No. 878,472. PATENTED FEB. 4, 1908

L. C. STEELE.

ROLLS FOR CUTTING SHEET METAL.

APPLICATION FILED JUNE 16, 1905.

3 SHEETS—SHEET 1

Fig. 1

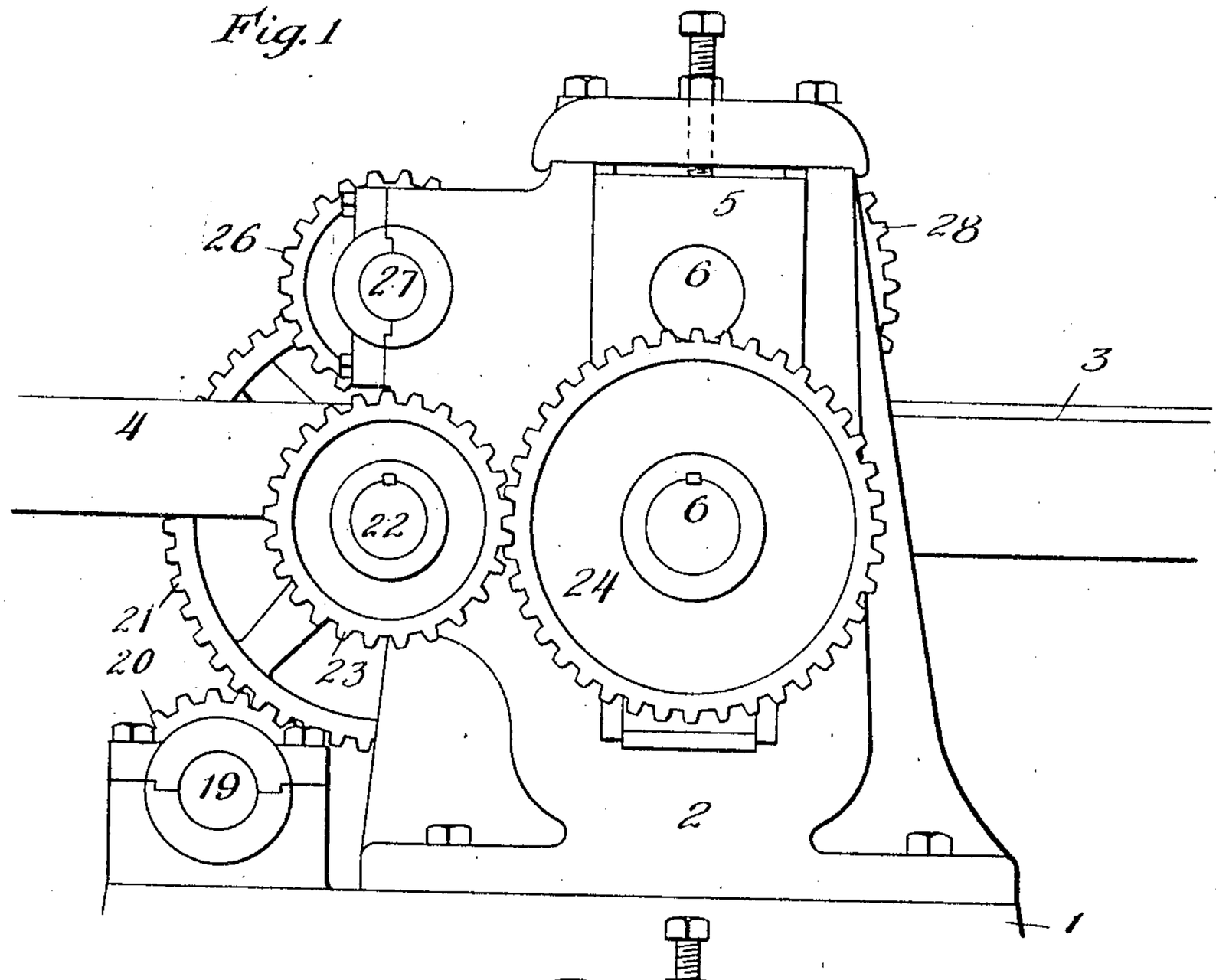
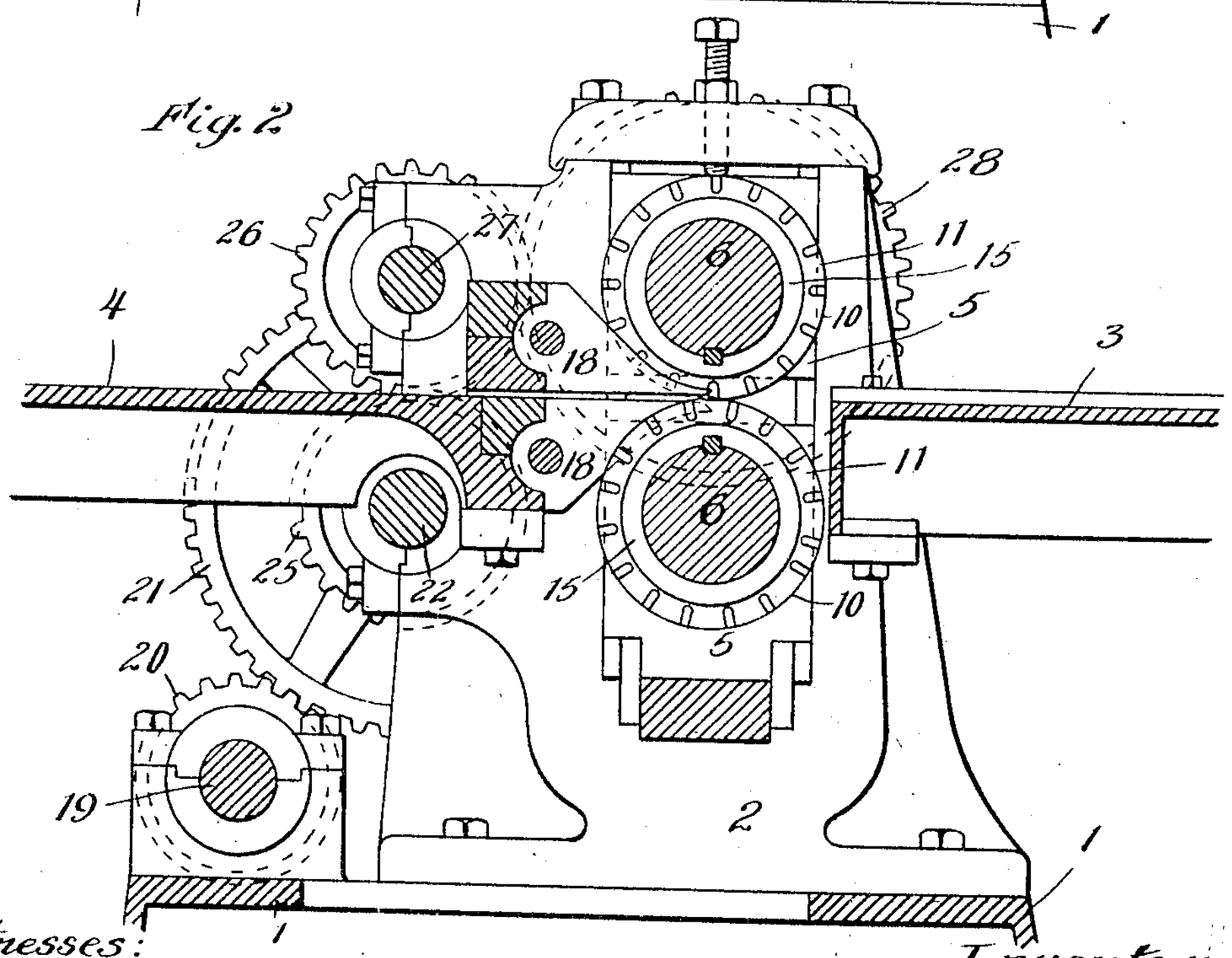


Fig. 2



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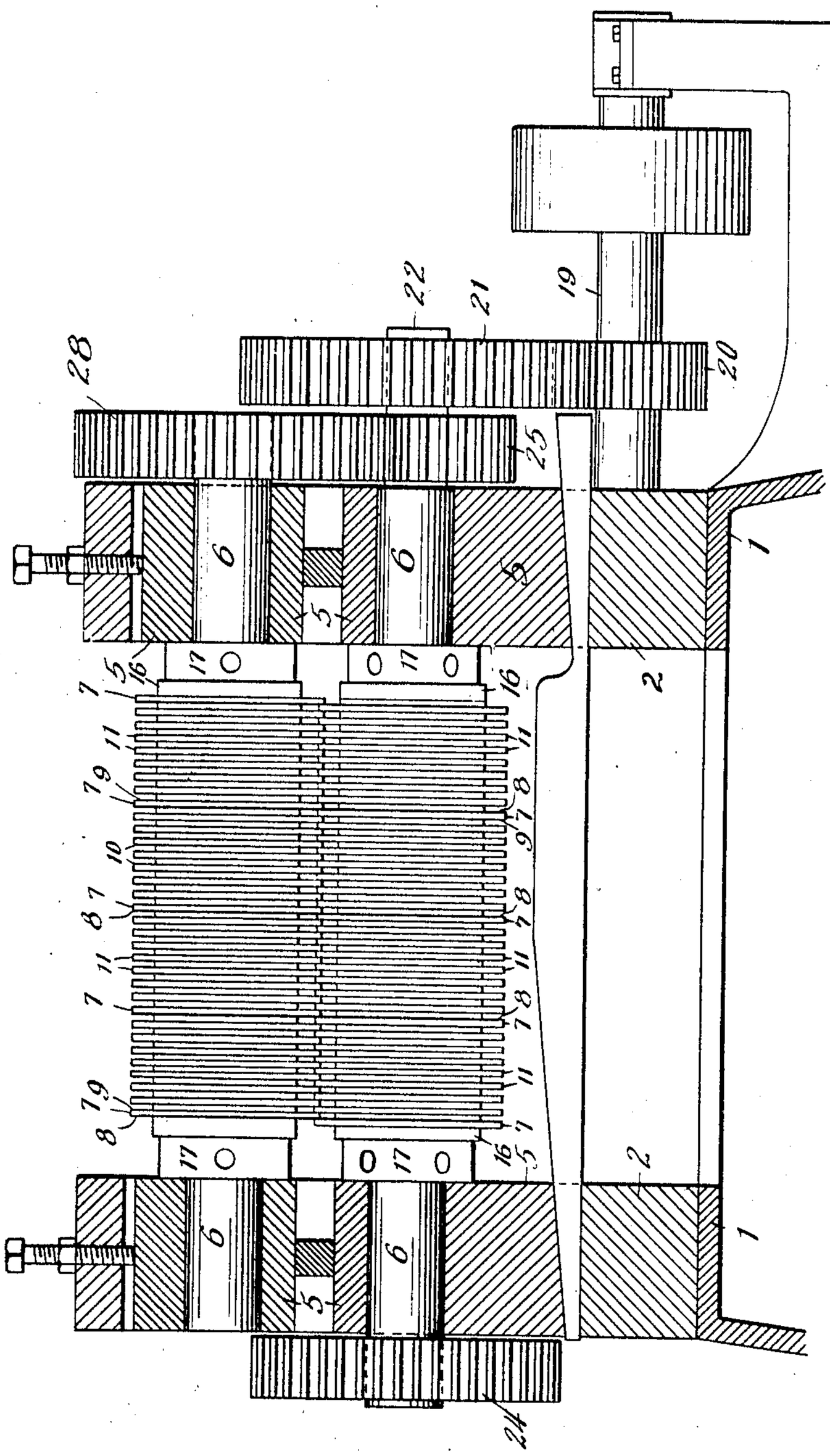

Fig. 3

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3 SHEETS—SHEET 3.

Fig. 4

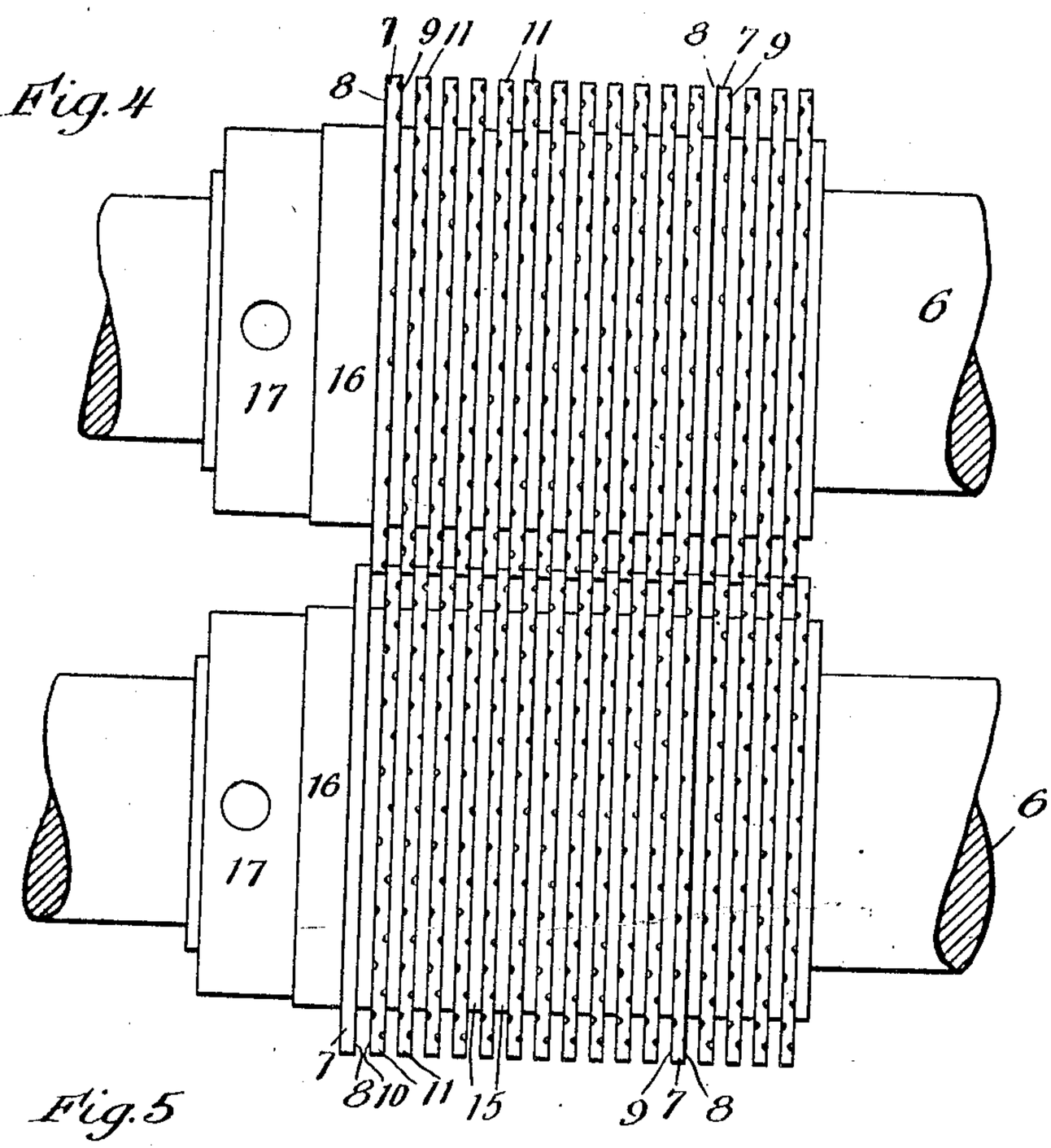
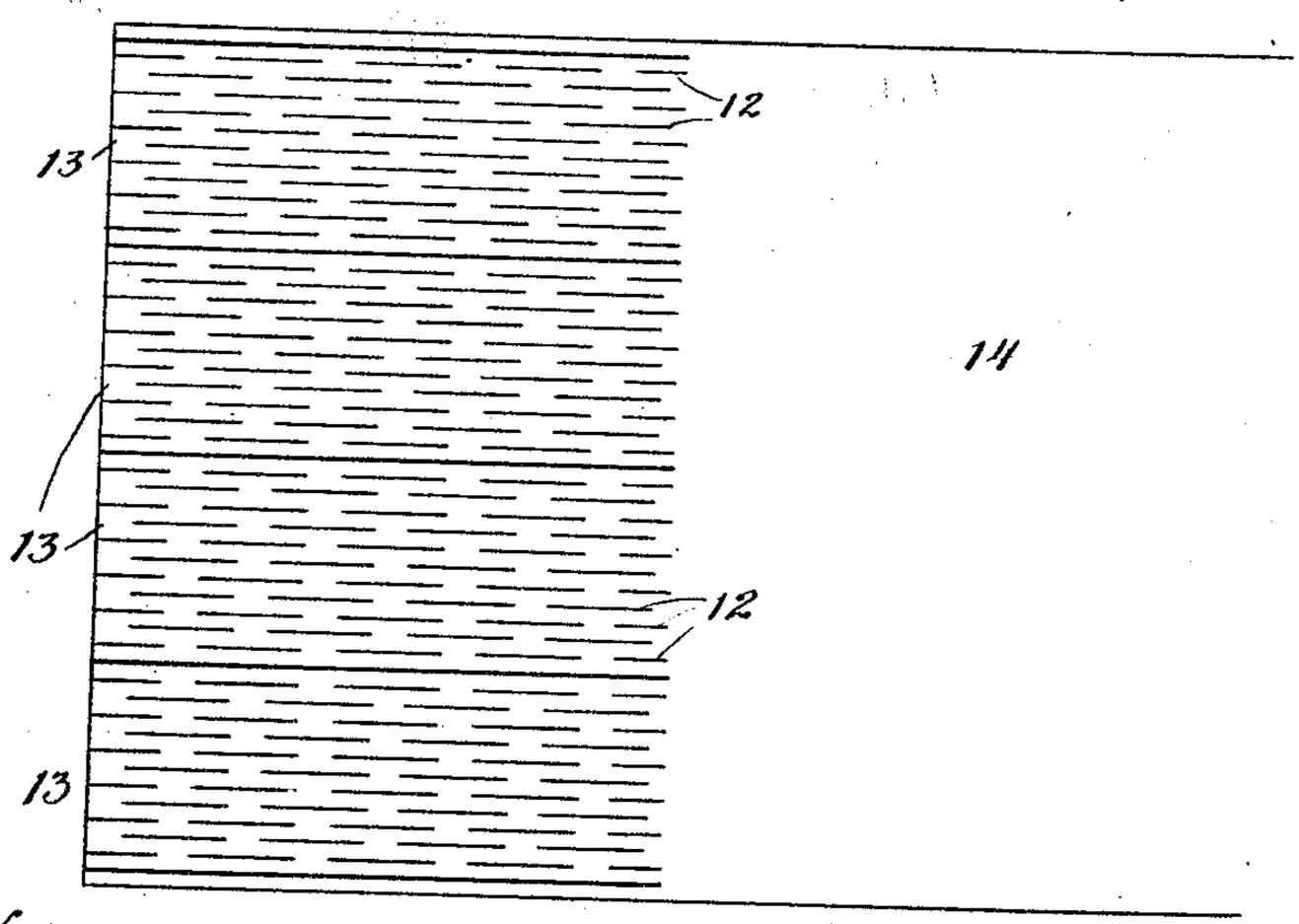


Fig. 5



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UNITED STATES PATENT OFFICE.

LAWRENCE C. STEELE, OF WHEELING, WEST VIRGINIA, ASSIGNOR TO LEWIS E. CURTIS, OF CHICAGO, ILLINOIS.

ROLLS FOR CUTTING SHEET METAL.

No. 878,472. Specification of Letters Patent. Patented Feb. 4, 1908.

Application filed June 16, 1905. Serial No. 265,482.

To all whom it may concern:

Be it known that I, LAWRENCE C. STEELE, a citizen of the United States, residing in Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Improvement in Rolls for Cutting Sheet Metal, of which the following is a specification.

This invention relates to rolls for cutting sheet metal and more particularly to rolls for cutting sheet metal, which is afterwards to be opened up or spread out into what is known as expanded metal.

Heretofore the practice of making expanded metal from previously slitted sheets has been to first cut the original sheet of metal into long narrow strips of the proper width to form the desired sheet of expanded metal, and then to form in these strips longitudinal rows of short slits, cuts or perforations, the slits, cuts or perforations in one row breaking joints with those of the next row. After this has been done, the strip is passed through a device for opening or spreading it into the finished expanded metal product. In carrying out the above process, the cutting of the strips from the sheet has been done by two methods. In the first method, squaring shears are used, but this has been found to be unsatisfactory owing to the impossibility of cutting the strips straight and with parallel edges. Variations in the width of the strips cause uneven margins in the finished product and result in the product having long sharp spears at its edges which is a great detriment in its use and very dangerous to the hands of the user or person handling it. Also these spears caused by slitting the uneven strip are apt to wedge themselves between the marginal slitting cutters and dull the latter very quickly. In the other method, rotary gang cutters are used for cutting the sheets into strips, and while this results in the strips having parallel edges and prevents the formation of the spears, it has been found in practice that the cutters dull very quickly owing to the warping and bending of the sheet between them. It has also been found in practice in slitting or perforating the strips preparatory to expanding them, that owing to the narrowness of the margins outside of the outside rows of slits, those margins have a tendency to turn or wedge between the marginal slitters and consequently dull them much more rapidly than the intermediate cutters are dulled, and therefore this feature necessitates the grinding of all cutters much more frequently than would otherwise be the case, thereby increasing the cost of cutters per ton of output.

It is the object of this invention to overcome these difficulties, to simplify the operation, and at the same time reduce the cost of the cutters, as well as to produce a much more perfect product, and it consists in a pair of mandrels or arbors having mounted thereon the required number of rotary coacting cutters having continuous cutting edges adapted to cut the sheet into strips of the required width, and other and intermediate cutters having interrupted cutting edges adapted to slit the strips with a number of rows of short slits, the slits of one row breaking joints with those of the others, both operations being simultaneous.

The invention will be more fully understood by reference to the sub-joined description taken in connection with the drawings, which form a part of this specification.

In the drawing, Figure 1 is a side elevation of the machine embodying my invention. Fig. 2 is a vertical, longitudinal section and Fig. 3 is a vertical cross section of the machine. Fig. 4 is an enlarged detail view of the cutting rolls, and Fig. 5 is a view illustrating the manner in which the sheet is cut into strips and slitted.

In the drawing, 1 represents the base frame of the machine, 2 2 the housings; 3 the feed table; 4 the discharge table; 5 5 the boxes or bearings for the cutting arbors 6 6; and 7 7 are the shearing cutters placed upon the arbors at proper intervals and having their edges made continuous on one side as at 8 for the purpose of cutting the sheet into strips. These shearing cutters 7 also have their edges interrupted on one side as at 9 so as to adapt them to co-act with the abutting interrupted cutting edges 10 of the adjacent coacting slitting cutters 11 which are mounted upon the arbors 6 between the shearing cutters. The slitting cutters 11 are employed in such numbers as may be necessary for the slitting of the entire width of the strips and are adapted to form rows of short slits 12 in the strip 13 cut from the sheet 14, as illustrated at Fig. 5. And inasmuch as the slitting cutters fill the spaces between the shearing cutters, they act upon the sheet in the same manner as if such spaces were oc-

cupied by feed rolls, and hold the entire width of the sheet in the line of the cuts perfectly flat and straight, thereby obviating the bending and warping which dulls the cutters in the old construction.

For the purpose of this application, I have shown the slitting cutters described in the U. S. Patents to L. E. Curtis for rolls for cutting sheet metal. It will, of course, be understood that any other form of cutters may be used without departing from my invention.

Between each pair of the cutters, spacing collars 15 are placed for the purpose of separating the cutters one from the other the required distance.

16 16 are clamped collars and 17 17 are nuts threaded to the arbors for the purpose of clamping all the cutters in position upon the arbor 6.

18 18 are strippers adapted to clear the metal from the cutters.

Motion is communicated to the cutters for their arbors from the power shaft 19 by means of pinions 20, gear 21, shaft 22, pinion 23 on shaft 22 meshing with a gear 24 upon the lower cutter arbor, and by pinion 25 on said shaft 22 meshing with pinion 26 on shaft 27, the pinion 26 meshing in turn with gear 28 upon the upper cutter arbor.

It will be understood that the invention may be used for trimming the edges of single strips and slitting them at the same time instead of cutting the whole sheet 14 at once into strips 13 and simultaneously slitting the strips.

I claim:—

1. In cutting rolls for sheet metal, the combination with shearing cutters having their edges continuous on one side and interrupted on the other, of slitting cutters having interrupted edges arranged between the shearing cutters, a roll upon which all of said cutters are mounted, an opposing roll, similar shearing cutters on said opposing rolls countering the first mentioned shearing cutters, and similar slitting cutters also on the opposing roll between the shearing cutters and countering the first mentioned slitting cutters.

2. The combination in a machine for cutting sheet metal, of opposing arbors or mandrels, each provided with shearing cutters having continuous edges on one side and interrupted edges on the other side, and each also provided with slitting cutters having interrupted cutting edges, all the cutters of one arbor countering like cutters upon the other arbor.

3. The combination in a machine for cutting sheet metal, of opposing arbors or mandrels, each provided with a plurality of shearing cutters spaced apart, and a plurality of slitting cutters located between and filling the spaces between the shearing cutters, all the cutters of one arbor countering like cutters upon the other arbor.

4. The machine for manufacturing expanded metal from wide sheets consisting of opposing rolls each armed with shearing cutters for dividing the sheet into narrow sheets or strips, and with slitting cutters for slitting the several narrow sheets preparatory to expanding them, the cutters upon each roll countering like cutters upon the other roll.

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Witnesses to signature:
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