

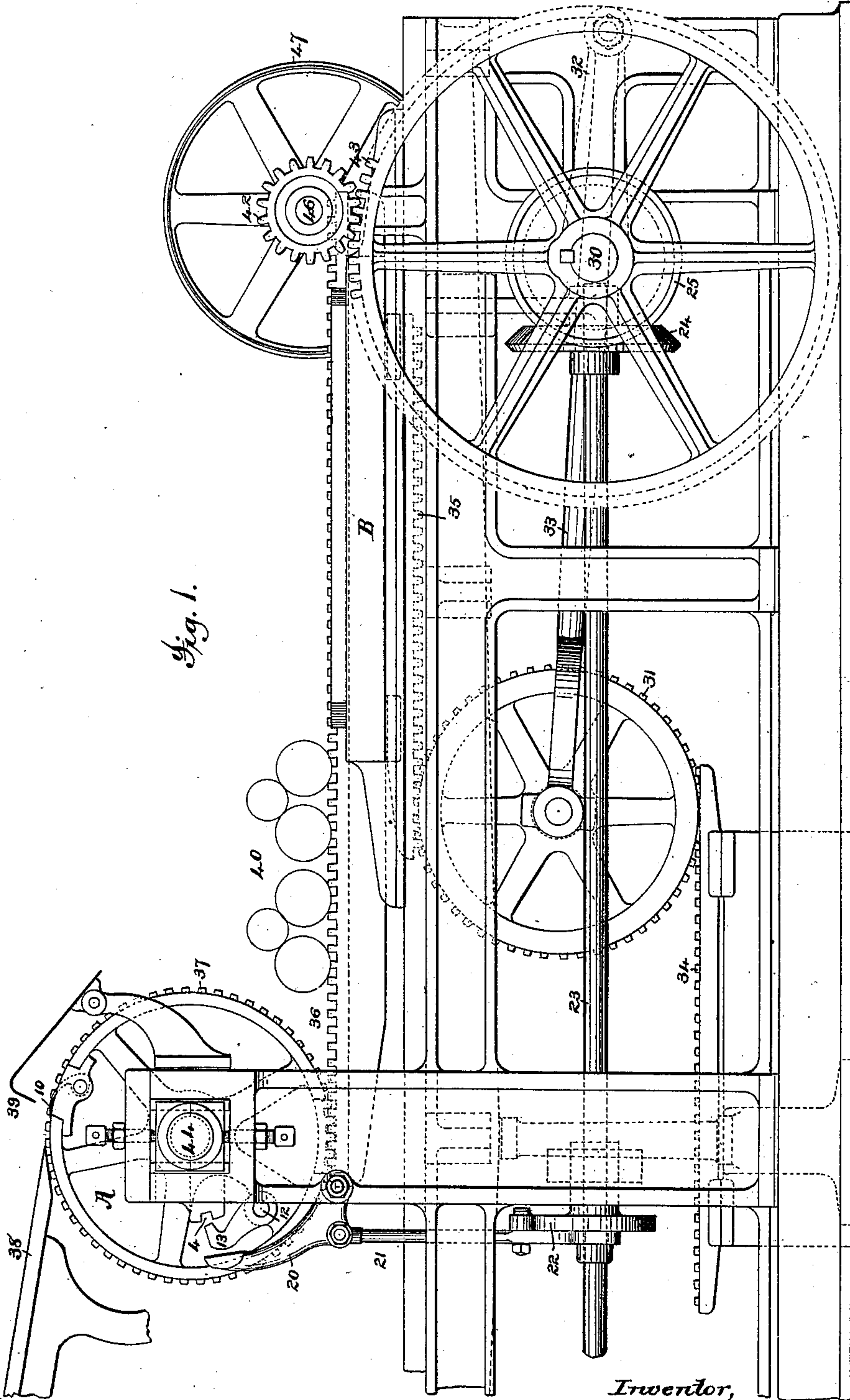
(No Model.)

3 Sheets—Sheet 1.

S. D. TUCKER.  
PRINTING MACHINE.

No. 272,604.

Patented Feb. 20, 1883.



Attest:  
Geo. H. Graham  
T. H. Palmer

Inventor,  
Stephen D. Tucker,  
by Munson & Philipp

Atty's.

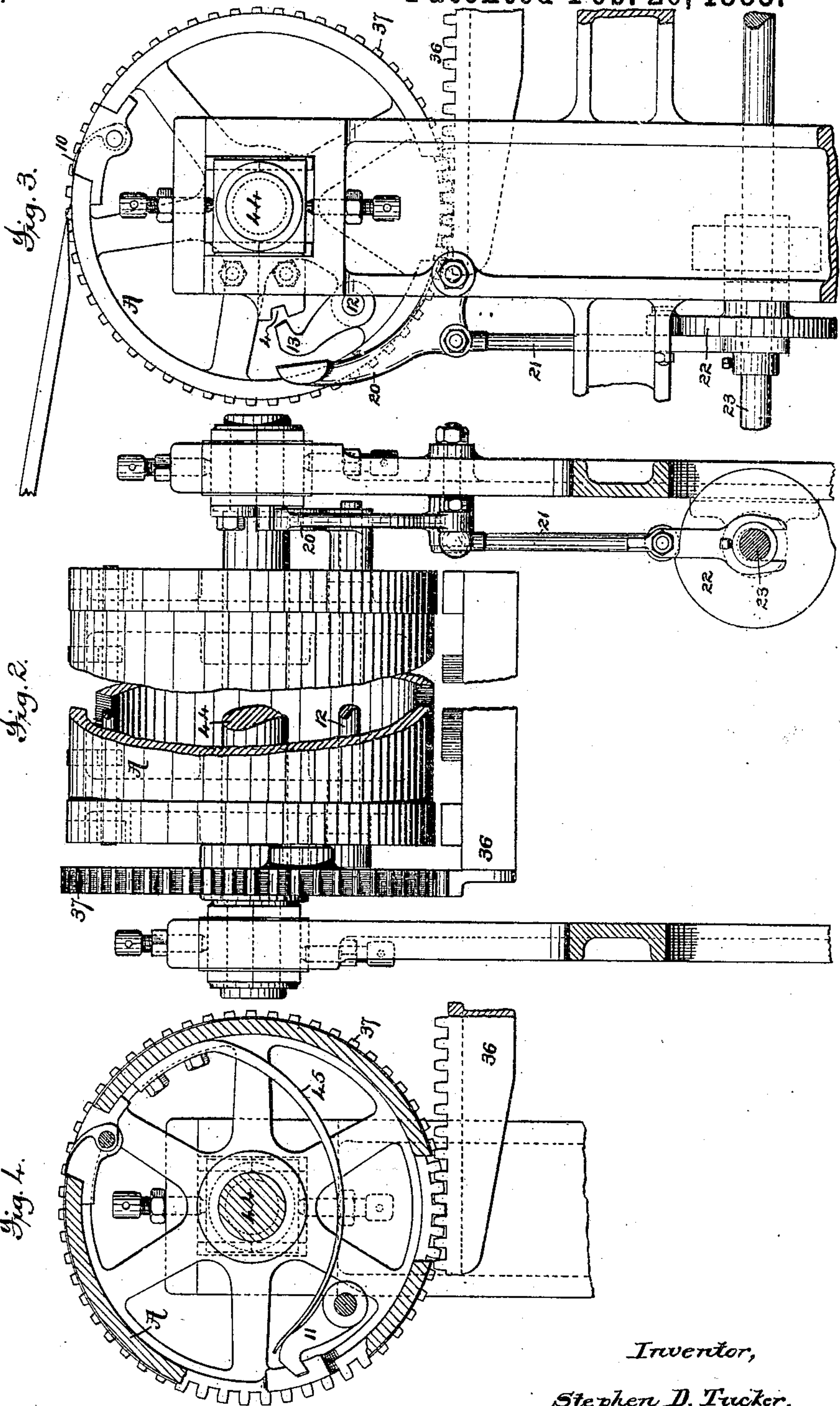
(No Model.)

3 Sheets--Sheet 2.

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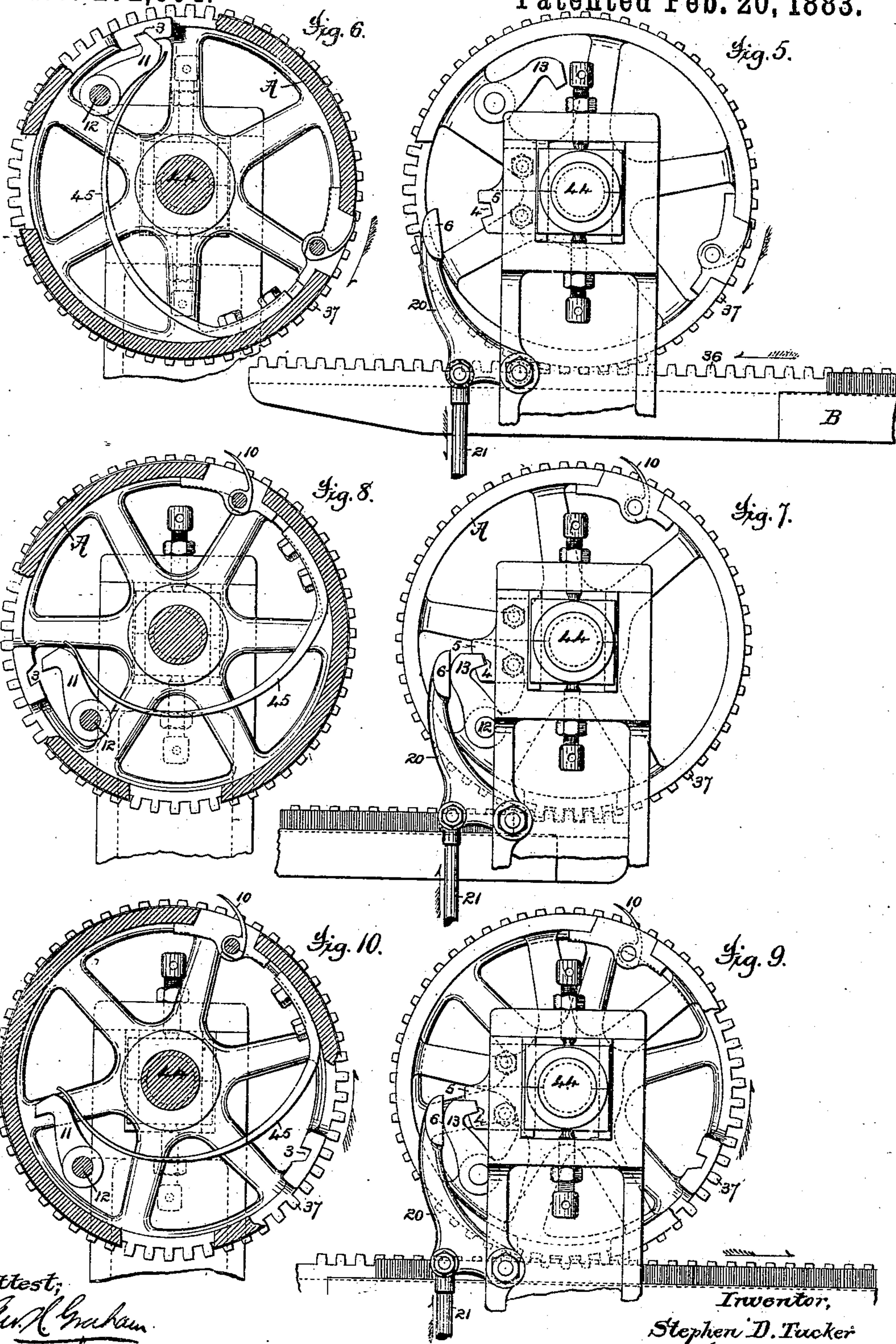
(No Model.)

3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

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

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 272,604, dated February 20, 1883.

Application filed May 21, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN D. TUCKER, a citizen of the United States, residing in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to that class of printing-machines known as "stop-cylinder presses," and more particularly those in which the impression-cylinder wheel remains constantly geared with the rack upon the reciprocating bed, which wheel is engaged with the impression-cylinder and disengaged therefrom by a coupling mechanism set into operation by means of cams driven from some moving shaft of the machine.

20 The invention comprises particular structures of parts and combinations thereof, too particularly hereinafter set forth to need specific preliminary description.

25 A mechanism embodying the present improvements is illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of the major part of such machine. Fig. 2 represents an end-view elevation of the impression-cylinder and its accessories. Figs. 3 and 4, 5 and 6, 7 and 8, and 9 and 10, represent respectively side elevations and sectional elevations of the impression-cylinder with its coupling mechanisms in various positions of adjustment.

35 Printing-machines of this character consist, as is well known, of an impression-cylinder, as A, mounted to turn in bearings supported by side frames, and of a type-bed, as B, reciprocated beneath said cylinder by means of gearing driven from a main shaft, as 30. This gearing is of various forms. That illustrated herein, for convenience of explaining this invention, embodies a driving toothed wheel, 31, which is caused to travel to and fro by means of a crank, 32, on the shaft 30, and a connecting-rod, 33, in the forked end of which said wheel 31 is journaled. This wheel 31 travels to and fro in a stationary rack, 34, and engages with a rack, 35, secured to the under side of the bed B, which latter, thus recipro-

cated, is sustained and guided in its movements by means of supporting-rails and friction-rollers, or in any other common manner.

The shaft 30 has a toothed wheel, 43, secured to its outer end, and is driven by the pinion 42, fixed to the shaft 46, the opposite end of which carries the belt-pulley 47.

The impression-cylinder A is here shown as driven from the bed-rack 36, that is constantly geared with the cylinder-wheel 37, the latter partaking of all the movements of said bed-rack and imparting a rotative movement to the impression-cylinder A whenever it is coupled thereto, as will be hereinafter explained.

The printing operation is effected, as is usual, by feeding a sheet from the table 38 against gages 39 while they are down and the cylinder is stationary, from which position it is seized by grippers, as 10, which, closing down upon its edge, as the gages lift and the cylinder starts, carry it around with the cylinder and into contact with the type form, which is inked in passing beneath the form-rollers 40, said sheet being then delivered from the cylinder A in any common manner.

No ink-fountain or delivery mechanism is shown, and the means for accomplishing the movements of the grippers 10 are omitted, as the same form no part of the present invention, and may have any of the constructions common in these machines.

Machines of this general construction—that is, such as have their cylinder-wheels 37 constantly geared with the bed-rack 36, and a coupling mechanism provided for securing the impression-cylinder A to its wheel 37 during the movement of the latter (that is, to give the impression upon the form)—have proved deficient in this coupling mechanism, the same being faulty in the operation of locking and unlocking said cylinder. The present invention avoids any defective operation by providing a coupling device so arranged that the locking and unlocking operations take place simultaneously, thus accomplishing the operation in the shortest possible time and avoiding any defective action.

The cylinder-wheel 37 runs loose on the cylinder-shaft 44, and is driven forward and backward by the bed-rack 36, into which it is always



geared. As the bed is about to run forward to accomplish the printing operation a coupling-arm, 11, fixed on the shaft 12, locks the cylinder to the wheel, and thus causes the latter to impart a proper rotation to the cylinder to carry it forward concertedly with the bed to produce an impression from the type-form. This movement of bed and cylinder I shall call the "printing-run." As the bed arrives at the end of its stroke the coupling-arm 11 is unlocked from the wheel 37, and at the same time an arm, 13, fixed to the same shaft, 12, is locked to the cylinder journal-box, and the cylinder is thus held stationary while the bed returns, in which operation the cylinder-wheel 37, running loosely upon its shaft, turns in a reverse direction, and this movement of the bed and cylinder-wheel I shall call the "inking-run."

The coupling-lever 11 extends from the shaft 12, which is journaled to turn in the cylinder, and is arranged so that its end may enter a recess, 3, formed in the inner surface of the rim of the wheel 37, its action in that direction being accomplished by a spring, 45, that is secured to the inner surface of the cylinder. At its opposite end this shaft 12 carries the locking-arm 13, the point of which is turned inwardly, and so arranged that it may at proper times engage a recess, 4, formed in a plate, 5, projecting from one journal-box of the cylinder. With this arm 13 is aligned an actuating rock-arm, 20, that is pivoted to one vertical frame supporting the cylinder journal-box, and its working-face 6, that bears upon the arm 13, is presented in substantially a vertical position. This arm 20 is rocked at proper times by means of a connecting-rod, 21, the stud or roller of which is acted upon by a cam, 22, that is carried by a shaft, 23, properly rotated, in this instance by means of miter-wheels 24 25, the latter being fast upon the main shaft 30. Any other arrangement of the cam for actuating the rock-arm 20 by timely movements may be applied for the purpose.

In Figs. 1 to 4 the mechanisms are shown in the positions they have at the moment the bed, having made its inking-run, is about commencing its printing-run—that is to say, a sheet having been fed from the table 38 to the gages 39 while the grippers 10 stood open, these latter have been rocked to clamp the paper upon the cylinder, and the gages 39 have lifted to permit its free movement, as is common in stop-cylinder printing-machines. At this time the gearing will have so operated as to have rocked the arm 20 outwardly away from the locking-arm 13, and the latter, thus freed from the pressure of the rock-arm 20, will permit the shaft 12 to be quickly rocked by the action of the spring 45, the effect of which will be to carry the locking-arm 11 into engagement with the recess 3 and the locking-arm 13 to be simultaneously disengaged from the recess 4, thus unclutching the impression-cylinder A from the journal-box, and at the same instant

clutching or locking the cylinder-wheel 37 to said cylinder. Now, as the forward or printing run of the bed B takes place it is manifest that the movement imparted through the rack 36 to the wheel 37 will be simultaneously imparted to the impression-cylinder A, the effect of which is to cause the said cylinder and the bed to move concertedly in the printing-run, and to impress the sheet carried by the cylinder upon the form carried by the bed.

In Figs. 5 and 6 the clutching mechanisms are shown in the position of engagement last described and a part revolution of the cylinder effected.

As soon as the printing-run has been accomplished, which is illustrated in Figs. 7 and 8, the grippers 10, which have been opened at a proper point to release the printed sheet, will have arrived at the proper point and will stand open to receive a second sheet, the impression-cylinder thus being in proper position to receive said sheet. The gearing will at this instant have so rotated the cam 22 as to quickly rock the arm 20 inward, (see Figs. 2, 7, and 8,) thus carrying the locking-arm 13 into engagement with the recess 4 of the journal box, so as to hold the cylinder stationary, and simultaneously withdrawing the arm 11 from the recess 3, thus releasing the cylinder wheel 37, so that the same is free to turn upon its shaft. This done, the return movement or inking-run of the bed takes place, as in Figs. 9 and 10, during all of which time the cylinder remains stationary, with its grippers open and the gages 39 down. A new sheet having been fed to the cylinder, the operation is repeated.

As ordinarily constructed, stop-cylinder printing-machines are provided with a mutilated gear-wheel passing out of gear with the bed-rack at the end of the printing-run of the bed and automatically brought into re-engagement with said rack at the beginning of the printing-run of the bed, said cylinder being held stationary during the inking-run of the bed, while its rack travels past the mutilated portion of the gear-wheel by mechanisms which not only perform the operation of arresting the movement of the cylinder, but are required to start the same in order to throw the cylinder-wheel and the bed-rack into re-engagement. Such operation requires nice adjustment, accurate operation, and in practice results in great wear of the parts. It also, when worn, causes a jarring operation injurious to perfect work. Improvements effected by D. Weck-erlin, as described in his Patent No. 263,004, have in part removed these objectionable qualities by providing the cylinder and its wheel with independent movements, the latter being constantly geared with the bed-rack and a coupling mechanism introduced for engaging and disengaging the cylinder and its driving-wheel. While said improvements have avoided previous faulty constructions, they do not so operate to uncouple the cylinder from its wheel and couple it with the frame simulta-



neously, and vice versa, as is effected by the present invention.

In the structure constituting my improvements whereby the impression-cylinder is positively held at all times, any improper movement of the same is prevented and all jarring and other imperfect action is removed, thereby increasing the efficiency of the press and removing its liability to derangement from undue wear.

It will be observed that the shaft of the impression-cylinder upon which the driving-gear wheel turns is provided, as is usual, with adjustable journal-boxes that can be raised or lowered by the adjusting-screws, so as to give more or less pressure upon the form, as may be desired, and as the recess 4, into which the arm 13 is locked to hold the cylinder stationary, is attached to the journal-box, it is evident that any vertical adjustment of the cylinder cannot impair or derange the accurate working of the locking mechanism. It will be observed, likewise, that the working-face of the rock-arm 20 is substantially vertical, which secures its perfect actuating-contact with the arm 13 in all positions of adjustment of the cylinder; for as said arm is hung to the cylinder it is carried up and down with it without losing its fixed relation to the recess 4, which is attached to one of the journal-boxes, or to the working-face of the rock-arm 20.

What is claimed is—

1. The combination, with the cylinder provided with the locking-arm, as 13, of the adjustable journal-boxes provided with a locking-recess, as 4, whereby the recess always

partakes of the adjusting movements of the cylinder, substantially as described.

2. The combination, with the impression-cylinder and its loose gear-wheel, of a rock-shaft mounted in said cylinder, and provided at opposite ends with locking-arms adapted to engage, the one with the wheel and the other with the journal-box, and means for rocking said shaft, all substantially as described.

3. The combination, with the cylinder carrying the rock-shaft 12, provided with the locking-arms 11 13, of the driving-gear provided with the locking-recess 3, the journal-box having the locking-recess 4, the rock arm 20, and its actuating-cam, substantially as described.

4. The combination, with an impression-cylinder and its driving gear-wheel, adapted to turn independently of the cylinder, and to be coupled thereto, of vertically-adjustable mountings or bearings for the shaft of said cylinder and wheel, mechanism for coupling said cylinder and wheel, and a rock-arm for actuating said coupling mechanism, hung upon a stationary pivot, and arranged to present its actuating-face in substantially a vertical position, so as to operate effectively in all positions of vertical adjustment of said cylinder and wheel, all substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

STEPHEN D. TUCKER.

Witnesses:

CHAS. W. CARPENTER,  
ERNEST VOORHIS.