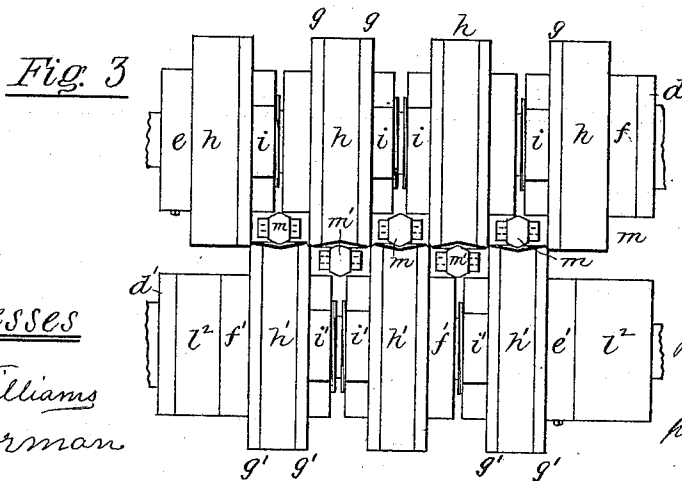
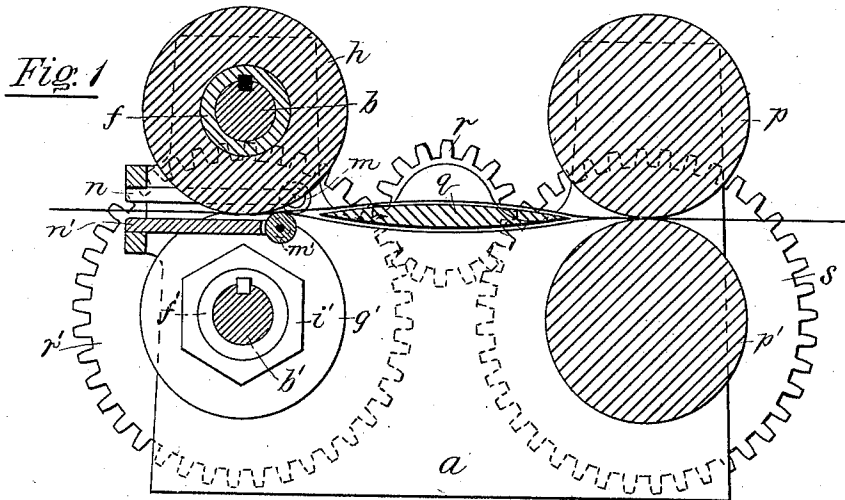
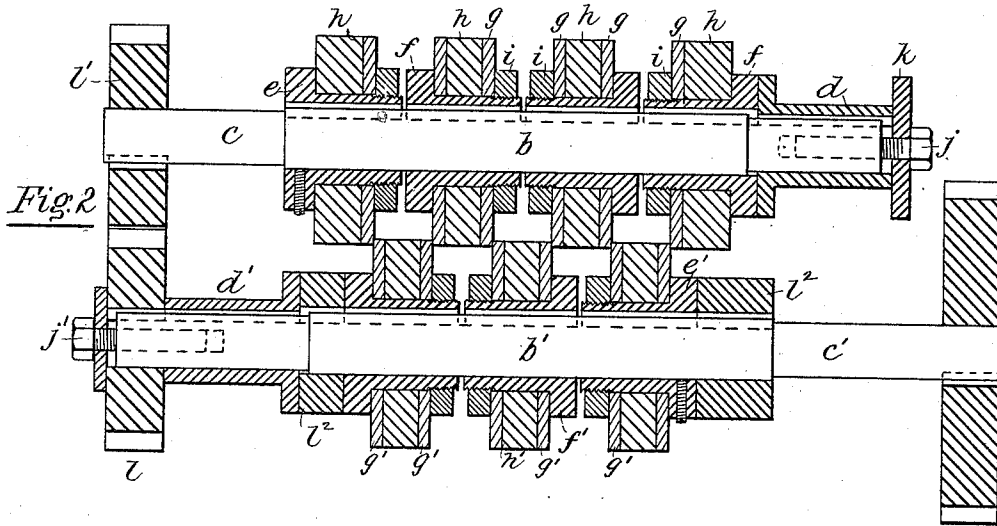


(No Model.)

J. VERMEULEN.
METAL SLITTING MACHINE.

No. 369,669.

Patented Sept. 6, 1887.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN VERMEULEN, OF NEW YORK, N. Y.

METAL-SLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 369,669, dated September 6, 1887.

Application filed December 14, 1886. Serial No. 221,514. (No model.)

To all whom it may concern:

Be it known that I, JOHN VERMEULEN, a subject of the King of Belgium, residing at New York, county and State of New York, have invented certain new and useful Improvements in Metal-Slitting Machines, of which the following is a specification.

This invention relates to that class of metal-slitting machines in which the work is accomplished by means of rotary knives, and has for its object to compensate for wear of the cutting-edges and provide for the free and easy discharge of the strips from the knives as they are slit from the sheet of metal thereby.

The improvement in the knives, which in this class of machines are mounted on two parallel shafts, each knife being in width equal to the strips of metal to be cut and the edges of the set on one shaft overlapping those on the other shaft, consists in making them of two comparatively thin disks of steel with a washer, preferably of cast iron, placed between them, so as to hold them apart a distance equal to the width of the strips to be cut, and clamping this compound cutter by means of a nut on a flanged sleeve. These sleeves are caused to rotate with the shaft by means of keyways and splines, but are free to slide longitudinally thereon, and the overlapping edges of the two sets of knives are held together by screws fitted into the edges of the shafts, by the adjustment of which all wear is promptly compensated for, and the edges of all the knives, after being re-ground, are readily and simultaneously brought together with their sides in proper active contact. The strips of metal slit from the sheet by each of the rotary knives tend to remain between the adjacent edges of the counter knives and cause considerable drag to the strips as they are forcibly discharged therefrom, the side wear of the knives being to a great extent due to the friction of the edges of the strips thereon. To obviate this I place between the knives small rollers, arranged to bear on the central parts of the strips at or a little beyond where the knives act on the sheet of metal, thus bending or creasing the strips longitudinally, which action draws the edges of the strips together away from the sides of the knives, so that the strips are discharged therefrom without side friction. If the small bending or

creasing rollers have imparted a permanent set to the strips, and it is required that the strips of metal so cut shall be flat, they are caused to pass through a pair of plain rollers placed behind the rotary cutters.

To describe my invention more particularly, I will now refer to the accompanying drawings, in which—

Figure 1 is a sectional view of a metal-slitting machine embodying my improvements. Fig. 2 is a longitudinal section of the rotary knives; and Fig. 3 is a rear elevation of the rotary knives, showing the action of the creasing-rollers on the strips as they are cut.

The main frame *a* consists of side pieces of ordinary construction, provided with suitable bearings for the rotary cutters and flattening rollers. The two sets of rotary cutters are similar in construction, comprising the shafts *b* and *b'*, having journals *c* and *c'* at their opposite ends, and flanged sleeves *d* and *d'*, which constitute the journals, at their other ends. On the bodies of these shafts *b* and *b'* are fitted a series of flanged sleeves, *e* and *e'* and *f* and *f'*, secured thereto by splines and key-seats, so as to rotate therewith. The sleeve-journals *d* and *d'* are also splined to the shafts. The end sleeves, *e* and *e'*, are further secured to the shafts by set-screws or suitable means, so as to be rigidly held as regards longitudinal movement; but all of the other sleeves are free to slide on the shafts. On these sleeves *e* and *e'* and *f* and *f'* are fitted the rotary cutters, composed of the steel disks *g* and *g'*, which constitute the cutting-edges, and the central washers, *h* and *h'*, made of cast-iron or other suitable metal, and nuts *i* and *i'*, fitted on the sleeves, clamp the cutters and washers rigidly against the flanges of these sleeves *e* and *e'* and *f* and *f'*.

When the two sets of rotary cutters are placed in working position, as shown at Fig. 2, the sides of the cutters *g* and *g'* are forced together, so as to properly act on the material to be cut up by means of the screw-bolts *j* and *j'*, screwed into the opposite ends of the shafts *b* and *b'*, respectively, the screw *j* acting against the washer *k*, which bears against the end of the sleeve-bearing *d*, the flange of said sleeve-bearing being in contact with the cutter-sleeve *f*. The other screw, *j'*, acts in a similar manner on the cutter-sleeve *f'*, but has a gear-wheel, *l*,

placed between its washer k' and the sleeve-bearing d' . The gear-wheel l is splined on the shaft b' and meshes into the gear-wheel l' , secured to the end of the shaft b .

5 As there is one knife less on the shaft b' than on the shaft b , the collars l' are placed thereon to fill up the space between the bearings. This arrangement may be departed from to suit the particular requirements of any case, as would
10 readily occur to the manufacturer; and it will be observed that the steel disks are omitted from the outsides of the end cutters on the shaft b , there being no counter-cutting edges therefor on the shaft b' . These cutters are
15 easily and cheaply made and their cutting-edges set together to a nicety, so as to cause them to make clean cuts in the material acted upon. They can be easily taken out for sharpening and replaced and reset with their cutting-edges again brought together in perfect
20 operating adjacency simply by the manipulation of the two screws j and j' .

To insure the free delivery of the strips from the rotary cutters bending or creasing devices
25 are arranged to bear on the strips as cut, which preferably consist of small rollers m and m' , having bearings at the ends of the fingers n and n' , which are secured to bars fixed across the frame at the entrance side of the rotary
30 cutters, and pass between the rotary cutters bearing on the strips of metal slit thereby, so as to bend or crease them longitudinally, as shown at Fig. 3, in which the heavy lines represent cross-sections of the strip so bent. It
35 is evident that by thus bending or creasing the strips they are reduced in width and their edges drawn away from the sides of the cutters g and g' , leaving them free to be discharged without resistance and without any rubbing
40 action on the sides of the cutters.

After the strips leave the rotary cutters they are directed to the pair of plain rollers p p' by the guide q . These rollers remove the bend or crease from the strips, so that they leave
45 the machine flat. Motion is imparted to the rotary cutters through the medium of the pinion r , which meshes into the wheel r' , secured to the end of the shaft b' . Said pinion r also drives the flattening-rollers p p' by meshing
50 into the wheel s , secured to the shaft of the lower roller, p' .

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

55 1. Rotary cutters for slitting-machines comprising the following elements in combination: a flanged sleeve, two cutting-disks placed on the sleeve, a washer placed between the disks, and a nut screwed on the sleeve, between which
60 and the flange of the sleeve the cutting-disks and the washer are held, substantially as and for the purpose set forth.

2. In a slitting-machine, in combination, two
65 parallel shafts, a set of rotary cutters fitted to slide on and rotate with each shaft with their edges overlapping, the opposite end cutters of each set being rigidly secured to their respect-

ive shafts, sleeve-bearings fitted on the other ends of the shafts, and adjusting-screws fitted in the ends of the shaft to act against the sleeve-
70 bearings, substantially as and for the purpose set forth.

3. In a slitting-machine, in combination, two parallel shafts, two sets of rotary cutters fitted to slide longitudinally on and rotate with the
75 shafts, each cutter composed of a flanged sleeve, two cutting-disks, a spacing-washer, and a holding-nut, and screws in the ends of the shafts for forcing and holding the edges of the two sets of rotary cutters together, substantially as
80 and for the purpose set forth.

4. In a slitting-machine, the combination, with two sets of rotary cutters having their cutting-edges overlapping, of bending or creasing
85 devices arranged to bear on the central parts of the strips at or a little beyond where the knives act on the sheet, substantially as and for the purpose set forth.

5. In a slitting-machine, the combination, with two sets of rotary cutters having over-
90 lapping cutting-edges, of bending or creasing devices arranged to bear on the central parts of the strips at or a little beyond where the knives act on the sheet, and a pair of flattening-rollers, between which the bent or creased
95 strips pass as they leave the rotary cutters, substantially as and for the purpose set forth.

6. In a slitting-machine, in combination, two sets of rotary cutters having overlapping cutting-edges, fingers arranged to extend between
100 the cutters, and bending or creasing rollers fitted in the ends of the fingers and arranged to bear on the central parts of the strips at or a little beyond where the knives act on the sheet, substantially as and for the purpose set forth.
105

7. In a slitting-machine, in combination, the shafts b and b' , sleeve-bearings d and d' , flanged sleeves e and e' and f and f' , cutting-disks g and g' , washers h and h' , nuts i and i' , screws j and j' , and washers k and k' , substantially as and for
110 the purpose set forth.

8. In a slitting-machine, in combination, the shafts b and b' , sleeve-bearings d and d' , flanged sleeves e and e' and f and f' , cutting-disks g and g' , washers h and h' , nuts i and i' , screws j and j' ,
115 washers k and k' , bending or creasing rollers m and m' , and fingers n and n' , substantially as and for the purpose set forth.

9. In a slitting-machine, in combination, the shafts b and b' , sleeve-bearings d and d' , flanged
120 sleeves e and e' and f and f' , cutting-disks g and g' , washers h and h' , nuts i and i' , screws j and j' , washers k and k' , bending or creasing rollers m and m' , fingers n and n' , and flattening-rollers p and p' , substantially as and for the pur-
125 pose set forth.

In testimony whereof I have hereunto set my hand, at New York, county and State of New York, this 6th day of October, 1886.

JOHN VERMEULEN.

Witnesses:

S. STEINFELD,
H. D. WILLIAMS.