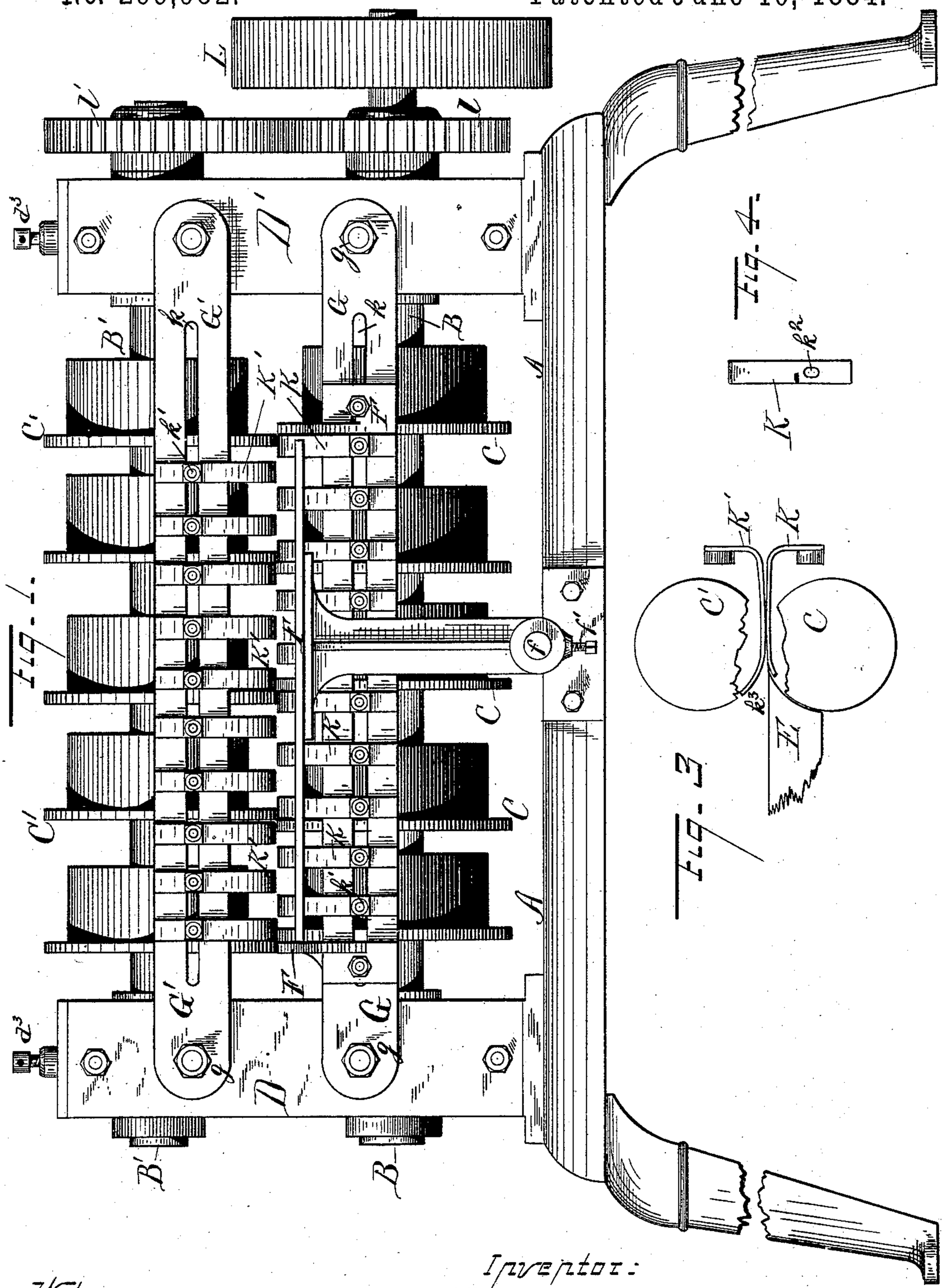
(No Model.) 2 Sheets—Sheet 1.

J. G. HODGSON.

SHEET METAL CUTTING MACHINE.

No. 299,982. Patented June 10, 1884.



Witnesses
Edw. L. Carman.
Taylor E. Brown.

Inventor:
John G. Hodgson,
per Munday, Evarts & Adcock
his Attorneys:

(No Model.) 2 Sheets—Sheet 2.

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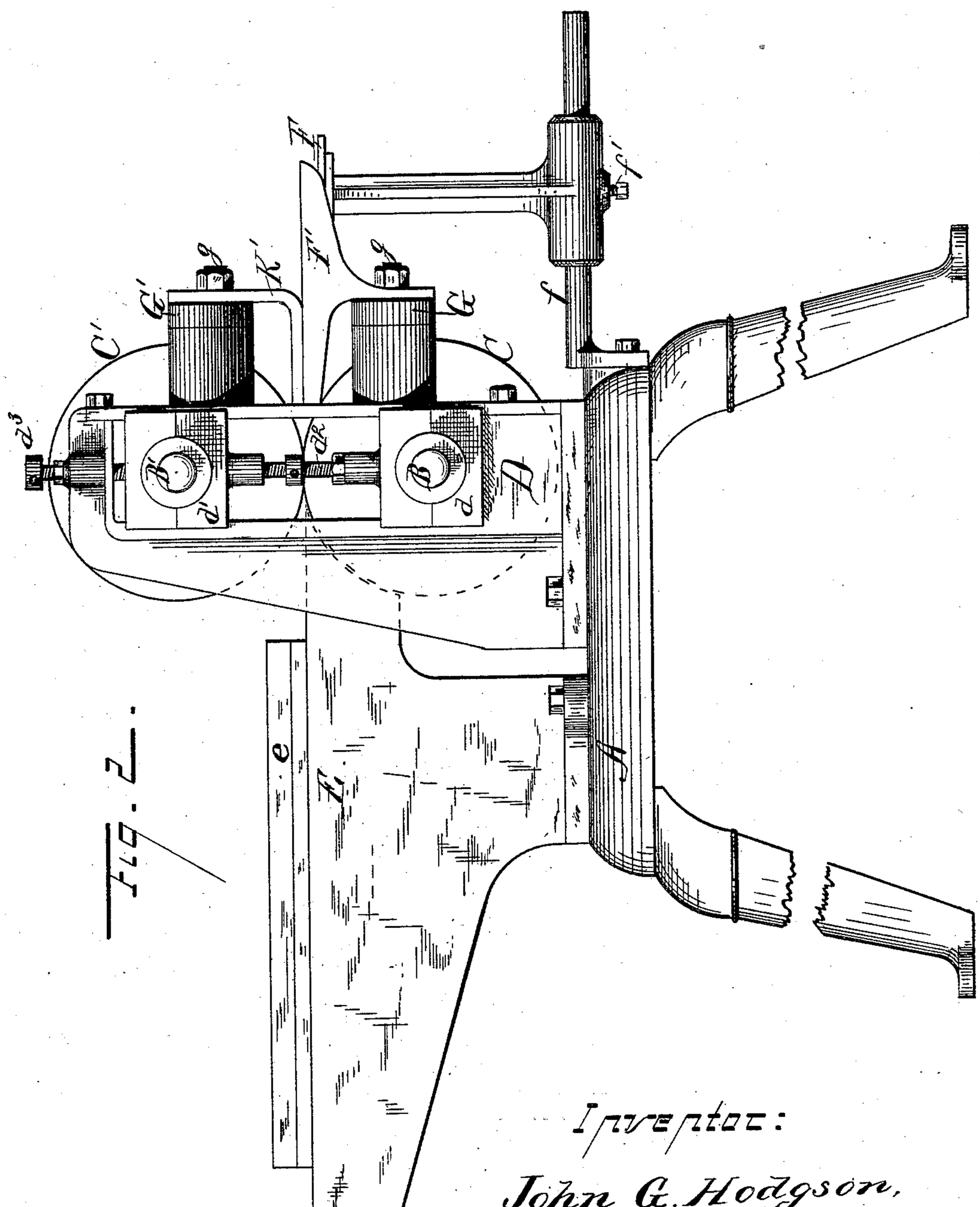

Fig. 2.

Witnesses

Chas. L. Carmans

Taylor E. Brown

Inventor:

John G. Hodgson,

per Munday, Evarts and Adcock

His Attorneys:

UNITED STATES PATENT OFFICE.

JOHN G. HODGSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO EDWIN NORTON AND OLIVER W. NORTON, BOTH OF SAME PLACE.

SHEET-METAL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 299,982, dated June 10, 1884.

Application filed December 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. HODGSON, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Sheet-Metal-Cutting Machines, of which the following is a specification.

This invention relates to machines for cutting out can-bodies from sheet-metal blanks, wherein rotary cutters are employed. In this class of machines considerable difficulty has been experienced in their practical operation, owing to the tendency of the stock to buckle between the cutters or bend out of a true plane, either from the action of the cutters on the sheet or by reason of previous buckles, dents, or inequalities in the sheet when it is fed to the machine before entering the cutters. This buckling of the stock causes the can-body to vary in width at different points to the extent of sometimes from one thirty-second up to one-sixteenth of an inch, which, of course, occasions great difficulty and irregularity in the manufacture of the cans, and often causes them to be imperfect and leaky. Another trouble in the operation of these machines, which it is also the object of my invention to overcome, is the tendency of the sheet to drag harder or draw faster on one side than the other, and thus pass slightly askew instead of squarely through the cutters. These results I accomplish by combining with the cutters a series of spring-bridges, supports, or guides above and below the sheet, and which extend through the machine and under and between the cutters, so as to support and hold the sheet flat directly at the point or line where the cutting is being done, as well as on each side thereof, and thus render it impossible for the sheet to buckle between the cutters. The bridges or guides are secured by bolts or otherwise to slotted rails or bars attached to the standards of the machine. These bridges not only serve to prevent the sheet from buckling under the action of the cutters, as they support it at the very point where the cutting is done, but they also serve to smooth and flatten out the sheet as it passes under the cutters to strip the slitted blanks from between the cutters as they issue therefrom, and prevent their being turned or carried up or down with the revolving cutters, and also to equalize the drag or draw upon both sides of the sheet, and thus cause it to pass squarely through the machine. To aid in the accomplishment of the latter end, I also provide the feed-table with a side guide to abut against the side of the sheet. The stripping of the slitted blanks from between the contiguous cutters on the upper or lower shaft tends very much to equalize the draft on both sides of the sheet and to cause it to pass freely and squarely through the machine, because, if one of the blanks happens to be carried up by the revolving cutters, it causes an unequal resistance at that point, as well as a tendency of the sheet to buckle.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a rear elevation of a machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detail side view of the bridges, and Fig. 4 is a detail end view of one of the bridges.

In said drawings, A represents the frame of the machine; B B′, the shafts, to which the upper and lower revolving cutters, C and C′, are secured, and D D′ are the standards, in which the boxes *d d′* of said shafts are supported. The lower box, *d*, is stationary, while the upper one, *d′*, is adjustable by means of the set-screws d^2 and d^3, so that the shaft and cutters thereon may be adjusted closer or farther apart, as may be required.

E is the feed-table, upon which the sheets are supported as they are fed through the machine. This table is provided with a guide, *e*, on one side, by which the sheet may be guided so as to pass squarely through the machine.

F is a table or support at the rear of the machine, for receiving the slitted blanks as they come from the rotary cutters C C′. This table is supported on an arm, *f*, secured to the frame of the machine, and it may be adjusted to or from the machine by means of the set-screw *f′*.

G and G′ are a pair of slotted bars secured to the standards B B′ by means of bolts *g* at the rear of the machine, and K K and K′ K′ are the upper and lower spring bridges or guides, which extend through the machine and under and between the cutters C C and C′ C′.

These bridges K and K′ are secured in the slots *k* of the bars G and G′ by means of bolts *k′*, which pass through slots k^2 in the bridges K and K′. It will be observed that the opposing contiguous cutters, whether on the upper or the lower shaft, fit either both inside or both outside each other. Between the contiguous cutters C, which fit outside the opposing cutters C′, I place three bridges, K K K, the two extreme bridges fitting directly over the opposing cutters C′ C′, which fit inside the cutters C C, and between said cutters C′ C′, fitting inside, I place two bridges, K′ K′. The bridges K K′ extend entirely through the machine between the cutters, and the ends of the same are slightly curved, as shown at k^3, so as to readily receive the sheet between them. As the bridges K K′ extend entirely through between the cutters, the sheet is supported at the very point where the cutting is being done, so that the action of the cutters has no tendency to pucker or buckle the sheet.

L represents the driving-pulley, and *l l′* the spur-gears for driving one shaft from the other. By means of the slots k^2 in the bridges K and K′, the same may be adjusted vertically up or down, as may be required. The number of bridges between each pair of cutters may of course be increased or diminished without materially affecting the operation of my improvement. If the bridges are made wider, a fewer number may be employed than when made narrow; and, if preferred, a single wide bridge extending the whole width between the contiguous cutters on either shaft may be employed, instead of two or more, as shown.

I am aware that heretofore in these rotary cutting-machines guide or feed rollers have been employed located immediately in front of the cutters; but these guide-rollers of course could not extend under the cutters so as to support and guide the sheet at the point where the cutting is being done, so that the sheet was still liable to buckle under the action of the cutters; nor did these guide-rollers perform the function of stripping the slitted blanks from between the contiguous cutters which fit outside their opposing cutters. By means of the feed-table, the upper and lower spring-bridges, and the receiving-table, the sheet is supported and held in the same plane while passing through the machine, and all tendency of the sheet to buckle or to pass through the machine askew is overcome. The receiving-table F is provided with guides F′—one on each side thereof—to guide and direct the slitted sheet as it comes from the cutters. These guides F′ are adjustable, being secured to the slotted bars G G′ by means of bolts, which pass through the slots in said bars. The guides F′ extend back to the cutters.

I am aware that in rotary cutting-machines for making wire the feed-table or support for the sheet has been extended up to the cutters on one side, and that clearers or guards have been employed on the opposite side to raise the wires out of the grooves of the slitters, as shown in the Letters Patent No. 85,520, granted to T. Fowler under date of January 5, 1869, and I hereby expressly disclaim the same as being no part of my invention.

My invention consists in extending bridges or supports not only up to the cutters, but under and between the cutters, so as to support the sheet at the very point where the cutting is being done, and thus prevent the sheet from buckling, &c., between the cutters.

I claim—

1. In a sheet-metal-slitting machine, the combination of the upper and lower rotary cutters with bridges or guides extending under and between the cutters, so as to support the sheet at the point where the cutting is being done, substantially as specified.

2. The combination of the upper and lower rotary cutters with bridges extending through the machine under and between the cutters, so as to support the sheet at the point where the cutting is being done and strip the slitted blanks from the cutters as they issue therefrom, and a feed-table provided with a guide on one side, substantially as specified.

3. The combination of the upper and lower rotary cutters with bridges extending through the machine under and between the cutters, a feed-table provided with a guide on its side, and a receiving-table, whereby the sheets are held and supported in the same plane while passing through the machine, substantially as specified.

4. The combination of the upper and lower rotary cutters with spring-bridges extending through the machine under and between the cutters, substantially as specified.

5. The combination, with the upper and lower rotary cutters, of the slotted bars G G′ and bridges K K′, secured to said slotted bars, and extending through the machine under and between the cutters, substantially as specified.

JOHN G. HODGSON.

Witnesses:
O. W. NORTON,
H. M. MUNDAY.