

(No Model.)

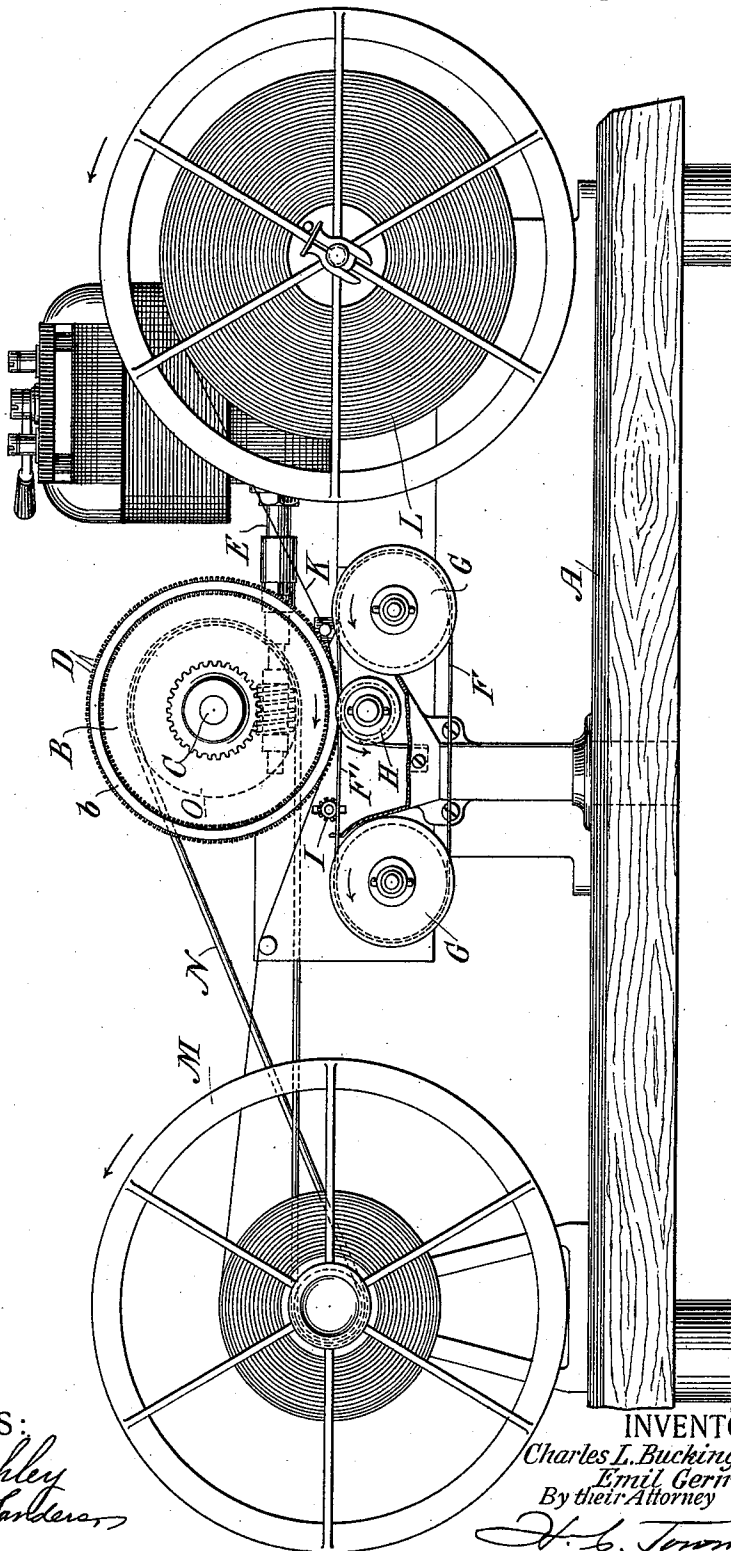
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C. L. BUCKINGHAM & E. GERMANN.
PERFORATING MACHINE.

No. 568,515.

Patented Sept. 29, 1896.

Fig. 1,



WITNESSES:

C. E. Ashley
John C. Sanders

INVENTORS:

Charles L. Buckingham &
Emil Germann.
By their Attorney

H. C. Townsend

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4,

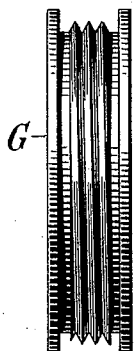


Fig. 2,

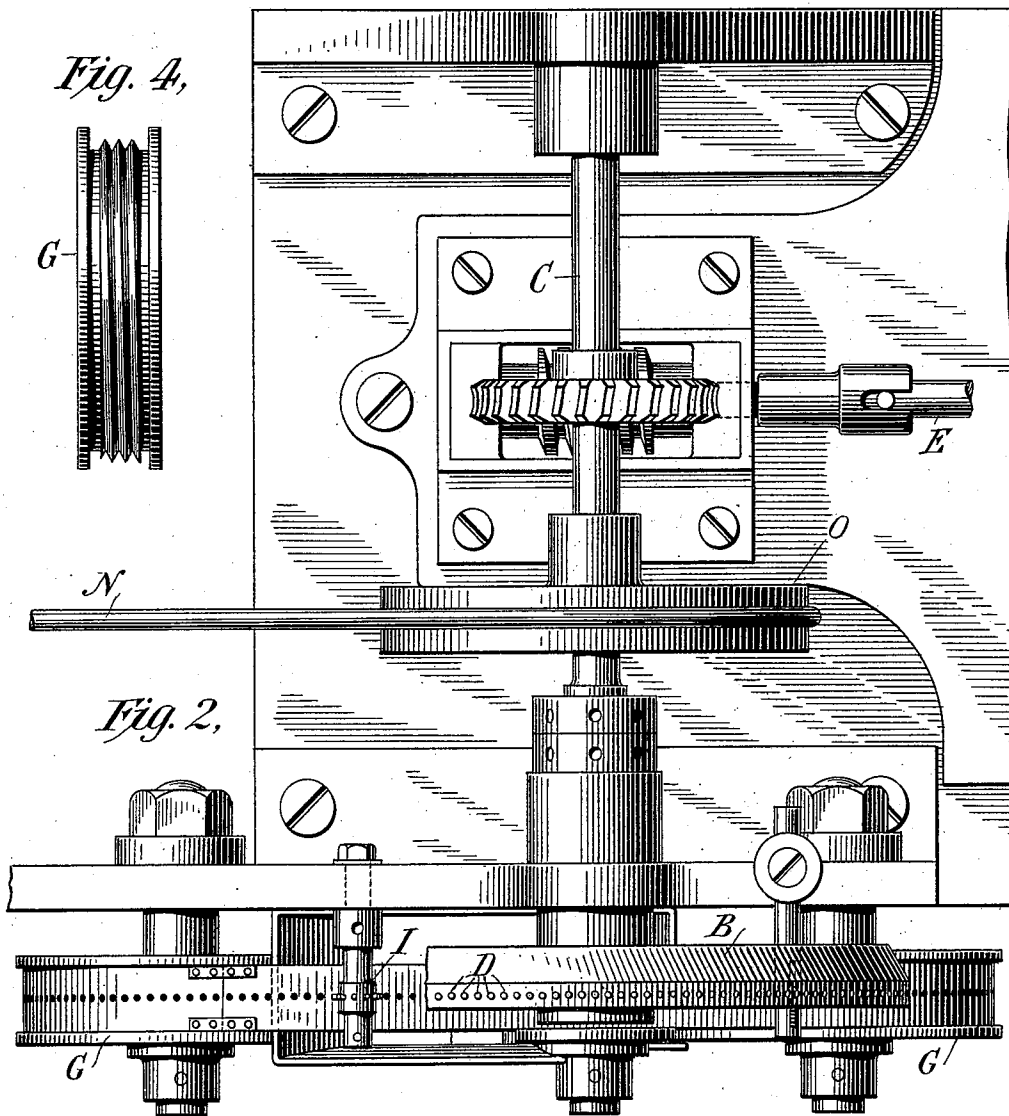
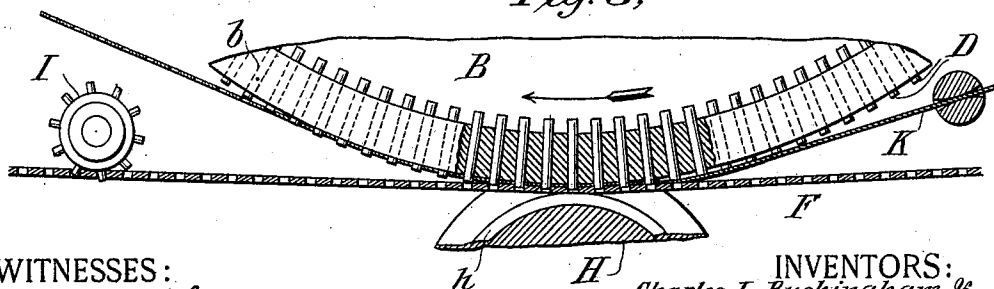


Fig. 3,



WITNESSES:

C. E. Ashley
John Sanders

INVENTORS:

Charles L. Buckingham &
Emil Germann.
By their Attorney

H. L. Townsend

UNITED STATES PATENT OFFICE.

CHARLES L. BUCKINGHAM, OF NEW YORK, AND EMIL GERMANN, OF BROOKLYN, NEW YORK; SAID GERMANN ASSIGNOR TO SAID BUCKINGHAM.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,515, dated September 29, 1896.

Application filed May 11, 1896. Serial No. 591,052. (No model.)

To all whom it may concern:

Be it known that we, CHARLES L. BUCKINGHAM, residing at New York, in the county of New York, and EMIL GERMANN, residing at Brooklyn, in the county of Kings, State of New York, citizens of the United States, have invented a certain new and useful Perforating-Machine, of which the following is a specification.

10 This invention relates to a perforating-machine designed to perforate a strip or fillet of paper with a continuous row of holes.

The object of the invention is to provide a machine of high speed and efficiency and 15 capable of producing a row of holes spaced with exact uniformity, to which end the invention consists in the combination, with a series of punches projecting radially from a suitable revolving wheel or head, of a series 20 of dies constructed or formed as a flexible band or strip in which the die-openings are spaced in exact correspondence with the spacing of the punches and which travels over suitable wheels or pulleys and is engaged at its die-openings or perforations by 25 the punches. Power may be applied to the punch-carrying wheel, in which case the punches, by engaging with the dies in the die-bands, will cause the same to travel, or vice versa the power may be applied to the 30 die-band to cause it to travel continually, and said band will, by engagement with the punches, cause the punch-wheel to rotate, or power may be applied to both, in which 35 case each will act as a check upon the power of the other, the meshing of the punches and die-openings in the band causing them to travel in exact correspondence. In some cases, if the strength of the paper will permit, the power might be applied to the paper, 40 so as to pull it through between the punch-wheel and band. The paper strip or fillet is fed between the band and punches in any suitable way.

45 The invention consists, further, in details of construction, as more particularly hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying the 50 invention. Fig. 2 is an enlarged plan of the same. Fig. 3 is a vertical section through

the punch-wheel, die-band, and support-wheel at the point where the punches and band engage. Fig. 4 is a plan of a preferred 55 form of wheel or pulley over which the die-band passes after leaving the punches.

A is a suitable base on which the frames or standards carrying the working parts are mounted.

B is a wheel mounted on an axle C and having punches D projecting radially from its 60 periphery. These punches may be mounted on the wheel by driving them into holes in a flange *b* of said wheel. The construction is of special advantage from the fact that the 65 punches when worn may be driven radially outward and reground, thus rendering repairs of the punches a matter of little expense.

E is a shaft driven by an electric or other motor and geared to axle C by a worm or 70 other gear, as shown.

F is the flexible die band or strip. This band consists, preferably, of a ribbon of sheet metal, in which are formed the die-openings, 75 as clearly shown in Fig. 3. The band travels in the direction indicated by the arrow over wheels G, G, and at the point where it is engaged by the punches is supported by an idler-wheel H, formed at *h* with a groove coinciding with the line of die-openings in the 80 band. The punchings drop into this groove and escape below. To aid in clearing the die-openings from punchings a toothed idler-wheel I may be employed. The teeth of this idler mesh with the band and are adapted to 85 pass well through the same, as indicated in Fig. 3, and force out the punchings. When the band travels at high speed, there is liability that the refuse punchings may be carried over onto wheel G and collect so as to obstruct the operation of the apparatus. To 90 obviate this, either or both of the wheels G may be formed with a grooved periphery, as shown, and rather sharp edges between the grooves. This grooving may be made by cutting a screw-thread in the periphery. The 95 band passes around this grooved periphery, but raised above the diameter of the wheels near the sides. The action of this grooving is to cut up the paper clips and to afford a 100 space for them, so that they may not come between the peripheries of G G and the metal

die-band. Moreover the raised thread and diminished diameters at either side of the thread permit a free passage for the joint of the die-band. The ends of said band are riveted together near the outer edges of the band and in such manner as to allow the rivets to pass over the reduced diameters of G G. Fig. 2 shows a ribbon so jointed. We desire to claim this specific feature, although we also wish to claim die-bands whether made of a continuous closed strip or of a strip whose ends are fastened, as here shown.

K is the paper strip or fillet, which is fed between the punch-wheel and band from a reel L onto a reel M. The latter takes up the paper as fast as it is punched and may be driven by a belt N, passing over a pulley O on the main shaft C. The belt is adapted to slip as the size of the roll on the reel M increases. Thus the wheel will be driven at sufficient speed to take up the paper at the beginning of the operation of the machine, but will not break the paper when, owing to the larger diameter of the roll, it tends to wind the paper up at a faster rate.

What we claim as our invention is—

1. In a punching apparatus, the combination, substantially as described, of a punch-wheel having radially-projecting punches, and a series of cooperating dies formed as a flexible band or strip.

2. In a punching apparatus, the combination, substantially as described, of a wheel carrying a series of radially-projecting punches, and a perforated metal band forming a die-plate for said punches.

3. The combination, substantially as described, of the punch-wheel, the endless die-band, and the grooved supporting-wheel beneath the band at the point where it is engaged by the punches.

4. The combination with the endless die-band, of the toothed clearance-wheel meshing therewith, as and for the purpose described.

5. The combination with the traveling die-band, of the wheel having its surface over which the band passes, formed with a grooved periphery, as and for the purpose described.

6. The combination of the punch-wheel shaft, the punch-wheel, a perforated metal band forming the die-plate for said punches, a motor for driving said punch-wheel and die-plate, and the take-up wheel belted to the shaft of said punch-wheel.

Signed at New York, in the county of New York and State of New York, this 7th day of May, A. D. 1896.

CHARLES L. BUCKINGHAM.
EMIL GERMAN.

Witnesses:

ROBT. F. DOYLE,
JOHN C. SANDERS.