(No Model.)

J. A. HORTON.

2 Sheets—Sheet 1.

FRICTION MOVEMENT.

No. 260,394. Patented July 4, 1882.

Fig. 1.

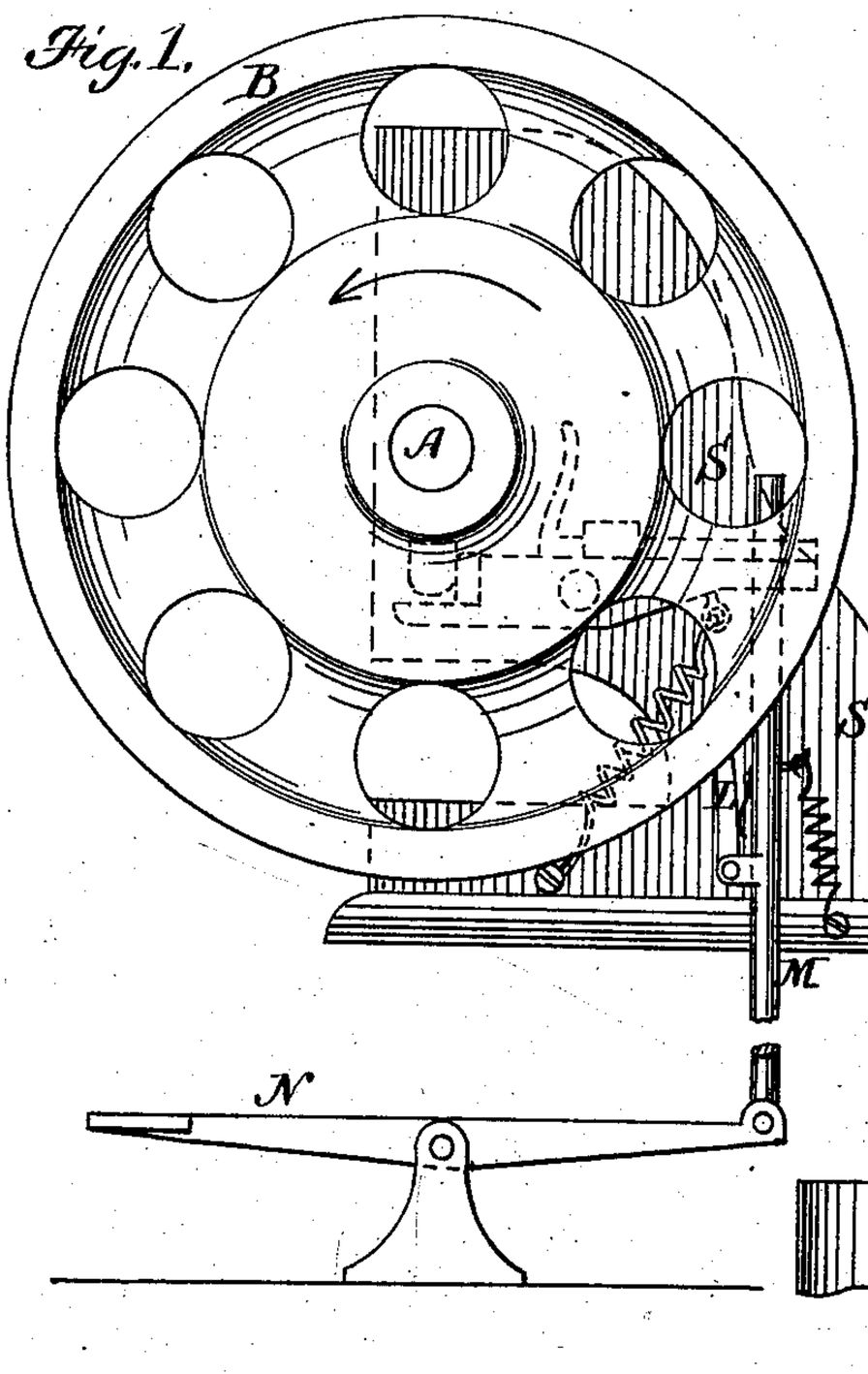


Fig. 2.

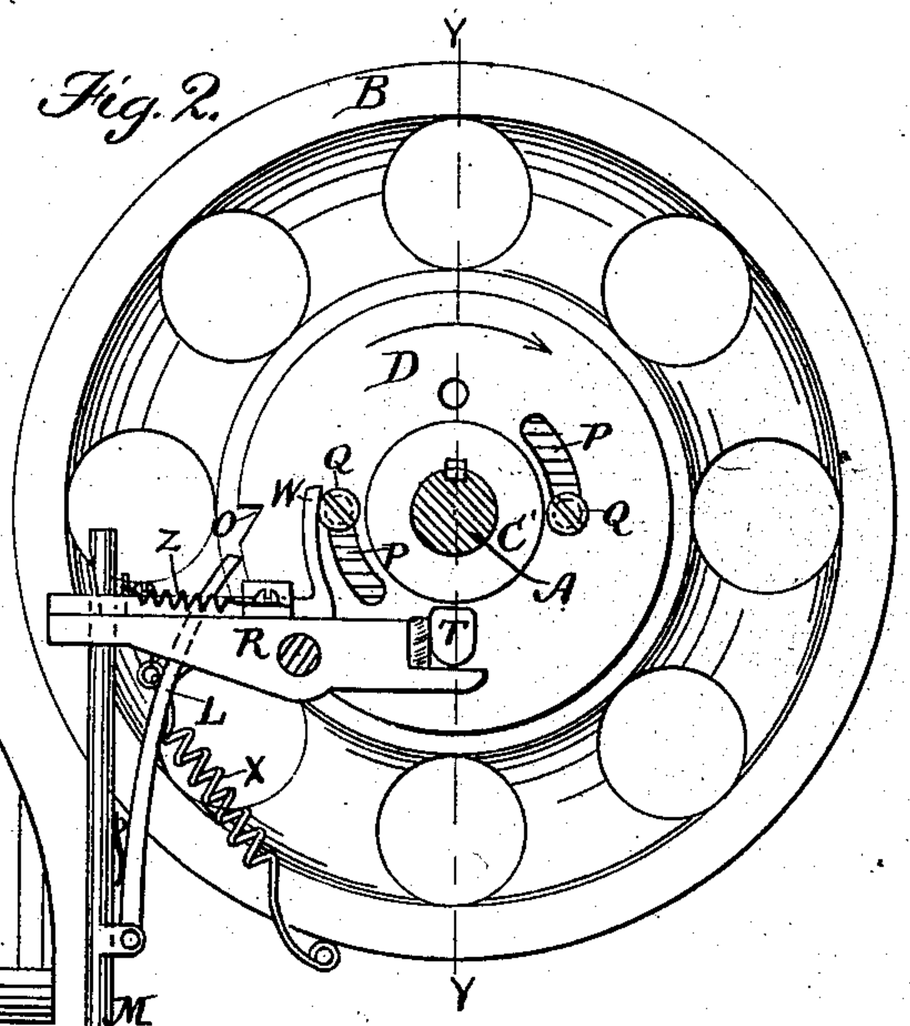
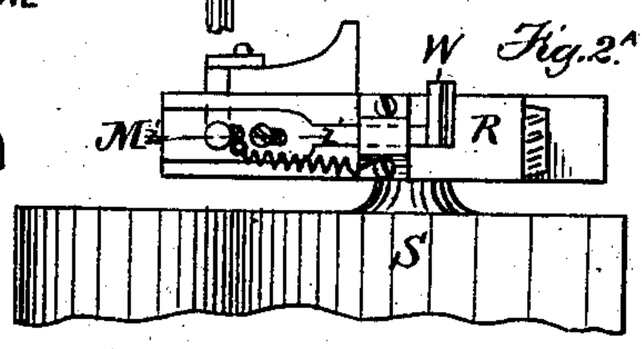


Fig. 5.

Fig. 2^



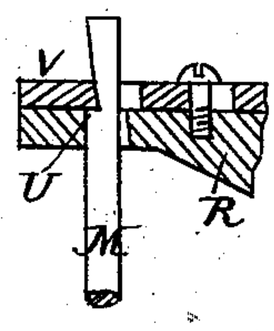


Fig. 4.

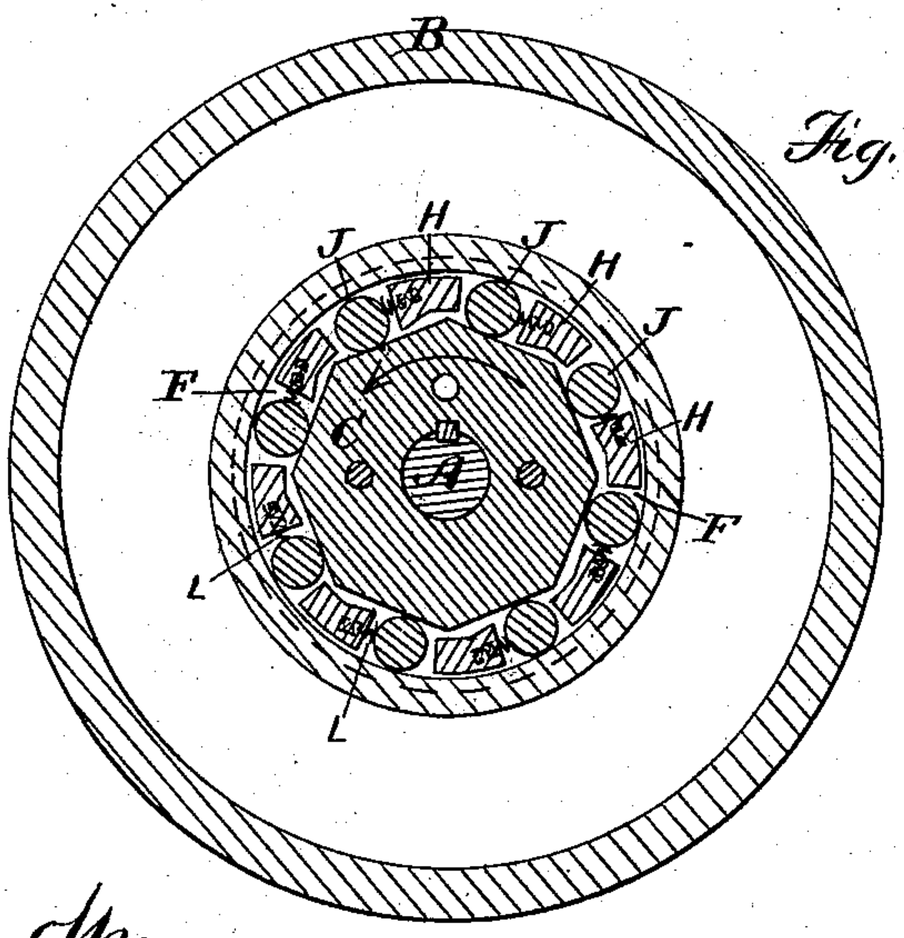
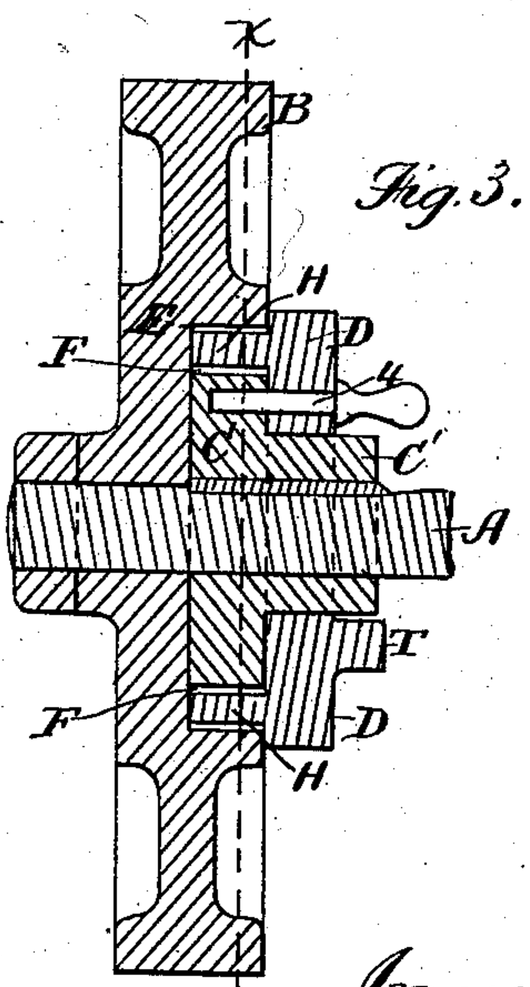


Fig. 3.



Witnesses.
A. L. White.
Melville Church Jr.

Inventor.
J. A. Horton
by Wright & Brown.
Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

J. A. HORTON.

FRICTION MOVEMENT.

No. 260,394. Patented July 4, 1882.

Fig. 6.

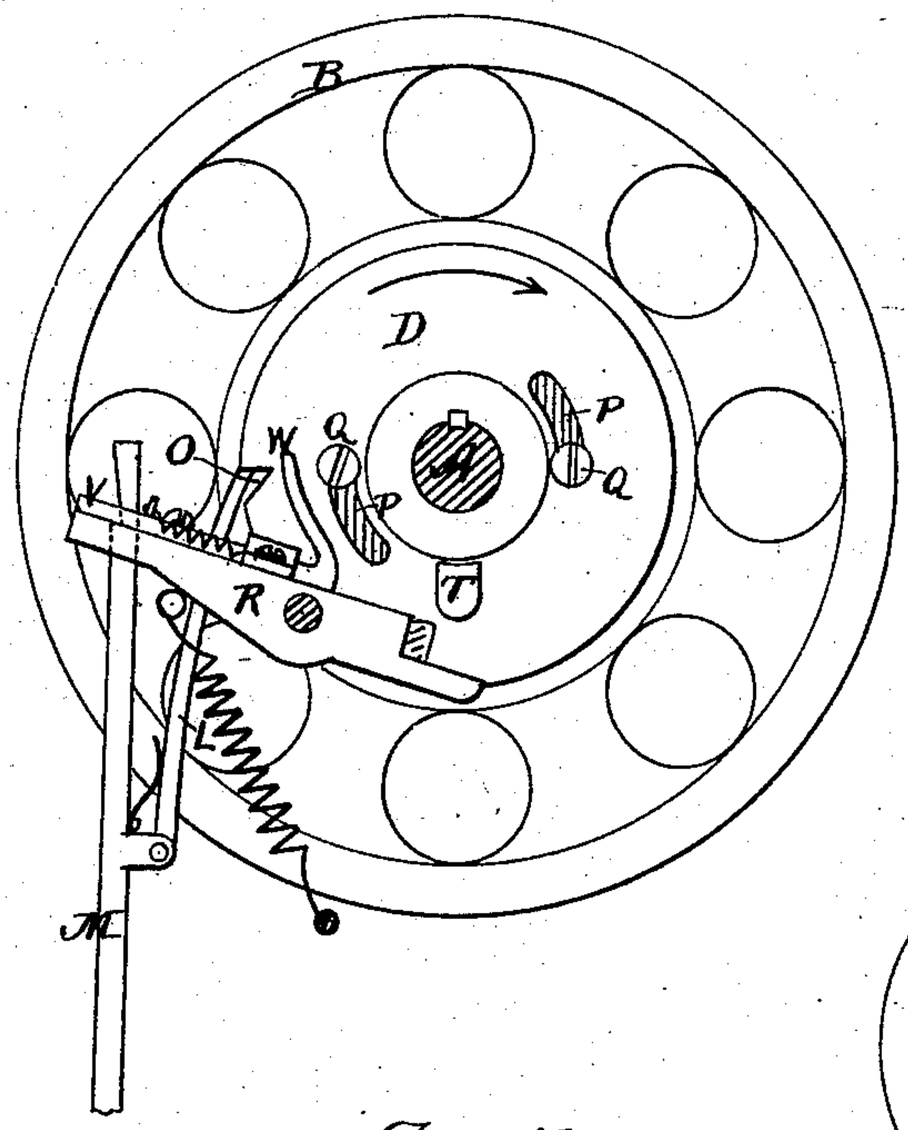


Fig 8

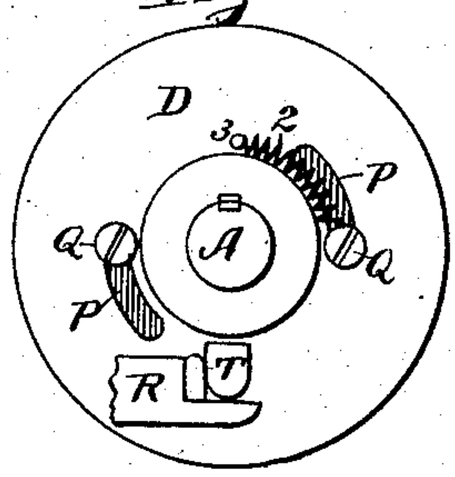
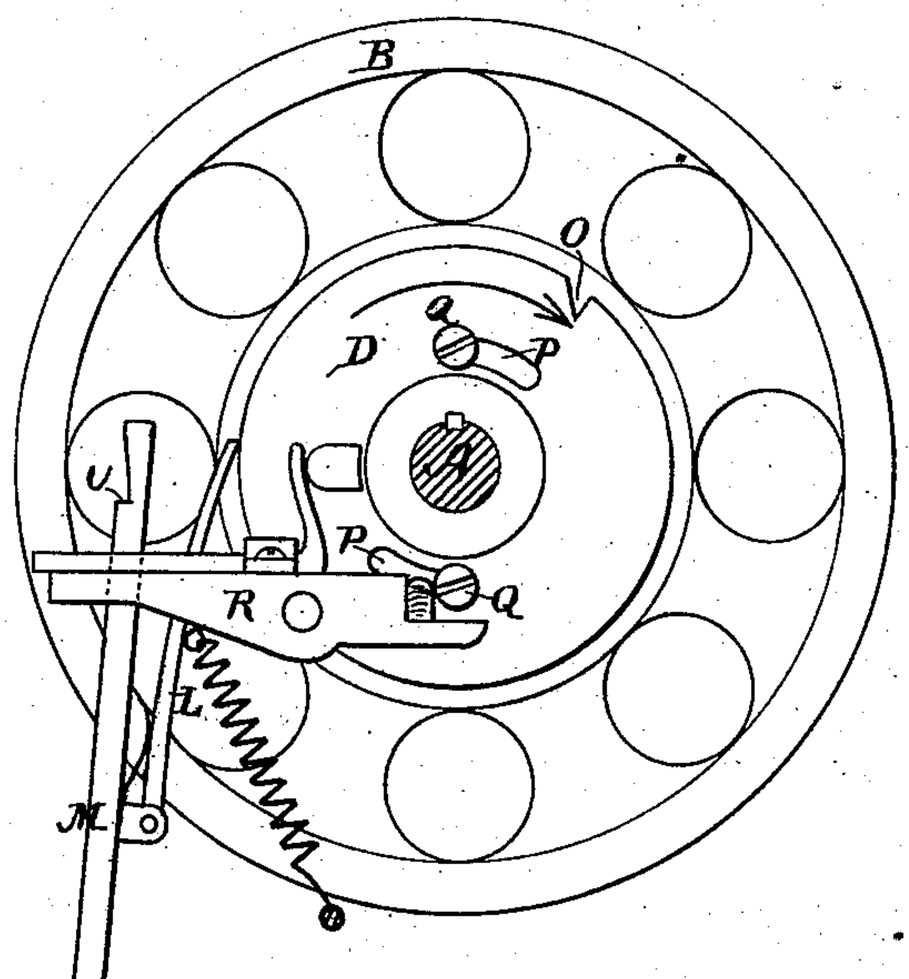


Fig. 7.



Witnesses,
A. L. White.
Melville Church

Inventor:
J. A. Horton
by Wright & Brown
Attys

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JAMES A. HORTON, OF BOSTON, MASSACHUSETTS.

FRICTION-MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 260,394, dated July 4, 1882.

Application filed November 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. HORTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Friction-Movements, of which the following is a specification.

This invention has for its object to provide an improved friction-movement adapted to readily connect and disconnect a shaft which operates a die in a drop-press, or performs a similar function, with and from the driving-wheel which gives it motion, so that said shaft, after each performance of its allotted work, will be automatically disconnected from its motor and become inoperative until it is again connected with its motor by the act of the attendant.

The invention consists in the improved devices which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents an elevation of the improved mechanism embodying my invention, the driving-wheel being shown in side elevation. Fig. 2 represents an elevation showing the opposite side of the driving-wheel, the shaft being shown in section. Fig. 2ª represents a top view of a portion of the mechanism shown in Fig. 2. Fig. 3 represents a section on line Y Y, Fig. 2. Fig. 4 represents a section on line X X, Fig. 3. Fig. 5 represents a section on line Z′ Z′ of Fig. 2ª. Figs. 6 and 7 represent elevations showing parts of the mechanism in different positions. Fig. 8 represents a modification.

The same letters of reference indicate the same parts in all the figures.

In the drawings, A represents the shaft to which power is to be applied. B represents the driving-wheel, which rotates loosely on said shaft, excepting when made fast thereto by the devices described hereinafter, and is continuously rotated by the prime motor in the direction indicated by the arrows in Figs. 1, 2, and 4.

Upon the shaft A is rigidly keyed a collar, C, whose perimeter is composed of several plane surfaces or sides of equal length, each having the same relation to the center of motion of the shaft. In the present instance the collar is shown as octagonal, but the number of its sides may be varied. The collar C is located in a circular recess, E, in the driving-wheel B, a space, F, of varying width being left between the recess and the perimeter of the collar. Journaled to have a partial loose rotation on the hub C′ of the collar C is a plate or disk, D, having a series of projections, H, on its inner side extending into the space F between the recess E and the perimeter of the collar C. The independent rotation of the disk D is limited by segmental slots P P in said disk and studs Q Q attached to the collar C and projecting into said slots.

In advance of each projection H is a friction-roller, J, there being as many rollers as there are sides on the collar C, each roller coinciding with one of said sides, and adapted, when moved in one direction, to become wedged in the narrower portions of the space F, between the proximate surfaces of the recess E and collar C, so as to connect the driving-wheel with the shaft and cause both to rotate together, and when moved in the opposite direction to be freed from contact with one or both of said surfaces and release the wheel from the shaft.

Between each roller and the projection behind it is interposed a light spring, L, said springs having only sufficient power to overcome the weight of those rollers which are in such position as to require to be moved upwardly to effect their engagement with both the collar and the wall of the recess.

The rollers J are moved to connect and release the shaft, as described, by the rotation of the disk D upon the hub C′ in one direction or the other. When the shaft is to be made fast to the wheel B the disk D is rotated in a forward direction, as indicated by the arrows in Figs. 1, 2, and 4, the projections H being caused to press the rollers J into the narrower portions of the space F and cause them to connect the wheel and shaft. This movement of the disk D may be effected by means of a dog, L, on a vertically-movable rod, M, which is adapted to be raised by pressure of the operator's foot on a treadle, N. When the rod M is raised its dog L engages a notch, O, in the disk D and gives said disk a sufficient independent rotary movement to effect the connection of the driving-wheel and

the shaft by the rollers J. The shaft is thus set in motion by the driving-wheel and caused by friction-studs Q to rotate the disk D.

To effect the disengagement of the shaft from the driving-wheel it is only necessary to arrest the rotation of the disk D. When this is done the rollers J are arrested by the projections H, but the shaft A and its collar C continue to rotate as far as permitted by the slots P and studs Q, each stud moving from one end of its slot to the other after the disk D is stopped. This independent movement of the collar C while the rollers are arrested is of course equivalent to moving the rollers into the wider portions of the space F, so that they cease to connect the driving-wheel and the shaft, the latter stopping when the studs Q reach the opposite ends of the slots P.

To arrest the disk D, I employ a bar, R, pivoted to a fixed support or standard, S, and a stud, T, formed on the outer side of the disk D. The end of the bar R is arranged to form a stop for the stud T when the bar is in its normal position, as shown in Figs. 1 and 2.

The rod M, which operates the dog L, is provided with a shoulder, U, which engages a sliding latch, V, on the bar R, and is thus adapted, when raised, to rotate the disk D, as above described, to also tilt the bar R, as shown in Fig. 6, so that its end falls below the stud T, and the disk is released just before the rollers J are moved to engage the driving-wheel with the shaft.

It is obvious that when the bar R resumes its former position the end of the bar will arrest the disk D and effect the above-described release of the shaft from the driving-wheel. The release of the treadle H by the operator will allow the bar to resume its former position and stop the shaft; but to prevent accidents, which might result from continuous rotation of the shaft in case of the failure of the operator to release the treadle, I provide the latch V, which is adapted to slide on the bar R, and has an arm, W, arranged to be forced back by the stud T when the disk D is being rotated, so that the latch will be disengaged from the shoulder U of the rod M, and the outer end of the bar will be allowed to fall independently of the rod, a spring, X, being employed to pull the outer end of the bar downwardly when it is released. The stopping of the shaft A after each complete rotation is thus insured.

The latch V is provided with a spring, Z, which draws it back and holds it in yielding contact with the side of the rod M, so that it may engage automatically with the shoulder U when the rod M descends.

I do not limit myself to the dog L and notch O as the means for imparting to the disk D the independent rotation which engages the driving-wheel with the shaft. A modification is shown in Fig. 8, in which a spring, 2, secured at one end to a stud, 3, on the disk D and at the other end to one of the studs Q, is substituted for the dog and notch. The spring is to be extended by the continued rotation of the shaft through the length of the slots P after the disk D is arrested, so that when said disk is released by the displacement of the bar R the extended spring, in contracting, will give the disk a similar rotation to that imparted by the dog L.

4 represents a safety-pin, which may be inserted in coinciding holes in the disk D and collar C, as shown in Fig. 3, to prevent the accidental rotation of the disk and rotation of the shaft when such rotation would be detrimental or dangerous—as, for instance, when the dies of a drop-press are being changed. An accidental pressure on the treadle N—such as might be caused by the dropping of a tool upon it—will release the disk D and obviously cause damage under some circumstances. This may be avoided by the use of the pin 4.

My described improvements are applicable to drop-presses and other machines in which the operating devices or tools are to be alternately put in operative connection with and disconnected from the prime motor. The shaft A in a drop-press will be provided with a suitable crank or eccentric to enable it to reciprocate a die or plunger.

I claim—

1. The combination of a shaft, A, having a many-sided collar, a continuously-rotated driving-wheel normally loose on said shaft and provided with a concentric recess surrounding said collar, a series of friction-rollers located in the space between said recess and collar, and means for varying the position of the rollers with relation to the wider and narrower portions of the space F, as described, and thereby engaging the shaft with or releasing it from the driving-wheel.

2. The combination of a shaft, A, having a many-sided collar, a continuously-rotated driving-wheel normally loose on said shaft, and provided with a concentric recess surrounding said collar, a series of friction-rollers located in the space between said recess and collar, a disk, D, having a limited independent rotary movement on the shaft, and provided with projections H, arranged between the rollers, and means for rotating said disk to cause the rollers to engage the driving-wheel with the shaft and for stopping said disk to release the wheel from the shaft, as set forth.

3. The roller-operating disk D, having a limited independent rotary movement, and provided with a stud, T, combined with the pivoted bar R, adapted to arrest the disk D, and means, substantially as described, for turning the bar on its pivot to release the disk, as set forth.

4. The combination, with the roller-operating disk D, having a limited independent rotary movement, and provided with the stud T, of the bar R, the sliding latch V, and the shouldered rod M and its operating device, as and for the purpose set forth.

5. The combination of the bar R, shouldered

rod M, and the latch V, arranged to be unlatched by a cam or projection fixed on the rotating shaft, as set forth.

6. The combination of the roller-operating disk D, having a limited independent rotation, the collar C, and the safety-pin 4, whereby accidental independent rotation of the disk is prevented, as set forth.

7. The combination of a driving-wheel adapted to be continuously rotated, a shaft normally disconnected from said wheel, mechanism controlled by an attendant to engage the shaft with the driving-wheel, and automatic mechanism for disengaging the shaft from the wheel after the shaft has performed its allotted work, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 2d day of November, A. D. 1881.

JAMES A. HORTON.

Witnesses:
C. F. BROWN,
A. L. WHITE.