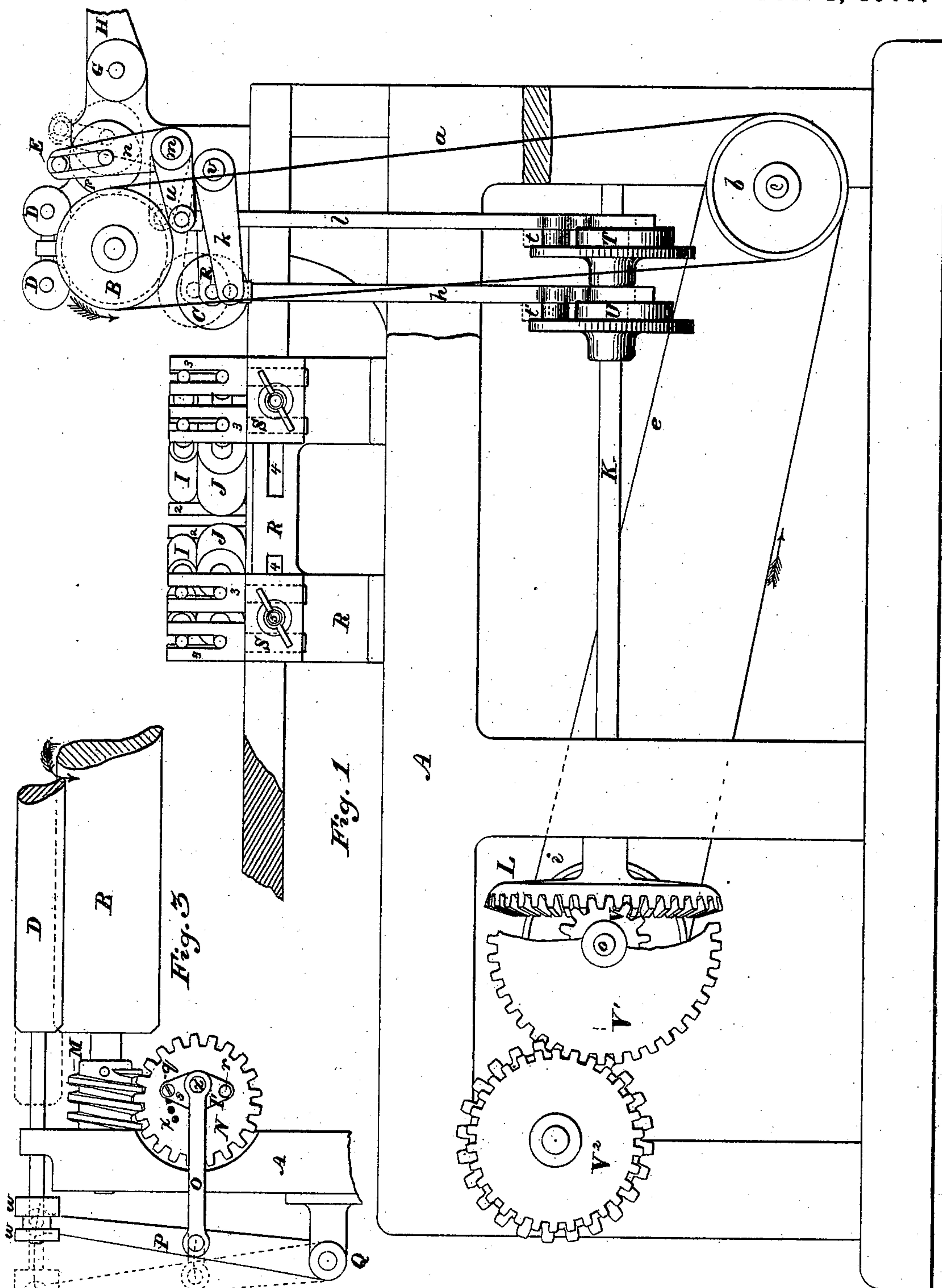


S. D. TUCKER.

INKING APPARATUS FOR PRINTING-PRESSES.

No. 173,085.

Patented Feb. 1, 1876.



W. H. Hale

Witnesses

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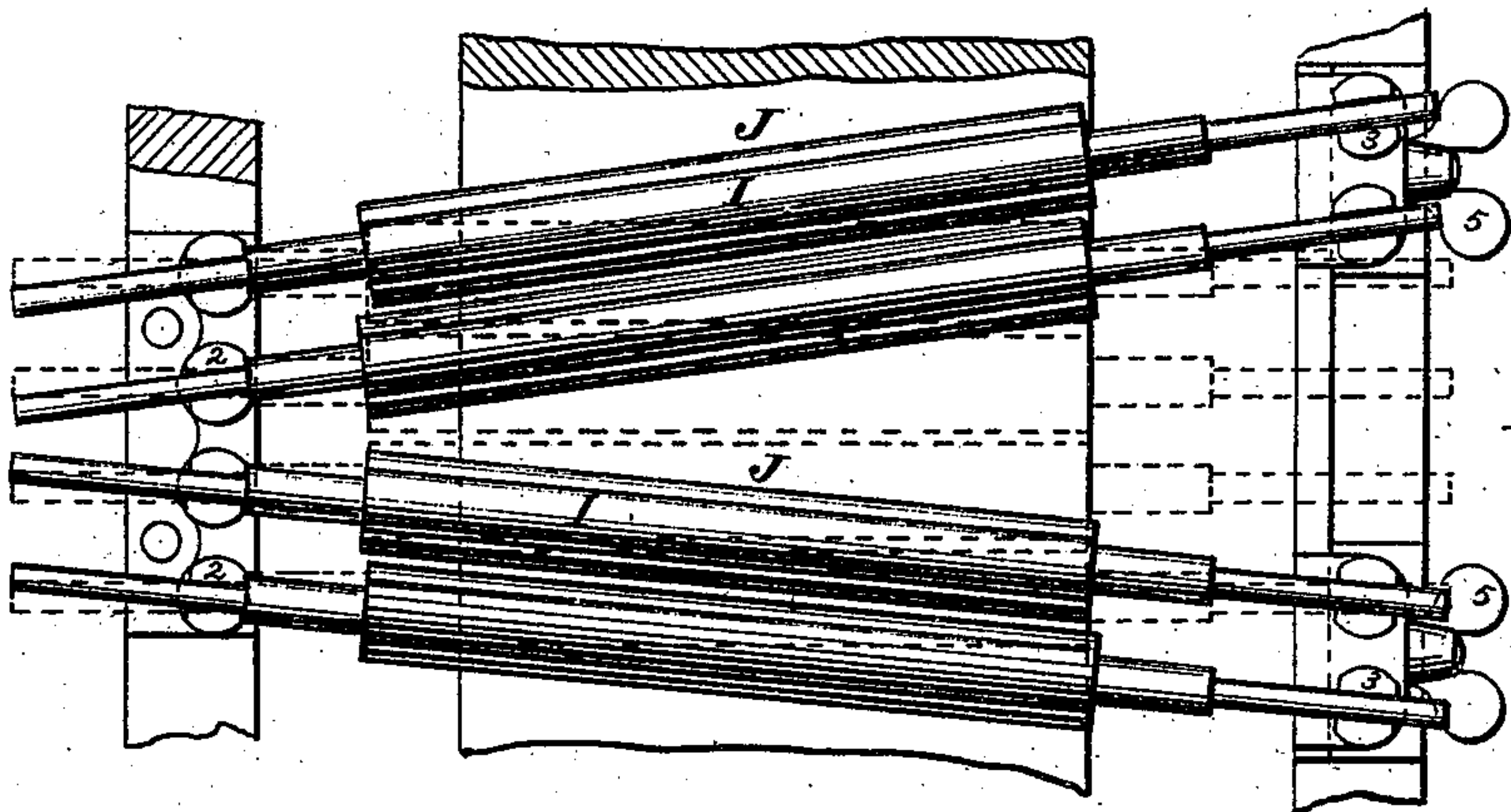


Fig. 4.

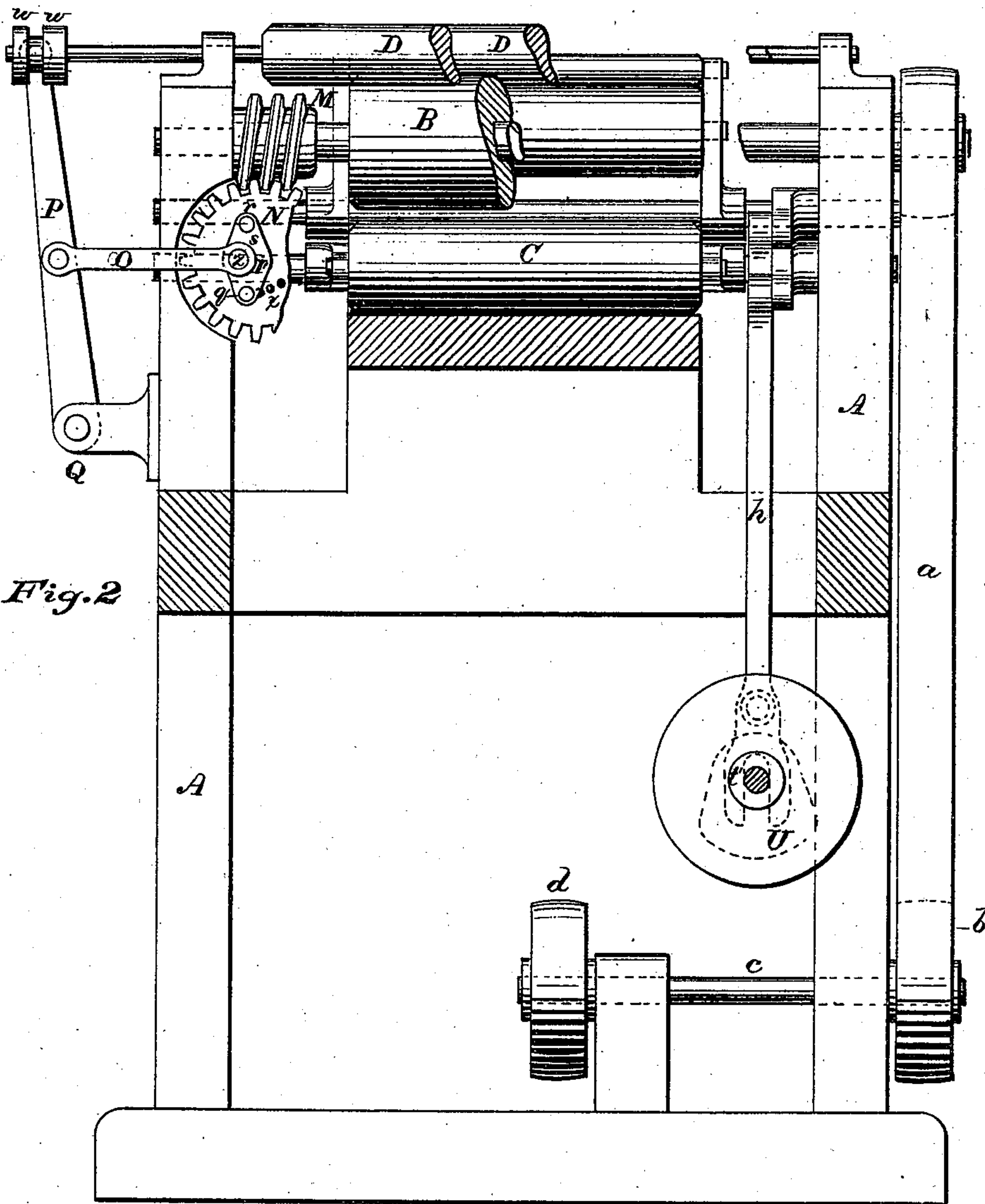


Fig. 2

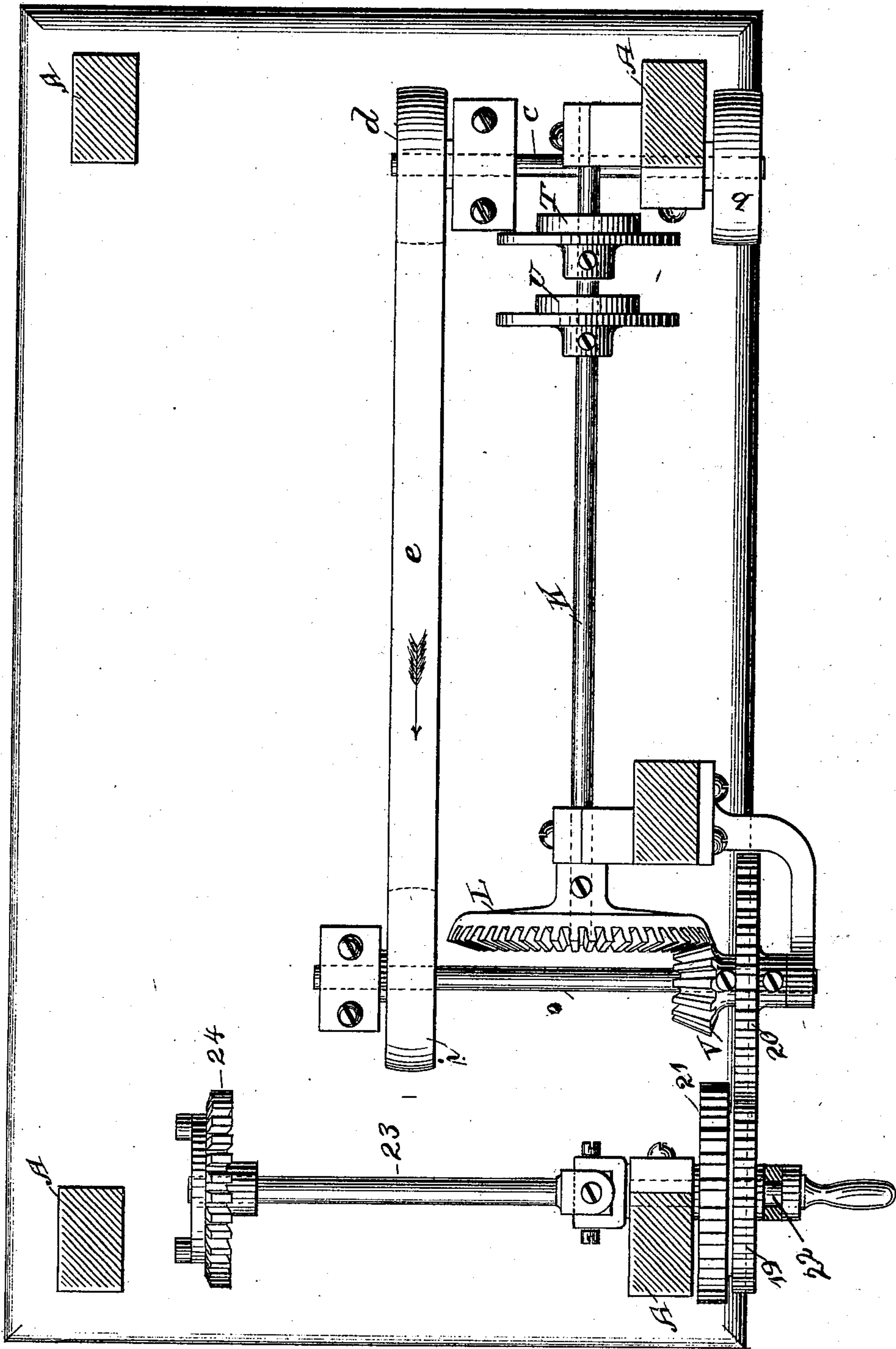
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Fig. 5



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UNITED STATES PATENT OFFICE.

STEPHEN D. TUCKER, OF NEW YORK, N. Y.

IMPROVEMENT IN INKING APPARATUS FOR PRINTING-PRESSES.

Specification forming part of Letters Patent No. **173,085**, dated February 1, 1876; application filed October 11, 1875.

To all whom it may concern:

Be it known that I, STEPHEN D. TUCKER, of the city, county, and State of New York, have invented an Improvement in Inking Apparatus for Printing-Presses, of which the following is a specification:

In the accompanying drawings, in which like letters represent like parts, Figure 1 is a side elevation with part of the frame-work removed, so as to show the interior connections; Fig. 2, a rear view, showing the inking-rollers and their driving mechanism, the frame-work and driving-gears being omitted for this purpose; Fig. 3, a detached view, showing the means for imparting the vibrations to the top rollers; Fig. 4, a top view of the ink-distributing-rollers, showing the mode of their adjustment; and Fig. 5, a top view, showing the mode of actuating the cam-shaft, and of revolving the inking-cylinder from a transverse driving-shaft.

The invention consists in mechanical devices for vibrating the top rollers upon the ink-distributing cylinder; in means for regulating and adjusting the degree of their longitudinal motion or traversing movement; in means for adjusting the ink-distributing rollers in their angularity with reference to the ink-table and printing-form; in mechanical arrangements for driving the ink-distributing cylinder, and in various details, as will be hereinafter explained.

The main elements of this apparatus are supported in an open frame-work, A, in which the rotating parts are suitably journaled. The inking-cylinder B, to which the ink is delivered, upon whose surface it is evenly distributed, and from which it is taken to be deposited upon the inking-table, is continuously revolved by means of a belt, *a*, running over a pulley, *b*, on a shaft, *c*, to which motion is imparted by a pulley, *d*, belt *e*, and pulley *i* on the transverse shaft *o*, which shaft is arranged and driven in an improved manner, as will now be explained. This inking apparatus is adapted to be actuated from the main or driving shaft 22 of that class of cylinder printing-machines wherein the reciprocating bed is driven by a pinion, 24, at the end of a vibrating shaft, 23, which is attached by a universal joint to the

main shaft 22. In Fig. 5, which is a top view of these devices, is also shown the toothed wheel 21, fast on the main shaft 22, through which the cylinder (not shown) is driven. In this arrangement of the bed and cylinder actuating mechanism with the main shaft, the means heretofore employed for driving the shaft *o* directly from the main shaft 22 cannot be used. Since neither a worm and wheel or bevel-gears can be made a means of direct connection between the shafts 22 and *o*, and be contained within the compass of the main frame, I place the short transverse shaft *o* parallel with the main shaft, and, from a pulley, *i*, and bevel-gear V upon the shaft *o*, drive the pulleys *d* and *b* and the longitudinal cam-shaft K. Spur wheels 19 and 20 at the ends of the main shaft 22 and transverse shaft *o*, outside of the main frame, connect the two shafts, and thus impart the requisite motion to the inking apparatus by a direct connection with the main or driving shaft.

The ink is taken from the roller G, hung in an ink-fountain supported by the brackets H, by means of a conveying-roller, F, which is loosely seated in slotted journal-bearings *n*, and which is surmounted by a roller, E, resting upon and moved by frictional contact therewith, to lay the ink evenly upon its surface. The journal-bearings *n* are arms fast upon a rock-shaft, *m*, actuated through an arm, *u*, and a rod, *l*, the latter being bifurcated to straddle the shaft K, as in Fig. 2, and carrying a friction-roller, *t*, hung to one of its faces, so as to bear upon a cam, T, fast upon and revolved by the longitudinal shaft K, which is driven by bevel-gears L and V from the transverse shaft *o*. The ink-conveying roller F is thus intermittently and alternately moved into contact with the fountain-roller G and inking-cylinder B, and thus transfers the requisite amount of ink from the fountain-roller to the ink-distributing cylinder. The ink thus deposited upon the inking-cylinder B is distributed thereon by means of the top rollers D, which revolve by frictional contact therewith; but in order to render this distribution more even and perfect, I cause these top rollers to be independently reciprocated, so as to traverse over the surface of the inking-cylinder, the

following means being preferred to accomplish this movement: Fast upon the extended shaft of the inking-cylinder B is a worm or screw, M, which engages with and drives a worm-wheel, N, hung in a bracket on the main frame. To the face of this worm-wheel N a plate, s, is attached, having a crank-pin, z, projecting from its outer side; and this crank-pin, by means of the short connecting-rod O, imparts a reciprocating motion to the lever P, which is thus vibrated to and fro during each revolution of the gear-wheel N. This lever P is fulcrumed at Q, and its upper end is T-shaped, so as to bear between collars w, fast on the ends of the shafts of the top rollers D. The said rollers D are thus reciprocated longitudinally, so as to traverse over the surface of the inking-cylinder B, upon which they perfectly distribute the ink. In order to adjust the extent of this longitudinal or traversing movement of the top rollers to suit the quality of printing to be accomplished or the fineness of the ink distribution required therefor, I attach the plate I' to the face of the gear-wheel N by a pivot, r, and arrange it to be swung thereon into positions governed by the fastening-screw q and its sockets x, so as to bring the crank-pin z into or more or less away from the center of motion of the said worm-wheel N, and thus accomplish the lesser or greater throw of the crank-pin z, and consequently determine the extent of the longitudinal movement or traversing motion imparted to the top rollers by the vibrating lever P.

The ink is taken from the under side of the inking-cylinder B by a roller, C, which is alternately vibrated into contact with its surface and that of the inking-table. This roller is hung in arms R, fast upon the rock-shaft v, and its vibratory movement is accomplished in like manner to that of the conveying-roller F, the mediums being a rock-shaft, v, arm k, rod h, friction-roller t', cam U, and shaft K. The movements of the conveying-rollers F and C are so timed that the latter, covered with a charge of well-distributed ink, will leave the inking-cylinder for the inking-table just before the roller F deposits a fresh supply of ink from the fountain into the inking-cylinder.

Thus the ink will be perfectly distributed before it is taken from the cylinder by the roller C. The ink is transmitted by the roller C to the surface of the inking-table, which reciprocates beneath it, and, after being further distributed, is taken therefrom and deposited upon the types by the form-rollers, in a manner well understood by those acquainted with presses having reciprocating forms.

The distributing-rollers J are surmounted by riding rollers I, resting loosely in frictional contact with them, and both sets of rollers I and J are journaled at their opposite ends in slotted posts 2 3, which are free to turn in their seats. The posts 3 are seated in stocks or holders S, which are capable of sliding upon their supporting-base R, being fixed in any

determined position by clamp-screws running in slots 4, whose fastening thumb-screws 5 bear upon the outer face of said base R. As these stocks S are moved sidewise they carry with them the rollers I J, the bearings of which turn in their seats sufficiently to adjust themselves in their new position.

Thus any degree of horizontal obliquity of the said rollers I and J relatively to the bed is readily accomplished, and consequently the amount of their lateral vibration on the inking-table determined, according as the quality of the ink and printing and the condition of the rollers may require.

These devices remedy the imperfect taking of the ink by the roller F from the fountain-roll G, since the top rollers D, by traversing the surface of the inking-cylinder B, perfectly distribute the ink over portions of its surface which have not received it from the roller F, and thus insure the deposition of an even body of ink from the cylinder upon the roller C, and from it to the inking-table; and the oblique position of the distributing-rollers J will impart to them such a lateral vibration that, as the ink-table passes under them, they will give to this ink a still finer distribution, so that, when it is taken up by the form-rollers, these latter will become perfectly charged with ink evenly distributed upon them, in which condition they will ink the types or other printing-form with an evenly-laid film or coating of equal body over the entire surface thereof.

What I claim is—

1. The combination, with an inking-cylinder, of a traversing top or distributing roller or rollers, a vibrating lever, a rotating worm-wheel, and a worm, substantially as shown and described.

2. The combination of the vibrating roller or rollers D, lever P, rod O, wheel N, and worm M with an adjustable crank-pin, substantially as shown and described.

3. The combination of rollers B D, lever P, worm M, worm-wheel N, and adjustable plate s and rod O, substantially as shown and described.

4. Distributing-rollers provided with means, substantially as described, for their adjustment horizontally in oblique positions over the ink-table.

5. The combination of distributing-rollers, their turning bearing-posts, and horizontally-adjustable stocks, substantially as shown and described.

6. The combination of the transverse shaft o, longitudinal shaft K, bevel-gears L V, and spur-wheels 19 20, for actuating the ink-conveying rollers C or F, substantially as shown and described.

7. The combination of the transverse shaft o, spur-wheels 19 20, bevel-gears, longitudinal cam-shaft K, and pulleys i and b, substantially as shown and described.

8. In an inking apparatus, the combination

of ink-carrying rollers C or F, a cam-shaft for vibrating them, an inking-cylinder, with spur-wheels 19 and 20, and transverse shaft o, the latter actuating the cam-shaft, and, through belting, continuously rotating the inking-cylinder, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEPHEN D. TUCKER.

Witnesses:

ISAAC KRAUS,

JOHN E. DONEGAN.