

No. 749,679.

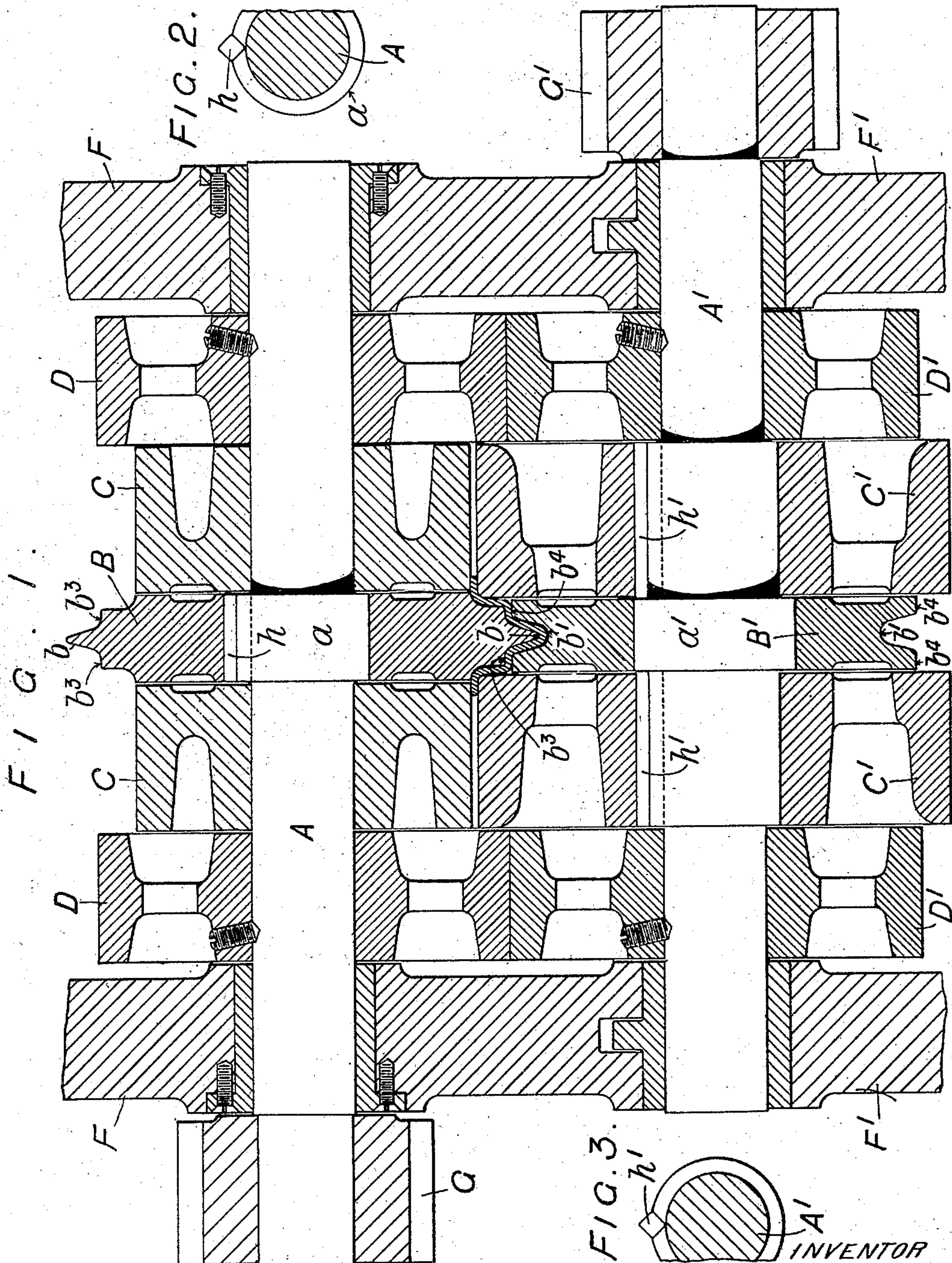
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G. B. JOHNSON.

ROLLS FOR USE IN THE PRODUCTION OF SHEET METAL STRIPS.

APPLICATION FILED JUNE 9, 1903.

NO MODEL.

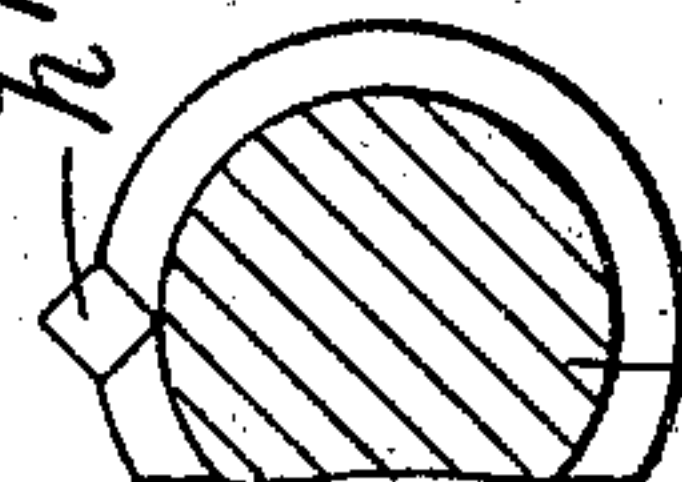


WITNESSES:

W. M. Avery

A. B. Davis

FIG. 3.



INVENTOR

Godfrey Bennington Johnson

BY

M. M. L.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GODFREY BENINGTON JOHNSON, OF LONDON, ENGLAND.

ROLLS FOR USE IN THE PRODUCTION OF SHEET-METAL STRIPS.

SPECIFICATION forming part of Letters Patent No. 749,679, dated January 12, 1904.

Application filed June 9, 1903. Serial No. 160,713. (No model.)

To all whom it may concern:

Be it known that I, GODFREY BENINGTON JOHNSON, engineer, a subject of the King of Great Britain, residing at 8 Victoria street, in the city of Westminster, London, England, have invented certain new and useful Improvements in Rolls for Use in the Production of Sheet-Metal Strips, of which the following is a specification.

My invention relates to improvements in the rolls used in a machine for rolling sheet-metal strips to a curved, reversely-curved, or other form in cross-section, (for fencing standards, "droppers," and pales, guttering, sash-bars, and the like,) for which previous Letters Patent of the United States of America, dated April 28, 1903, No. 726,691, were granted to me; and the invention has for its object to obviate rubbing friction on the opposite sides of the strip consequent on difference of surface velocity of the rolls of a pair.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 shows a longitudinal section of one of the pairs of rolls of the machine, and Figs. 2 and 3 are detail cross-sections of portions thereof.

The same letters of reference indicate the same parts in all the figures.

The members of each pair of rolls are shaped to match each other, the diameter of those shaped portions which are of greatest diameter and that of those which are of least diameter being respectively equal in both members, while the end portions of the rolls (which serve to regulate the minimum distance between the axes of the two members of a pair) are of equal diameter in both members.

My present improvement consists in dividing the acting surfaces of the rolls into annular zones or rings corresponding approximately to the salient and reëntering parts of the shaped portions of the rolls, two rings of a pair comprising the one a salient and the other a reëntering portion matching therewith and the one of the two rings of a pair being positively driven and the other being loose on its axis, so that it will be free to re-

volve at the surface speed of the ring with which it matches.

In the construction shown A and A' are the shafts of the two rolls of a pair, the rolls being composed of series of rings or annular sections comprising central portions B and B', adjacent lateral portions C C' and C' C', and what may be termed "distance" portions D D' and D' D'. The shafts A A' are journaled in bearings in upper and lower frames F F' and are rotated at the same angular velocity in any suitable manner—as, for example, through the medium of gear-wheels G G', respectively, fast on the ends of the shafts. Of the component parts of the one roll of a pair the central portions B B' are shaped peripherally according to the form or the stage in the form of the work which they are to produce, the one roll, B, having a circumferential salient portion, as at b , and the other a reëntering portion or groove, as b' , matching therewith. These salient and reëntering portions are flanked by approximately straight or cylindrical portions $b^3 b^3 b^4 b^4$, and as the portions b^3 of the one are or may be of different diameter to the portions b^4 of the other these two portions if positively driven at the same angular velocity would have different surface speeds and rubbing friction between the rolls and work would be set up. To obviate this, the one or other ring B or B' is loose on its shaft. These rings are mounted upon circular portions $a a'$ of their respective shafts, and in the example the ring B' is loose, while the ring B is keyed to its shaft preferably by a key h of square section set with one of its diagonal planes in radial alinement with the shaft, the key being received in coinciding V-grooves in the shaft and ring.

The rings C C' and C' C' adjacent to the main or central shaped portions or rings B B' are substantially cylindrical in form and are of unequal diameters, those C' C', which are the greater, being made fast on the shaft A' by means of keys h' , preferably of the form hereinbefore described with reference to the key h of the central ring B. The rings D D' and D' D' are of equal diameters those of the one pair to those of the other pair and are or may be

loose on their respective shafts, the function of these rings being that of distance-rings to so limit the approach to each other of the two rolls of a pair as to maintain an interval between the salient portion *b* of the ring B and the reëntering portion *b'* of the ring B' rather greater than the thickness of the strip I of metal being rolled, so that the strip shall not be nipped between the portions *b b'*. It will thus be seen that in the example illustrated whereas the acting part of ring B of the upper roll is of greater diameter than the acting part of ring B' of the lower roll the rings C' of the lower roll are of greater diameter than the rings C of the upper roll and that only the parts of each roll which are of greater diameter than the corresponding parts of the other roll are keyed to their respective shafts, the parts of small diameter being loose.

I claim—

1. A pair of rolls for shaping the cross-section of sheet-metal strips, consisting in the combination with a pair of shafts rotated at the same angular velocity, of independent annular sections carried thereby and constituting the operative surfaces of the rolls, the sections of the one roll matching the sections of the other roll of the pair, and some of the sections being of greater and some of lesser diameter than the mean diameter of the pair of rolls, the diameters of those sections which are of greatest and of least diameter being respectively equal for both rolls of the pair, and

those sections whereof the diameter differs from the mean diameter to the greatest extent in the one respect being fast on their shaft, while those sections whereof the diameter differs from the mean diameter to the greatest extent in the other respect are loose on their shaft, substantially as specified.

2. A pair of rolls for shaping the cross-section of sheet-metal strips, consisting in the combination with a pair of shafts rotated at the same angular velocity, of independent annular sections carried thereby and constituting the operative surfaces of the rolls, the sections of the one roll matching the sections of the other roll of the pair, and some of the sections being of greater and some of lesser diameter than the mean diameter of the pair of rolls, the diameters of those sections which are of greatest and of least diameter being respectively equal for both rolls of the pair, those sections whereof the diameter differs from the mean diameter to the greatest extent in the one respect being fast on their shaft, while those sections whereof the diameter differs from the mean diameter to the greatest extent in the other respect are loose on their shaft, and the diameter of the end sections of both rolls being equal to the mean diameter of the pair of rolls, substantially as specified.

GODFREY BENINGTON JOHNSON.

Witnesses:

H. D. JAMESON,
F. L. RANDS.