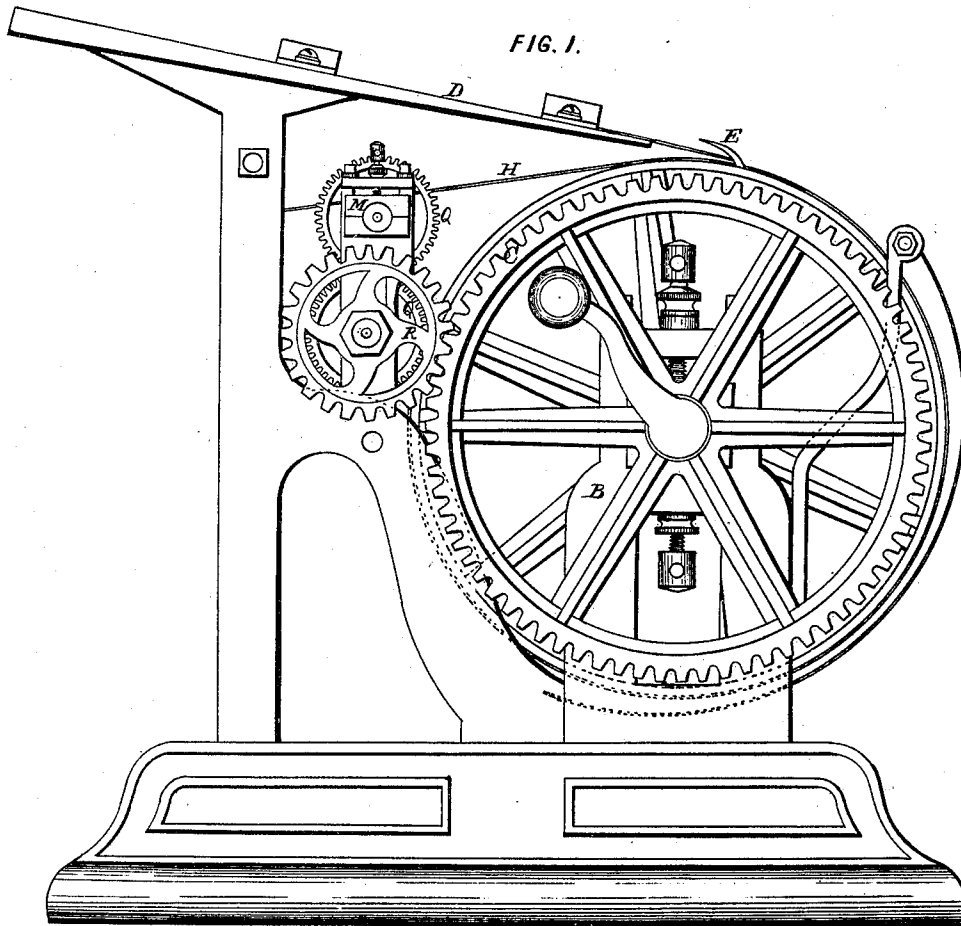


J. C. FORMAN.

PERFORATING ATTACHMENT FOR PRINTING PRESS.

No. 170,724.

Patented Dec. 7, 1875.



WITNESSES.

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FIG. 3.

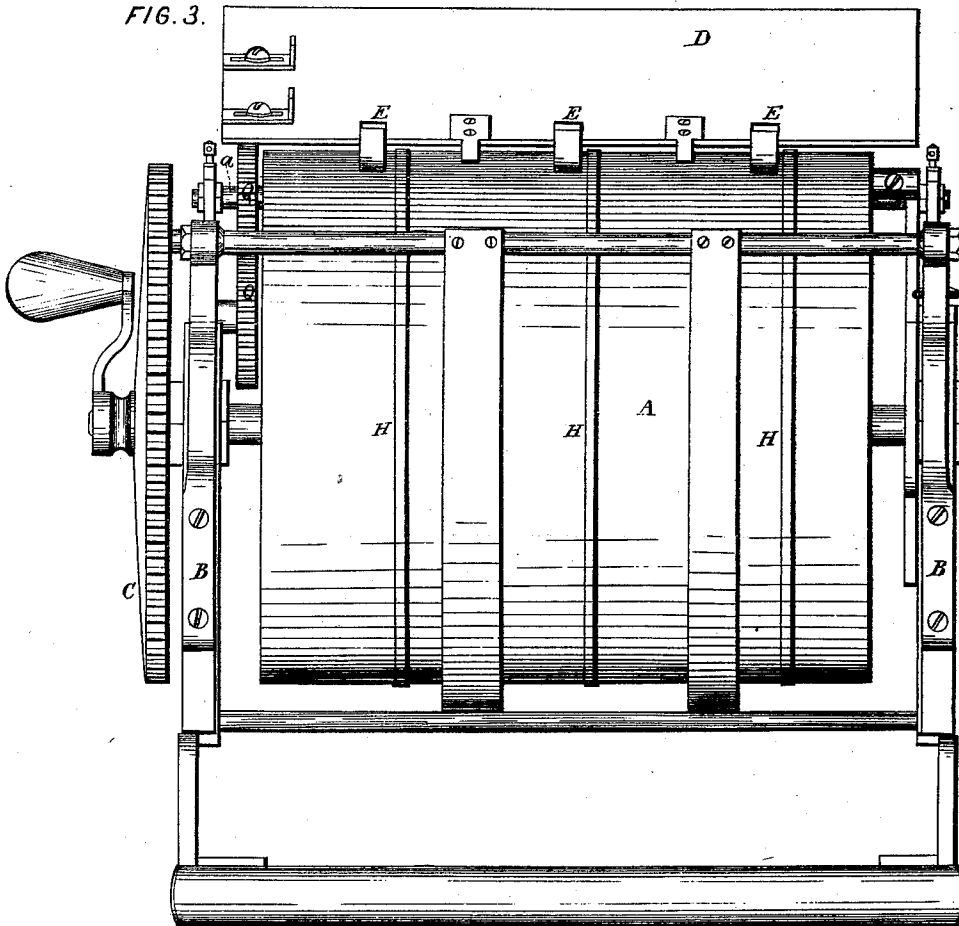
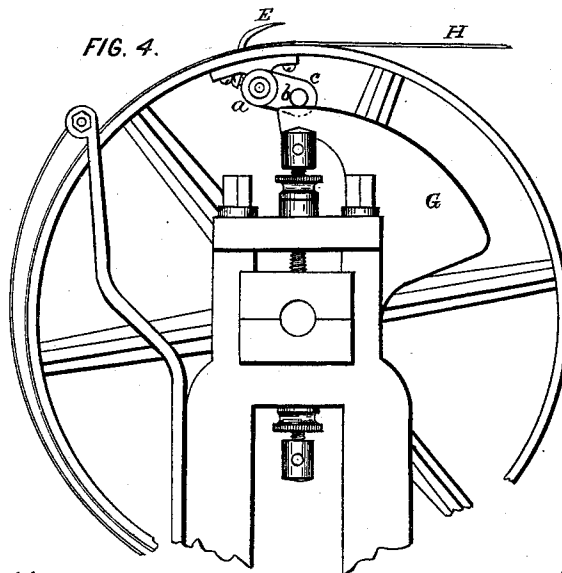


FIG. 4.



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FIG. 5.

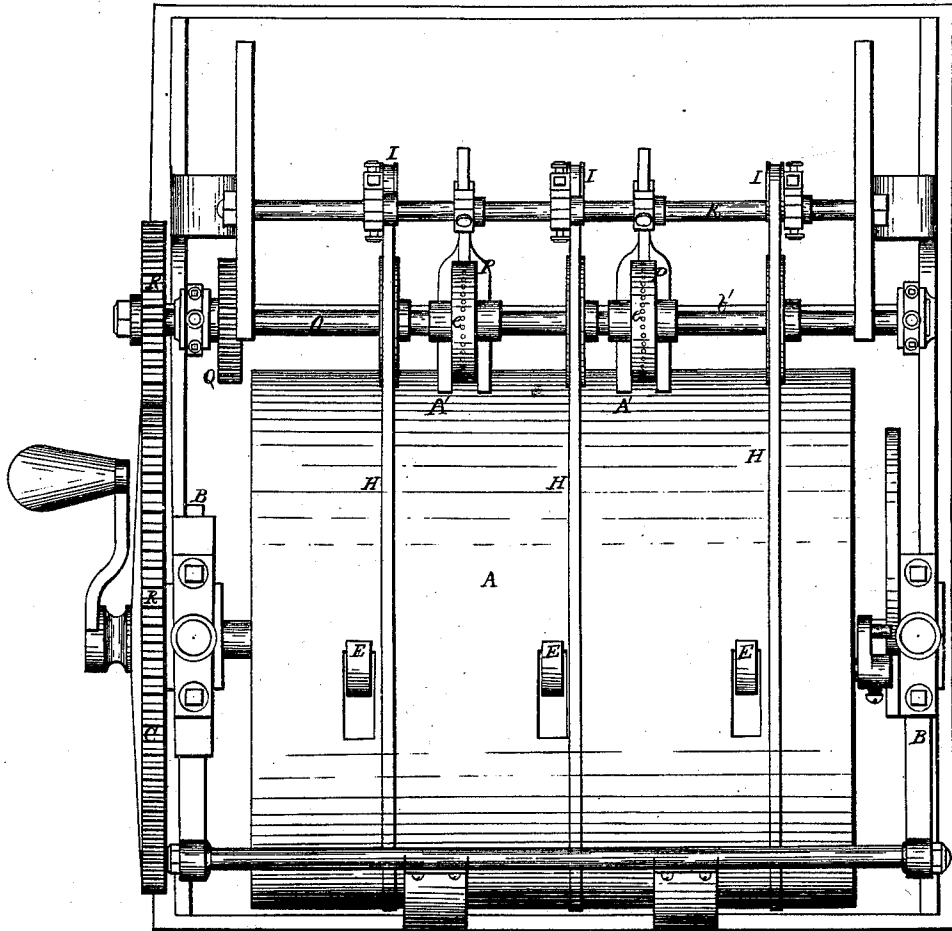


FIG. 6.

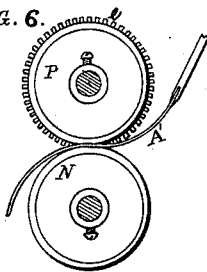
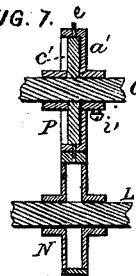


FIG. 7.



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UNITED STATES PATENT OFFICE.

JONATHAN C. FORMAN, OF CLEVELAND, OHIO.

IMPROVEMENT IN PERFORATING ATTACHMENTS FOR PRINTING-PRESSES.

Specification forming part of Letters Patent No. **170,724**, dated December 7, 1875; application filed June 25, 1875.

To all whom it may concern:

Be it known that I, JONATHAN C. FORMAN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful improvements in Rotary Perforating Apparatus Combined with Power Printing-Presses; and I hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings making part of the same.

Figure 1 is a side elevation of a section of a printing-press having attached thereto the improved perforating apparatus. Figs. 2 and 3 are side views of Fig. 1. Fig. 4 is a detached section. Fig. 5 is a plan view. Figs. 6 and 7 are detached sections.

Like letters represent like parts in the several views.

The nature of this invention relates to certain improvements in a perforating apparatus, and its attachment to, and operating conjointly with, a printing-press; and the object thereof is to perforate checks, drafts, bills, and all such printed forms whereof several are on one sheet, immediately on leaving the press—that is to say, the printed matter runs from the press at once to the perforator.

The construction and operation of the same are substantially as follows: So much only of a printing-press is shown that will be sufficient to illustrate the application of the perforator, the press being no part of the invention, and which is or may be the ordinary power-presses in use.

In the drawing, A represents the cylinder of a printing-press, journaled in the frames B in the ordinary way, and driven by the gearing C, or otherwise. D is the feed-board, whereon the sheets are laid to be fed to the press. E are the clamps for holding the sheet to the cylinder. Said clamps are secured to a shaft, *a*, Figs. 3 and 4, whereby they are raised, as shown in the drawing, by the partial rotation of the shaft, operated for that purpose by a cam, G, engaging a pin, *b*, projecting from the arm *c* of the shaft, as will be seen in Fig. 4, all of which is substantially as that in ordinary use. H are the tapes for guiding and delivering the printed sheets, and I the rollers over which the tapes run. Said rollers

are secured to the hangers J, depending from the rod K.

Having briefly described so much of a printing-press as is shown in the drawing, the application thereto of the perforating apparatus and its construction are substantially as follows: On the shaft L, Fig. 2, having its bearings in the standards M, are secured a pair of hollow rollers, N N. Circumferential in the face of the rollers is made a series of small holes, *i*, through to the inside or cavity of the roller. Said holes are of exact distance apart and of equal number in each roller. Immediately above said shaft and perforated rollers, in vertical line thereto and parallel therewith, is a shaft, O, Fig. 2, carrying a pair of rollers, P P, Fig. 5, corresponding in size to the rollers N N below them, and on the face of which they run, as shown in Fig. 6. Circumferential in the face of the rollers P P are inserted a series of punches, *e*, corresponding in number and size to the perforations in the lower rollers N N, and into which the punches enter, as the two sets of rollers revolve upon each other, driven by the cog-wheels Q. Said wheels are operated in turn by the gearing R. The relative position that the two shafts K L and their respective rollers hold to the cylinder A of the press is such that the sheet of printed matter, as it leaves the press or cylinder A, is carried by the tapes between them, and by their co-operation the paper or sheet is perforated before it is delivered to the receiving-table; hence the paper is printed and perforated by one continuous operation.

Heretofore the work of perforating printed matter has been done after the sheets have been delivered upon the receiving-table. This required a second handling of the paper in order to pass it through the perforator, which was run separately and independently of the press. This second handling of the paper required not only extra hands to handle the paper, but it also took up much time, thereby rendering the perforated matter expensive. To economize in these particulars is the purpose of combining the perforating apparatus with the press in the manner as above described, by which, as will be obvious, this extra labor and time are saved, and the per-

forated matter produced at less expense. The perforating-rollers are adjustable on their respective shafts; hence the printed sheets can be perforated as the nature of the work may require—that is, the lines of perforations can be wider or closer together, as the printed matter may render it necessary, the adjustment of the perforating-rollers being made in view of the matter to be printed; hence no special care is required for the perforation of the sheets as they are fed to the press, which are passed therefrom printed and perforated by one continuous operation.

As above said, the rollers N N and P P are made hollow, as will be seen in Fig. 7. Said rollers P P consist of a shell, *a'*, secured in position on the shaft by a set-screw, *v'*, in the hub of the roller, and which is prevented from turning thereon by a feather, as will be seen at *b'*, Fig. 5, which permits of its sliding on the shaft, but not to turn thereon. To the inside of the shell is fitted a plate or disk, *c'*. The purpose of said disk is to prevent the punches from being pushed inward while punching, as the inner end of the punches rests upon the periphery of the disk, as will be seen in Fig. 7.

In the event one of the punches should break off, the stump left in the roller can be pushed out for the insertion of a new punch by simply removing the disk and driving the stump of the broken punch from the hole.

In having the lower rollers N N made hol-

low, as shown in said Fig. 7, the punchings or burrs are collected therein, and thus prevented from being scattered upon the receiving-table or about the machine. The punchings can be removed from the rollers through a hole made in the side thereof, which, when in use, is closed. To prevent the paper from adhering to the punches a stripper, *A'*, is introduced between the upper and lower rollers, under which the sheet for perforating runs, and is stripped from the punches as it passes along. When the perforating apparatus is not required to be used on the sheets being printed the rollers can be adjusted out of the way, and, if need be, the lower ones can be arranged for running the tapes on.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a printing-press, the herein-described perforating apparatus, consisting of the perforating-rollers N N and P P, shafts K L, and wheels Q Q, operating conjointly with said press, in the manner substantially as described, and for the purpose specified.

2. The combination of the roller P, carrying a series of removable punches, and roller *n*, constructed with a receiving-cavity, substantially as and for the purpose described.

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Witnesses:

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