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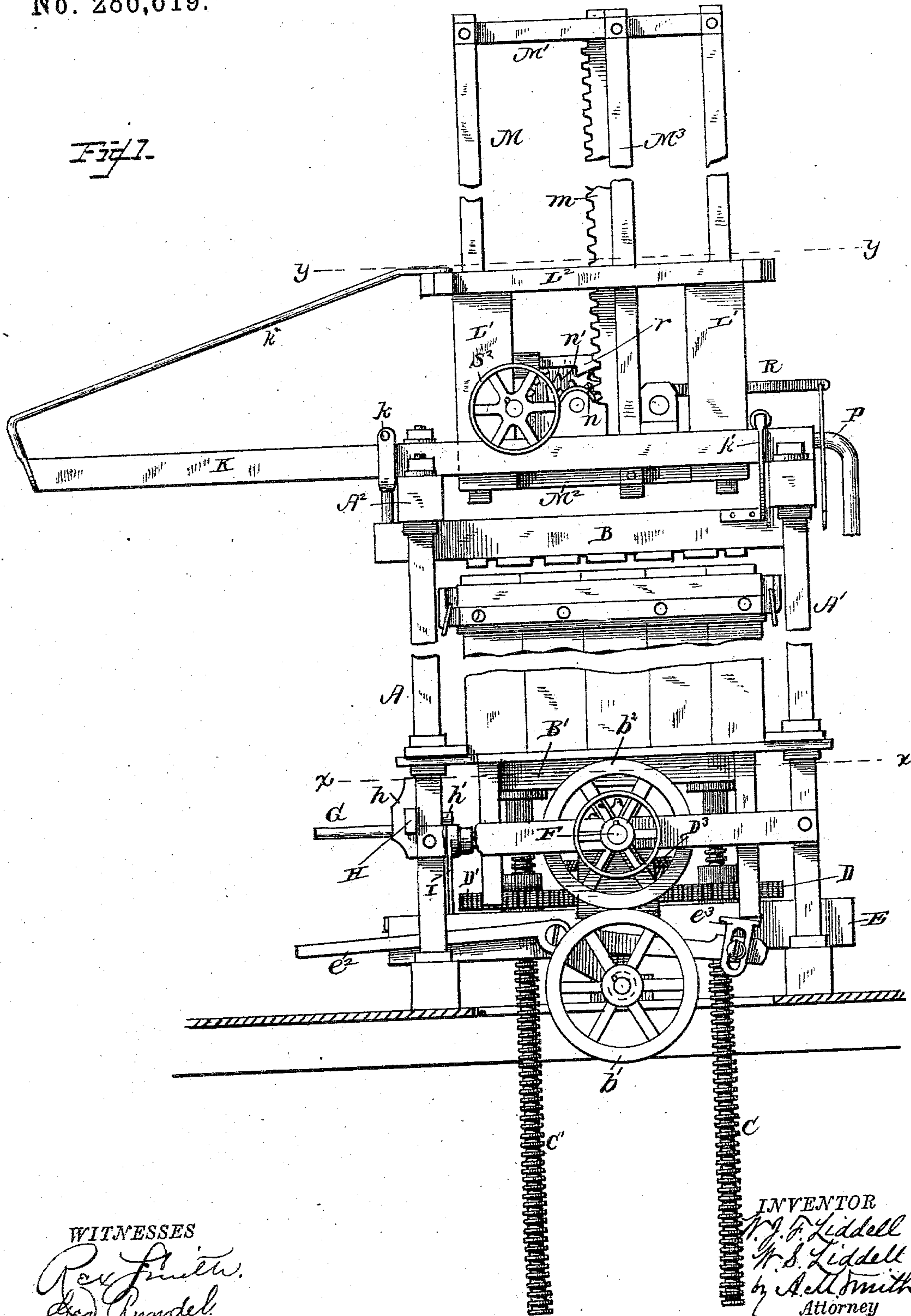
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W. J. F. & W. S. LIDDELL.
HAY AND COTTON PRESS.

No. 286,619.

Patented Oct. 16, 1883.

Fig. 1.



WITNESSES

Rev. Smith.
Geo. Arnold.

INVENTOR

W. J. F. Liddell
W. S. Liddell
by *A. M. Smith*
Attorney

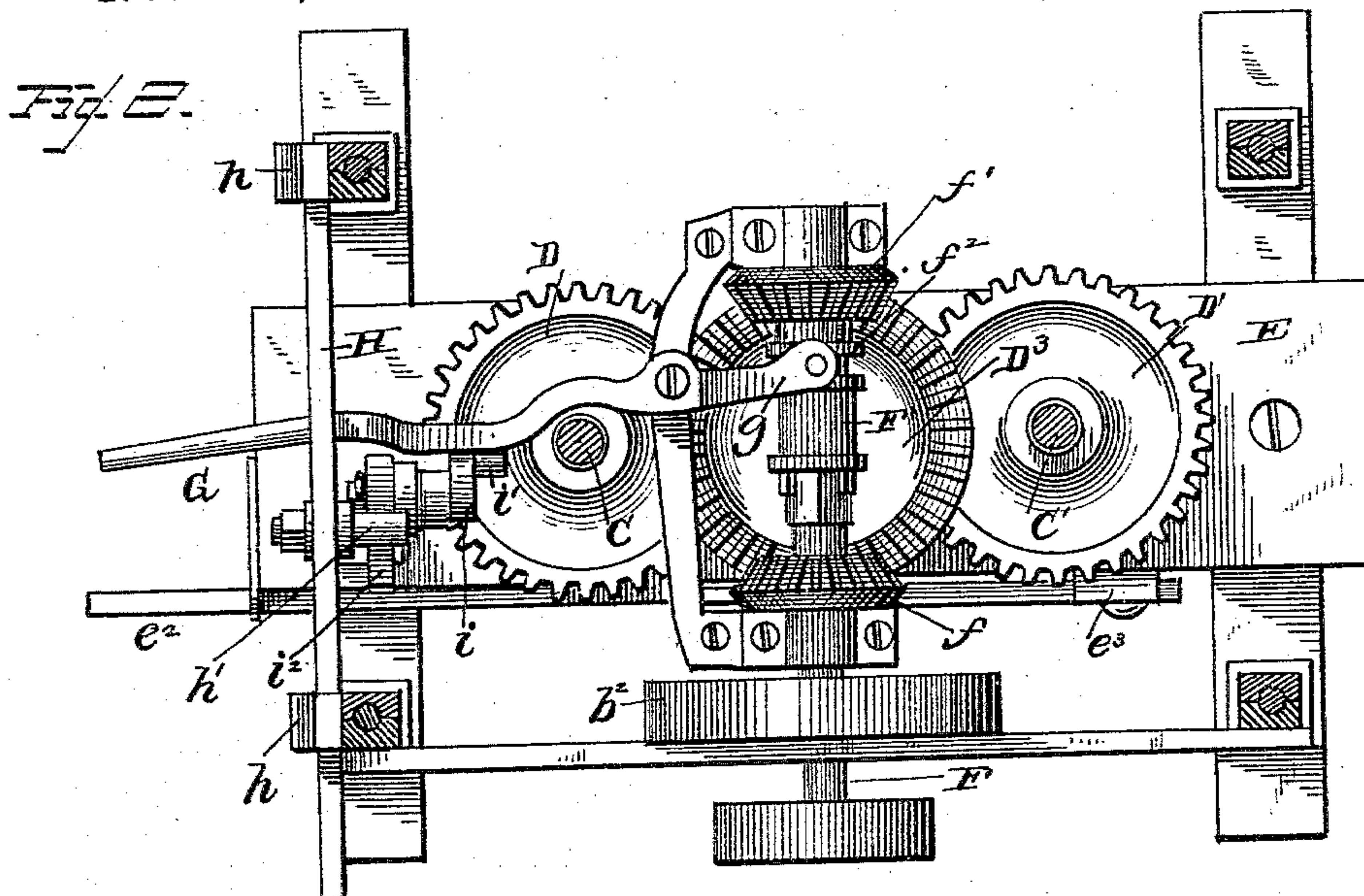
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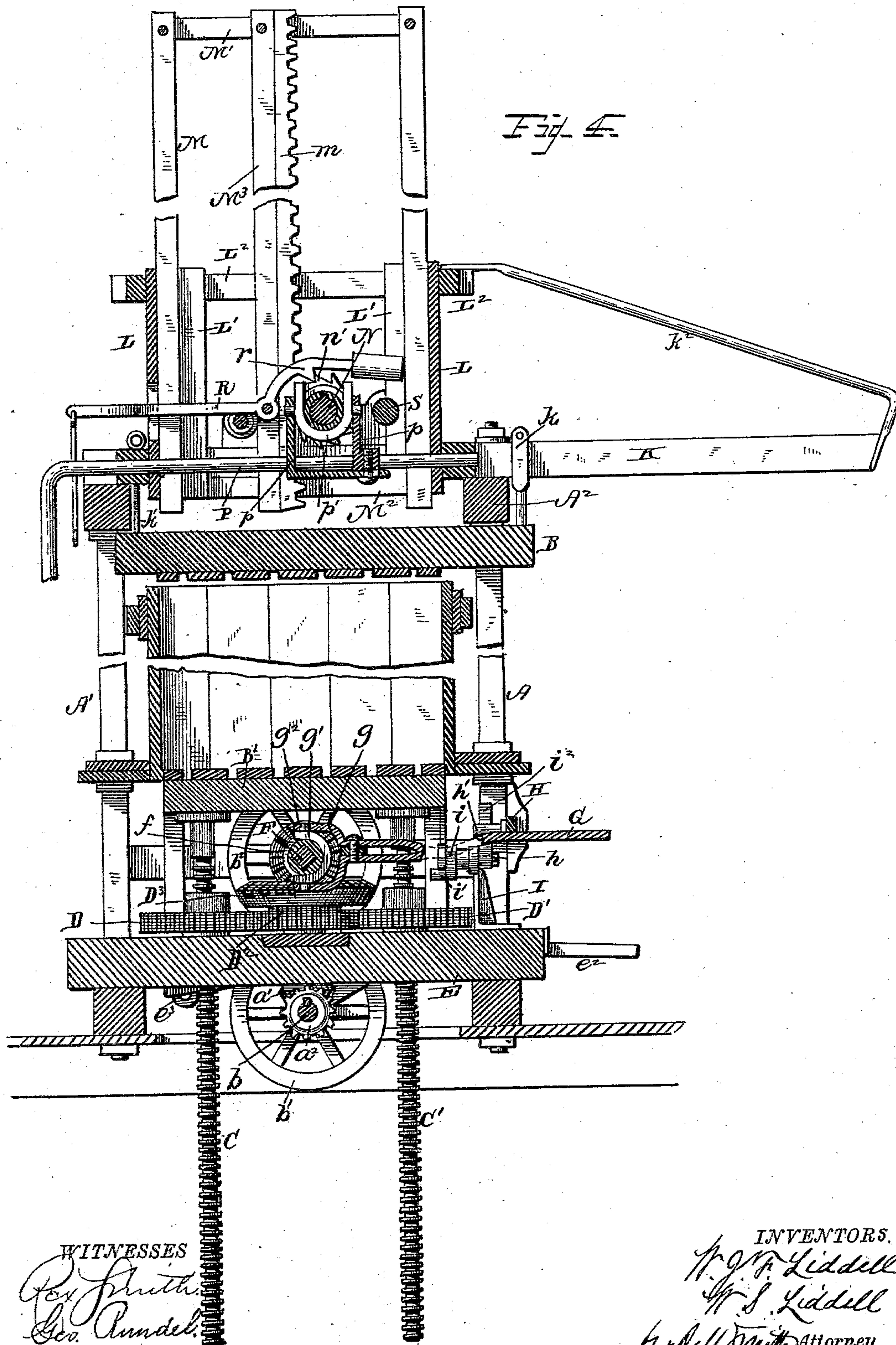
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Fig. 5.

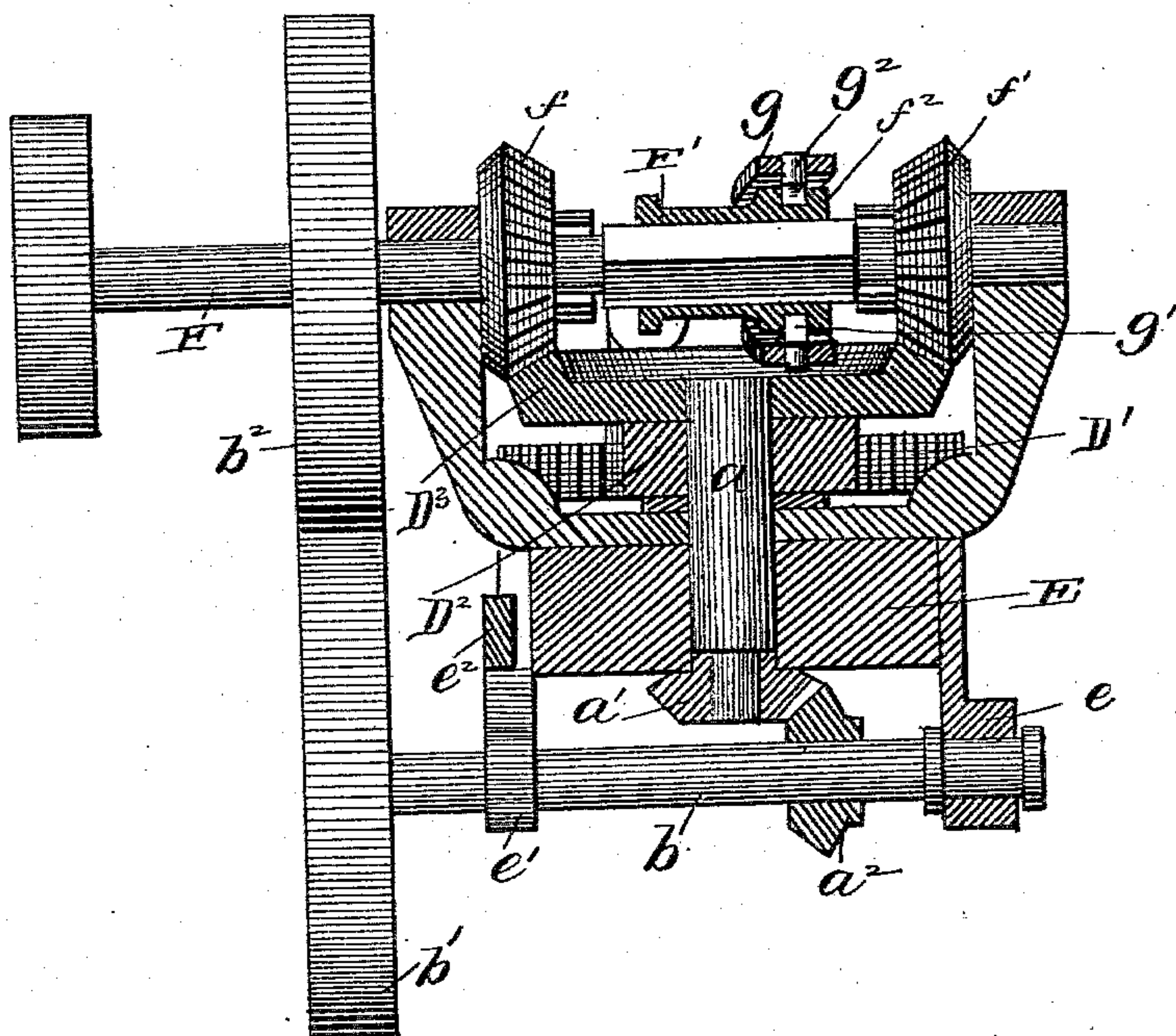
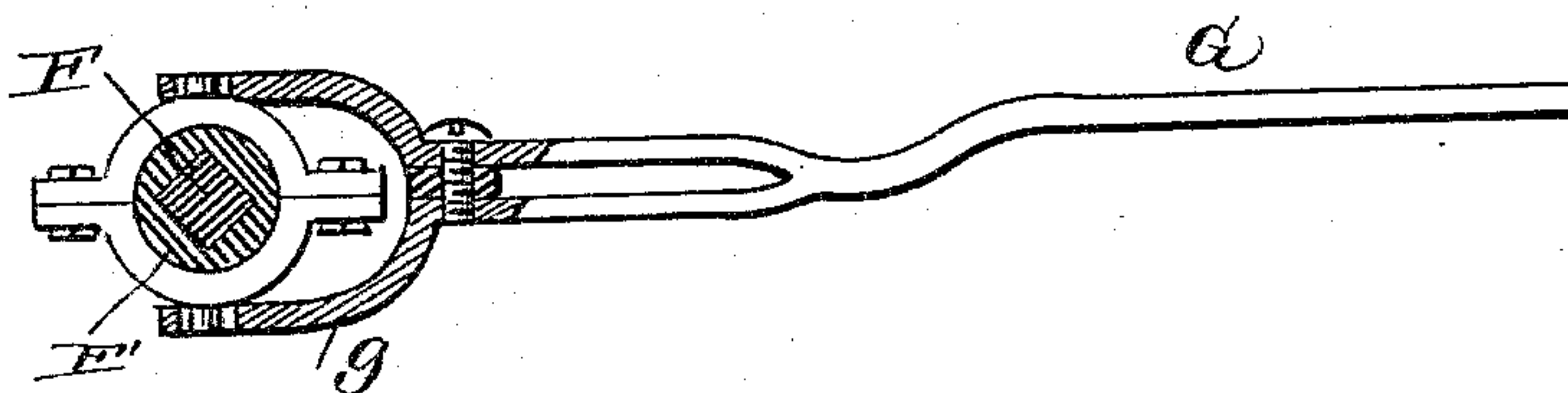


Fig. 6.



WITNESSES

Geo. Smith
Geo. Rindel

INVENTOR

W. J. F. Liddell

W. S. Liddell

Ed. Smith, Attorney

UNITED STATES PATENT OFFICE.

WALTER J. F. LIDDELL AND WALTER S. LIDDELL, OF CHARLOTTE, N. C.

HAY AND COTTON PRESS.

SPECIFICATION forming part of Letters Patent No. 286,619, dated October 16, 1883.

Application filed September 1, 1883. (No model.)

To all whom it may concern:

Be it known that we, WALTER J. F. LIDDELL and WALTER S. LIDDELL, of Charlotte, county of Mecklenburg, State of North Carolina, have invented a new and useful Improvement in Hay and Cotton Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to the improvement of that class of presses in which the moving platen or plunger is actuated by means of one or more screws, similar to that described in Letters Patent granted to W. J. F. Liddell, April 8, 1879, No. 214,046, and February 20, 1883, No. 272,719; and it consists in the combination, with the bevel-wheel shaft, through which motion is imparted to the plunger, of a second bevel-gear, through which increased speed may be imparted to said shaft, and the plunger for retracting the latter, after compressing a bale, by an arrangement of friction wheels or gears connecting said bevel-wheel shaft with the first or driving shaft; in means for automatically throwing the retracted mechanism out of action when the plunger has completed its retractive or imperative throw; and in a novel construction of clutch-lever, whereby its friction upon the grooved collar of the clutch or gear sleeve is diminished, as hereinafter explained.

It further consists in a packing mechanism for packing the material in the press-chamber preparatory to compressing said material into a bale therein.

In the accompanying drawings, Figure 1 represents a side elevation of our improved press. Fig. 2 represents a horizontal section taken on the line $x x$, Fig. 1; and Fig. 3, a similar section taken on the line $y y$. Fig. 4 represents a vertical section taken on the line 2 2, Fig. 3. Fig. 5 is a similar section through the gear-block and gearing, taken in line with the central upright bevel-wheel shaft; and Fig. 6 is a detailed view, showing a modification in the swiveling loop connecting the shipping-lever fork with the clutch-sleeve.

The construction of the frame of the press and the arrangement of the movable platen or plunger and of the screws and gear-nuts for actuating said plunger are similar to those of

the patents referred to, and said parts will not therefore be described herein in detail further than is necessary to an understanding of our present improvement.

A and A' represent the corner posts and horizontal connecting-timbers of the upright press-frame; B, the fixed and B' the movable platen; C and C', the endwise-moving screws for actuating the platen B'; D and D', the geared nuts for actuating said screws, and D² the interposed pinion or gear-wheel, through which motion is imparted to the gear-nuts D and D', said gear-nuts and pinion being journaled in a gear block or plate, E. The gear D² has formed upon or secured to its upper face, or to the upper end of the shaft a , with which said gear is connected, a bevel-wheel, D³, with which bevel-pinions f and f' on the main driving-shaft, F, on opposite sides of shaft a , engage. Pinions f and f' are loose on the shaft F, and the latter, between said pinions, is squared or feathered and has a clutch-sleeve, F', upon it, adapted to slide endwise on the shaft, for coupling either of the pinions f and f' to the shaft and actuating the bevel-wheel D³ according to the direction in which it is desired to move the latter and the platen or plunger B'; or it may be moved to an intermediate position, for disengaging both pinions and throwing the machine out of gear.

The shaft a extends through and below the gear-block E, and has a bevel-pinion or miter-wheel, a' , fast on its lower end, which engages a corresponding gear, a'' , fast on a transverse shaft, b , journaled in pendent lugs or brackets attached to the gear-block. One of these bearing-brackets, e , is rigidly secured to said block, while the other, e' , is secured to a lever, e'' , pivoted near the center of its length to said block, one end extending forward to within convenient reach of the attendant, and the other carrying an adjustable angular foot, e^3 , for a purpose which will appear. The end of the shaft b projecting outside of the bearing-bracket e' has a friction-wheel, b' , upon it, which, by the adjustment of lever e'' , is adapted to be moved into or out of frictional engagement with a corresponding wheel, b'' , fast on the first or main driving-shaft F. The wheels b' and b'' , as also the gears a' and a'' , are by preference made those of each pair of equal

diameter, in such manner that, when the shaft a , with its pinion D^2 , are geared through them to and driven by them from the first or main driving-shaft F , the speed of the shaft a will be equal to that of shaft F , and will serve to rapidly withdraw or retract the movable platen. The lever e^2 is actuated by the attendant for moving the wheel b' into engagement with wheel b , and is automatically operated for moving said wheel b' out of engagement, just as the movable platen completes its outward or imperative movement, by means of a pendent arm or foot, B^2 , attached to one corner of said platen or plunger, and which comes in contact with the angle-iron or foot e^3 on the end of lever e , depressing the latter and with it the wheel b^2 . The angle-iron or foot e^2 has a vertical slot formed in its vertical portion, and is secured by a set-screw to the end of lever e^2 , for permitting its adjustment and varying the point at which the descending plunger shall terminate its downward throw. When the gears a' , a^2 , b' , and b^2 are not employed for retracting the plunger, and the latter movement is effected through the pinions f and f' , the following arrangement of parts serves to automatically throw the retracting mechanism out of gear as the plunger completes its downward or imperative throw:

The clutch-sleeve F' has a grooved collar, f^2 , with which the fork g of a shipping-lever engages for adapting the clutch-sleeve to be moved endwise on the shaft F . The fork g is provided with an inner fork or ring, g' , connected by pins g^2 with the fork g of the lever in such manner as to adapt it to swing in its bearings in said fork to conform itself to the groove in the sleeve under the varying angles of the latter to said groove, thereby obviating to a great extent the friction due to the employment of the fork as ordinarily applied. The inner swiveling fork or loop, g' , may be made either in the form of a half-ring, or it may be made in two parts united by flanges or feet at the ends, as shown in Fig. 6, and so be made to surround the sleeve, if desired, without interfering with its free rotation. The outer end of the lever G passes through a notch or perforation in a bar, H , sliding horizontally in loop-brackets h , attached to the corner posts at one side of the frame, and provided on its inner face with spur h' , through which the bar H is moved laterally for acting on the lever G and the clutch-sleeve F' , as follows:

In the upper end of a suitable standard-bracket, I , secured to one end of the gear-block, is mounted a rock-shaft, i , provided on its inner end with a crank-arm, i' , which reaches upward in an inclined position, adapting it to be acted upon by an arm or bracket, c , attached to the lower side of the plunger in such manner that as the latter nears the end of its downward throw the bracket c comes in contact with the arm i' , depressing it and rocking the shaft i in its bearings in the bracket I . The

outer end of the shaft i has attached to it an arm, i^2 , which extends upward in position to act upon the spur h' in such manner that as the arm i' is vibrated downward the bar H will be moved laterally, carrying with it the arm of the lever G , attached thereto, and withdrawing the clutch-sleeve F from engagement with the pinion f or f' , whichever may be acting to depress the plunger. The arm i^2 may be forked or slotted to embrace the spur h' , if preferred, and the crank-shaft i may have the end to which the crank i' is attached squared to match a corresponding socket in the crank-arm, for permitting the latter to be applied, inclining on either side from an upright or vertical position, according to the direction of movement of the main driving-shaft actuating the press, it being convenient to be able to drive said shaft sometimes in one direction and sometimes in a reverse direction. The spur h' passes through a horizontal slot in the bar H , and is connected with said bar, a thumb-nut or equivalent device permitting the lateral adjustment of the spur, as may be required to suit the direction of rotation referred to and to compensate for wear of the parts.

To the upper transverse bar, A^2 , at one side or end of the press-frame proper, is secured one end of a horizontal bar, K , forming a support and horizontal track for a roller in the upper end of a loop, k , through which one end of the upper platen, B , is suspended from said bar K . The other end of said platen is suspended from the upper front and rear frame-timbers by angle-irons k' , secured at their lower ends to said platen, and having inwardly-projecting horizontal arms at their upper ends, provided with rollers which rest and roll on said frame-timbers. By this arrangement the platen B can be moved over the press-chamber or be run off to one side, for facilitating the filling of the latter. The outer end of the rail or track-bar K is supported by a brace-rod, k^2 , extending obliquely downward thereto, from the upper end of a packer-frame supported above the press-chamber upon the upper press-frame timbers. This packer-frame is composed of corner uprights, L and L' , secured at their lower ends to the upper horizontal press-frame timbers, which are thereby made to serve as a lower horizontal frame for the packers, and at their upper ends the uprights L and L' are united to a similar rectangular frame, L^2 . Within the frame $L L'$ is arranged a second upright frame, M , corresponding in external measurement in horizontal section to the internal measurement of the frame $L L'$, within which said frame M is adapted to slide vertically, and also with that of the press-chamber beneath it. The frame $L L'$ is designed as a guideway and support for the frame M , and may be of any suitable construction for that purpose, and the frame M , which is designed for packing the material to be operated upon in the press-chamber until a sufficient amount is contained therein to

form a bale, may also be of any suitable construction adapting it to move easily on ways in the frame L L'. It is shown composed of end uprights united at their upper ends to horizontal bars M', and at their lower ends to similar bars or a plate, M², which serves as a piston or packing-head for packing the material operated upon into the baling-chamber. To the end bars, M' M², or to a central upright, M³, secured to said end bars, is attached a vertical rack, m, which engages with the teeth of a pinion, n, loose on a horizontal shaft, N, mounted in bearings on the upper press-frame timbers. The shaft N has a squared or feathered portion adjacent to the pinion n, and upon said portion is a sliding clutch-sleeve, n², for connecting said pinion with or releasing it from its shaft.

Insuitable bearings in the upper press-frame timbers is mounted a rock-shaft, P, arranged at right angles to and below the shaft N, and provided with an angular fork or crank-arms, p p, between the upper ends of which is pivoted an inner fork or loop, p', similar to g', above described, arranged within a groove in a collar of clutch-sleeve n², the arrangement being such that the attendant, by rocking the shaft P, can move the clutch-sleeve into or out of engagement with the pinion n, for coupling the latter to or releasing it from its shaft N. The pinion n has a ratchet-disk, n', formed upon or secured to it, with which a pawl, r, on a weighted lever, R, engages, for holding the pinion, and with it the rack m and piston-frame M, at any desired adjustment. One arm or lever, R, extends outward into convenient position to be actuated by the attendant for releasing the ratchet-disk and pinion, which, when the latter is released from the shaft N, leaves the frame M free to fall upon the material in the press-chamber, for packing said material therein. The shaft N has upon one end a spur-gear, N', which engages with and is driven by a pinion, S', on one end of a shaft, S, arranged by the side of shaft N in bearings on the upper press-frame timbers, and provided on its opposite end with a crank for actuating it, or with a band-wheel, S², to which motion may be imparted from a band-wheel on the first or main driving-shaft of the press, or other convenient driving-shaft, for actuating the shaft N and raising the piston or packer M. By this arrangement the packer can be readily raised by the pinion n with its shaft, and, when raised to the desired height, will be held by the pawl r, with the pinion n released from its shaft, until it is desired to pack the loose material in the baling-chamber, when by lifting pawl r the packing-piston M drops by its own gravity upon said material. The operation can be repeated until the amount of material required for the bale is packed in said chamber, when the platen B moved into place under it and over the baling-chamber, and the material in said chamber is then

compressed and formed into a bale in a manner well understood. A "safety" pin (indicated at t) is passed through a perforation in the frame-timber, and engages the packer-frame, for preventing the latter from falling accidentally when not in use.

Parts of the press not particularly described may be constructed and arranged as described in the patents referred to, or in any usual or preferred way.

Having now described our invention, we claim as new—

1. The shaft of the central bevel-wheel and pinion, through which motion is imparted to the screws actuating the movable platen or plunger, extended below the gear-block, in which it has its bearings, and provided with a second gear, in combination with gearing connecting said gear with the main or first driving-shaft, substantially as and for the purpose described.

2. The combination, with the central bevel-wheel and pinion-shaft and the gear-nuts and screws for actuating the movable platen, of the second bevel-gear, a', the shaft b, provided with the pinion a², and the friction-wheel thereon, adapted to be moved into or out of engagement with a friction-wheel on the driving-shaft, substantially as and for the purpose described.

3. The central bevel-wheel and pinion-shaft, with the gear-nuts and screws for actuating the movable platen, in combination with an adjustable shaft geared to said central shaft, and provided with a friction or gear wheel engaging a similar wheel on the driving-shaft, and means connected with the movable platen for automatically throwing said wheels out of engagement as the platen or plunger completes its retractive or inoperative throw, substantially as described.

4. The combination, in a baling-press, of the sliding clutch-sleeve with its grooved collar, the shipping fork or lever, and the swiveling loop or ring connecting said sleeve and lever, substantially as described.

5. The combination, with the shipping fork or lever for throwing the press-gearing into and out of action, of the sliding bar H, with its spur, and the rock-shaft i, with its crank-arm and lever for actuating said sliding bar and shipping-lever, adapted to be operated by the moving plunger or platen for throwing the press mechanism out of gear, substantially as described.

6. The sliding packer moving in a suitable frame or ways above the baling-chamber, in combination with mechanism, substantially as described, for lifting said packer, and means for releasing the same and allowing it to descend upon the material in the baling-chamber for packing said material therein, substantially as described.

7. The combination, with a baling-press, of a packing-piston provided with a rack, m, a pinion engaging with said rack for actuating

said piston, and means for holding said piston at any desired height, substantially as described.

8. The combination, in a baling-press, of a
5 piston or packer for packing the loose material in the baling-chamber, a rack and pinion for actuating said packer, means for coupling said pinion to and releasing it from its actuating-shaft, and means for holding and tripping
10 said pinion when released from its shaft, substantially as described.

9. The combination, in a baling-press, of the packer-frame, the reciprocating packer

moving in ways therein for packing the material operated upon in the baling-chamber, and
15 the stationary platen suspended underneath said packer-frame and adjustable laterally on ways connected therewith, substantially as described.

In testimony whereof we have hereunto set
our hands this 29th day of August, A. D. 1883. 20

W. J. F. LIDDELL.

W. S. LIDDELL.

Witnesses:

J. L. CHAMBERS,

T. S. FRANKLIN.