrical surface of each cylinder, and a pipe extending into one end of each cylinder, substantially as and for the purposes set forth.

5. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating the same, rotary brushes for cleaning said rolls, and means for feeding a lubricant or other liquid in contact with the surface of the metal sheet just prior to passing between the feed-rolls, consisting, essentially, of a hollow cylinder having journals rotatively arranged in bearings on the machine, the shell of said cylinder having perforations, a flexible material or fabric over said shell, and a pipe extending into one end of said cylinder, substantially as and for the purposes set forth.

6. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating the same, and a pair of guide-plates adjustably arranged directly back of the operating-surfaces of said rolls, and a pair of oppositely-placed guide-plates, one provided with a chisel-shaped edge f^2 in close proximity with the upper feed-roll, and the other having chisel-shaped fingers in close proximity to the lower punching-roll and also having spaces between said fingers to permit the passage of the cutters on said punching-roll between said fingers, substantially as and for the purposes set forth.

7. In a machine for making sheet-metal lath, or the like, the combination, with the frame of the machine, of a pair of feed-rolls, having cutters and depressions to form a lath, mechanism for operating the same, and a pair of guide-plates f and f' directly back of said rolls, said plate f having a chisel-shaped edge f^2, and said plate f' having chisel-shaped fingers f^3 and intermediate spaces f^4, all arranged, substantially as and for the purposes set forth.

8. In a machine for making sheet-metal lath, a pair of feed-rolls, one of said feed-rolls comprising a series of disks provided with annular depressions or recesses, and intermediate disks having plain circumferential surfaces, and said other roll comprising a series of disks provided with annular rows or cutters directly opposite the depressions in the disks of the other roll, and each cutter having a straight surface e^8, a shearing edge e^9 to cut slits in the metal sheet, and a rounded shaping-surface e^{10}, to elongate the metal at one side of each slit to form a pocket, and intermediate disks between said cutter-disks having plain circumferential surfaces, substantially as and for the purposes set forth.

9. In a machine for making sheet-metal lath, a pair of feed-rolls, one of said feed-rolls comprising a series of disks provided with annular depressions or recesses, and intermediate disks having plain circumferential surfaces, and a series of disks having longitudinal grooves in their circumferential surfaces, and said other roll comprising a series of disks provided with annular rows of cutters directly opposite the depressions in the disks of the other roll, and each cutter having a straight surface e^8, a shearing edge e^9 to cut slits in the metal sheet, and a rounded shaping-surface e^{10}, to elongate the metal at one side of each slit to form a pocket, and intermediate disks between said cutter-disks having plain circumferential edges, and a series of disks having annular beads coöperating with said grooved disks, all substantially as and for the purposes set forth.

10. In a machine for making sheet-metal lath, a pair of feed-rolls, one of said feed-rolls comprising a series of disks provided with annular depressions or recesses, and intermediate disks having punching-studs e^{11}, and said other roll comprising a series of disks provided with annular rows of cutters directly opposite the depressions in the disks of the other roll, and each cutter having a straight surface e^8, a shearing edge e^9 to cut slits in the metal sheet, and a rounded shaping-surface e^{10}, to elongate the metal on one side of each slit and form a pocket, and intermediate disks having holes c^8 directly opposite said punching-studs, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 18th day of March, 1898.

GEORGE A. OHL, JR.

Witnesses:
FREDK. C. FRAENTZEL,
WM. H. CAMFIELD, Jr.