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Patented July 11, 1899.

J. W. BUELL.

PRINTING ATTACHMENT FOR ROLL PAPER HOLDERS.

(Application filed Sept. 22, 1898.)

(No Model.)

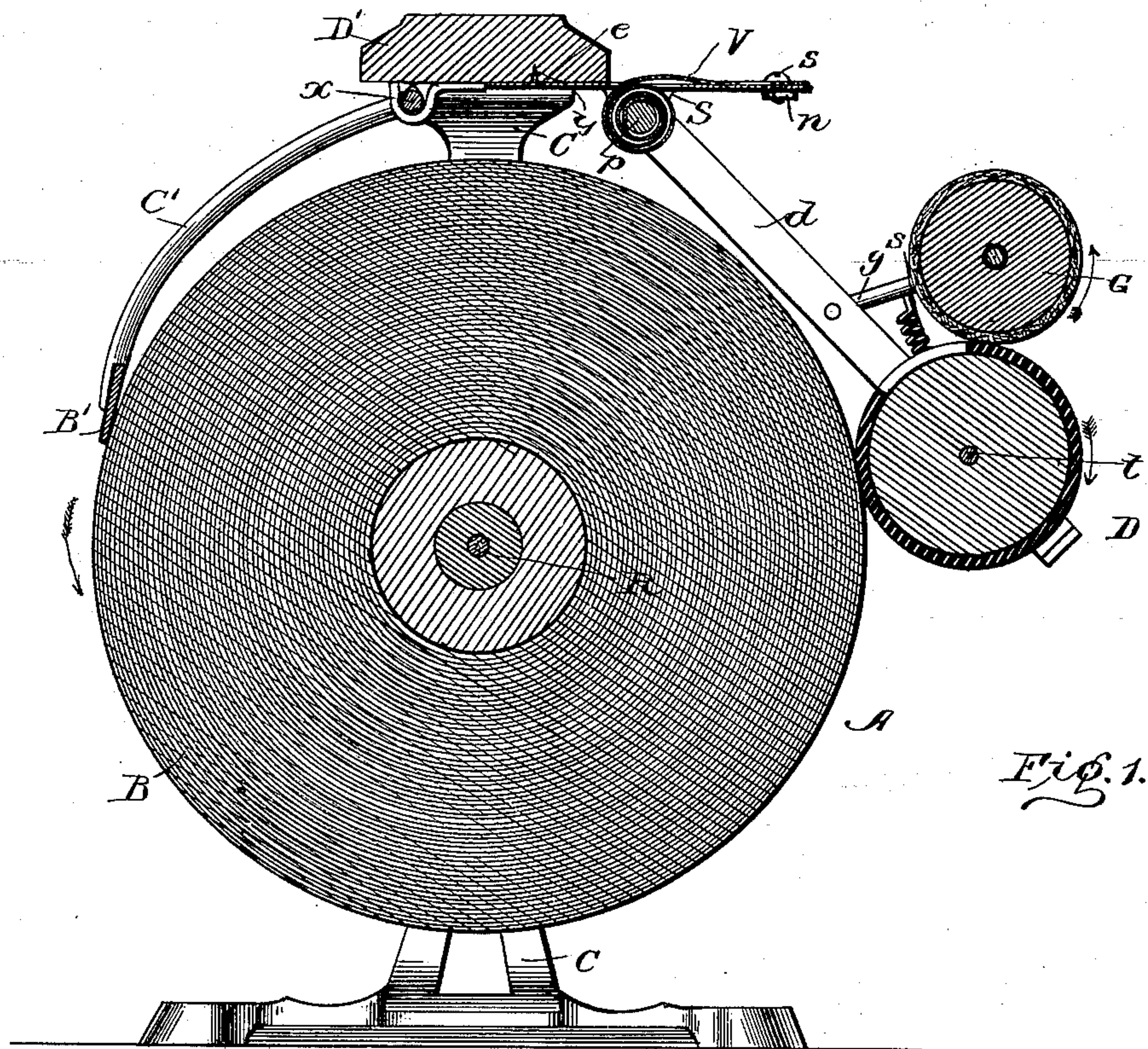
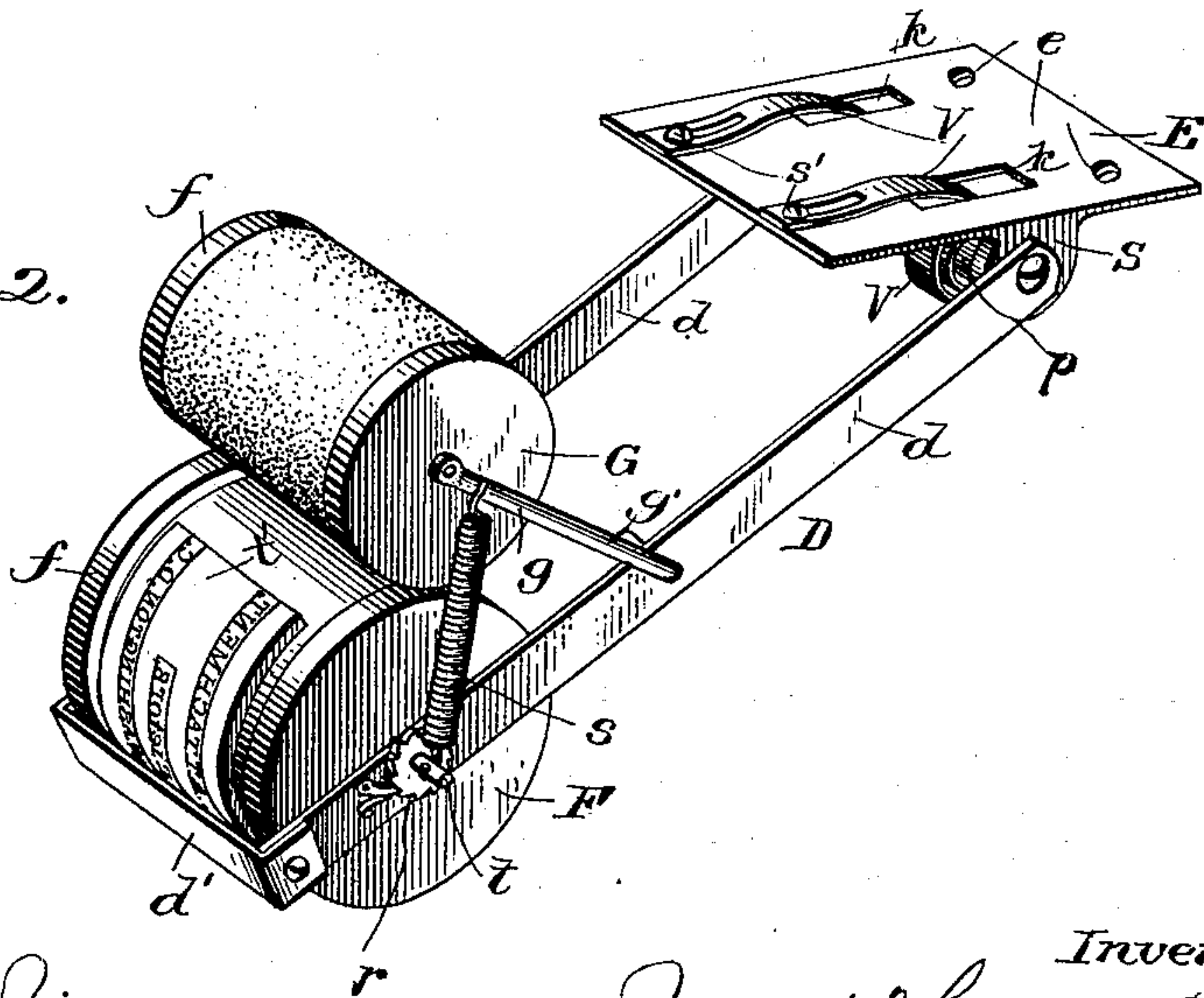


Fig. 2.



Witnesses:

J. M. Fowler Jr.  
A. G. DuBois

Inventor

Joseph Whitman Buell



# UNITED STATES PATENT OFFICE.

JOSEPH WHITMAN BUELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

## PRINTING ATTACHMENT FOR ROLL-PAPER HOLDERS.

SPECIFICATION forming part of Letters Patent No. 628,445, dated July 11, 1899.

Application filed September 22, 1898. Serial No. 691,572. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH WHITMAN BUELL, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Printing Attachments for Roll-Paper Holders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an automatic printing attachment for roll-paper holders; and it consists, essentially, in a spring equipment therefor that involves the novel arrangement of a special type of spring—*i. e.*, in so applying a spring-bar or overcoiled spring in relation to the axis of the paper-roll and the pivotal structure carrying the printing-cylinder that the limits of the latter's angular movement caused by the spring in recovering its natural line of structural adjustment is increased in sweep from the limit of angular movement ninety degrees on one side of said paper-roll axis to a like limit of angular travel on the other side thereof before said spring reaches its neutral point. As the varying force of the elastic tension of the spring corresponds with the distance it occupies from normal position, it is proposed to utilize the force action of the spring for the purposes of this invention in the quadrant in which it is greatest and in which the comparative angular movement is more extensive than the absorption of tension when the mechanism is operating, whereby the yielding pressure exerted by the printing-cylinder against the paper-roll in the direction of the axis thereof will be but little diminished from the largest to the smallest diameter of the paper-roll as the paper is consumed. The obtainment of this better force action, which results in more effective operation within the prescribed limits than heretofore obtained, is due to the employment of a type of spring which provides an elastic lever-arm that may be continued to form coils that have long arcs which distend in reaction with less easement as compared to the predetermined angular movements of the pivotal structure obtained by its employment than has been found possible

by any mode of application of any other type of spring heretofore employed to produce motion and pressure in like devices.

Heretofore various spring-operated mechanisms have been provided for controlling the motion and pressure of a rotary type-cylinder in relation to the paper-roll; but they have been practically inoperative because the spring-wire of the coils employed was of a gage that created such friction or pressure between the cylinder and the paper-roll that the underlying paper was torn or marred in withdrawing it, or if the coils were made of spring-wire of a smaller gage, such as to be sufficiently powerful for properly holding the printing-roller on the paper-roll of greatest diameter, the tension therein would be so weak as to yield in an undesirable manner when the paper-roll had diminished in size by consumption.

In the drawings, Figure 1 represents a sectional view of a paper-roll holder and roll with my attachment in position. Fig. 2 represents in perspective the attachment removed from the holder.

Referring to the accompanying drawings, in which like letters of reference indicate like parts, A indicates a paper-roll holder of ordinary construction comprising the usual side standards C of any preferred construction, while D' represents the cross-bar. B represents the horizontal shaft, which is passed through the roll of paper and is mounted in open bearings (not shown) that project from the inner sides of the side standards. The roll thus mounted is prevented from unreeling by the employment of the ordinary spring-controlled pendent curved bracket or bail C', that is pivotally suspended from the cross-bar and which is provided with a tearing-bar B', that is adapted to be constantly depressed angularly in a radial direction by reason of the exertion of the spring-coil  $x$  that is arranged on the shaft of the bracket. Positioned on the opposite side of the cross-bar is centrally arranged a supporting-plate E. Pivotaly attached to said plate is a swing hanger-frame D, that is journaled to the lower face by means of the collars S. The hanger-frame is shown of substantially rectangular shape, made in skeleton form from sheet metal, while the arms



$d$  thereof are connected rigidly at their upper ends by a bar or shaft  $p$  and at their lower ends by a tie-bar  $d'$ , which latter is detachably fastened by means of screws. Said hanger-bar is intended to support and carry a printing-roll or type-cylinder  $F$  and an inking-roller  $G$ . The type-cylinder is rotatably mounted in said frame by reason of the trunnions  $t$ , that project axially at the opposite ends thereof and which rest in bearings formed in the side bars  $d$ , and the axial location of which should be approximately the same distance from the pivotal axis of the hanger-frame as is the axis of the roll of paper, thereby enabling the type-cylinder to always press angularly in a radial direction until it reaches the center of the unreel roll. The type-cylinder is provided on its ends with side flanges  $f$ , that press at all times on the paper-roll, causing said cylinder to rotate thereon when the paper-roll is turned. The printing-cylinder is also provided on its periphery, intermediate of its side flanges, with rubber or other suitable surface, upon which the type  $t'$  is arranged to protrude sufficiently to reach the paper (top sheet) and make a clean and clear impression thereon. The printing-cylinder is adapted to rotate in the direction of the arrow shown, and to prevent back turning of said cylinder there is provided a pawl-and-ratchet mechanism  $r$ , that is shown in connection with the trunnion  $t$ . Parallel with said printing-cylinder and superimposed thereon is an inking-roller  $G$ , which is of the same length and is provided with like flanges that rest on those of the type-cylinder and which is supported in proper relation thereto by means of the bail  $g$ , that is pivotally suspended from the hanger-frame side bars by reason of the arms  $g'$ , journaled, respectively, in the holes therein. The inking-roller is provided with absorbent material, which is saturated with ink and which contacts with the type on the printing-cylinder by the rotary movement thereof when the type-cylinder revolves. When the pressure of the roller  $G$  upon the type-cylinder is not sufficient to maintain it in constant contact with said cylinder, a spring  $s$  may be employed as an auxiliary to the weight thereof to accomplish that end.

$V$   $V$  represent volute springs that are arranged in spaced parallelism and are located within the slots  $k$  of plate  $E$ , secured at one end by screws  $s'$ , and which are adapted to engage at one end with the upper face of the plate  $E$  and at their other respective ends or terminals with the shaft  $P$ . The said plate and hanger-frame are then turned in opposite directions against the tension of the overcoiled springs until there is sufficient energy stored for the purpose of carrying the pivotal structure or hanger through its field of travel. The office of these springs is to hold the printing-cylinder upon the roll of paper regardless of what angle the hanger-frame

assumes, and thereby allow the frame to adjust itself with proper pressure to the gradually-diminishing size of the roll. When the springs are thus arranged in spaced parallelism, they allow the printing-cylinder a lateral yielding movement to permit the printing-cylinder to assume a position to compensate for any unevenness in the roll of paper. When the springs have been sufficiently coiled, the plate  $E$  is secured to the under face of the cross-bar  $D'$  by screws  $y$ . The hanger-frame thus attached will tend to stand out at right angles to the side of the cross-bar opposite to the location of the plate  $E$ , but when positioned for labor it is swung over against the spring tension of the springs to its full limit on the other side and held in that position until the roll of paper has been mounted on its shaft, when the type-cylinder carried by said frame will be supported in operative position against the roll by reason of the recoil condition of said springs. When the paper-roll is turned, it will cause the rotation of the type-cylinder and the inking-roller in the direction indicated by the arrows. Owing to the location of said springs and the manner of disposing and applying the spring force thereof the angular movement of the hanger-frame has little effect upon the tension of the springs and the pressure exerted thereby is practically constant within the possible range of travel of said frame—i. e., until the type-cylinder has reached the center of the roll of paper and the last sheet thereof has been unwound.

The operation of this attachment is apparent from the foregoing description.

It will be seen that this automatic printing attachment for roll-paper holders is exceedingly simple and inexpensive in construction and is positive and reliable in operation and will insure a perfect impression even when the paper-roll has unwound to the last sheet.

What I claim as new and useful is—

1. The combination with a paper-reel of a pivotal structure that is suspended centrally from the cross-arm of the reel to one side thereof, and that is adapted to carry a printing-cylinder and an overcoil-spring arranged in operative relation to said pivotal structure as and for the purpose set forth.

2. A printing attachment for paper-holders comprising a hanger designed to be hinged to the frame of the holder a printing-cylinder in the hanger and an inking-roll mounted in the hanger contacting with the printing-cylinder, and an overcoil-spring arranged in operative relation to the hinged hanger as and for the purpose described.

3. The combination with a paper-reel of a pivotal structure carrying printing-cylinder and inking-roll, that is suspended centrally from the cross-arm of the reel and to one side thereof by means of a hinged plate having collars in which is journaled the shaft of said pivotal structure, and a pair of parallel spaced



overcoil-springs arranged within slots in said  
plate, said springs being adapted to engage  
respectively at one end with the upper face  
of the plate and at their other terminals with  
5 the shaft of said pivotal structure, the whole  
arranged and operating substantially as de-  
scribed.

In testimony whereof I affix my signature  
in presence of two witnesses.

JOSEPH WHITMAN BUELL.

Witnesses:

WANDA A. BUELL,

RALPH S. WARFIELD.