

J. T. HAWKINS.
Buffer Spring for Printing Machines.

No. 237,975.

Patented Feb. 22, 1881.

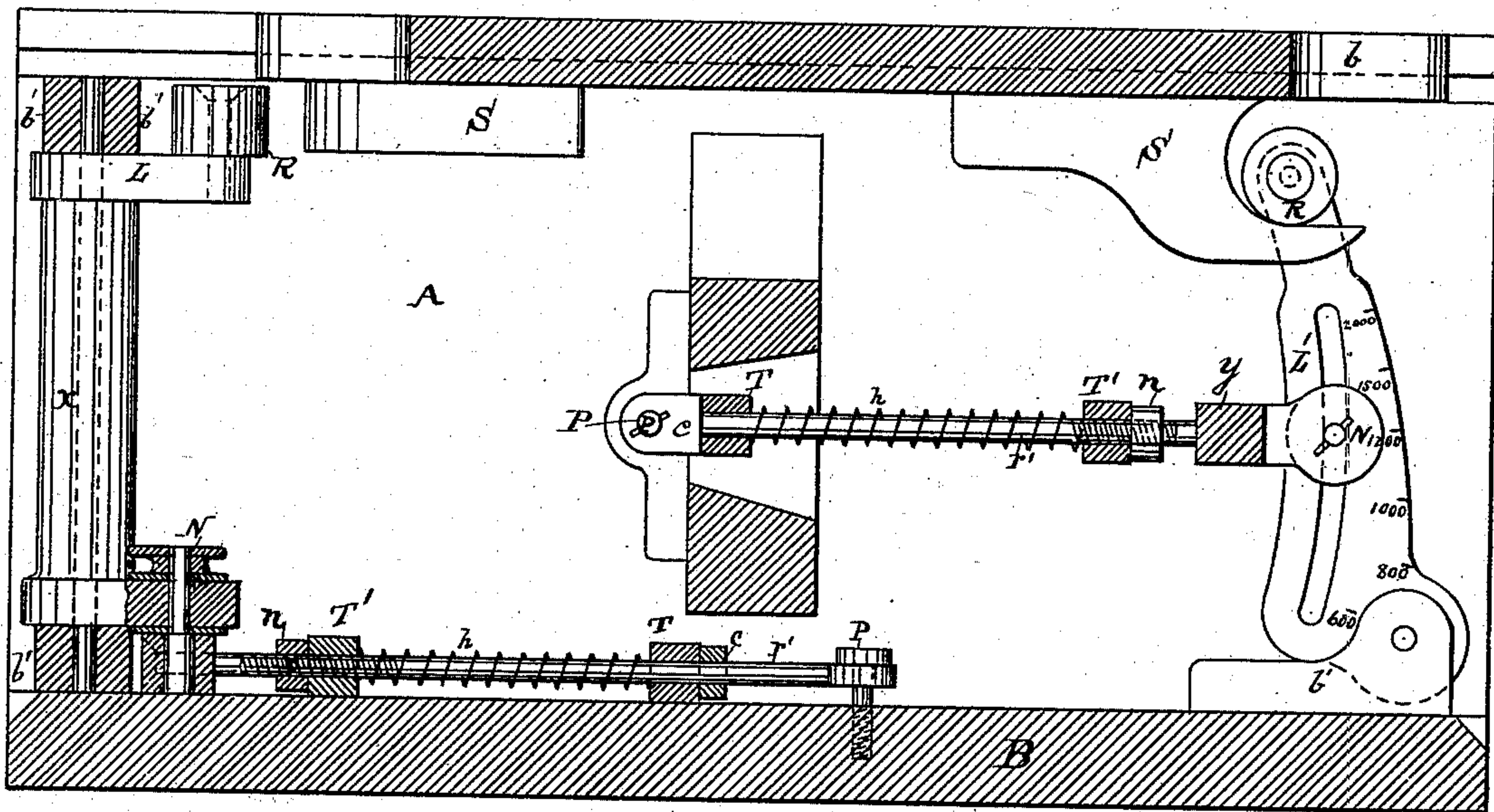
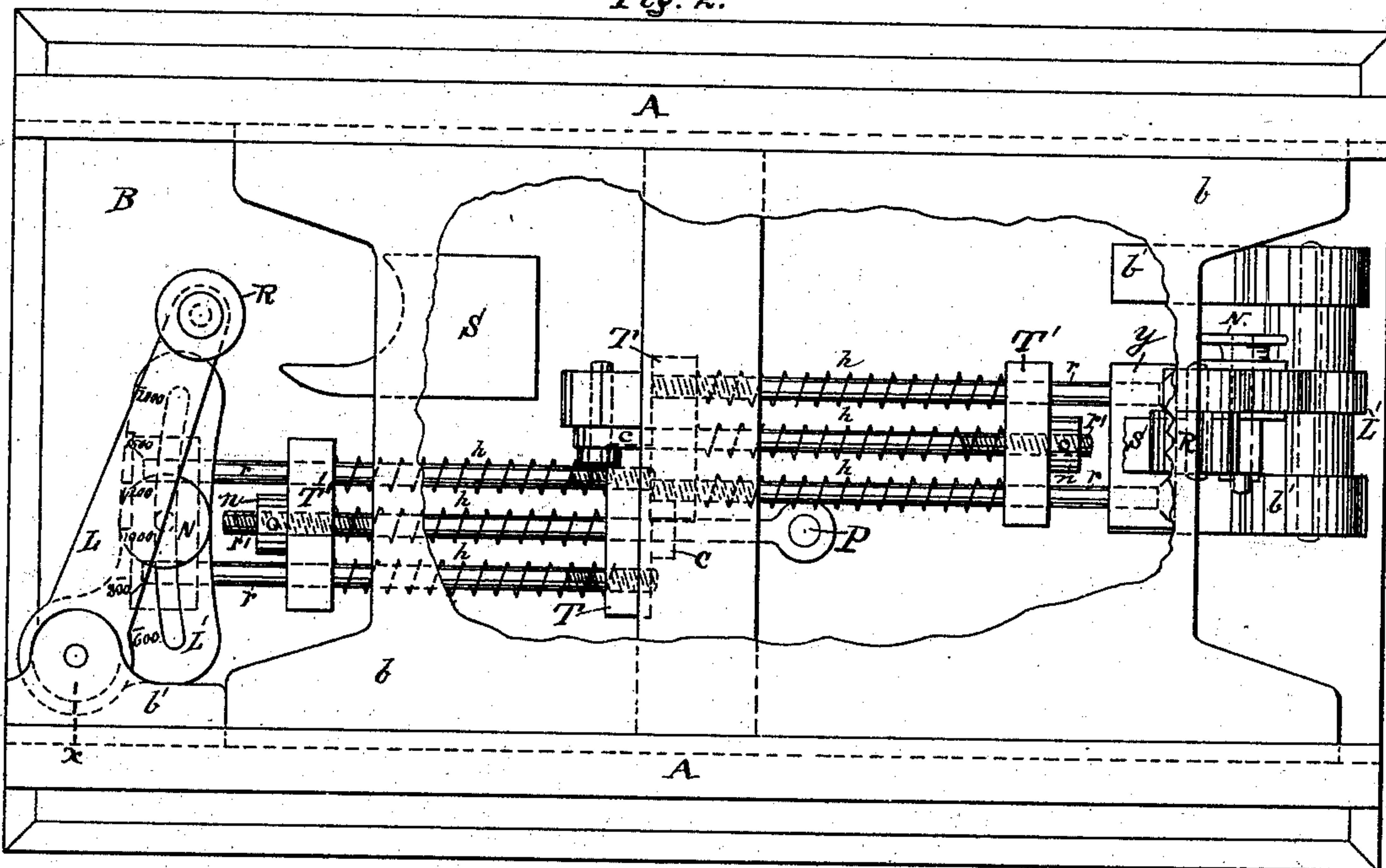


Fig. 1

Fig. 2.



Witnesses:

A. C. Hubler
J. T. W. Jennings

Inventor:
John T. Hawkins
by R. R. Voorhees
Attorney

UNITED STATES PATENT OFFICE.

JOHN T. HAWKINS, OF TAUNTON, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO JOHN L. BROWER, OF NEW YORK, N. Y., AND ALEX. F. BROWN, OF MONT CLAIR, NEW JERSEY.

BUFFER-SPRING FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 237,975, dated February 22, 1881.

Application filed February 13, 1880.

To all whom it may concern:

Be it known that I, JOHN T. HAWKINS, of Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Buffer-Springs for Printing-Presses, which improvement is fully set forth and illustrated in the following specification and accompanying drawings, in which—

Figures 1 and 2, respectively, illustrate a side elevation, partly in section, and a plan of the lower part of a printing-press, embodying the improvements constituting the invention herein described and claimed.

In a large number of the varieties of printing-presses having reciprocating type-beds it is necessary to counteract or overcome the momentum of the type-bed at each end of its stroke, and this is generally accomplished by means of springs in some form; but as such presses are run at varying speeds it becomes necessary to so adjust these springs, automatically or otherwise, that the reaction afforded by them may be varied proportionately to said speeds. Where metallic springs are used for this purpose they generally consist of a series in helical form, which resist the momentum of the bed by their compression. With nearly all such springs heretofore used a variation in their resistance to comport with varying speeds of the bed has been obtained solely by increasing the initial tension or compressive set of the springs. In all these types of presses the distance through which the springs may act upon the bed is limited by the fact that the normal motion of the bed while the impression is being taken cannot be interfered with without detriment to the character of the work. The mechanism, therefore, of such machines is such that the springs are allowed to act upon the bed only through an arbitrary and constant distance, and this being the case the bed always begins to compress the springs at the same time of its travel for either end. Under the above-mentioned conditions, if the initial compressive set of the springs be increased for the purpose of resisting the greater momentum due to an increased speed of bed, the springs must react upon the bed more violently

at the commencement of their action than at slower speeds of the bed, and must also accumulate greater resistance up to the end of the stroke of the bed, equal only to the change made in their initial tension or compressive set. The action and effect, therefore, of such springs at high speeds of bed, when thus arranged, are very different from their action and effect at low speeds of the same, and the higher such speeds the greater must be the departure, under such circumstances, from the theoretically perfect action of a spring. The action of such springs, in order to be perfect and uniform in overcoming the momentum of any such moving body as the reciprocating bed of a printing-press at any and all of its different speeds, should offer practically the same initial resistance, constituting a "zero of resistance" at the commencement of the bed's motion, accumulating up to the necessary maximum at the end of the stroke of the bed, said maximum spring resistance and the ratio of accumulation of such resistance alone varying with the speed of bed.

The object, therefore, of this invention is to so adapt and arrange in a printing-press a series of buffer-springs that their above-mentioned perfect action may be, as nearly as possible, obtained practically, the method employed of adjusting said springs for varied speeds of the bed of the press effecting no change in their initial reactive force or zero of resistance, whatever that may be, but varying the accumulation of that resistance and its maximum degree for any given speed of bed at pleasure.

The spring mechanism constituting this invention is provided with a divided index arc or scale, which indicates at sight, without necessitating any trial adjustments, the points of adjustment for the said mechanism necessary to insure its proper reaction in opposition to the momentum of the bed at any desired number of revolutions of the press or speed of its bed—an object of great importance to correctly and quickly discern, not only thereby saving the pressman's time and much wear and tear of the machinery, if not actual breakage of

parts, but also thereby conducing to easy and less noisy motion of parts and greater precision and excellence of work.

The several parts and their arrangement designed to effect these objects will now be described in connection with the above-mentioned figures of the drawings, and then be specifically set forth in the claims.

In the said figures the invention is shown in two forms of arrangement as applicable to two different styles or varieties of machine. In some printing-presses the type-bed is not supported at the center of its width, except immediately under the impression-cylinder. In such form of press the arrangement of springs shown on the left half of the figures is preferable, in order to prevent any tendency of the spring mechanism to spring or depress the central parts of the bed, the resistance of the spring mechanism other than that in direct line of the travel of the bed being, in this case, in a horizontal direction. In those printing-presses in which the type-bed is supported at one or more points near the center of its width the more simple arrangement of springs shown on the right-hand half of the figures is used, the resistance offered by the springs other than that in direct line of motion of the bed being, in this case, vertically downward. In the drawings the lower part of the frame of the press is designated by the letter A, the base-piece by the letter B, and the type-bed by the letter b.

To the bed b are attached the usual curved shoes S S, which act upon the rollers R R, which latter are pivoted to the free ends of the lever L' in the vertical arrangement on the right of the figures, and to the upper arm, L, of the levers L L' in the horizontal arrangement at the left. In the vertical arrangement at the right the lever L' is pivoted at its lower end in the bracket b', attached to the base-piece B. In the horizontal arrangement at the left the lever consists of the two separate arms L L', united to a connecting body or shaft, x, of cylindrical or other suitable form, and is pivoted in the brackets b' b', attached to the side frame A. The lower arm, L', of the lever L L' in the horizontal and the lever L' in the vertical arrangement contain each a curved slot whose curve corresponds to the arc of a circle struck from the pivotal point P.

The rods r r r' each have placed upon them helical springs h h h. The central rod, r', is pivoted at one end at the point P to any suitable part of the press, and the block T slides freely upon it. Its other end is secured in the block T' by the nut n, the block T' sliding freely upon the outer rods, r r. The said outer rods are secured at one end to the block T, and at the other to the yoke y.

The yoke y is secured at any desired point in the curved slot in the lever L' by means of the bolt and nut N, which bolt serves as a pivot upon which the yoke y oscillates.

Each inner rod, r', at each end of the press

is provided with a stop, c, in order to limit the inward motion of the block T, which also, under this construction, limits the inward position of the lever-arms L on the left and L' on the right, and consequently the position of each of the rollers R R. The inward motion of the levers and their rollers being limited by the contact of the blocks T T, with the stops c c, leaves the levers, when not in action, (the rollers R R not being in contact with the shoes S S,) without any tension being exerted upon them by the springs, and permits of the bolt and nut N, with its attached yoke y, being adjusted in the curved slots of the levers without effort. The initial compression of the springs h h may be varied, if desired, by means of the nuts n. A mark or point upon the yoke y, and a divided curved line laid off on the lever-arms L'—the divisions on which correspond to the required position of the yoke y or bolt and nut N in the curved slot for the required speeds or number of strokes of bed indicated by numbers—serve as a guide to the printer in adjusting for such speeds.

The curved slots in the lever-arms L L' being each an arc of a circle struck from the center of oscillation of the yoke y, the initial compression of the springs remains constant, while the farther from the center of oscillation of the levers L L' the yoke y is secured the more rapid will the accumulation of resistance be in the springs, and vice versa, the springs receiving a varying amount of compression for every position of the yoke y.

I do not limit myself to the use of levers with curved slots therein, as these levers may be made solid, with different methods of securing the pivot-bolt and nut N and yoke y in different positions upon said levers, said bolt and yoke describing an arc of a circle from the pivotal point P. All such devices, therefore, which move in arcs of circles upon said levers are within the principle of this my invention.

Having thus fully described my said improvement and its method of operation as of my invention, I claim—

1. In combination with the reciprocating bed of a printing-press, a series of buffer-springs attached at one end to a pivotal center of oscillation, and at the other end adjustably upon or within an arc or curved slot of a rocking lever, whereby the reaction of said springs is varied proportionately to the speed and momentum of said bed without changing the initial compressive set or tension of said springs, substantially as set forth.

2. In combination with the reciprocating bed of a printing-press, a set of buffer-springs adjustably connected to a rocking lever and provided with a pivotal rod having thereon a stop, c, as described, whereby the inward motion of said lever is limited, while leaving it free from pressure for the purpose of adjustment, substantially as set forth.

3. In combination with the reciprocating
bed of a printing-press and buffer-springs, as
described, a rocking lever provided with an
adjusting arc, whereby, while the initial com-
5 pressive set or tension of said springs is pre-
served constant, their reaction is increased or
diminished for varying speeds of said bed by

their varied adjustment within or upon said
arc, substantially as set forth.

JOHN T. HAWKINS.

Witnesses:

ELISHA T. JACKSON,
H. T. MONTGOMERY.