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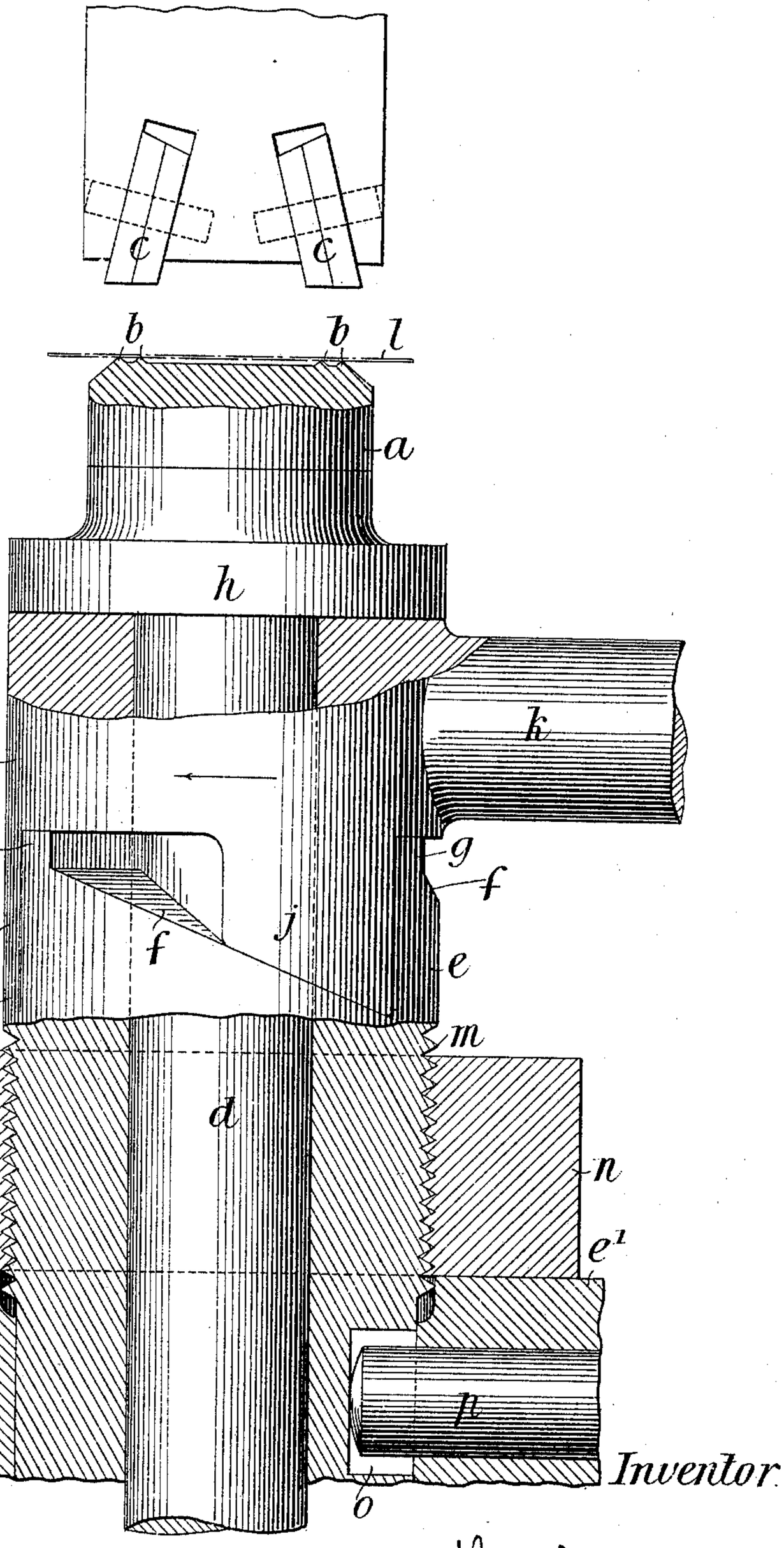
F. W. FEAVER.

MANUFACTURE OF SHEET METAL CANS OR BOXES.

(Application filed May 23, 1898.)

(No Model.)



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MANUFACTURE OF SHEET-METAL CANS OR BOXES.

SPECIFICATION forming part of Letters Patent No. 619,289, dated February 14, 1899.

Application filed May 23, 1898. Serial No. 681,495. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM FEAVER, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in or Connected with the Manufacture of Sheet-Metal Cans or Boxes, (for which I have applied for a patent in Great Britain, No. 25,018, dated October 28, 1897,) of which the following is a specification.

My invention relates to the manufacture of sheet-metal cans or boxes of the kind wherein cuts or grooves are formed in the lids or covers to facilitate the tearing out of metal strips for opening such boxes. Various means have heretofore been used for forming these cuts or grooves; but in practice none of them have been successful, as after a short time the cutting edges become worn to such an extent that the cuts or grooves cannot be formed with certainty and uniformity.

The object of my invention is to overcome these difficulties, and to this end I make use of a die having ribs or cutting edges corresponding to the cuts or grooves to be formed. The pieces of sheet metal to be acted upon are placed upon this die, and then a rolling pressure is applied to press the sheet metal against the said die in order to impress the cuts or grooves therein.

In practice when making the cuts or grooves in the lids of round tins I find it advantageous to arrange the cutting-die upon a vertical axis, so that the face of it is in a horizontal plane, and to rotate the said die, the pressure being applied to the metal upon the said die by means of a roller, which roller rotates as the die, with the metal upon it, rotates beneath it.

To enable my invention to be fully understood, I will describe the same by reference to the accompanying drawing, which shows in sectional elevation an apparatus suitable for carrying out my invention.

a is the rotary die, having the ribs or cutting edges *b b* corresponding with the grooves to be formed in the sheet metal, and *c c* are rollers which bear against the sheet metal as the die rotates in order to roll the grooves in the said sheet. In practice these rollers may be moved down toward the die or the die moved upward toward the rollers. In the drawing I have represented the latter arrangement. For this purpose the die *a* is secured to a driving-shaft *d*, which is connected by a feather key with a driving-wheel, (not shown,) so that the said shaft may be raised and lowered relatively with the said wheel. For the purpose of raising the shaft I arrange around it a sleeve or bush *e*, which is held against rotation, the said bush having at its upper end a series of inclines *f f*, each of which terminates in a stop *g*. Upon this sleeve and between the latter and a collar *h* on the die I arrange what I term a "cam-sleeve" *i*, having on its under side inclined lugs *j j*, which bear with their lower ends upon the inclined surfaces *f f*, the said cam-sleeve *i* having formed in connection with it or attached to it a lever *k*, by which it may be operated. With this arrangement it will be understood that when the said cam-sleeve *i* is rotated in the direction of the arrow the said sleeve will be lifted and carry with it the die *a* and its shaft *d*, so as to bring the plate *l*, of metal, placed upon the said die, into contact with the pressing-rollers *c c*.

It is necessary that the lift of the die *a* should be such that when the upward movement is completed the grooves shall be formed to a sufficient depth to insure the tearing out of the strip, but without cutting through the metal. To provide for this, I arrange that the sleeve *e* shall be adjustable vertically in the bed or frame *e'*, carrying it, and in the drawing I have represented this as being provided for by forming external screw-threads *m* upon the sleeve and arranging a nut *n* upon the said threads, so that a slight rotation of the latter will serve to raise or lower the said sleeve and, consequently, also the die to the desired extent.

It will be understood that the adjustment must be such that when the lugs *j* impinge against the stops *g g* at the tops of the inclines *f* the die will be pressed into the metal to the desired extent. To prevent the sleeve *m* from rotating, a slot *o* is formed in the latter, into which a pin or stud *p* upon the frame *e'* projects.

The rollers *c c*, as shown, are formed in two parts, this arrangement being provided to minimize as much as possible any slip between the rollers and the metal plate *l*, it having been

found in practice that it is difficult to place the rollers *c c* at an angle sufficient for their axes to intersect the axis of the die *a*, as would be necessary if the rollers were made so that there was no slip between them and the plate.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. Apparatus for grooving the lids or covers of sheet-metal cans or boxes wherein a die having ribs upon its end face corresponding with the grooves to be formed is arranged to coöperate with pressure-rollers in such a manner that when the said die and rollers are rotated relatively with one another the said ribs will be forced into a sheet of metal placed on said end face and between the die and rollers, substantially as described.

2. In apparatus for grooving the lids of sheet-metal cans or boxes, the combination of a rotary die having ribs upon its end or face, pressure-rollers mounted adjacent to the said ribs and means for moving the face and ribs of said rotary die toward the pressure-rollers, substantially as, and for the purpose, described.

3. In apparatus for grooving the lids or covers of sheet-metal cans or boxes, the combination of a rotary die, a shaft carrying the said die, a sleeve surrounding the said shaft and having inclined surfaces upon it and a second sleeve having inclined lugs working upon the said inclined surfaces, substantially as described.

4. In apparatus for grooving the lids or covers of sheet-metal cans or boxes, the combination of a rotary die mounted upon a shaft, two sleeves surrounding the said shaft and having coöperating inclined surfaces one of the said sleeves being adapted to be rotated relatively with the shaft while the other remains stationary with respect to the frame and an adjusting-nut arranged upon screw-threads on the stationary sleeve, substantially as and for the purpose, described.

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