

(No Model.)

2 Sheets—Sheet 1.

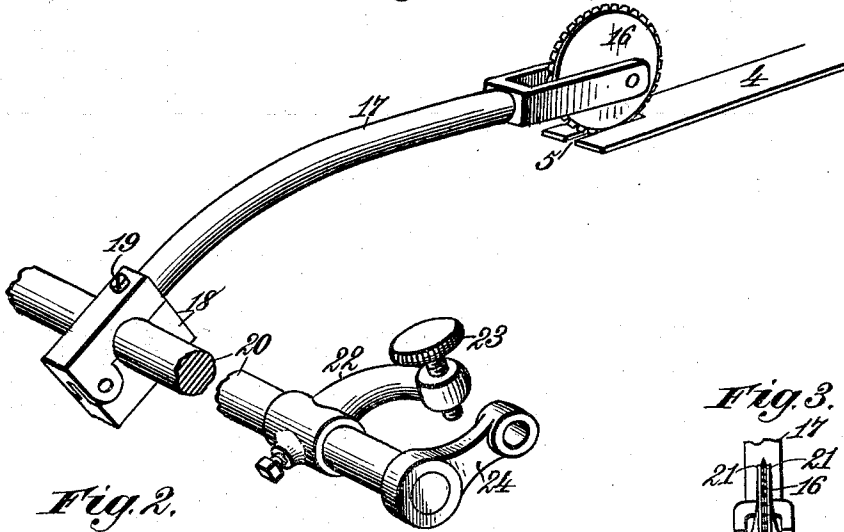
E. KELLNER.

PERFORATING MECHANISM FOR CYLINDER PRINTING PRESSES.

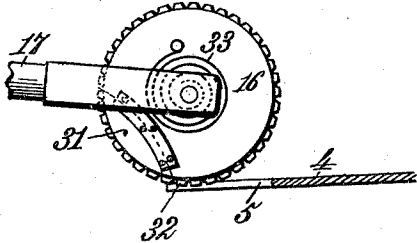
No. 518,505.

Patented Apr. 17, 1894.

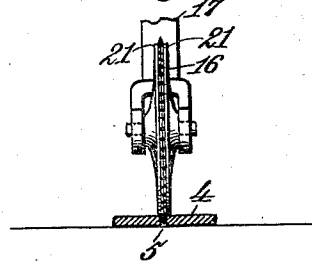
*Fig. 1.*



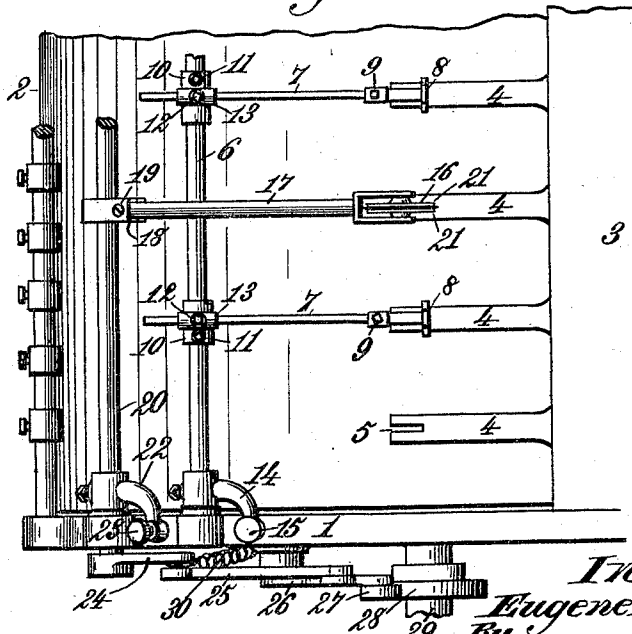
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses.  
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*J. M. Kelley*

Inventor.  
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By *James L. Norris.*  
*Att'y.*

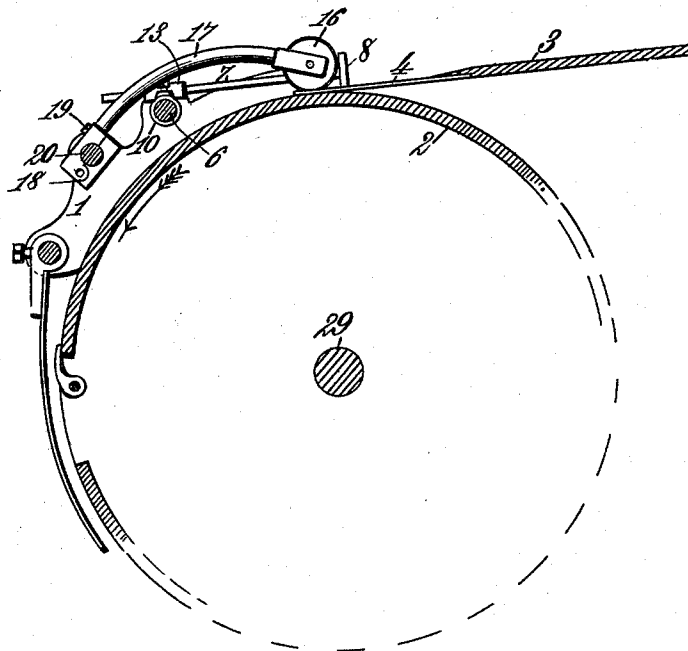
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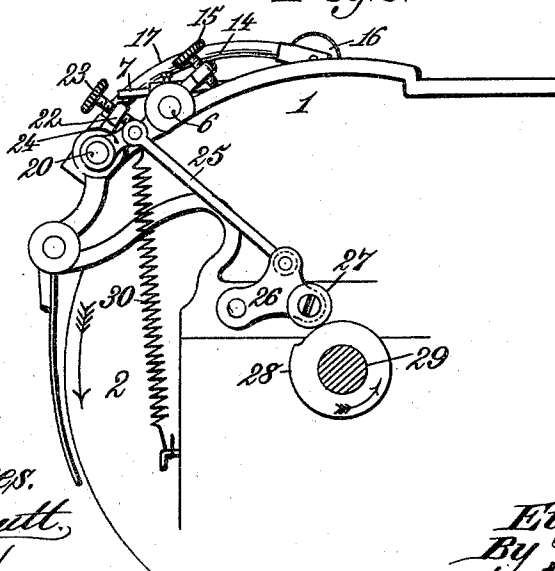
No. 518,505.

Patented Apr. 17, 1894.

*Fig. 5.*



*Fig. 6.*



Witnesses.  
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# UNITED STATES PATENT OFFICE.

EUGENE KELLNER, OF WACO, TEXAS, ASSIGNOR OF ONE-HALF TO FOSTER W. FORT, OF SAME PLACE.

## PERFORATING MECHANISM FOR CYLINDER PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 518,505, dated April 17, 1894.

Application filed July 28, 1893. Serial No. 481,756. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE KELLNER, a citizen of the United States, residing at Waco, in the county of McLennan and State of Texas, have invented new and useful Improvements in Perforating Mechanism for Cylinder Printing-Presses, of which the following is a specification.

This invention relates to perforating attachments for cylinder printing and lithographic presses and has for its object to provide a simple automatic device adapted to produce lines of perforations at any required distance apart and of any desired length in paper or cardboard at the time of printing thereon the forms for checks, drafts, bills, notes, tickets or other printed or lithographed matter.

The invention consists in features of construction and novel combinations of parts in perforating attachments for printing presses, as hereinafter more particularly described and claimed.

In the annexed drawings illustrating the invention—Figure 1 is a perspective of my improved perforating attachment for printing and lithographic presses. Fig. 2, shows a longitudinal section of one of the slotted feed tongues and a side elevation of the perforating wheel, illustrating a modification in its construction. Fig. 3 is an edge elevation of the perforating wheel and transverse section of its co-acting feed tongue. Fig. 4 is a plan showing a portion of the feed board, the cylinder and the feed guide and perforating devices. Fig. 5 shows a vertical section through the cylinder, the feed board and the supports of the feed guides and perforating attachments. Fig. 6, is a side elevation of a portion of a cylinder press illustrating my improvements.

Referring to the drawings, the numeral 1, Figs. 4, 5, and 6 designates a portion of the press frame; 2 the impression cylinder and 3 the feed board. The feed board 3 is provided with feed tongues 4 projecting toward and lying on the cylinder, as shown in Figs. 4 and 5. These feed tongues 4 are preferably constructed of spring metal, and as shown in Figs. 1, 2, 3 and 4 each feed tongue is pro-

vided with a slot 5 in its free end for a purpose presently explained.

At a convenient point above the cylinder 2 and parallel therewith is a shaft 6 the ends of which are journaled in the press frame. This shaft 6 affords support for a series of arms 7 carrying feed guides 8 that form stops for the sheet as it is placed in position to be grasped by the grippers. The feed guides 8 may be attached to the arms 7 by means of set screws 9, Fig. 4, and said arms 7 are preferably secured to the shaft 6 by means of collars 10 and set screws 11 so as to be capable of radial and lateral adjustment on the shaft 6 as may be required. Each guide arm 7 is preferably held by means of a set screw 12 in a socket 13 on the collar 10 so as to permit a longitudinal adjustment of the feed guide and guide arm along or in line with the corresponding feed tongue. On one end of the shaft 6 is a laterally curved arm 14 carrying in its end a set screw 15 that is adapted to bear on the upper surface of one side of the press frame, as shown in Figs. 4, and 6. By rotating this set-screw 15 in the proper direction to raise or lower it, as the case may be, and thus slightly rock the shaft 6 upward or downward, the guides 8 will be simultaneously adjusted to vary the pressure with which they rest on the feed tongues. The guides 8 are slightly raised by well known mechanism to permit passage of the paper, when the grippers which carry it around the cylinder take hold of the sheet.

The device for perforating the paper consists of a perforating wheel 16 mounted in the bifurcated end of a curved or arched arm 17 having at its other end a hinged clamp 18 that may be locked, by means of a set screw or bolt 19, in close clamping connection with a shaft 20 journaled in the press frame 1 parallel with the shaft 6 on which the feed guides are mounted. As shown in Figs. 5 and 6 the arm 17 is sufficiently arched to enable it to be readily extended above or over the shaft 6 of the feed guides.

The perforating wheel 16 is provided with a centrally circumferential series of teeth the length of which is a little less than the thick-

ness of the slotted feed tongues 4 with one of which the said wheel is arranged to operate. On both sides of its circumferential series of teeth the perforating wheel 16 is provided with annular rims or shoulders 21, Figs. 3 and 4, that are adapted to bear on the opposite sides of the slot 5, in one of the feed tongues. By providing each feed tongue 4 with a slot 5 the perforator wheel can be used with any one of said feed tongues according to the position to which the said wheel may be adjusted laterally on its shaft. The slots 5 do not in any way injure the tongues 4, and serve the convenient purpose of permitting the use of either of them with the perforator wheels. At the same time the other feed tongues are in readiness for use with the feed guides. Any number of perforating wheels 16 may be employed if more than one line of perforations is to be made at once. I prefer to make the slotted feed tongues 4 about one-sixteenth of an inch in thickness and to have the teeth of the perforator wheel 16 a little less than one-sixteenth of an inch in length. Thus when the wheel is in position with its teeth in the slot 5 of one of the feed tongues as shown in Figs. 1, 2 and 3, it will be enabled to properly perforate the paper without any liability of coming in contact with or cutting the press cylinder or the tympan sheet; the toothed perforating wheel when in its lowest position being supported by its rims or shoulders 21 resting on the tongue 4 at the sides of the slot 5 therein.

On the shaft 20 is a laterally curved arm 22 carrying a set screw 23 adapted to bear on an upper surface of one of the side pieces of the press frame so that by turning the screw in either direction the shaft 20 may be rocked upward or downward to regulate the pressure of the perforating wheel 16 at pleasure and control the distance to which the wheel teeth are allowed to extend through the paper. If the paper to be perforated is thin or of light weight, it is obvious that without the adjustment provided by the set-screw 23 the teeth of the perforating wheel 16 would penetrate the paper so far and enter the slot 5 to such depth that in becoming disengaged from the paper they would be liable to lengthen the perforations and mutilate the paper sheet. The set-screw 23 thus provides an adjustment whereby the degree or extent of penetration may be easily regulated according to the thickness of the paper to be perforated and without any liability of mutilating or tearing the paper in the disengagement of the wheel teeth therefrom. This set screw 23 provides, also for a simultaneous adjustment of the pressure of the perforating wheels on the feed tongues when more than one wheel is used. The arm 22 may be sleeved on the shaft 20 and held in any required position by means of a set screw or other fastening.

To one end of the shaft 20, outside the press

frame, is attached a crank arm 24 that is connected by a rod 25 to a three cornered lever 26 pivoted to the outside of the press frame. One corner of the lever 26, Fig. 6, carries a roller 27 in position to be acted on by a cam 28 on the shaft 29 of the impression cylinder. This cam 28 and its connections to the shaft 20 are designed for use when work with a stub is being printed, or whenever it is desired to break the line of perforations at certain intervals. At each revolution of the cylinder 2 the cam 28 lifts the lever 26 and rod 25 and thereby rocks the shaft 20 upward a sufficient distance to raise the perforating wheel or wheels while the stub portion of the paper sheet passes beneath, after which the perforating wheel again drops into operative position. A spring 30 may be connected with the arm 24 to draw the shaft 20 down and hold the perforating wheel 16 as low as the adjustment given to the set screw 23 will permit it to go or until the wheel rims 21 rest on the slotted feed tongue 4 in the lowest position of said wheel. When the paper to be perforated is heavy the set screw 23 is turned so as to let the perforating wheel down farther than when used for perforating light weight paper which requires only a little pressure.

The perforating is done before the sheet to be printed reaches the form, and one inch (or less) or the whole length of the sheet on the cylinder may be perforated, as desired. The perforating and the printing or lithographing are accomplished at one operation. No lock up or justification is necessary. The perforating attachment is readily adapted to lithographic or cylinder printing presses of any make or style and can be quickly set to work on any part of the cylinder. By simply turning the set screw 23 the perforating wheel can be regulated at once for light or heavy stock so that in perforating thin paper the teeth of the perforating wheel will not be allowed to pass through the paper to such a great distance as to lengthen the perforations and risk the liability of tearing the paper during the disengagement of the wheel teeth. The perforating wheel never touches the cylinder and tympan in its working, being held therefrom by the adjustment given to the set screw 23 and also by reason of the wheel rims 21 when in their lowest position being supported on the slotted feed tongue. Should it be desired to use the perforating wheel without the slotted feed tongue a small strip of hard pasteboard or other suitable material may be secured to the cylinder or tympan, as usual, to obviate any risk of injury. The perforations made by the wheel 16 are always straight with the printing and are scarcely visible after the work has been pressed. When the perforated portions of a sheet are torn apart the edges will be left almost as smooth and straight as if cut with a knife.

In Fig. 2 I have shown a perforating wheel having a removable toothed segment 31 that will be detached when the wheel is to be used in a mutilated form for work requiring a stub.

On starting a line of perforations the mutilated wheel will occupy such position that the first tooth 32 will strike the paper at the required point for beginning the work of perforating. The perforating is done by the toothed portion of the mutilated wheel in the same manner as by the teeth of a solid wheel, and when the wheel has revolved sufficiently to bring its mutilated portion above the paper the perforating will cease and will not be resumed until the part of the paper to form the stub has passed on from beneath the mutilated portion of the wheel. A light spring 33 that has been wound by the rotation of the wheel will return it to position for beginning another line of perforations, but before the wheel regains this position the unperforated or stub portion of the paper will have passed on. The spring 33 does its work of returning the wheel only after sufficient time has elapsed to permit the required feed of paper to form the stub, and although the spring may tend to hold the last tooth of the mutilated wheel in contact with the paper for a time, it will not exert sufficient pressure to cause the said tooth to cut or tear the paper. With this mutilated perforating wheel it is not necessary to employ the cam 28 and lifting mechanism connecting with the shaft 20, as while the paper stub is passing beneath the mutilated portion of the wheel it will not be perforated. The wheel can be made any size but has been found most practical at about four and a half inches in diameter, the removable section being about one third the circumference of the wheel. In this case, also, the wheel does not come in contact with the tympan on the cylinder. The wheel remains stationary until the sheet to be perforated reaches it, then revolves while the sheet passes under and again stops until the next sheet arrives in position for perforation, thus doing away with all unnecessary friction. It will be understood that by replacing the removable segment 31 the sectional wheel can be employed for continuous perforating or in connection with the cam lifting mechanism, hereinbefore described, it may be employed in stub work. It is obvious that by unfastening the clamp 18 the perforating wheel may be adjusted laterally to any desired position or it may be wholly removed if no perforating work is required.

Having thus described my invention, what I claim is—

1. In a perforating attachment for presses, the combination of a series of slotted feed tongues, a rock-shaft provided with arms, a perforating wheel mounted on one of said arms and adapted to work in the slot of one of said feed tongues, a set screw supported by another of said arms to adjust the pressure of the perforating wheel, a spring to draw

down the perforating wheel as far as the adjustment of the set screw will permit, and a series of adjustable feed guides arranged to rest on the other slotted feed tongues, substantially as described.

2. In a perforating attachment for printing presses, the combination with the impression cylinder, of a rock shaft having an arm, a perforating wheel mounted on said arm, a crank on the rock shaft, a lever pivoted to the press frame, a rod connecting said crank and lever, a roller mounted on said lever, and a cam located on the cylinder shaft and adapted to act on said roller to actuate the lever and its connections with the rock shaft for the purpose of lifting the perforating wheel at intervals, substantially as described.

3. In a perforating attachment for printing presses, the combination of an impression cylinder, a rock shaft having arms 17 and 22, a perforating wheel mounted on one of said arms, a set screw 23 supported by the other arm and having a fixed bearing against a portion of the press frame to regulate the pressure of the perforating wheel, a crank arm 24 on the rock shaft, a cam 28 on the cylinder shaft, lever connections between said cam and crank arm to cause the lifting of the perforating wheel at intervals, and a spring 30 to draw down the perforating wheel, substantially as described.

4. In a perforating attachment for printing presses, the combination with the impression cylinder, and the feed board, of a slotted feed tongue, and a perforating wheel having a central circumferential series of teeth and provided on both sides with annular rims or shoulders, the teeth of said wheel being arranged to work in the slot of the feed tongue while the wheel rims or shoulders bear on the tongue at the sides of said slot, substantially as described.

5. In a perforating attachment for printing presses, the combination with the impression cylinder and feed board, of a series of slotted feed tongues, a perforating wheel having a central circumferential series of teeth adapted to work in the slot of one of said feed tongues, said wheel provided with annular rims or shoulders to bear on the tongue at opposite sides of the slot therein, an arm on which said wheel is mounted, and a shaft on which said arm is adjustably supported, substantially as described.

6. In a perforating attachment for printing presses, the combination with the impression cylinder and feed board, of a series of slotted feed tongues, a perforating wheel adapted to work in the slot of one of said feed tongues, a laterally adjustable support for said perforating wheel to bring it into operative relation with either slotted feed tongue, means for regulating the pressure of the perforating wheel, and adjustable feed guides arranged to rest on the other feed tongues, substantially as described.

7. In a perforating attachment for printing

presses, the combination with the impression  
cylinder and feed board, of a slotted feed  
tongue, a sectional perforating wheel having  
a removable segment, and a spring for return-  
5 ing said wheel to its initial position, substan-  
tially as described.

In testimony whereof I have hereunto set

my hand in presence of two subscribing wit-  
nesses.

EUGENE KELLNER.

Witnesses:

D. M. WELLS,

W. S. HOLLIFIELD.