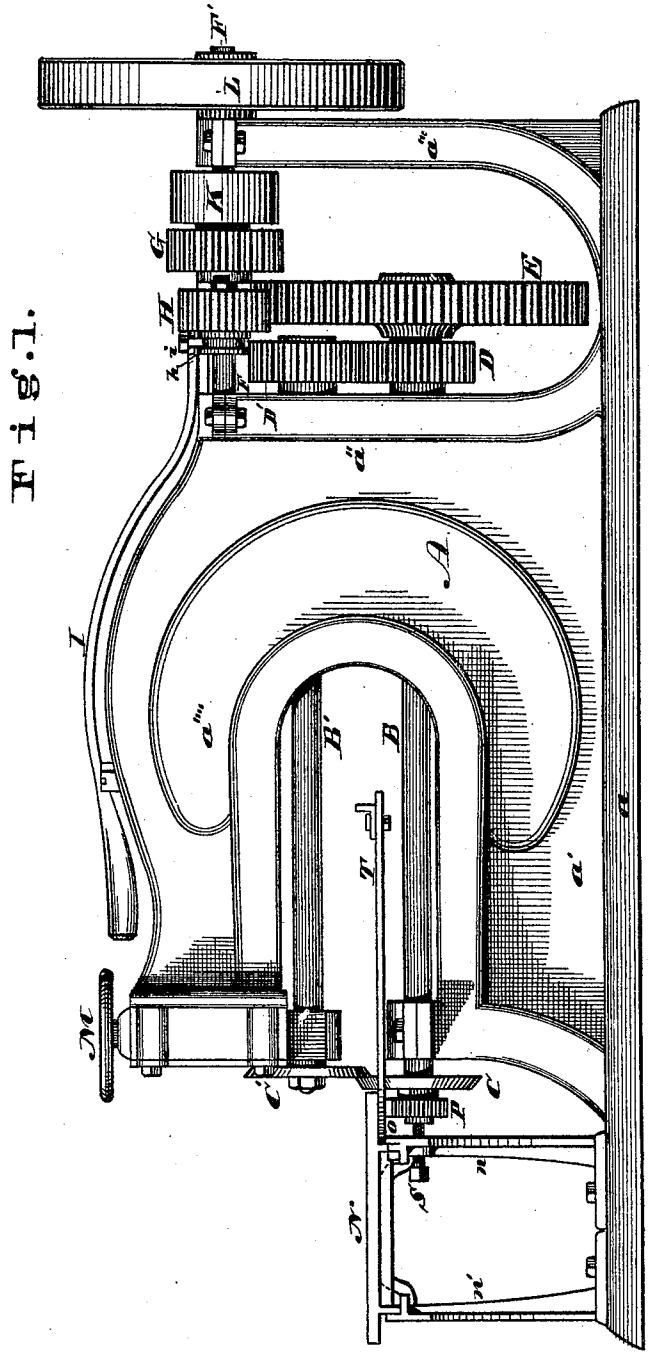
3 Sheets—Sheet 1.

J. J. LUCAS.

ROTARY SHEET-METAL SHEARING-MACHINE.

No. 175,614. Patented April 4, 1876.

Fig. 1.



WITNESSES.

John W. Collins

Charles Pickles

INVENTOR.

John J. Lucas.

By chas. D. Moody.

atty.

3 Sheets—Sheet 2.

J. J. LUCAS.

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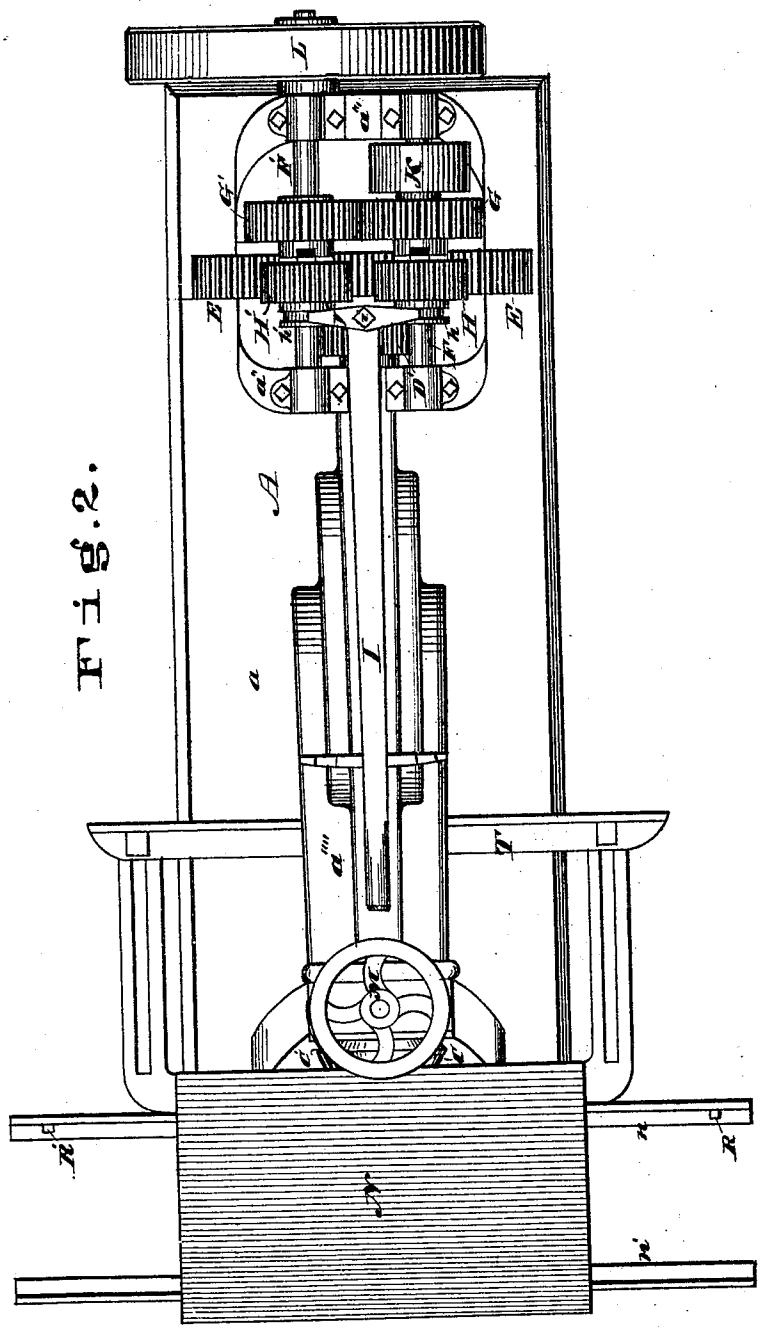

Fig. 2.

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3 Sheets—Sheet 3.

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Fig. 3.

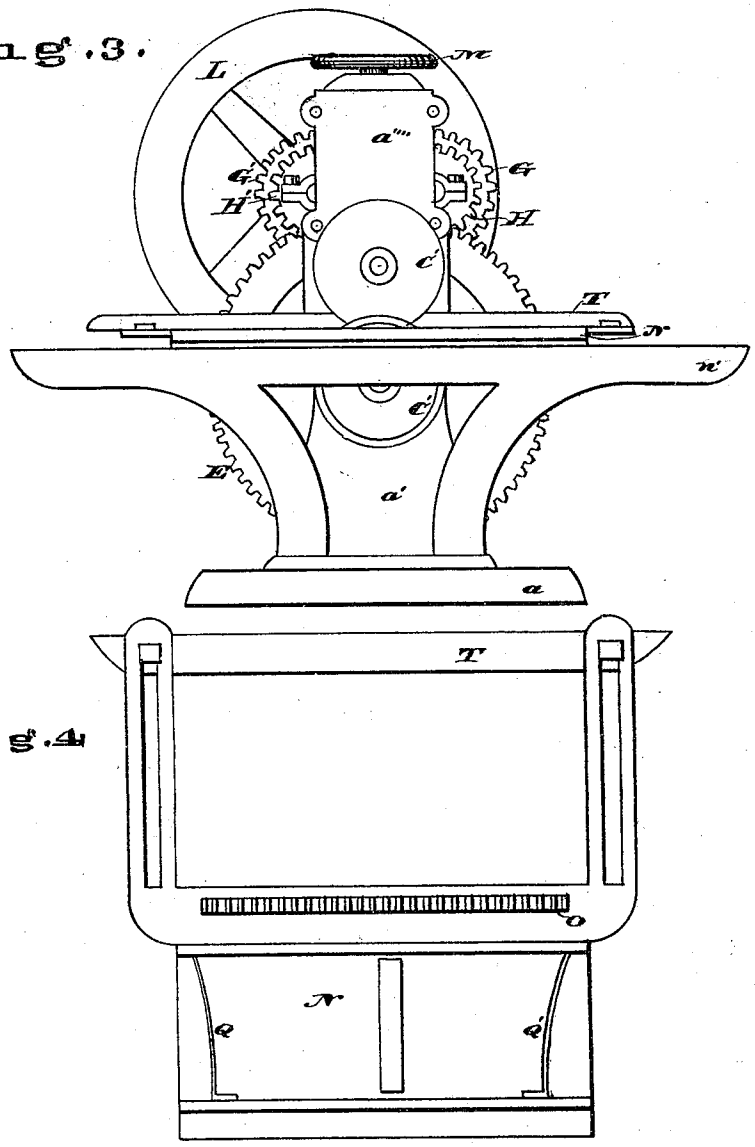

Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN J. LUCAS, OF BELLEVILLE, ILLINOIS.

IMPROVEMENT IN ROTARY SHEET-METAL-SHEARING MACHINES.

Specification forming part of Letters Patent No **175,614**, dated April 4, 1876; application filed February 15, 1876.

To all whom it may concern:

Be it known that I, JOHN J. LUCAS, a resident of Belleville, St. Clair county, State of Illinois, have invented new and useful Improvements in Sheet-Metal-Cutting Machines, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making part of this specification, in which—

Figure 1 is a side elevation, Fig. 2 a plan, Fig. 3 a front-end elevation, and Fig. 4 a bottom view, of the table and gage.

Like letters indicate like parts.

The present invention is designed more especially for cutting heavy material, like boiler-plate, which is cumbersome to handle, and which requires considerable power to cut. To this end it relates to the provision by which the plate can be cut in different directions without being required to be turned between the cuttings, and without stopping or checking the movement of the driving power. It also has reference to the means used in supporting the work while being cut. It further relates to the cutting mechanism, and the means for adjusting the shears to each other, both in a vertical and in a lateral direction. It further relates to the mode of operating the supporting-table, and to the provision by which the movement of the table in one direction can be checked, and in such manner as to enable the table to be readily moved in the contrary direction.

Referring to the accompanying drawing, A represents the frame of the machine, consisting of a bed-plate, *a*, bed-piece *a'*, two standards, *a''* and *a'''*, and an overhanging arm, *a''''*, extending from the standard *a''* forward over the bed-piece *a'*, and to the front thereof. B B' represent a pair of shafts, arranged one above the other and longitudinally in the frame, and supported in suitable bearings, as follows: The lower shaft B in bearings at the outer end of the bed-piece *a'* and in the standard *a''*, and the upper shaft B' in bearings at the outer end of the arm *a''''* and in the standard *a'''*. At their outer ends the shafts are each furnished with a circular shear-blade, C C'. The shafts and blades are so arranged and adjusted as to cause the latter to lap and press against each other, as shown in the drawing. The blades are made with beveled edges, and the flat sides of the blades are opposed to each other. At their inner ends, and beyond the standard *a''*, the shafts are each furnished with a spur-wheel, D D', which wheels engage. The lower shaft is extended, and, beyond the wheel D, is furnished with another larger spur-wheel, E. F F' represent two shafts, arranged side by side and longitudinally in the frame, and having their bearings in the standards *a''* and *a'''*. G G' represent spur-wheels, fastened, respectively, to the shafts F F', and arranged to engage. H H' represent two other and smaller spur-wheels on the shafts F F', respectively, but are loose thereon. They are similarly and respectively provided with clutches, which, when the wheels H H' are moved suitably against the wheels G G', engage with counterparts on the latter wheels, respectively. The wheels H H' do not engage with each other, but with the large wheel E below. I represents a lever, pivoted to the frame at *i*, and extending nearly, or quite, to the forward end of the arm *a''''*. At its rear end the lever is provided with a cross-piece, J, the ends of which engage, respectively, in grooved extensions *h h'* on the wheels H H'.

By moving the forward end of the lever I to one side or the other of the arm *a''''*, the corresponding wheel H or H' is made to engage with the spur-wheel G or G' beside it, and the other sliding wheel H' or H to disengage with the other fixed wheel G' or G; and when the forward end of the lever is directly over the arm *a''''* neither sliding wheel is engaged with the fixed wheels G G'. K represents a band wheel or pulley, fastened on the shaft F. L represents a fly-wheel, fastened to the shaft F', and, preferably, on an extension thereof beyond the standard *a'''*. M represents a screw, arranged vertically in the forward end of the arm *a''''*, for the purpose of adjusting vertically the upper shaft B' and its blade C'. N represents a table to support the sheet while being cut. It rests upon supports *n n'*, and is constructed to move thereon, and transversely to the line of the shafts B B', and in the following manner: On the under side of the table is attached a rack, O, in which engages a pinion, P, which is fastened to an ex-

tension of the lower shaft B, beyond the point of the attachment of the blade C. As the shaft B turns the table moves. Q Q′ represent springs, attached, respectively, at either end of the table, on the under side, and which, as the table is moved in either direction, encounter stops R R′, at either end of the support *n*, and prevent the table from being carried so far in its movement as to disengage the rack and pinion. At the same time the springs yield sufficiently to enable the pinion to turn. S represents a set-screw passing horizontally through the support *n*, and opposite the shaft B. By means of this the shaft B can be moved so as to suitably adjust the blades C C′ to each other in a horizontal direction. T represents an adjustable gage attached to the table N.

The operation of the machine is as follows: It is set in motion by means of a belt passing around the pulley K. This causes the shafts F F′ and wheels G G′ to turn. The cutting mechanism, however, does not come into operation until one of the wheels H or H′ is, by means of the lever I, suitably moved on its shaft, so as to come, by means of its clutch, into connection with the fixed wheel G or G′, as the case may be, beside it. When this is done, the movement is communicated through the wheels D D′ E to the shafts B B′ and blades C C′, and also to the table N, causing it to move past the blades. To cut a sheet in a certain direction, let it be properly laid upon the table, and by means of the lever I let wheel H, for example, be connected with the wheel G. In this case the motion is communicated through the wheel H to the wheel E, while the wheel H′ remains loose upon its shaft. The cut having been made, to cut the sheet in the opposite direction it is suitably moved sidewise, and the lever I turned to the other side of the arm *a*′′′′. This movement, without stopping or checking the motion of the driving-pulley, disengages the wheel H from the wheel G, and puts the other wheel H′ into connection with the wheel G′. The driving power is then transmitted through the wheel H′, turning the wheel E in the opposite direction, as well as the blades and table, and making the desired cut in the new direction.

In cutting thick sheets of metal ponderous machinery is required, and when such machinery is once in motion it is undesirable to frequently check it.

By means of the above-described mechanism it will be seen that the cutting apparatus can be readily controlled without interfering with the driving power, and also cuts may be made in different directions with but little handling of the sheet.

Should the blades wear away the proper lap can be preserved by means of the screw M, by turning which the upper shaft and blade are depressed. By means of the screw S the lower blade can be made to press suitably against the upper blade. By reason of the position of the lever I the entire machine is brought under the control of a single operator, who can attend to the management of the sheet, and also direct the cutting mechanism.

Having described my invention, what I claim is—

1. The combination of the frame A, shafts B B′, wheels D D′, wheel E, shafts F F′, and wheels G G′ and H H′, operating substantially as described.

2. The combination of the frame A, shafts B B′, wheels D D′ E, shafts F F′, wheels G G′ H H′, and lever I, substantially as described.

3. The combination of the wheel E, shafts F F′, pulley K, wheels G G′ and H H′, and lever I, substantially as described.

4. The combination of the frame A, standards *a*′′ and *a*′′′, shafts F F′, fly-wheel L, pulley K, wheels G G′ H H′, lever I, wheels E D D′, shafts B B′, and blades C C′, substantially as described.

5. The combination of the lever I, shafts F F′, wheels G G′ H H′, and wheel E, substantially as described.

6. The combination of the table N, supports *n n*′, rack O, pinion P, springs Q Q′, and stops R R′, substantially as described.

7. The combination of the table N, supports *n n*′, blades C C′, and gage T, substantially as described.

JOHN J. LUCAS.

Witnesses:
LOUIS P. KRAFFT,
JAMES F. KRAFFT.