No. 808,694. PATENTED JAN. 2, 1906.

O. SMITH.

PRESS.

APPLICATION FILED OCT. 24, 1902.

6 SHEETS—SHEET 1.

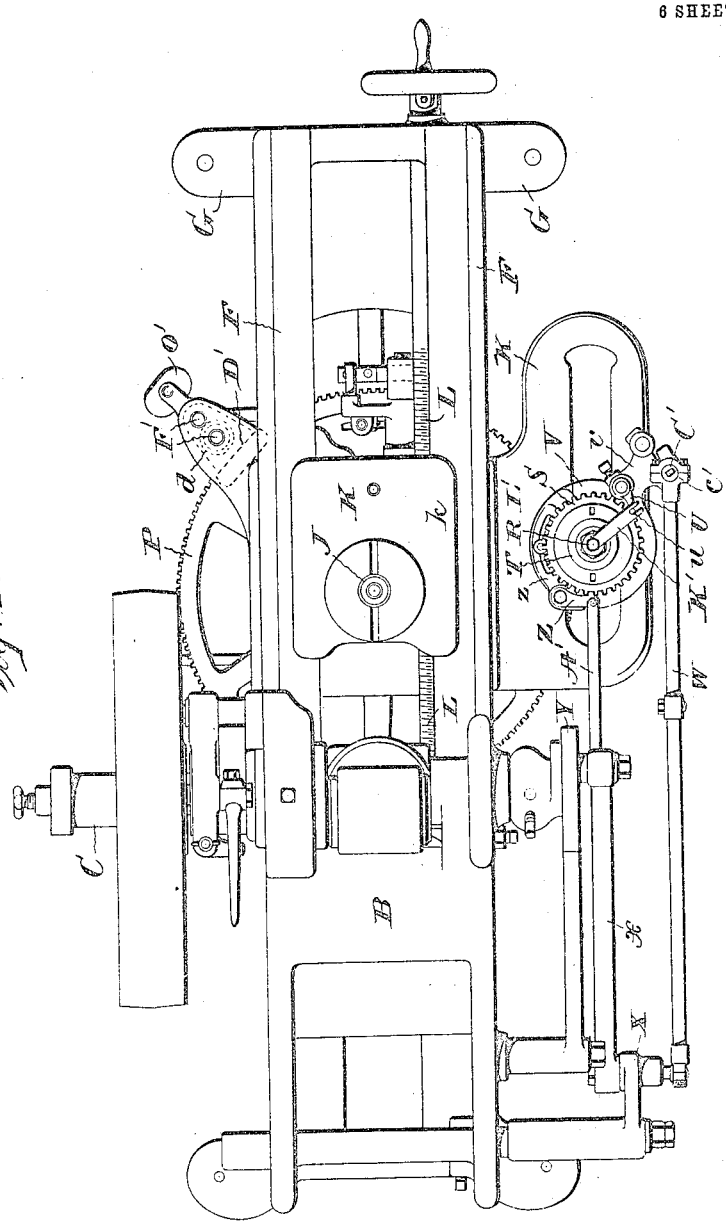

Fig. 1.

Witnesses:
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J. L. Lawler

Inventor.
Oberlin Smith,
by Edwin J. Prindle,
his Attorney.

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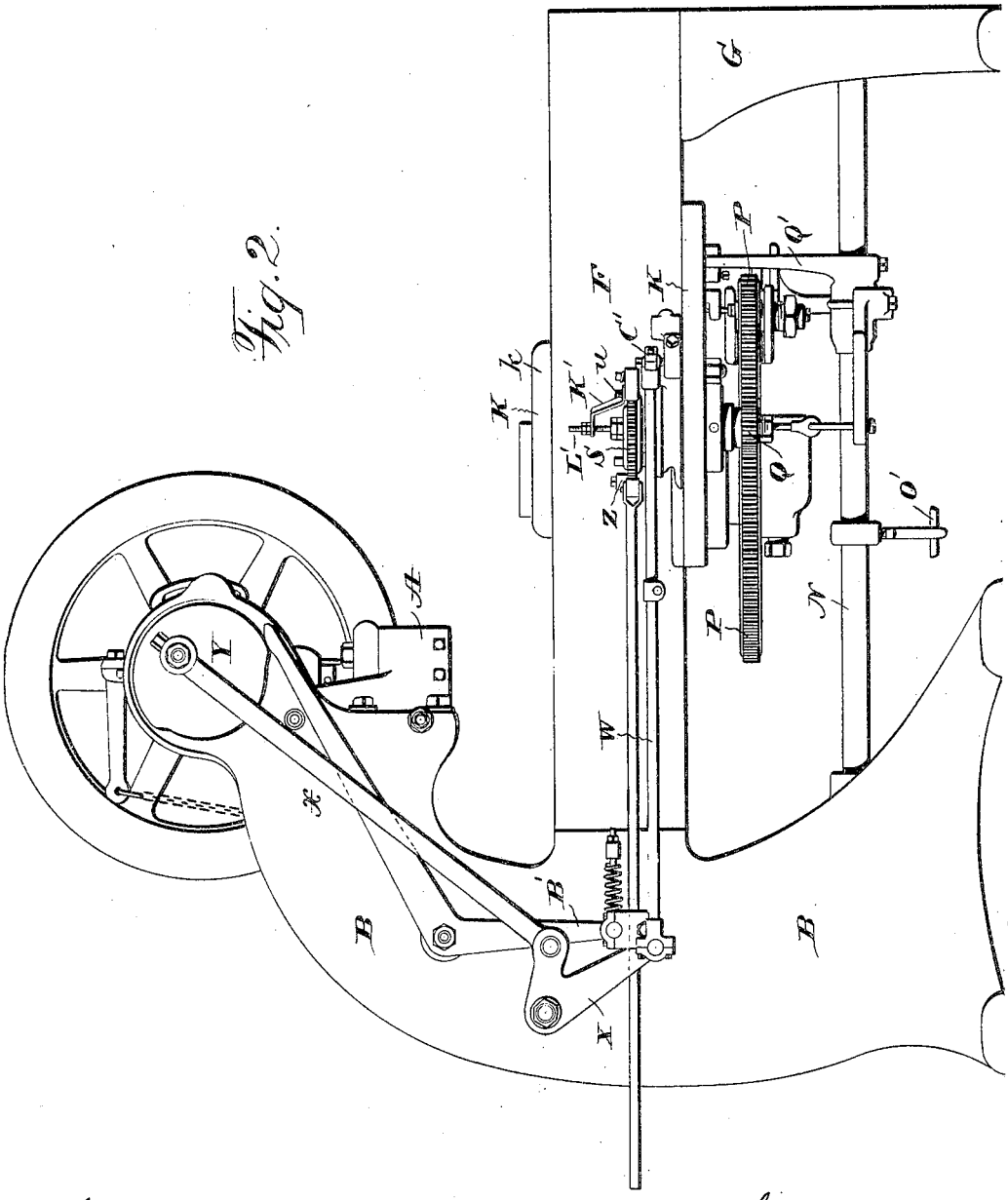
6 SHEETS—SHEET 2.

Fig. 2.



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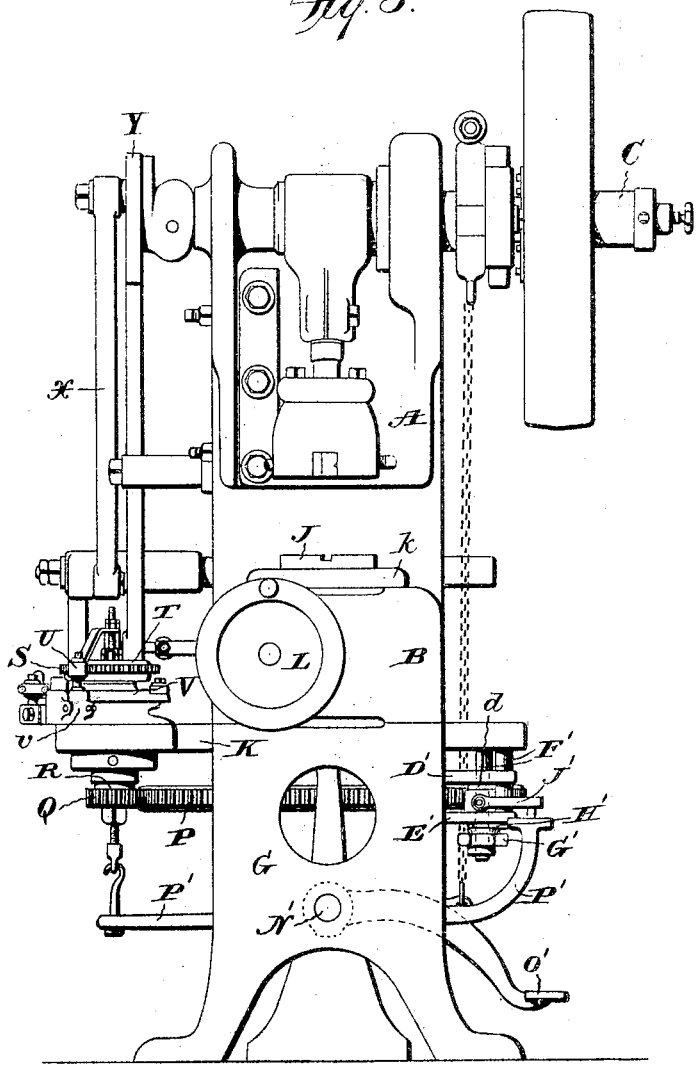
6 SHEETS—SHEET 3.

Fig. 3.



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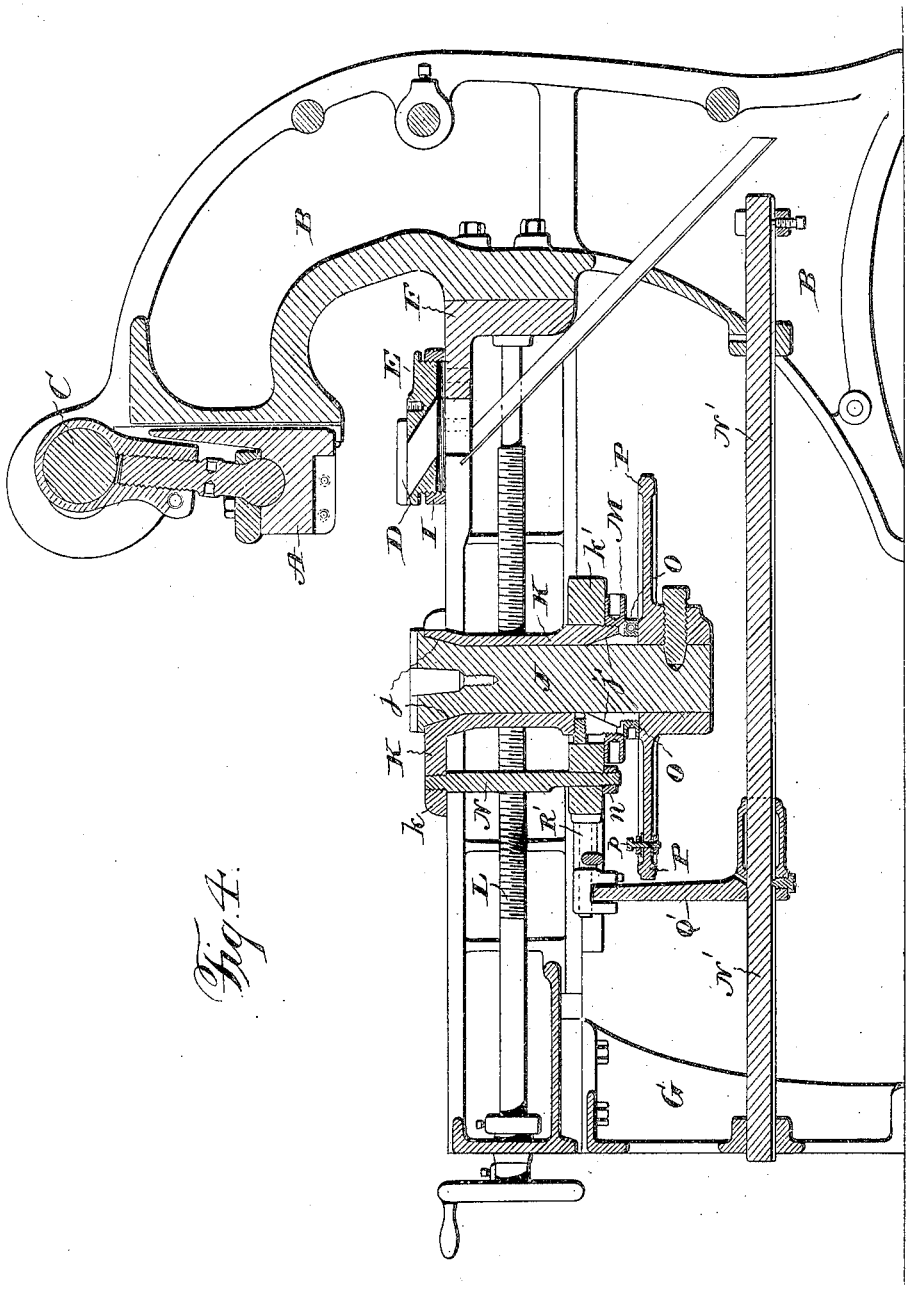

Fig. 4.

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6 SHEETS—SHEET 5.

Fig. 5.

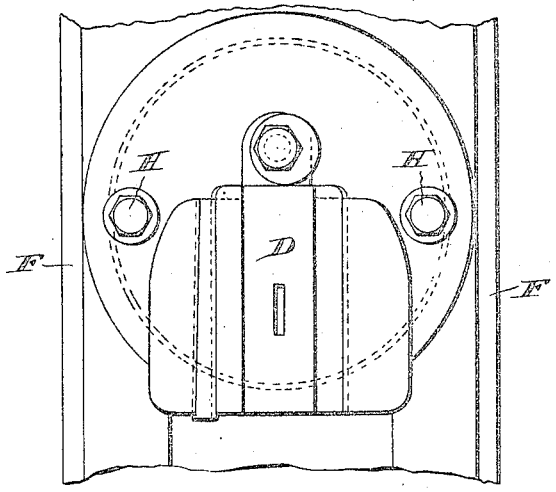
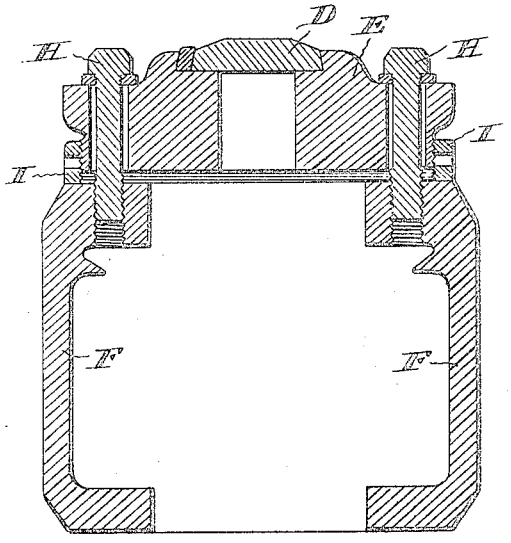


Fig. 6.



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6 SHEETS—SHEET 6.

Fig. 8.

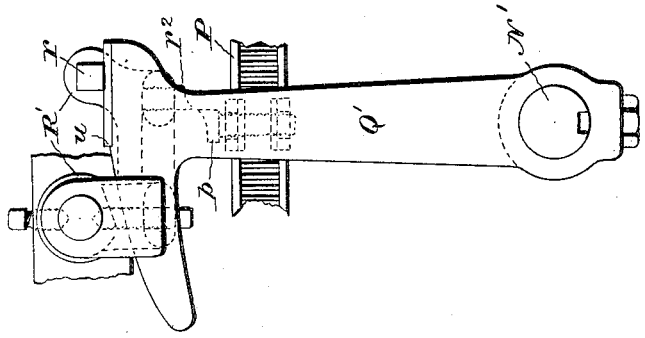
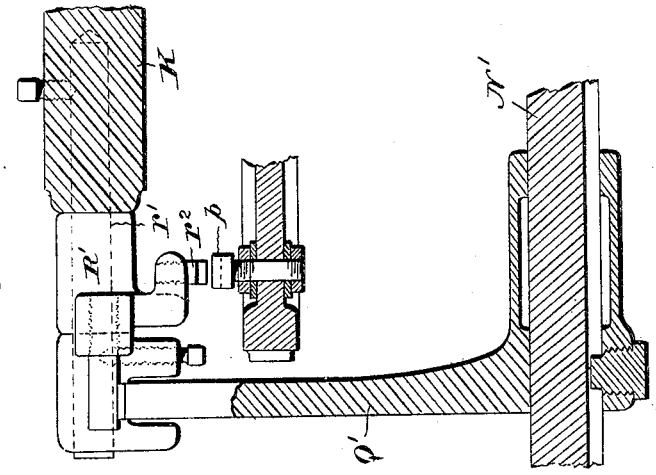


Fig. 7.



Witnesses:
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his Attorney.

UNITED STATES PATENT OFFICE.

OBERLIN SMITH, OF BRIDGETON, NEW JERSEY.

PRESS.

No. 808,694. Specification of Letters Patent. Patented Jan. 2, 1906

Application filed October 24 1902. Serial No. 128,653.

To all whom it may concern:

Be it known that I, OBERLIN SMITH, of Bridgeton, in the county of Cumberland, and in the State of New Jersey, have invented a certain new and useful Improvement in Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of a punching-press constructed in accordance with my invention. Fig. 2 is a side elevation thereof. Fig. 3 is an end elevation. Fig. 4 is a vertical longitudinal section. Figs. 5 and 6 are respectively a plan and a vertical section of the die-holder, and Figs. 7 and 8 are detail views of the automatic stopping mechanism.

The object of my invention is the improvement of machines for punching or notching plates—such, for example, as armature-disks; and to this end my invention consists in the machine having the construction of parts substantially as hereinafter specified and claimed.

In their general construction machines for punching armature-disks, for example, comprise a punch and a die and a spindle for carrying the disk to be punched that is rotated intermittently or step by step to bring portions of the rim of the disk successively in position for punching. In the machine illustrated the punch and its operating mechanism are of ordinary construction, and therefore they need not be specifically described. It will be sufficient to say that the punch A is mounted to reciprocate vertically on a frame B, the driving-shaft C being mounted horizontally in bearings on the top of the frame B. Beneath the punch the die D is mounted in a chuck E, which is supported by a horizontal bed F, which at one end is bolted to the frame B and at its other end is bolted to legs G. The die-chuck E is secured to the bed by two vertical bolts H, that pass through holes in the chuck and enter threaded openings in the bed. The portion of the chuck next the bed is threaded peripherally, and screwed upon it is a ring-nut I, which rests upon the bed. By means of said nut the chuck can be adjusted vertically to place the die in proper position for the disk or work to be punched. The nut and not the chuck being revolved to effect the vertical adjustment of the chuck, there is, of course, no derangement of the relative position of the die and the punch.

The disk to be punched is supported upon the upper end of a vertical spindle J, journaled in a saddle K, mounted on the bed F, the latter having a vertical longitudinal slot to permit shifting of the saddle toward and from the punch and die by means of a horizontal screw L, journaled in the bed and having at the end of the latter a suitable operating-wheel. The saddle has above and below the bed portions k and k', that engage the top and bottom of the same, respectively. The lower portion k' is slidably connected to the saddle and beneath and engaging it is a ring-nut M, that is screwed upon the threaded lower end of the saddle, by which nut the saddle may be securely clamped to the bed. In addition to the ring-nut M a bolt N and nut n connect the two parts k and k'.

The spindle J has cone-bearings in the saddle, the cones j and j' being provided at the upper and lower ends of the saddle, respectively, the cone j' being separate from the spindle and adjustably held in place by a ring-nut O, that bears against a gear-wheel P, fastened on the lower end of the spindle, which gear-wheel forms part of the mechanism for rotating the spindle. Meshing with the gear-wheel P is a pinion Q on the lower end of a vertical shaft R, mounted in bearings in the saddle K and having on its upper end a ratchet-wheel S, both pinion and ratchet-wheel being removable from the shaft to enable the substitution of different-sized pinions and wheels. The pinion is secured to the shaft by a simple nut screwed on the lower end of the shaft. The ratchet-wheel is in the form of a ring or annulus that is clamped to the upper end of the shaft by a ring-nut T, that is screwed to the end of the shaft, and has a flange that overlaps the ratchet-wheel, the thread of the ring-nut being preferably interrupted to facilitate its application and removal. For moving the ratchet-wheel there is a pawl U, that is pivoted to an arm v, which projects from a ring V, mounted concentric with the shaft R. The arm v is connected by a pitman W to one end of a lever X, pivoted to the side of the frame A and having its other end connected by a link x to a crank-disk Y on the driving-shaft C. The arm v has a plurality of sockets for or means of connection thereto of the pawl

U, so that when ratchet-wheels of different sizes are used the pawl may have its position shifted to suit the diameter of the wheel. A locking detent or dog Z is provided for the ratchet-wheel to hold it in its position of rest, said dog or detent having attached to it for moving it into and out of engagement with the ratchet-wheel a pitman A′, which is connected to one end of a lever B′, that is pivoted to the side of the frame B, and has its other end acted upon by a cam on the periphery of the disk Y. The detent or dog Z is pivoted to an adjustable plate *z*, so that the position of said dog or detent may be shifted to suit different sizes of ratchet-wheels. For such adjustment of the disk that is to be punched to place the disk keyway in proper relative position to the notches to be punched the connection between the pawl-carrying arm *v* and the pitman W consists of an eccentrically-mounted pivot, which, as shown, is a ball C′, situated eccentrically on a screw *c* in a threaded hole in the arm *v*, the ball having projecting from it a head *c′*, shaped for the reception of a tool for turning the screw, and so shifting the position of the ball. Such shifting of the position of the ball operates to move the pawl-carrying arm *v*, and thus to turn the ratchet-wheel S, and through its gear connection with the disk-carrying spindle to turn the disk.

To prevent overthrow of the disk from the momentum of the parts, a friction-brake is applied, preferably, to the gear-wheel P, which brake comprises two jaws D′ and E′, that respectively engage the upper and lower sides of the gear, each having a shoe of friction material to have contact with the gear. The upper jaw D′ is slidingly mounted upon two parallel vertical rods F′, that depend from the saddle K. Extending downward from said upper jaw D′ and encircling one of the rods F′ is a tubular stem *d*, upon which the lower jaw E′ is sliably mounted, and between the lower jaw and a nut G′ on the lower end of said stem is interposed a helical spring H′, that acts normally and yieldingly to press the jaws toward the gear-wheel. The jaw E′ also has an opening for the other rod F′, and the entire brake device is free to rise and fall, guided by said rods F′, so that its position may vary to suit any irregularities in the gear-wheel P. Having a fulcrum formed by the lower ends of two pins I′, whose upper ends bear against the jaw D′, is a lever J′, that is pivotally connected to the side of the jaw E′. By the rocking of the lever J′ both jaws may be moved to release the gear-wheel P, and they are so moved to release the gear-wheel when it is desired to punch only a sector, and not an entire disk, so that on completion of the sector the disk-carrying spindle may be turned backward to the starting-point without the necessity of completing the movement of the ring in one direction. When the spindle is to be turned backward, as under the circumstances mentioned, it is essential to disengage the pawl U, and for this purpose the pawl has on its upper side a pin *u*, that is engaged by the bifucated end of a slender spring-bar K′, that thence inclines upward and inward, and has its other end attached to the upper end of a rod L′, that passes through a longitudinal axial opening in the shaft R, and at its lower end is connected to an arm M′ on a treadle-shaft N′, having a suitable treadle O′. The treadle-shaft also has an arm P′, whose end is situated to engage the brake-releasing lever J′.

As is common in presses, the driving-shaft has a clutch that is operated by the depression of the treadle O′ to connect the shaft with the driving-pulley, and an automatic unclutching means is provided to stop the press when the cycle of movement is completed. When the treadle is depressed to clutch the shaft and pulley together, it is latched in such position by means of an arm Q′ on the treadle-shaft N′, which has a shoulder *u*, that is engaged by a latch-pin *r* on a latch R′, pivoted to a stud *r′* on the saddle K. The latch R has a pin r^2 in the path of a pin *p* on the gear-wheel P, the latch-pin r^2 being engaged by the gear-pin *p* when the gear-wheel has completed one revolution, the latch-pin being thereby freed from the shoulder *u* and the treadle-shaft rocked. When the treadle-shaft is thus rocked, the arm P′ is lifted, and such arm engaging the brake-releasing lever J′ the gear-wheel P will be freed, and the arm N′ is depressed, pulling down the rod L′, and the spring-bar K′ being drawn downward, its free end, that engages the pawl-pin, will be pressed outward, and the pawl thereby disengaged from its ratchet-wheel. The stop-motion is very delicate and does not strain the machine, as the work that the pinion *p* on the gear-wheel P does is merely to operate the small latch R to free the treadle-shaft.

It will be noted that the gearing for rotating the disk-carrying spindle step by step is extremely simple, the rotation of speed being secured by the employment of the single large gear P, with which the pawl-shaft is directly geared by its pinion Q. To change the machine for work upon disks of different sizes, it is not necessary to remove the gear-wheel P, but it is only necessary to change the pinion Q and the ratchet-wheel S.

Having thus described my invention, what I claim is—

1. The combination of a work-holder, a punch, a die-holder, a bed supporting both work-holder and die-holder, and means for adjusting the die-holder and work-holder relatively to each other in a direction transverse to the line of movement of the punch.

2. The combination of a rotatable work-holder, comprising means for supporting the

work, a shaft that is rigid with said means, a gear-wheel on said shaft, a second shaft to which power is applied, and a removable pinion on said second shaft and meshing with the gear-wheel.

3. The combination of a rotatable work-holder comprising means for supporting the work, a shaft rigid with said means, a gear-wheel on the shaft, a shaft that is intermittently actuated and a removable pinion on said shaft meshing with the gear-wheel.

4. The combination of a rotatable work-holder comprising means for supporting the work, a shaft rigid with said means, a gear-wheel on the shaft, a shaft having a ratchet-wheel, a pinion on said shaft, said ratchet-wheel and pinion being removable from the shaft, and a suitably-operated pawl for operating the ratchet-wheel.

5. The combination of a rotatable work-holder comprising means for supporting the work, a shaft, a gear-wheel on the shaft, a shaft for imparting motion to said gear-wheel, having a removable wheel, and a screw-ring having interrupted thread, for securing said wheel to its shaft.

6. The combination of a rotatable work-holder, means for revolving the same comprising a pawl and ratchet-wheel, a brake, and means to disengage the pawl and ratchet-wheel and to release the brake.

7. The combination of a rotatable work-holder, means for revolving the same comprising a pawl and ratchet-wheel, a brake and means to simultaneously disengage the pawl from the ratchet-wheel and release the brake.

8. The combination of a rotatable work-holder comprising means for supporting the work, a shaft, a gear-wheel on said shaft, a friction-brake to act on the gear-wheel, pawl-and-ratchet mechanism for revolving said gear-wheel and means to release the brake and to disengage the pawl.

9. The combination of a rotatable work-holder comprising means for supporting the work, a shaft, a gear-wheel on the shaft, a driving-shaft, mechanism for transmitting motion from the latter to said gear-wheel, a treadle-shaft for connecting the driving-shaft to the source of power, an arm on the treadle-shaft, a latch for said arm and a part carried by the gear-wheel to operate the latch.

10. The combination of a rotatable work-holder, means for rotating said work-holder comprising a gear-wheel and a pawl-and-ratchet mechanism, a friction-brake for the gear-wheel, a driving-shaft, a treadle-shaft for connecting the latter with a source of power, an arm on the treadle-shaft, a latch for said arm, a part carried by the gear-wheel to actuate the latch, and arms on the treadle-shaft to release the friction-brake and disengage the pawl of the pawl-and-ratchet mechanism.

11. The combination of punching mechanism, a rotatable work-holder, pawl-and-ratchet mechanism for rotating the work-holder, a pawl-operating device and an adjustable connection between the pawl and said device whereby the position of the work-holder relative to the punching mechanism may be adjusted.

12. The combination of punching mechanism, a rotatable work-holder, a pawl-and-ratchet mechanism for operating the work-holder, a pawl-operating device, and an eccentric connection between the pawl and said device.

13. The combination of a rotatable work-holder comprising means for supporting the work a shaft, a saddle for supporting the work-holder, cone-bearings for the shaft in the saddle, a bed and means for clamping the saddle to the bed.

In testimony that I claim the foregoing I have hereunto set my hand.

OBERLIN SMITH.

Witnesses:
JAMES J. REEVES,
MAX LEVI.