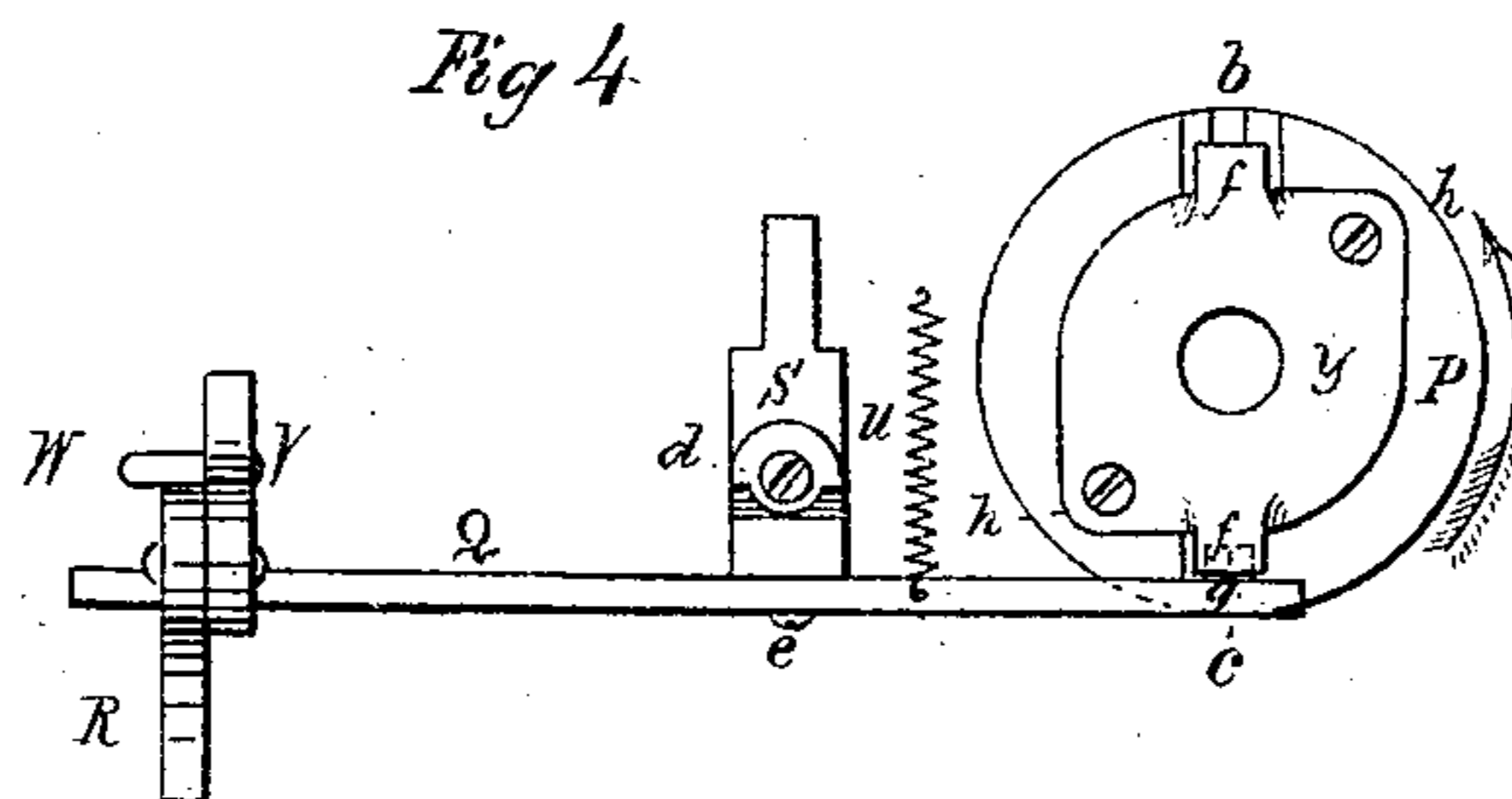
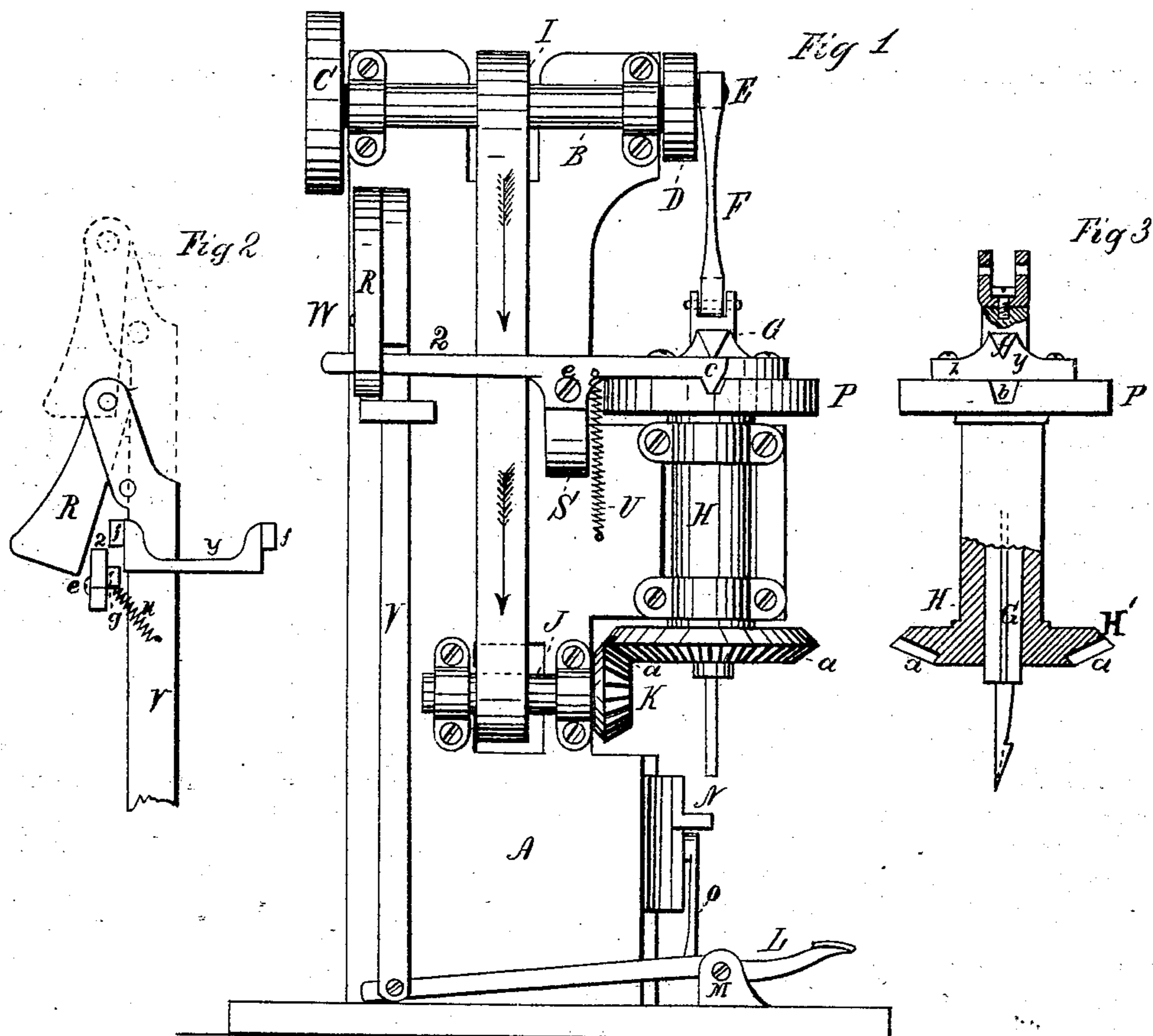


G. B. DURKEE.
Mortising-Machines.

No. 152,473.

Patented June 30, 1874.



Witnesses.

Weller D. T. Bishop.
Geo. Graham.

Inventor.

George B. Durkee.

UNITED STATES PATENT OFFICE.

GEORGE B. DURKEE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO HIRAM P. MINOT, OF SAME PLACE.

IMPROVEMENT IN MORTISING-MACHINES.

Specification forming part of Letters Patent No. **152,473**, dated June 30, 1874; application filed August 22, 1873.

To all whom it may concern:

Be it known that I, GEORGE B. DURKEE, of Chicago, in the county of Cook and State of Illinois, have invented a new Improvement in Mortising-Machines, of which the following is a specification:

Figure 1 is a side elevation of my improved reversing device applied to a mortising-machine. Fig. 2 is a front view of the cam-plate, inclines, stop-lever, pawl, and spring. Fig. 3 is a broken section taken vertically through the reversing-wheel and sleeve, showing the chisel-arbor and swivel-head, which allow it to reverse while in action. The slots which disconnect the power are also shown in this view. Fig. 4 is a plan view of the pawl, lever, and axes, and shows the form of the cam-plate.

The object of my invention is the production of an automatic power-reversing device, by means of which the power may be engaged and disengaged, as required; and it consists, principally, in the construction of the bevel-wheel and sleeve through which the chisel-arbor moves, substantially as and for the purpose hereinafter shown. It consists, further, in the means employed for starting and stopping the wheel and sleeve, and for holding them securely in place, substantially as and for the purpose hereinafter set forth.

In the annexed drawing, A represents the plate or frame of the machine, at the upper end of which the shaft B is journaled in suitable boxes, and is provided at its outer end with a pulley, C, from which a belt may be extended to the line-shaft. At the opposite end the crank-wheel D is secured, giving motion to the chisel by means of the ordinary wrist-pin E, connecting-rod F, and chisel-arbor G, which is made to revolve with the sleeve H by means of the ordinary groove and feather. The shaft B is also provided with a pulley, I, from which a belt communicates power to the pulley and shaft J, at the end of which the bevel-pinion K is secured. L is a treadle, with the fulcrum at M. The table N is connected with the treadle by the rod O, all these being features in common use.

In machines of this kind it has heretofore been customary to impart a rotary movement to the wheel and sleeve by means of a belt,

while an automatic stop or catch arrests the movement of the wheel at the required points without releasing the power. The power thus transmitted through the belt is being absorbed while no movement of the reversing device is required, and the belt is soon worn out and rendered useless by friction.

To obviate these difficulties I use the bevel-wheel H', provided with recesses or slots *a a* cut across its face at the proper points, which allow the pinion K to run free when no movement of the sleeve is required. This wheel being driven by the adhesion or rolling contact of the pinion K until the face is discontinued or cut off by one of the slots *a a*, the pinion now runs out of contact and becomes completely disconnected, and the belt which runs it performs the same office at such time as when running a loose pulley, thereby relieving the wheel H' from any useless application of power while at rest.

To insure perfect accuracy in stopping and starting the wheel H' and sleeve H, it is provided with a flange, P, at the upper end of the sleeve, having V-shaped slots *b b* in its upper face. A catch or stop lever, Q, provided with a male, V, at *c*, made to fit the slots *b b*, is supported by a fulcrum at S, with two axes—vertical, *d*, and horizontal, *e*—which allow it to move in any direction, while its opposite end extends to the pawl R. A cam-plate, *y*, provided with two projecting inclines or lips, *f f*, is secured to the upper face of the flange, in such a manner that the inclines stand directly over the V-shaped slots *b b* in the flange. There is also a corresponding inclined lip, *g*, at the end and side of the lever next to the cam-plate. A spring or weight, U, placed at an angle of forty-five degrees, serves to keep the stop-lever firmly against the side of the cam-plate *y*, and at the same time to bear down on the upper face of the flange P while rotating.

In using this machine, as the work is brought in contact with the chisel the rod *v*, which is connected to the rear end of the treadle, raises the pawl R above the lever Q, when the pawl, by its own weight, falls against the pin W, as shown by the dotted lines in Fig. 2. It then, being directly over the lever, is carried upward

until the work is completed in one direction. It being necessary now to reverse the chisel, the operator removes his foot from the treadle, and the bed or table, being constructed entirely of iron, and consequently sufficiently heavy, goes down, carrying with it the rod *v* and pawl R, which, at the lower portion of its stroke, comes in contact with the lever and raises the opposite end out of the slot *b*, at the same time bringing the inclined lip *g* in contact with one of the inclined lips *f f* on the cam-plate *y*. The action of the two inclined lips *g* and *f* coming thus in contact causes the bevel-wheel H' to move forward sufficiently for the slot *a* to pass the pinion K. The faces of the wheel and pinion are thus brought into contact, and a connection of the power to the reversing parts is accomplished. At this point in the movement one of the projections *h h* of the cam-plate *y* is brought to bear against the side of the lever, causing it to oscillate on its axis *d*. A trip is thus effected, which relieves the lever from the pawl, and allows the male V to enter one of the V-shaped slots *b b* at the same time that one of the slots *a a* in the bevel-wheel comes in line with the driving-pinion, and the reversing process is accomplished.

It will be seen that the inclines assist in stopping as well as starting the wheel and sleeve, by striking the incline *f* on the reverse side just before the male V enters the slot *b*, thus taking a part of the shock and relieving the concussion which would otherwise be caused by suddenly stopping the wheel and sleeve in its revolution.

It will also be seen, in applying this device to a full-sized machine, that the pinion may be applied directly to the flange P, its under side being beveled to fit the pinion, and having the slots *a a*, the wheel H' being done away with.

I do not confine the application of the slots *a a* strictly to beveled wheels, as they may be applied as well to wheels with plain faces. Neither do I confine myself to the number of slots *a a* to be used in the wheel, as it is obvious that any number may be used, having a corresponding arrangement of the cam-plate and stop-lever; and a machine may thus be constructed on this principle to make a mortise of any required number of sides. It may also be applied to slotting or milling machines, for working in the various metals.

Having thus fully described my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. The wheel H', having the slots or grooves *a a* cut across its face, in combination with the chisel-arbor G, substantially as and for the purpose herein described.
2. The lever Q, axes *d* and *e*, pawl R, flange P, slots *b b*, stop *c*, cams *h h*, inclines *f f*, and incline *g*, in combination with the wheel and sleeve H and chisel-arbor *g*, substantially as and for the purpose herein specified.

GEORGE B. DURKEE.

Witnesses:

WELLER D. BISCHOFF,
GEO. T. GRAHAM.