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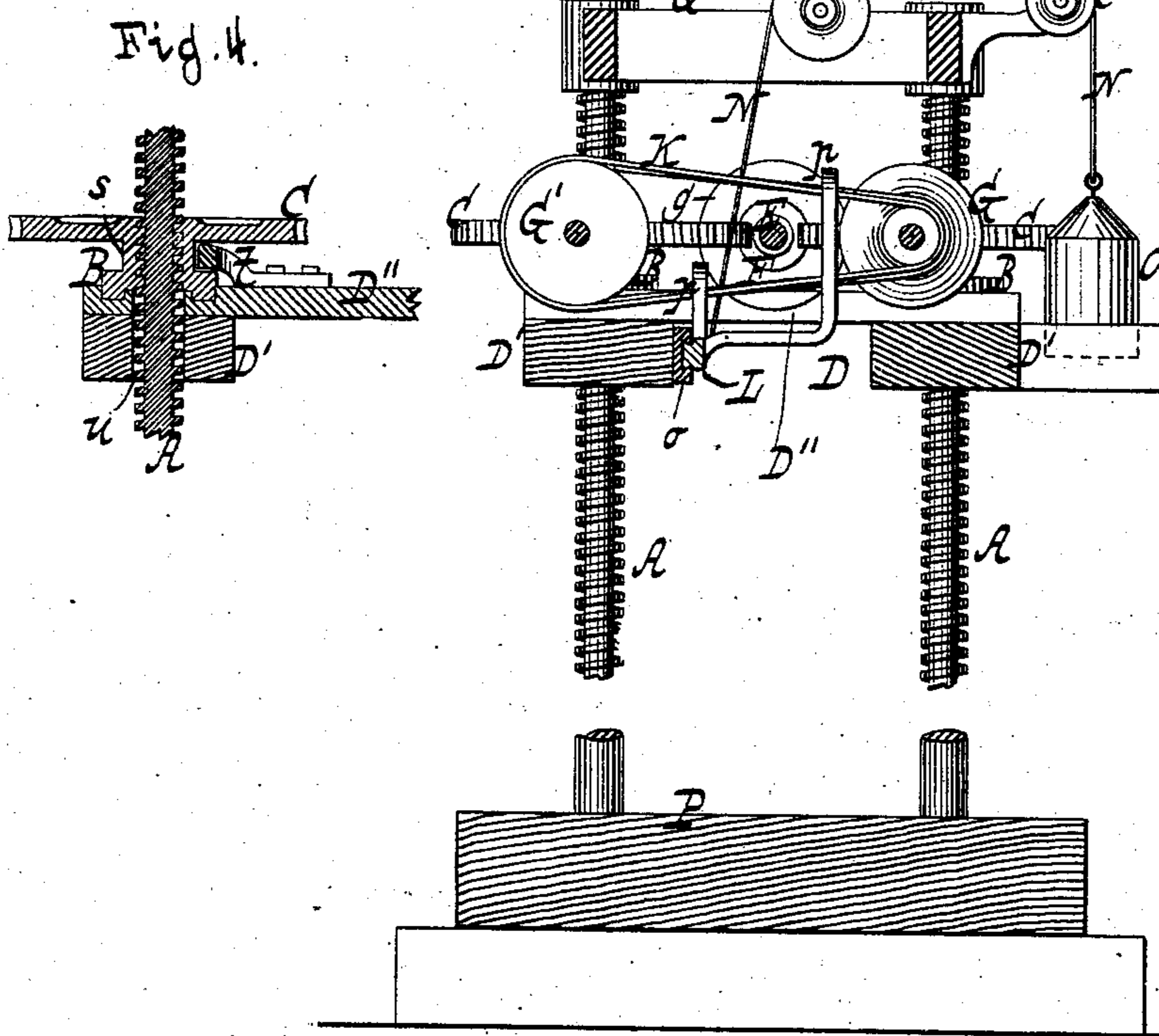
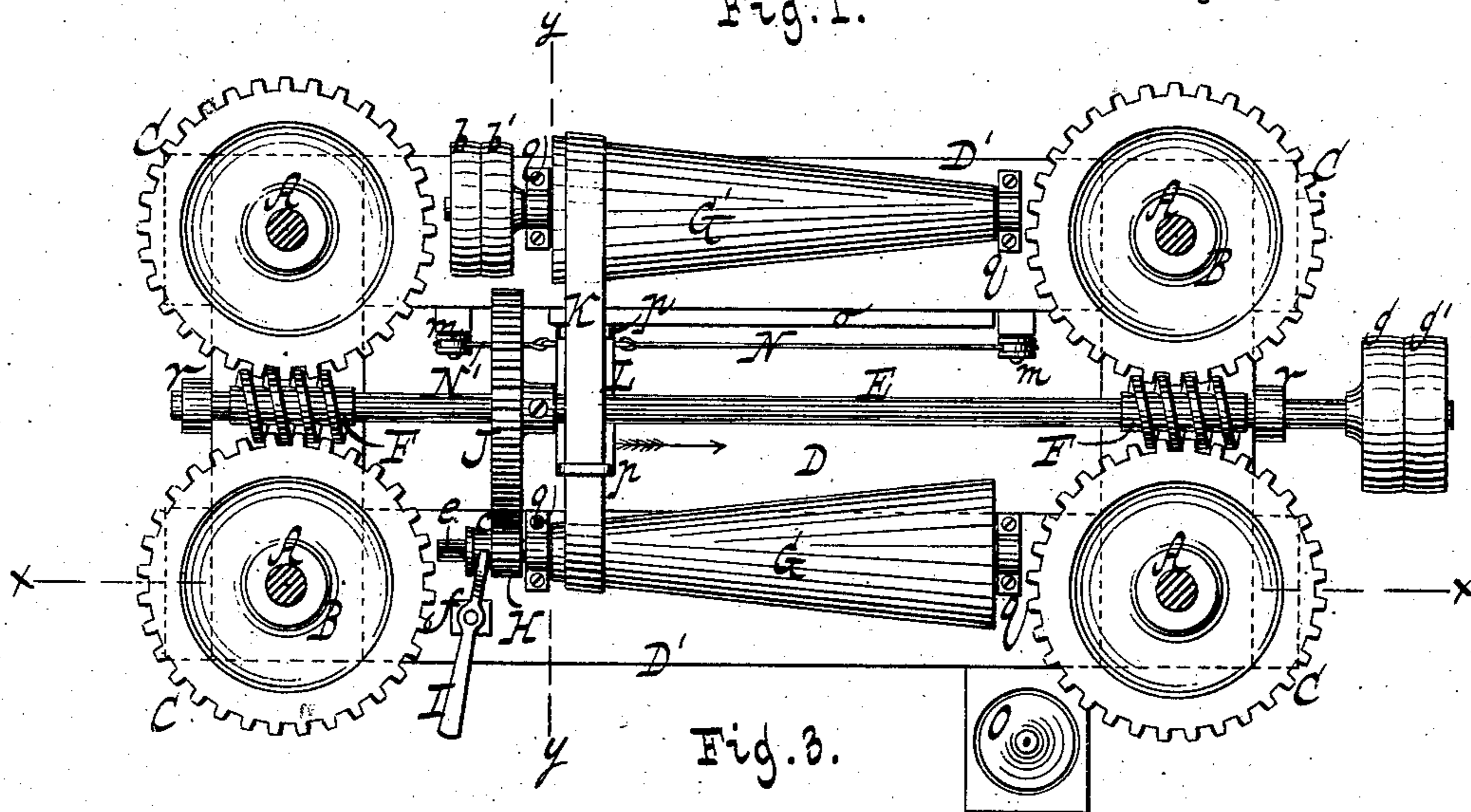
2 Sheets—Sheet 1.

G. B. BOOMER.

POWER PRESS.

No. 260,528.

Fig. 1. Patented July 4, 1882.



WITNESSES:

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William Moller

INVENTOR

George B. Boomer

BY

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(No Model.)

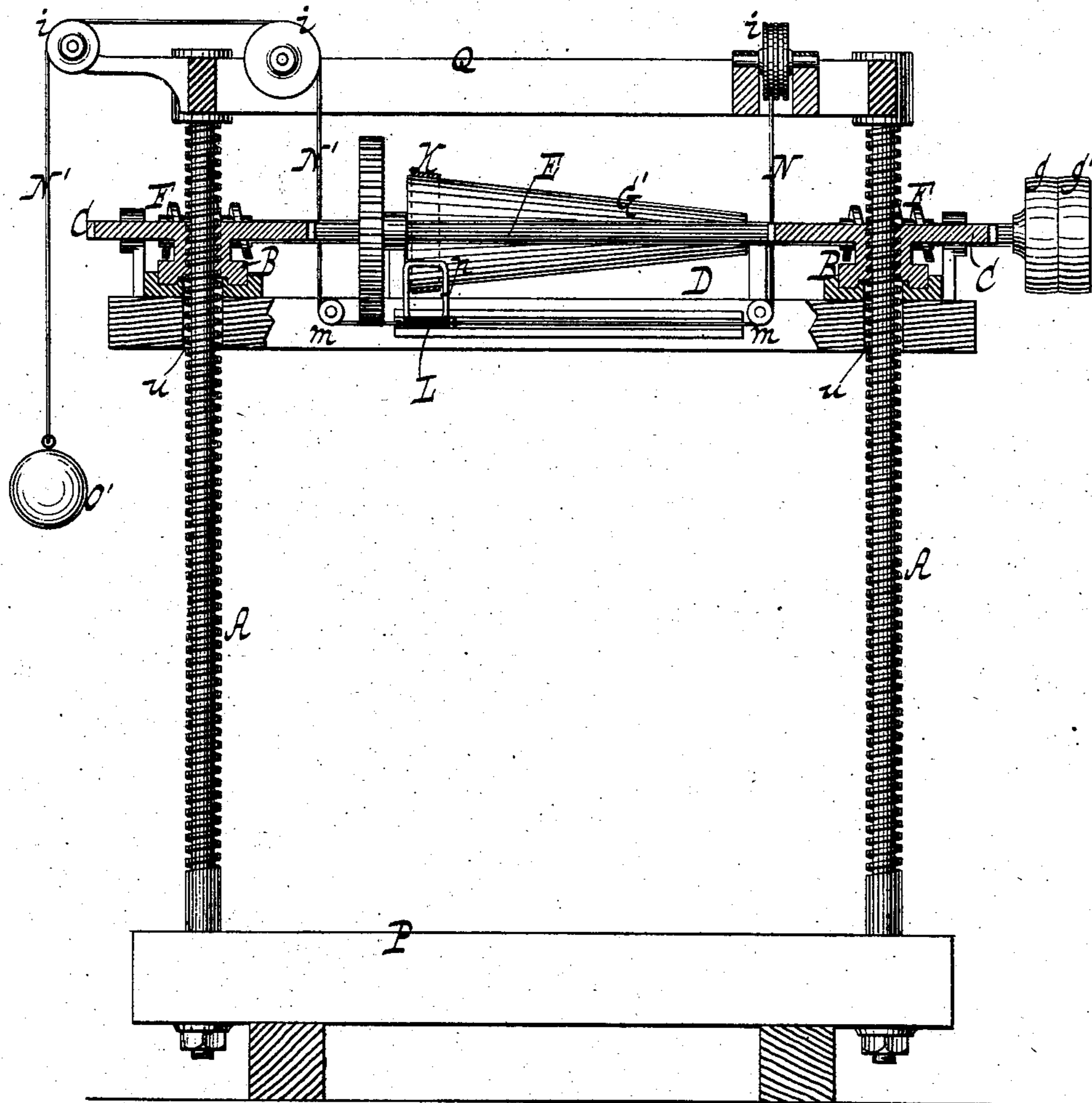
2 Sheets—Sheet 2.

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Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE B. BOOMER, OF NEW YORK, N. Y.

POWER-PRESS.

SPECIFICATION forming part of Letters Patent No. 260,528, dated July 4, 1882.

Application filed May 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. BOOMER, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Power-Presses, of which the following is a specification.

The primary object of this invention is to obtain a power-press wherein the follower shall descend with a "retarded" or gradually-decreasing motion without changing the speed or power of the driving medium for the purpose of improving the operation of the machine, especially in treating wet substances; and it consists in two or four stationary screws having fitted thereon revolving screw-nuts, to which is connected the follower, and which are driven by a shaft which is arranged in proper relation to a differential gearing operating to impart a retarded motion to the shaft in the descent of the follower. The revolving screw-nuts are formed with worm-wheels, and the machine-shaft carries worms which engage the worm-wheels to produce the required action of the shaft on the nuts. The differential gearing embodies in its structure two cone-pulleys, one having its shaft provided with a pinion engaging with a spur-wheel on the machine-shaft, a belt connecting the cone-pulleys, and a traveling belt-shifter to which a reciprocating motion is imparted in the operation of the follower—as by means of two cords, both having one end provided with a weight, the weight of one cord resting on the follower. Said pinion of the pulley-shaft is fixed thereto by a feather-key to slide thereon, and with the pinion is combined a shifting-lever for throwing it out of gear.

This invention is illustrated in the accompanying drawings, in which Figure 1 represents a plan or top view, partly in section. Fig. 2 is a vertical longitudinal section on the line *x x*, Fig. 1. Fig. 3 is a vertical cross-section on the line *y y*, Fig. 1. Fig. 4 is a detail view, showing the connection of the follower to the screw-nuts.

Similar letters indicate corresponding parts.

The letter A designates the stationary screws; B, the revolving screw-nuts; C, the worm-wheels; D, the follower; E, the machine-shaft; F, its worms; G G', the cone-pulleys;

H, the pinion; I, its shifting-lever; J, the spur-wheel; K, the belt; L, the belt-shifter; N N', the shifter-cords, and O O' the cord-weights.

The screws A are four in number, and rise from the bed P, they being secured thereto and to the head-piece Q in a proper manner, and the nuts B are fitted on the screws by means of their threads, there being one nut to each screw. The follower D comprises a frame formed of two beams, D', and of cross-pieces D'', uniting the beams, such parts being provided with holes *u* at the points of intersection, whereby the whole is mounted on the screws, the holes being plain and larger than the screws, so as to allow the passing and re-passing of the follower.

The connection of the follower to the screw-nuts B is effected by means of bifurcated coupling-pieces, (one of which is shown at *t*, Fig. 4,) which are secured to the cross-pieces D'' of the follower, and which straddle the screw-nuts respectively opposite to a circumferential groove, *s*, therein, so that the nuts are permitted to receive a revolving motion.

The worm-wheels C are integral with the screw-nuts B, respectively, and are in engagement with the worms F, which latter are fixed to the shaft E, so that the shaft is adapted to drive or communicate motion to the nuts; but this purpose can also be accomplished by means of bevel-gears.

The shaft E has its bearings in brackets *r*, secured to appropriate portions of the follower, and it extends between each pair of the worm-wheels, &c., as clearly shown in Fig. 1.

The cone-pulleys G G' are arranged in the usual relation toward each other, and their shafts have their bearings in brackets *q*, secured to the press-beams D', so that these pulleys, like the shaft E, are fixtures of the follower and share its motion. The pinion H is fixed to the shaft of the pulley G by means of a feather-key, *e*, so that it is capable of sliding thereon, while the spur-wheel J is fixed to the machine-shaft E, as by a set-screw, in a suitable manner to engage the pinion.

The belt-shifter L engages the belt K by means of two arms, *p*, (best seen in Fig. 3,) one near each of the pulleys, and it is arranged to travel parallel to the axes of the pulleys in a guideway, *o*, located on one of the press-

beams, such guideway being dovetailed. The cords N N' are both connected to the shifter L at one end, and extend in opposite direction therefrom, passing over pulleys *m*, applied to one of the press-beams, and thence over pulleys *i* in the head-piece Q, and the weights O O' are hung to the opposite ends of the cords respectively. The weight O is heavier than the weight O', and it rests on the follower—namely, on a suitable portion of one of the beams.

The shifting-lever I has its fulcrum on a pivot, *f*, on one of the press-beams, and it engages the pinion H at one end, where it is bifurcated to catch in a groove, *c*, in the pinion-hub, this lever serving to throw the pinion into or out of gear with the spur-wheel.

To the shaft of the cone-pulley G' are fixed a plain fast-and-loose pulley, *b b'*, and to the machine-shaft E are fixed corresponding pulleys, *g g'*, through which pulleys both said shafts are connected with a driving-shaft arranged parallel to the machine-shaft at a point approximately opposite the mid-length of the screws.

When it is desired to lower the follower power is applied to the cone-pulley G', whence the machine-shaft E receives a revolving motion through the belt K, cone-pulley G, pinion H, and spur-wheel J in the proper direction to act on the screw-nuts B through the worms and worm-wheels and cause a downward movement of the nuts. In this manner the follower is forced downward, and as it descends the weight O follows it by gravity, thus acting on the belt-shifter L, through the cord N, to force it in the direction of the arrow indicated in Fig. 1, while the shifter in turn acts on the belt K, moving it from one to the other end of the cone-pulleys. Hence the speed of the machine-shaft E gradually decreases, or, in other words, it obtains a retarded motion, while a like motion is imparted to the screw-nuts, and thence to the follower.

When it is desired to raise the follower a reverse motion is given to the shaft, and as the follower ascends the cord N loosens, while the weight O' acts on the belt-shaft, through the cord N', to bring the belt to its first position. In the ascent of the follower it obtains an accelerated motion.

If it should be desirable to move the follower with a uniform speed either up or down, or both, the pinion H is thrown out of gear, thus separating the machine-shaft from the cone-pulleys, and power is applied directly to the shaft.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, substantially as hereinbefore described, of the follower, the revolving screw-nuts carried thereby, the stationary screws, the longitudinal shaft mounted in bear-

ings on the follower and provided with means to rotate the screw-nuts, and differential gearing carried by and moving with the follower and connected with the said shaft to retard the rotation thereof as it descends with the follower.

2. The combination, substantially as hereinbefore set forth, of the stationary screws, the revolving screw-nuts formed integral with worm-wheels, the follower connected to the screw-nuts, the worms engaging the worm-wheels, the machine-shaft carrying the worms, and the differential gearing operating to impart a retarded motion to said shaft in the descent of the follower.

3. The combination of the follower, the cone-pulleys journaled in bearings thereon, and the shaft of one provided with a pinion, the automatically-traveling belt-shifter moving on the follower, the stationary screws, the rotary screw-nuts secured to the platform, the operating-shaft journaled in bearings on the latter and arranged to rotate the screw-nuts, and a spur-wheel on said shaft meshing with the pinion on the shaft of the cone.

4. The combination of the follower, the belt-shifter traveling on the same, the two cords having one end connected with the belt-shifter and the other end provided with a weight, the cone-pulleys journaled on the follower and the shaft of one provided with a pinion, the stationary screws, the screw-nuts and operating-shaft rotating on the platform, and the spur-wheel on the shaft meshing with the pinion on the shaft of the cone, substantially as described.

5. The combination of the follower provided with attached revolving screw-nuts, the machine-shaft operating the screw-nuts, the stationary screws and differential gear connected with the machine-shaft and operating to retard its rotation as the follower and screw-nuts descend, substantially as described.

6. The cone-pulleys mounted on the platform, one having its shaft provided with a pinion which is fixed to the shaft by a feather-key to slide thereon, the shifting-lever engaging the pinion, the belt of the cone-pulleys, the traveling belt-shifter, and the means for imparting a reciprocating motion automatically to the belt-shifter, in combination with the stationary screws, the revolving screw-nuts, the follower carrying the screw-nuts, and the machine-shaft arranged in bearings on the platform to drive the screw-nuts and provided with a spur-wheel engaging said pinion.

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

GEORGE B. BOOMER. [L. S.]

Witnesses:

W. HAUFF,

CHAS. WAHLERS.