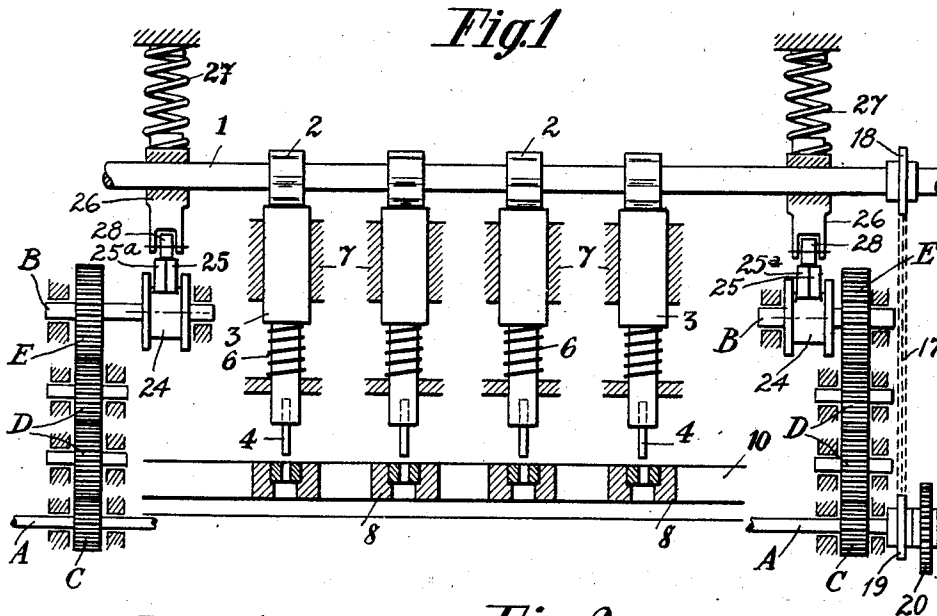
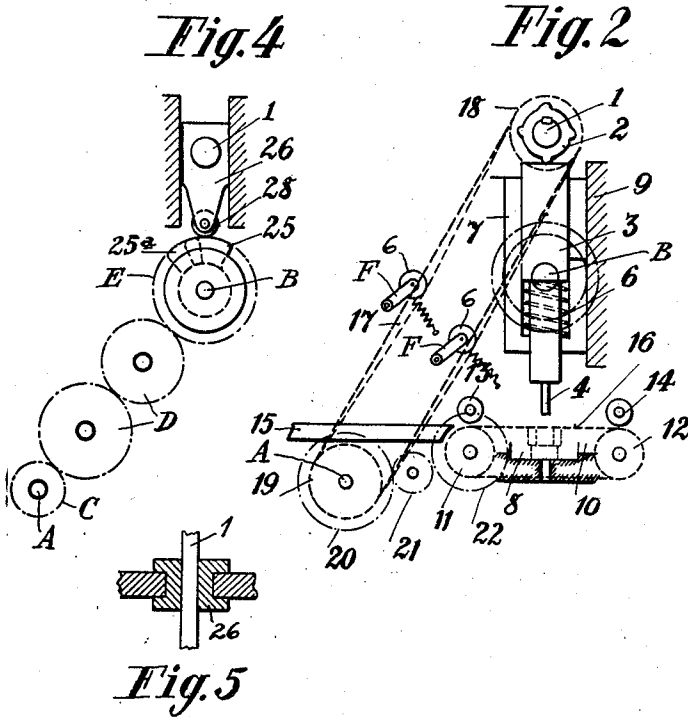
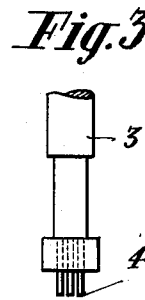
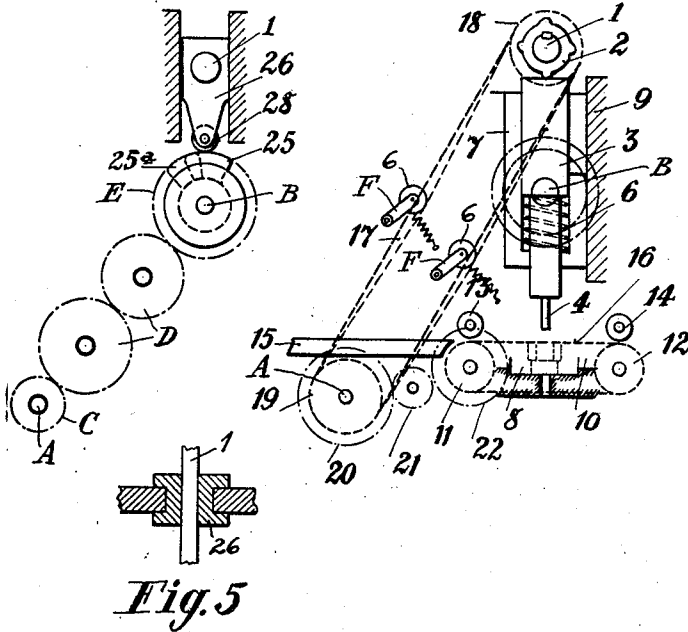


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R. A. HAUPT
PERFORATING MACHINE

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Inventor

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PERFORATING MACHINE

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My invention relates to improvements in perforating machines, the main objects thereof being the provision of one single punch for every cutting point, and of an adjustable pulling mechanism which causes the sheets to be perforated, to be pulled under the perforating punch automatically in continual operation. With these and other objects in view, my invention comprises the features of construction and combination of parts herein-after more particularly described and claimed.

The improved machine according to the invention is illustrated by way of example in the accompanying drawing in which:—

Fig. 1 shows a diagrammatical front elevation of the operative elements of the machine necessary to explain the invention;

Fig. 2 shows diagrammatically a side elevation of the improved machine;

Fig. 3 shows a die holder with three punches;

Fig. 4 shows in elevation the device for lifting the operative cam shaft; and

Fig. 5 is a horizontal cross-section of Figure 4.

On the driving shaft 1 of the machine, which carries out a very high number of revolutions, several cam discs 2 are arranged adapted to be shifted on shaft 1 in an axial direction.

Another form of construction consists in forming the cross section of the shaft similar to the cross section of a cam disc, so that it is not necessary to provide several adjustable cam discs. The cam discs or the cam disc shaped shaft operate in service in such a manner that the punch holders 3 with the punches 4 are periodically lowered by the cams acting upon the same. The punch holders are slidable in guides 7 and they are pressed upward by pressure springs 6. The punch holders 3 are therefore continually contacting with the cam discs 2 or with the cam like shaft 1. The guides 7 for the punch holders are adjustably mounted on the track 9 so that, by the adjusting, altering of the distance from centre to centre of two adjacent punch holders is possible and thereby also the

spacing of the punches 4 in the same. The dies 8 can be easily adjusted in their guides 10.

The feeding of the paper sheets to be perforated is generally effected by pairs of rolls which are arranged in front of and behind the dies 4. The two feeding rolls 11 and 13 convey the paper sheet from the table 15 to the punches 4. The sheet is then conveyed to the pull rolls 12 and 14. While the cylinders 11 and 12 are driving rolls, the upper rolls 13 and 14 serve as pressure rolls. The two rolls 11 and 12 are positively connected with each other by a transmission chain 16 and sprocket wheels. They are driven from the driving shaft 1 by means of a chain 17 and upper and lower sprocket wheels 18, 19 respectively. The sprocket wheel 19 is arranged at the side of a spur wheel 20, the rotating movement of which is transmitted to a spur wheel 22 through the intermediary of a change spur wheel 21. The spur wheel 22 is keyed on the axle of the feeding roll 11 and drives the pairs of rolls 11 and 13 and rolls 12 and 14. Owing to the possibility to interpose change speed wheels, it becomes possible to drive the feeding rolls at any desired speed, whereby to the sheets to be perforated an accordingly altered feeding speed is given, wherefrom results a narrower or wider perforation.

For carrying out limited or temporarily interrupted perforating, the cam wheels 24 are designed. Between the boundary rims of these wheels, two cams 25 and 25^a are arranged so that they are shiftable with regard to each other. The rollers 28 under the shiftable bearings 26 run on the cams 25 and 25^a so that these bearings are lifted for a longer or less long time against the counter pressure of springs 27. In the boundary rims of the cam wheels 24 several cams may be inserted, spaced at according distances, if several interruptions are desired.

At the left hand and at the right hand of Figure 1 is clearly shown the drive by means of the cams 24 through the medium of the shaft A. On the latter are mounted toothed wheels C which, by means of intermediate toothed wheels D, are in mesh with

the toothed wheels E, keyed to the shafts B carrying the cam wheels 24.

The chain 17 is made slack so as to allow to the cam shaft 1 the necessary displacements in vertical direction. Lying close to the chain 17 are spring-controlled levers F provided with rollers G rotating loosely and serving the purpose of constantly holding the said chain under tension. The bushing for the shiftable bearing is made as usual (see Figure 5).

The cam wheels 24 are constantly rotating. In the case of a lifting action of the cam shaft 1 being not intended, the cams 25, 25^a have to be moved away so as to bring them out of contact with the rollers 28. It is also possible to have the said cams 24 displaced laterally on the shafts B.

The moving away of the main shaft 1 from the die holders 3 has the advantage to have suddenly stopped the punching action of all the punches which are perforating the sheets, the machine continuing to rotate. In this position of the said main shaft 1, the cam discs 2 are rotating loosely, without coming in contact with the die holders. Owing to this arrangement, the perforating action of the punches may be interrupted at short or long intervals, as the case may be.

I claim:—

1. A perforating machine comprising in combination a frame, an upper transverse member in said frame, bearings in the upper transverse member, a punch holder slidable in each bearing, a punch mounted in the punch holder, a lower transverse member in said frame, dies mounted in said lower transverse member, a rotatable shaft mounted in the frame above said punch holder, yielding means acting against one side of the shaft, a cam on said shaft for operating the punch holders, spring means for raising the punch holders, and cam means for intermittently raising the shaft against its yielding means.

2. A perforating machine, comprising in combination a driving shaft, cam discs on said shaft, punch holders rapidly driven by said cam discs, guides in which said punch holders are guided, punches in said punch holders, two conveying rolls for conveying paper sheets continually under said punches for perforating the same, a chain for connecting said conveying rolls, pressing rolls above said conveying rolls, a chain gear transmission between said driving shaft and said conveying rolls for driving the latter, and a change speed wheel interchangeably inserted in said chain gear transmission for altering at will the feeding speed and thereby the spacing of the perforations.

In testimony whereof I affix my signature.

ROBERT ARNO HAUPT.