(No Model.) 4 Sheets—Sheet 1.

H. H. HARRISON.

PRINTING MACHINE.

No. 398,042. Patented Feb. 19, 1889.

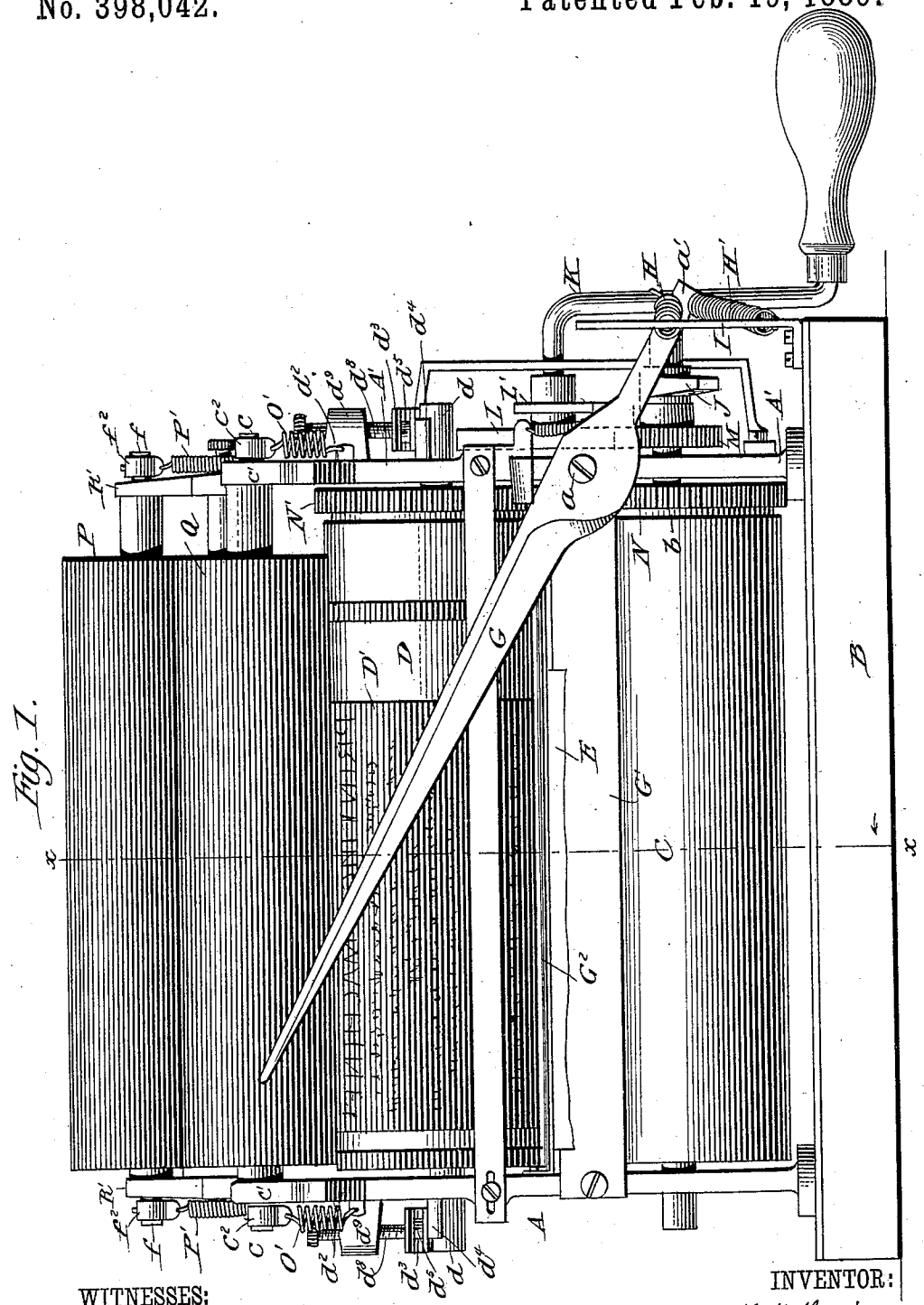

Fig. 1.

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C. Sedgwick.

INVENTOR:

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ATTORNEYS.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.)

4 Sheets—Sheet 2.

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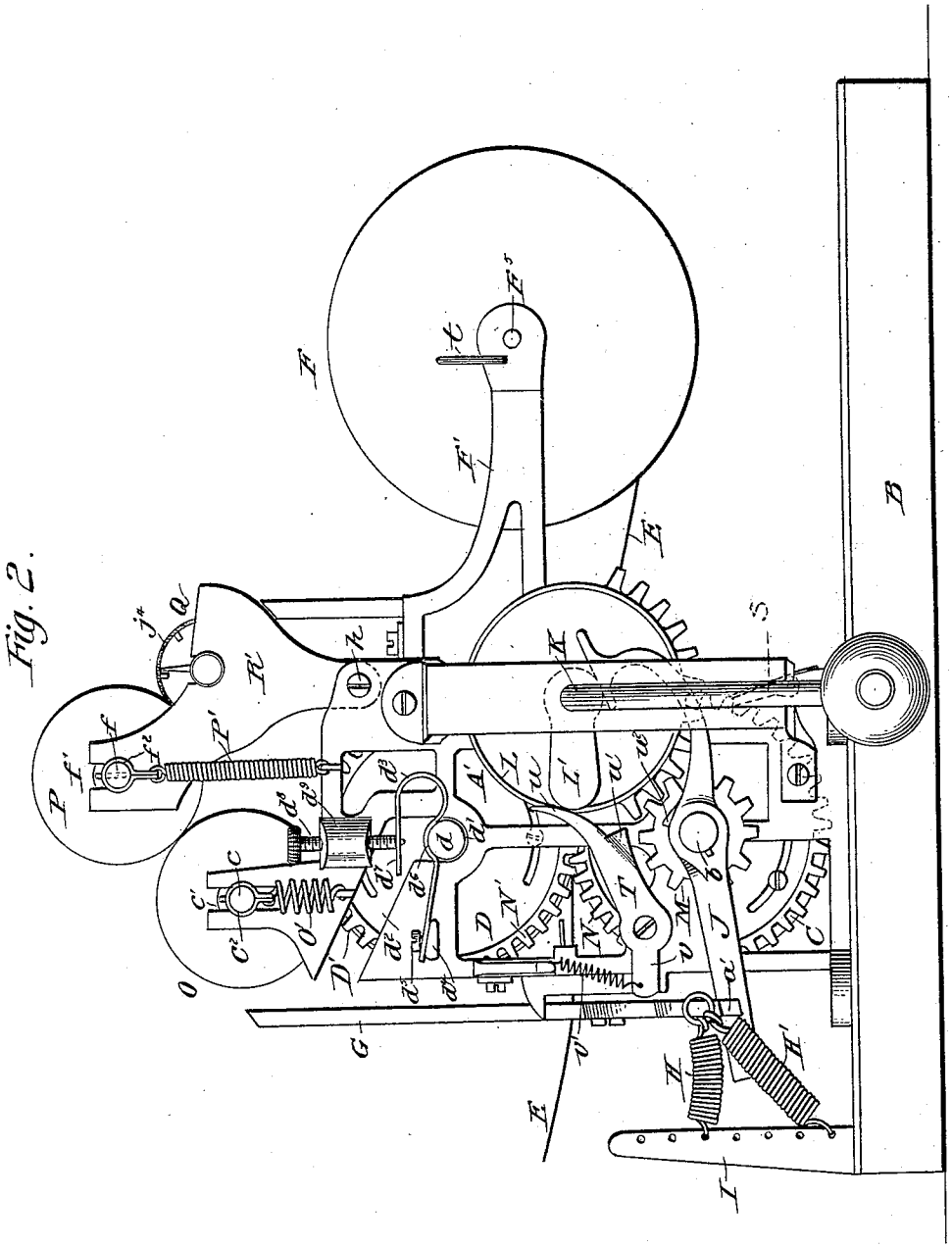
Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

H. H. HARRISON.

PRINTING MACHINE.

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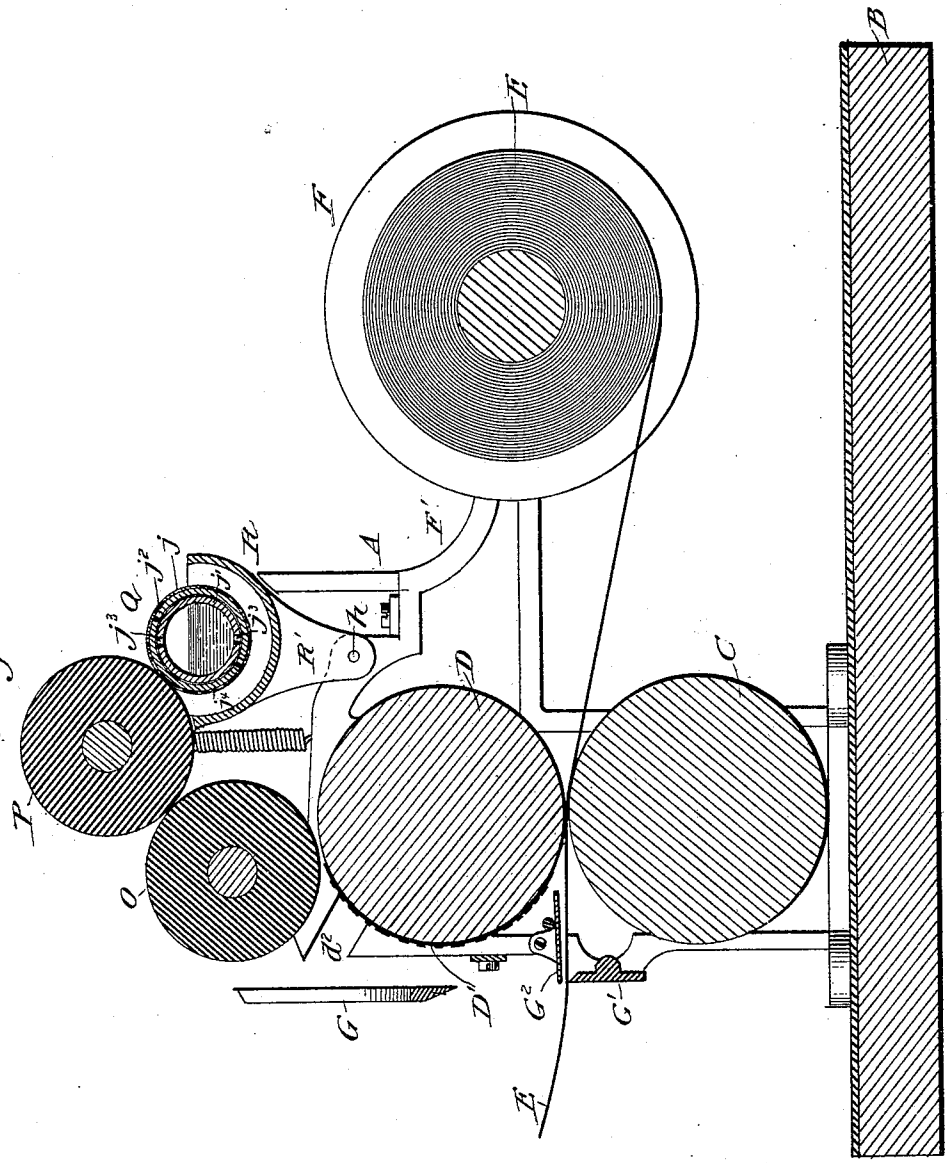
Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

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PRINTING MACHINE.

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Fig. 4.

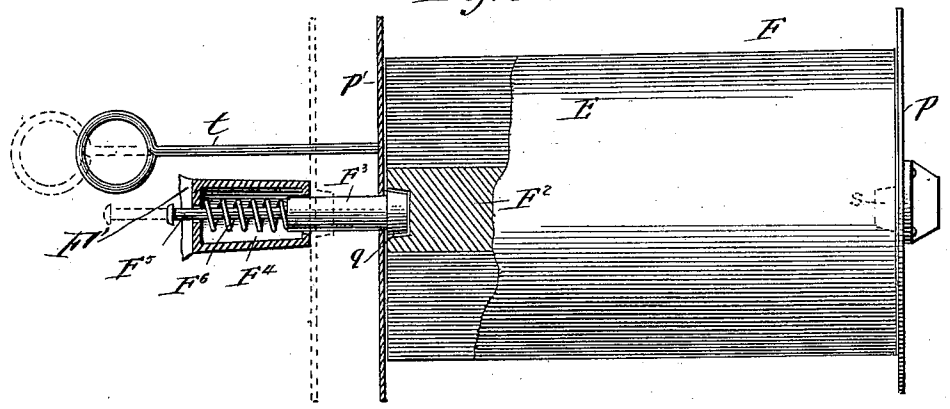


Fig. 5.

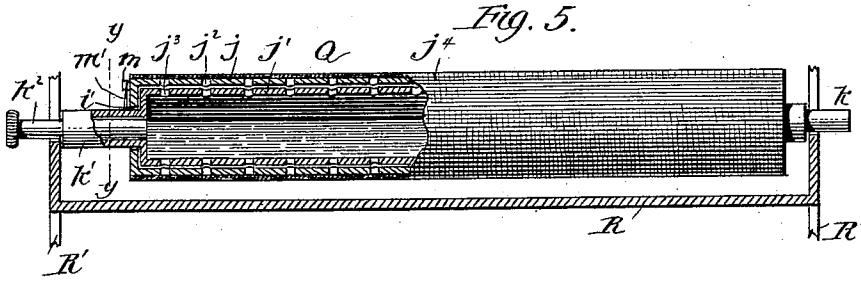


Fig. 6.

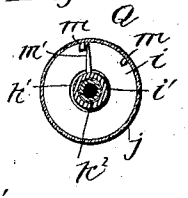
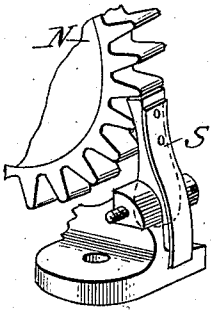


Fig. 7.



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UNITED STATES PATENT OFFICE.

HENRY H. HARRISON, OF NEW YORK, N. Y., ASSIGNOR TO AARON E. HARRISON, OF SAME PLACE.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 398,042, dated February 19, 1889.

Application filed January 20, 1888. Serial No. 261,349. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. HARRISON, of the city, county, and State of New York, have invented a new and Improved Printing-Machine, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of my new and improved printing-machine. Fig. 2 is a side elevation of the same. Fig. 3 is a central sectional elevation taken on the line x x of Fig. 1. Fig. 4 is a broken detailed view of the paper-roll and spring-holder for the same. Fig. 5 is a broken detailed view of the ink-fountain roller. Fig. 6 is a sectional view of the same, taken on the line y y of Fig. 5; and Fig. 7 is a detailed view.

The object of my invention is to provide a practical machine for printing cards, circulars, or other small matter upon one side of the paper only and cutting the paper into sheets as rapidly as printed.

A A′ represent the side frames or standards of the machine mounted upon the base B. At the lower part of these standards is journaled the roller C, of wood, hard rubber, metal, or other suitable material. Above the roller C is the type-roller D, in the face of which is secured the type D′, preferably executed in soft-rubber sheets. The gudgeons d of the type-roller D are held in open bearings d', made in the standards A A′, which open bearings communicate with diagonal slots d^2 in said standards, so that the said roller may be readily removed from said standards and replaced for removing or changing the type D′, as circumstances require. Bearing upon the gudgeons d are the curved springs d^3, which press the type-roller down upon the lower roller, C, and the paper E. One end of each spring d^3 is secured upon a fixed step, d^4, by a screw, d^5, and the spring is curved at d^6 to fit upon the gudgeon, and its opposite end, d^7, is curved back to a horizontal position above the gudgeon, and upon this end acts the adjusting-screw d^8, held in a lug, d^9, and by which the pressure of the spring upon the gudgeon may be regulated to regulate the pressure of the printing-wheel upon the paper. By removing the screws d^8 the springs d^3 may be swung to one side off from the gudgeons d, and the printing-roller removed from the machine through the diagonal slots d^2, as will be clearly understood from Fig. 2.

The paper E is wound in a continuous ribbon upon a drum, F, held to revolve between two corresponding rearwardly-projecting arms, F′ F′, of the side standards, A A′. From this drum the paper passes between the rollers C D, which are revolved intermittently for drawing the paper along and printing the same with an impression from the type D′, one complete impression being formed for each complete revolution of the type-roller D.

G G′ are the cutters or shears for cutting the paper E as it issues from between the rollers C D. The cutter G′ is stationary, and its sharp edge is on a line with the point of contact of the rollers C D, and a guide-plate, G^2, is held above it for guiding the paper over the cutter G′. The cutter G is like the blade of a pair of shears, and is pivoted at a, and is formed with an extension, a', to which the springs H H′ are attached, which are attached also to the post I, rising from the base B at one side of the cutter G, and which springs serve to normally hold the blade elevated, as shown in Fig. 1, and permit it to be closed by the lever J for cutting the sheets of paper.

The lever J and the rollers C D act in a certain relation to each other as to time, and are all operated from the same crank-shaft, K, through the medium of a mutilated gear-wheel, L, formed with a cam, L′, secured upon the said crank. The mutilated gear L meshes with the pinion M on the gudgeon b of the roller C and communicates intermittent motion thereto, and the roller C is geared to the type-roller D by gear-wheels N N′, so that the roller C communicates intermittent motion to the said type-roller. The lever J is fulcrumed upon the gudgeon b, as shown in Fig. 2, and at one end reaches under the extension a' of the blade G, and at the other end reaches under the shaft K, so that the cam L′ will depress the said end of the said lever and correspondingly elevate the opposite end of said

lever and close the blade G against the stationary blade G′ and cut the paper. This closing action of the blade G, caused by the cam L′ and lever J, is done while the rollers C D are at rest, and the blade G remains at rest while the rollers C D are in operation, so that by a single revolution of the crank K the rollers C D will be revolved a complete revolution, inking the type D′ and printing a strip of the paper E, and the blade G closed and returned, thus effecting the cutting off of the printed portion of the paper.

The type is inked by the two inking-rollers O P and the tubular ink-reservoir Q.

The gudgeons *c* of the roller O are held in open bearings *c′* in the standards A A′, and said roller is held in contact with the roller D by a coiled spring, O′, at each end. The lower end of each of these springs is made fast to a lug on the standard, while to its upper end is secured a ring, c^2, which slips loosely upon the gudgeon *c*. These rings or sleeves may be easily removed from the said gudgeons, thus detaching the springs from the roller O, which, owing to the open bearings *c′*, may be readily removed and replaced, which is necessary to remove and replace the type-roller D.

The gudgeons *f* of the upper inking-roller are likewise held in open bearings *f′*, formed in the end pieces, R′ R′, which are pivoted at *h* to the standards A A′, and on each of the gudgeons is placed a loose ring, f^2, to which is attached the upper end of a coiled spring, P′, the lower end of which is made fast to the standards. By slipping the rings f^2 off from the gudgeons *f* the wheel P may be lifted out of the bearings *f′*. For holding the roller P in contact with the roller O, the end pieces, R′ R′, turn on pivots *h* for that purpose, and owing to these pivots the roller P may be pushed back away from the roller O when the same is to be removed from its bearings. The ink-reservoir Q is journaled in the said end pieces, R′ R′, and in a trough, R, which serves to catch any drip of ink.

The reservoir is made of two tubes, *j j′*, one placed within the other. The outer tube, *j*, is formed with a series of holes, j^2, and the inner with a corresponding series of holes, j^3, and around the outer cylinder is placed a felt, j^4. The outer tube, *j*, is open at one end and formed with the annular flange *i* at the opposite end. The inner tube, *j′*, is formed with a gudgeon, *k*, at one end and with a hollow gudgeon, *k′*, at the other, which passes through the opening *i′* in the end of the outer tube, *j*. The inner tube, *j′*, is filled with ink through this hollow gudgeon *k′*, and is closed by a plug, k^2, which forms one of the journals for the inking-roller. By turning the inner tube so that its holes j^3 do not register with the holes j^2 of the outer tube the flow of ink will be stopped, but by turning the inner tube to bring its holes into registration with the holes of the outer tube ink will be supplied to the felt j^4 and applied through the rollers P O to the type on the roller D. Upon the hollow gudgeon *k′* is secured the pointer *m′*, which acts between the small lugs *m m* at the end of the outer tube, *j*, which lugs act as stops to the pointer and prevent the inner tube from being turned too far in either direction, and the pointer serves also as an indicator to assist in registering the holes in the two tubes.

The drum F, on which the paper E is wound, is composed of the end disks, *p p′*, and the core F^2, to one end of which the disk *p* is attached. One end of the core F^2 is recessed, as shown at *q*, to receive the head of the rod F^3, held in a sleeve, F^4, attached to the arm F′ of the standard A′. The rod F^3 is provided with the small rod F^5, which passes through the said arm F′, and in the sleeve F^4 is placed the coiled spring F^6, which constantly presses the rod F^3 into the recess *q*, thus holding that end of the drum, the opposite end being held by a stud, *s*, attached to the opposite arm, F′, of the standard A′. The disk *p′* is attached to the rod F^3, as shown in Fig. 4, and said disk is provided with a rod, *t*, by which the said disk and rod may be conveniently drawn to the position shown in dotted lines in Fig. 4, for releasing the core F^2 and for receiving another core fitted with paper.

The roller C is prevented from turning back by a spring-pawl, S, which engages with the teeth of the gear-wheel N, as shown clearly in Fig. 7, and the type-roller is prevented from turning too far by hand or by momentum by the pawl T, formed with the arm *u* and toe *u′*, which latter engages with a toe, u^2, on the hub of the pinion M. The arm *u* projects in the path of the cam L′ and is struck thereby, so that the cam at the proper time lifts the pawl T out of engagement with the projection u^2 and releases the parts. To cause the pawl T to drop suddenly after the cam L′ has passed the arm *u*, I form said pawl with the extension *v* and connect to this the lower end of the spring *v′*, which is connected at its upper end to the standard, so that the spring exerts a constant tension upon the pawl.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a printing-machine, the standards A A′, having the open bearings *d′* and diagonal slots d^2, reaching to the same, in combination with the type-roller D, lower roller, C, gudgeons *d*, springs d^3, pivoted to the standards and arranged to rest upon the gudgeons *d*, and the screws d^8, held in studs attached to the standards and adapted to hold the springs d^3, substantially as described.

2. In a printing-machine, the standards A A′, formed with a rearwardly-projecting arm having sleeve F^4, containing rod F^3, spring F^6, and small rod F^5, attached to the rod F^3 and reaching to the outside of the machine, in combination with the disk *p′*, placed upon the

rod F^3, and the core F^2, recessed at q, and the stud s, secured to the arm of the opposite standard A, substantially as described.

3. In a printing-machine, the lower roller, C, and gudgeon b thereof, in combination with the pinion M, placed on said gudgeon, the projection w^2, formed on said pinion, the pawl T, formed with the arm u and toe u', the wheel L, cam L′, and the crank K, substantially as and for the purposes set forth.

HENRY H. HARRISON.

Witnesses:
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EDGAR TATE.