

No. 760,030.

PATENTED MAY 17, 1904.

A. M. SMITH.
INTERMITTENT HOIST AND POWER DEVICE.

APPLICATION FILED APR. 9, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

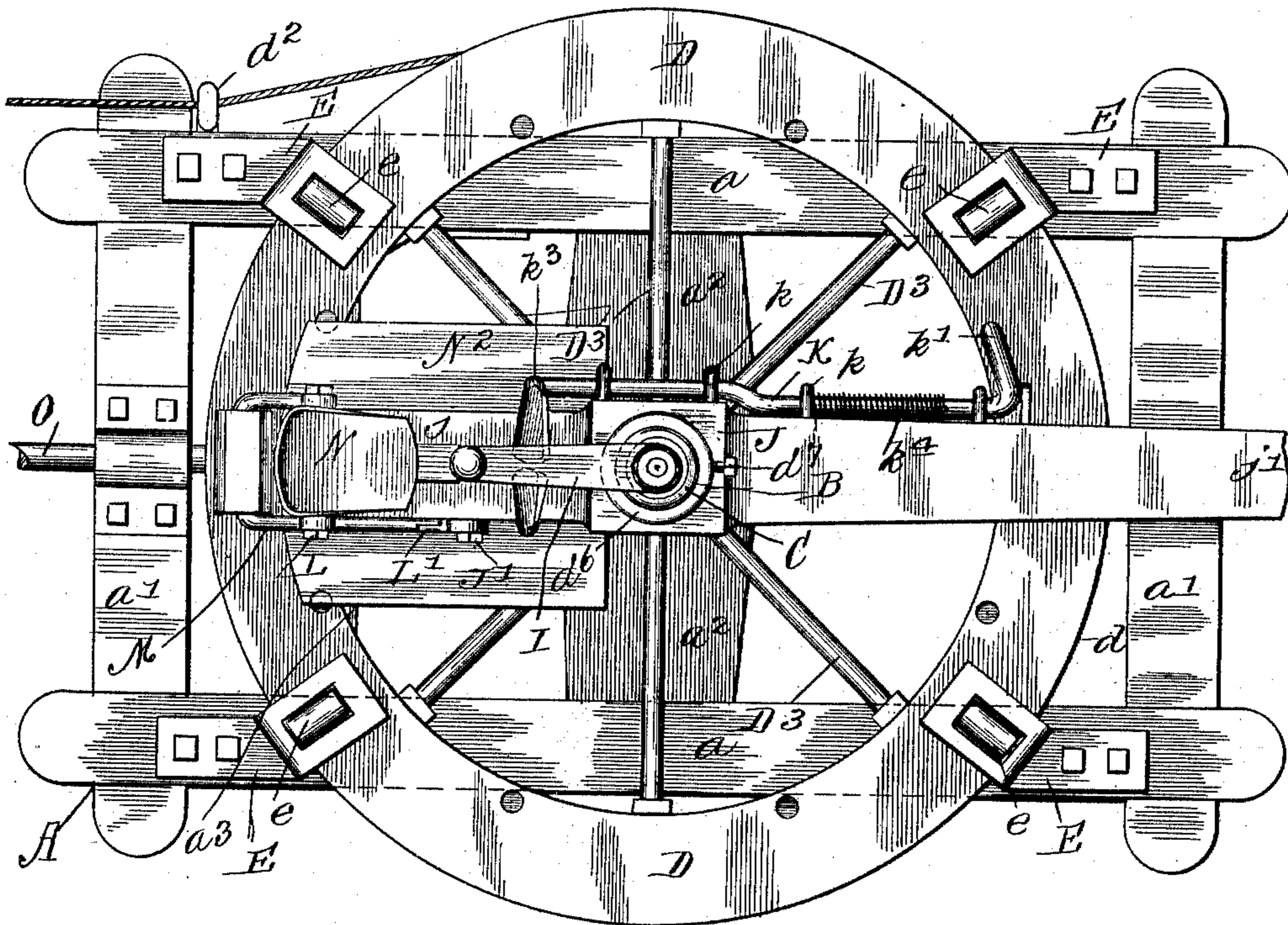
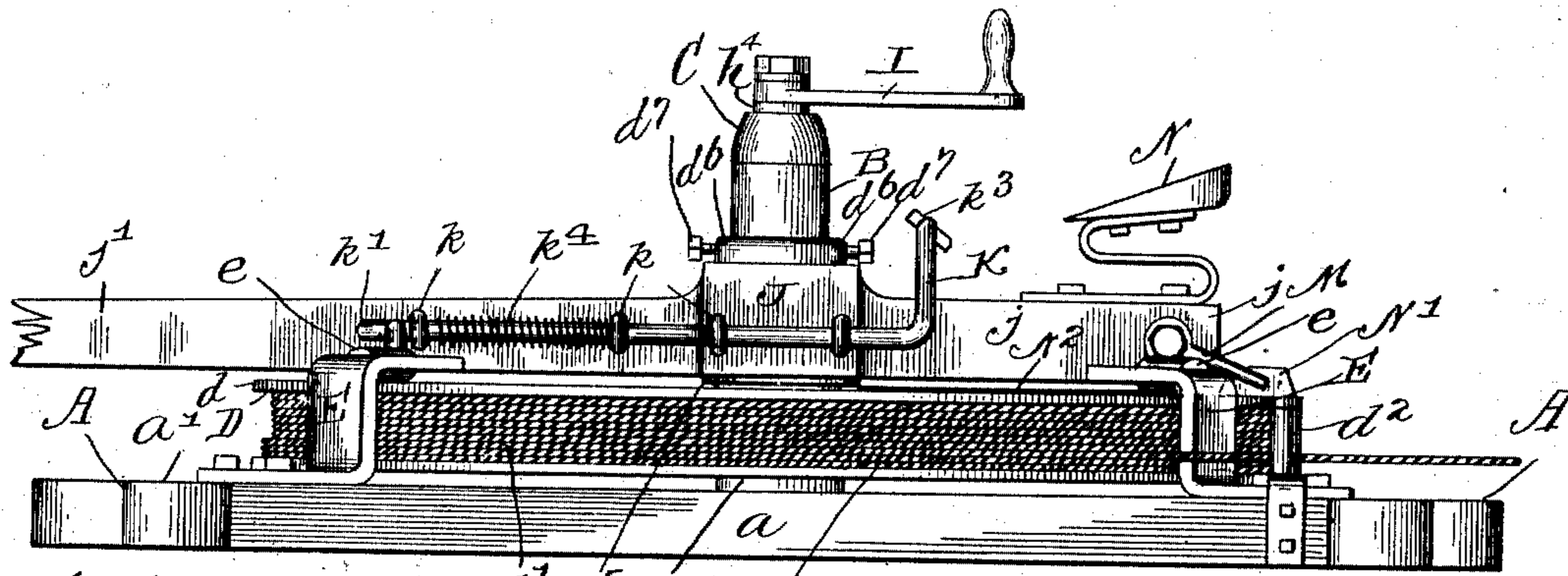


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

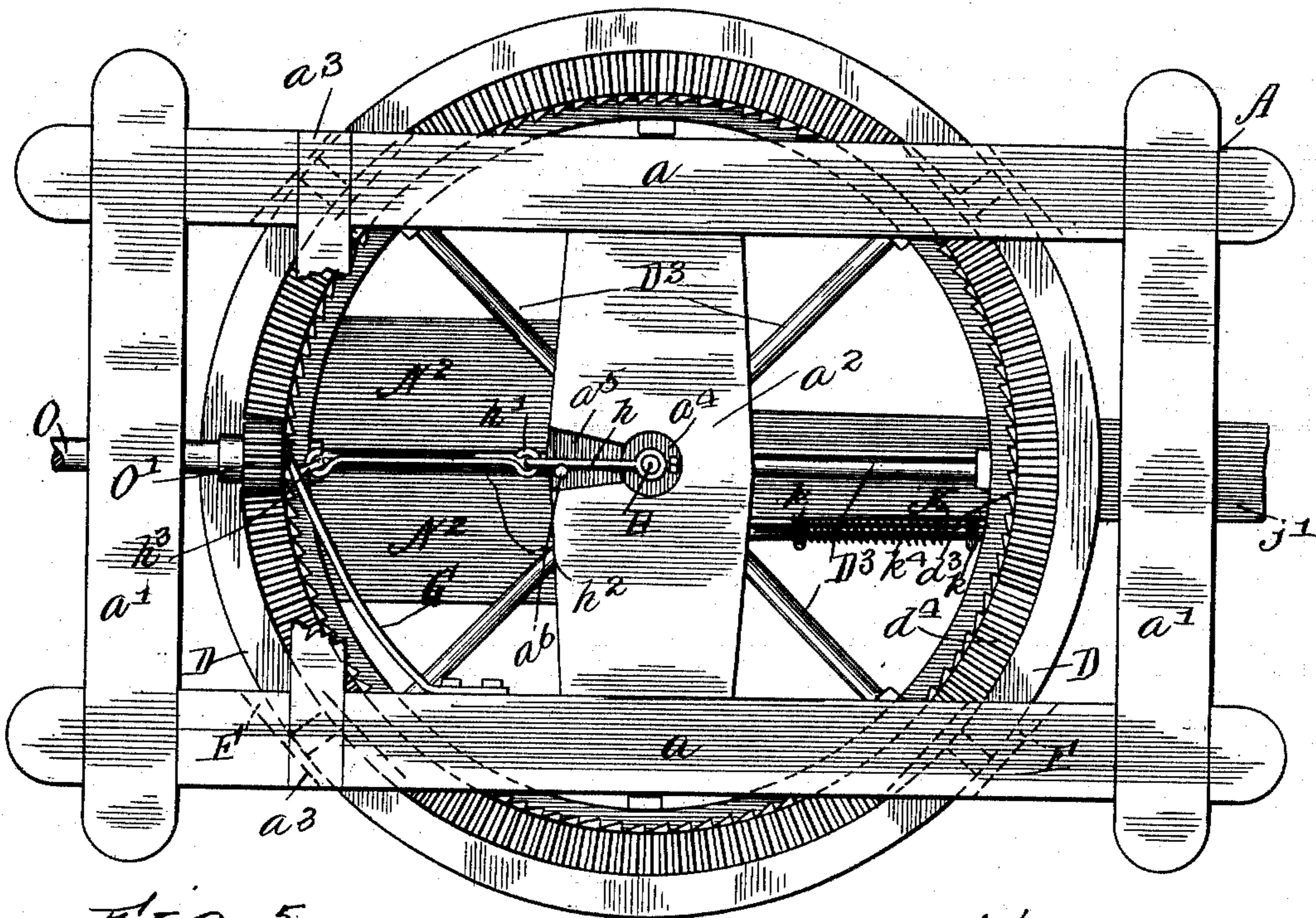


Fig. 5.

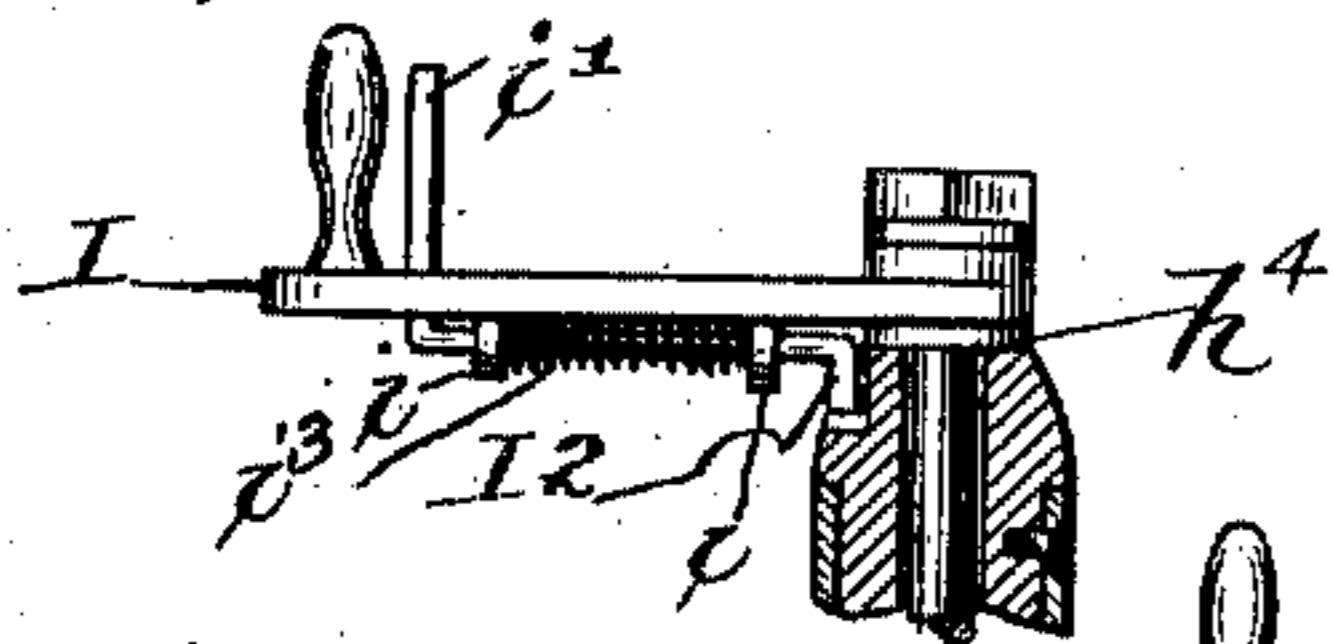


Fig. 6.

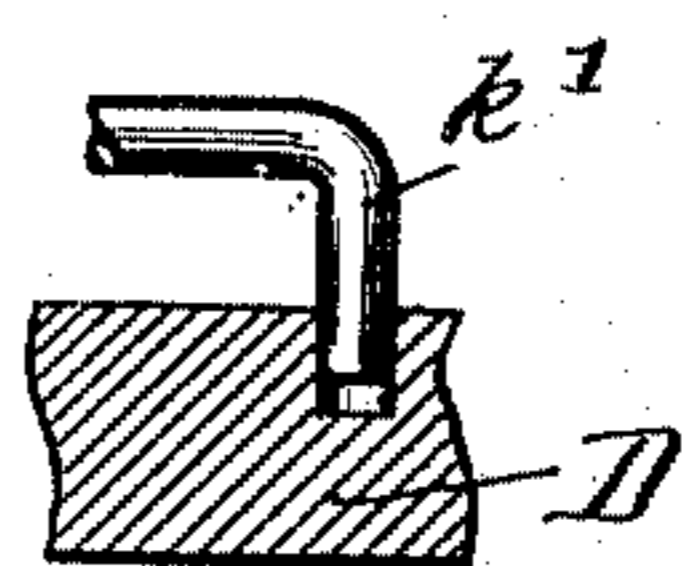
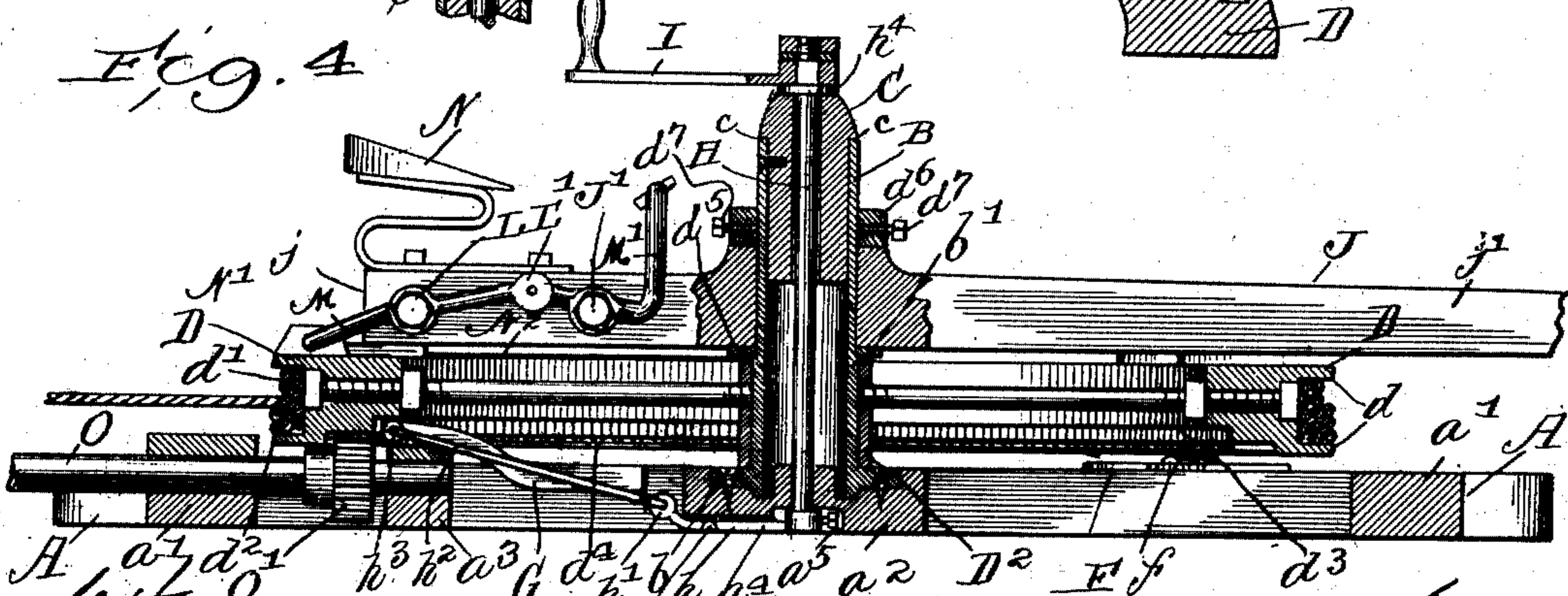


Fig. 4.



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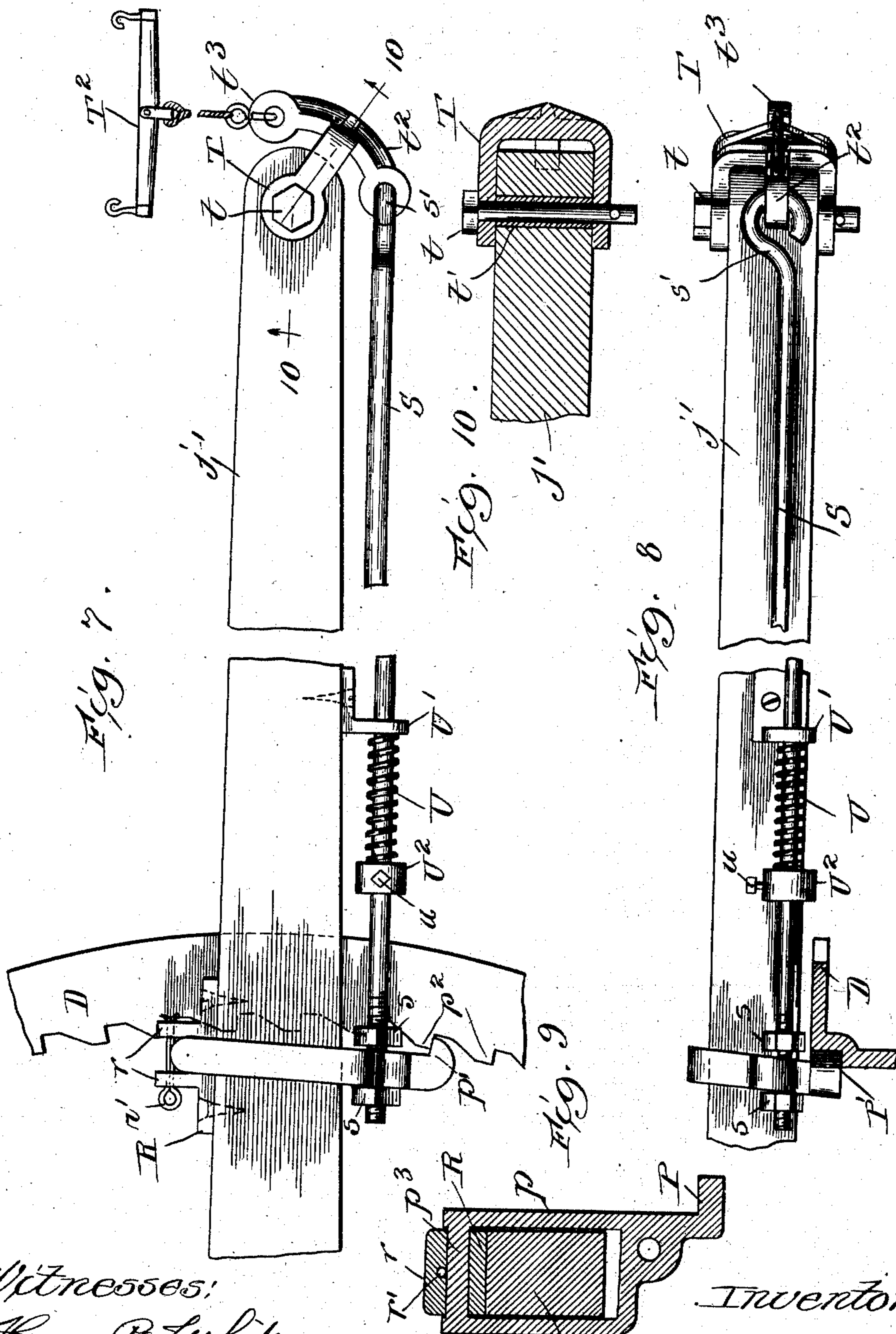
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INTERMITTENT HOIST AND POWER DEVICE.

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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

ADAM M. SMITH, OF DIXON, ILLINOIS, ASSIGNOR TO INTERMITTENT HORSE POWER COMPANY, OF DIXON, ILLINOIS, A CORPORATION OF ILLINOIS.

INTERMITTENT HOIST AND POWER DEVICE.

SPECIFICATION forming part of Letters Patent No. 760,030, dated May 17, 1904.

Application filed April 9, 1903. Serial No. 151,701. (No model.)

To all whom it may concern:

Be it known that I, ADAM M. SMITH, a citizen of the United States, and a resident of Dixon, in the county of Lee and State of Illinois, have invented certain new and useful Improvements in Intermittent Hoist and Power Devices; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in hoisting and power devices, and more particularly to a horse-power which may be used to impart either an intermittent or a constant motion and so constructed that when in use the operator while seated thereon is enabled to start or stop the device or reverse the drum without stopping the horse supplying the power.

The object of my invention is to provide a cheap, simple, and durable device which may be quickly changed from one form of power to the other and which may be used to operate a hay-fork or for other hoisting purposes where it is necessary that during a portion of the time a reverse action of the power be had and to provide during the reverse action means for regulating the speed thereof while the horse is at a standstill.

A further object is to provide a power that will occupy a minimum amount of space for itself and its operation.

The invention consists in the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a top plan view of a device embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a bottom plan view thereof partly broken. Fig. 4 is a sectional elevation of the same partly in perspective. Fig. 5 is a modification showing means for locking the detent out of engagement with the drum. Fig. 6 is a detail of the lock for the sweep. Fig. 7 is a top plan view of a modification of my device. Fig. 8 is a side elevation of the same. Fig. 9 is a

longitudinal vertical section of the dog. Fig. 10 is a section taken on line 10 10 of Fig. 7.

As shown in said drawings, A indicates a rigid frame, of wood or other suitable material, comprising the side member a , the end members a' , a central cross-beam a^2 , and a cross-beam a^3 intermediate thereof and one end. The said cross-beam a^2 is provided with a central aperture a^4 , which opens beneath said beam into the recess a^5 , extending from said aperture transversely of the beam to the edge thereof. Centrally disposed on the cross-beam a^2 is the vertical cylindric hollow post B, provided adjacent to its lower end with the circumferential flange b , extending at a right angle thereto and, as shown, counter-sunk into said cross-beam and rigidly secured thereto. Said post is also provided on its outer surface intermediate its ends with an annular shoulder b' , and fitted closely in the upper end thereof is the bearing-block C, provided near its upper end with an annular shoulder c , which, as shown, rests upon the upper end of said post. A longitudinal bore is provided through said bearing-block, as shown in Fig. 4.

Journaled upon the post B is a revoluble drum D, having a hub D^2 , which bears at its lower end on the flange b and spokes D^3 . Integral flanges d are provided on the periphery of the drum adapted to receive between the same the coils of a rope or cable d' . A vertical roller d^2 or other desired means is rigidly secured to the outer side of one of the side members of the frame A, near the end thereof, against which the cable engages, insuring true winding upon the drum. On the lower side and inner circumference of the drum is a plurality of ratchet-teeth d^3 , and below the same and the periphery of the drum are the cogs d^4 , the purposes of which will be hereinafter more fully set forth.

The hub is provided at its upper end with an inwardly-extending circumferential flange d^5 , which rests upon the shoulders b' of the shaft B. The spokes D^3 , as shown, have screw-threaded engagement in the hub and

at their outer ends extend through the apertures in the drum and are rigidly secured therein by means of nuts which are countersunk into the periphery of the drum. Obviously, however, said spokes may be otherwise connected.

Upon the frame A, near the corners thereof, are rigidly secured the bracket-arms E E, the upper ends of which extend radially over the drum and are provided each with a roller *e*, journaled with its axis in radial alinement with the hub and which engages upon the upper surface of the drum. Beneath and supporting the rim of the drum at points opposite the rollers *e* are the radially-disposed rollers *f*, journaled in the apertured plates F F, secured on the frame over suitable recesses. Said rollers *e* and *f* afford an anti-friction-bearing for the drum and serve to hold it in a plane parallel with the frame A.

Rigidly secured on the inner face of one of the side members *a* and projecting diagonally therefrom to a point approximately midway between said members into position to engage the ratchet-teeth *d*³ is the spring-detent G, adapted to engage said ratchet-teeth and hold the drum from reverse movement. Means are provided for operating said detent, comprising a shaft H, journaled axially in the hollow post B and having a bearing in the bearing-block C, and the cross-beam *a*². On the lower end of said shaft is adjustably secured the crank-arm *h*, adapted to be moved by the shaft H within a recess in the cross-beam, said movement being limited by the downwardly-extending stud *a*⁶. On the outer upwardly-curved end of the arm *h* is an eye *h*¹, in which is movably secured the rod *h*², which in turn engages in an eye *h*³ at the end of said detent G.

The upper end of the shaft H is provided with a removable crank I, between which and the top of the bearing-block is provided a washer *h*⁴ to take the wear. If preferred, said crank may be provided with means for locking the detent G out of engagement with the drum, as shown in Fig. 5, comprising a spring-actuated dog I², slidably engaged on the crank and consisting of a rod bent at its outer end to provide a handle *i*¹, which extends into position to be engaged by the hand when grasping the handle of the crank I and adapted to engage at its inner end in a recess in the top of the bearing-block C. A spring *i*³ is carried upon the dog, which engages against one eye, *i*, on the crank and normally tends to hold the dog in locking engagement.

A lever or sweep J is journaled upon the shaft B above the hub D² and seats upon the flange *d*⁵ of said hub and is securely held from upward movement by a collar *d*⁶, adjustably engaged on the shaft B by means of the set-screws *d*⁷ *d*⁷ or the like. Said sweep consists of a short arm *j*, the length of which is

slightly less than the radius of the drum, and the arm *j*¹, projecting beyond the frame a sufficient distance to permit a horse hitched at the end thereof to travel freely around the power. A bent lever K extends along the sweep J and is secured thereto by means of the staples *k k* or other desired means, permitting partial rotation, and at its outer end is bent laterally and downwardly, providing an arm *k*¹, adapted to engage in apertures or recesses in the top of the drum, thereby causing said drum to rotate with the sweep. The inner end of said lever is bent upwardly and laterally, providing horizontal foot-rest *k*³, by means of which the operator may throw the lever out of engagement with the drum-recesses. A coiled spring *k*⁴ is engaged on said lever and on the sweep and acts to normally hold the lever in engagement with the drum.

Means are employed in conjunction with the locking means before described whereby the locking of the sweep to the drum can be controlled by the movement of the horse, and for this purpose, as shown in Figs. 7 to 10, inclusive, a dog is provided comprising a casing P, loosely engaging around the sweep and having at one end a downwardly-extending arm *p*, provided with a laterally-directed tooth *p*¹, adapted to engage in ratchet-teeth *p*² in the upper inner surface of the drum. The opposite end *p*³ of the casing is rounded and serves as a pivot on which the dog turns and engages against a wear-plate R, rigidly secured to the side of the sweep. Said plate has an outwardly-directed apertured lug *r* on each side of said pivot *p*³, which prevents the dog from slipping along the sweep, and a cotter-pin *r*¹, engaged in said apertures, holds the opposite end of the dog extended from the sweep, as shown in Fig. 9, to allow it to swing on its pivot. Obviously a suitably-formed clevis might be used instead of the casing.

A shaft S is loosely engaged at one end thereof in a suitable aperture in the dog adjacent to the arm *p* and is threaded to receive the nuts *s s* on opposite sides of the dog, which serve to prevent the shaft from longitudinal movement therethrough. In position to swing about the outer end of the sweep is pivotally engaged a clevis T by means of the pin *t*, which extends through the eyes of the clevis and through a suitable aperture in the end of the shaft, the latter being provided with a casing *t*¹, of gas-pipe or any desired material, to take the wear of said pin. On opposite sides of said clevis, integral therewith and lying in the plane of the sweep, are the apertured lever-arms *t*² and *t*³, the former of which engages in an eye *s*¹ in the outer end of the shaft S and the latter affording means for attaching the swingletree T².

Means are provided for normally holding the dog out of engagement with the drum,

comprising a coiled spring U, carried upon the shaft S, one end of which engages against an apertured bracket-arm U', rigidly engaged upon the sweep and through which the shaft 5 slidingly engages, and the opposite end is engaged by an adjustable collar U², held in place by a set-screw u and which serves to regulate the tension of said spring.

A friction-brake for controlling the reverse 10 movement of the drum is provided, comprising a lever M, pivoted on the outer end of the arm j of the sweep by means of a bolt L, extending therethrough. Said lever extends outwardly beyond the arm j and is bent laterally above the periphery of the drum and 15 provided with a friction-shoe N', which when pressed upon the rim of the drum acts to hold the same from rotation. The inner end of said lever extends along the arm j and at its 20 inner end forms a toggle-joint with the outer end of a lever M', pivoted on the arm j by means of the bolt J', the inner end of which is bent upwardly and laterally above the arm j into position to be engaged by the foot of 25 the operator.

A seat N of any desired construction is secured upon the outer end of the arm j in position to enable the lever K and the brake-lever to be operated by the foot and the crank 30 I to be in convenient reach of the operator. A platform N² for the operator is secured below said arm j, as shown in Figs. 1 and 3.

To enable the device to be used for the many 35 purposes for which horse-power is applicable on the farm or elsewhere, a shaft O is journaled in bearings disposed centrally of the cross-beam a³ and the end member a'. A pinion O' is removably and rigidly secured thereto in position to be engaged by the cogs d⁴ on 40 the lower surface of the rim. The outer end of said shaft O may be connected with a tumbling-rod or other means for operating machinery.

The operation of my device is as follows: 45 When the sweep is rotated, the arm k' of the lever K moves along the upper surface of the drum D until engaged in one of the recesses or apertures in the drum, thereby causing the drum to rotate with the sweep. When used 50 for hoisting purposes after the load has been raised and removed or if the load is to be lowered, the operator by means of the crank I disengages the detent G from the ratchet d² and trips the lever K out of engagement with 55 the drum, permitting a reverse motion of the drum, which the operator controls by means of the friction-brake, the levers thereof enabling him to exert great pressure upon the upper surface of the drum and acting to retard the rotation of the drum. In using the 60 locking means shown in Figs. 7 to 10 the force exerted by the forward movement of the horse serves to swing the clevis T forwardly and the arm t² outwardly, thereby moving the 65 shaft S longitudinally of the sweep and bring-

ing the dog into engagement with the teeth p² of the drum, causing it to rotate with the sweep. When the force is relaxed, the spring U acts to throw the dog out of engagement.

If the device is to be used to impart a constant motion, as for running machinery, the 70 cable is dispensed with and the driving-shaft O is secured in place, with its pinion engaging the cog d⁴, and the outer end of said shaft provided with any desired means for imparting 75 the motion to the machine to be driven.

Obviously many details of construction may be varied without departing from the principles of this invention.

I claim as my invention— 80

1. In a combined horse-power and hoisting device a horizontally-revoluble drum, a sweep engaging the same, means for releasing the sweep therefrom and a brake carried on the 85 inner end of the sweep and acting to control the rotation of the drum in one direction.

2. In a combined hoisting device and horse-power, an intermittently-revolving drum, a sweep detachably engaged thereon for revolving 90 the same in one direction, means acting to permit rotation of the drum independently of the sweep, a brake adapted to control rotation of the drum in one direction and means acting to lock the drum from rotation in one direction. 95

3. In a device of the class described, a rigid frame, a hollow shaft rigidly secured thereon, a revolving drum journaled on said shaft, means for revolving the drum, a brake pivotally secured thereon and means carried on 100 the frame adapted to afford an antifriction-bearing for said drum and hold it in a plane parallel with said frame.

4. In a hoisting device a rigid frame, an upright hollow shaft rigidly secured thereon, a 105 drum journaled on said shaft, a sweep journaled above the drum, means secured thereon adapted to engage and rotate the drum with the sweep, a friction-brake carried on the sweep, a plurality of antifriction-rollers carried on the frame and engaging the periphery 110 of the drum above and below and holding the drum in a plane of rotation.

5. In a combined horse-power and hoisting device a frame, a rigid cross-beam thereon, 115 an aperture extending through the beam, a hollow shaft rigidly fixed on said beam in axial alinement with said aperture, a drum journaled thereon, a friction-brake adapted to engage the upper surface of said drum, means 120 adapted to engage the drum and prevent rotation in one direction and an upwardly-extending roller or the like rigidly engaged on the frame adapted to guide a cable on the drum. 125

6. The combination with a frame, of a centrally-apertured cross-beam thereon, a hollow shaft supported at its base on said beam, a drum journaled on said shaft and provided on 130 its upper surface with a plurality of aper-

tures, means adapted to engage in said apertures and control the operation of said drum, and a friction-brake adapted to engage the top of the drum.

5 7. In a device of the class described the combination with a frame of a centrally-apertured and transversely-recessed cross-beam rigidly secured thereon, a vertical hollow shaft, secured at its lower end on said cross-beam, a
10 centrally-apertured bearing-block engaged in the upper end of said shaft, a revoluble drum on said shaft having peripheral apertures at its upper end and ratchet-teeth at its lower end, a detent rigidly engaged on the frame and acting to engage said ratchet-teeth, means jour-
15 naled axially in said bearing-block and in the cross-beam adapted to retract said detent and a spring-dog adapted to engage with said bearing-block and lock the detent retracted out of
20 engagement with said ratchet-teeth.

8. In a device of the class described a frame, a tubular vertical shaft rigidly secured therein, a longitudinally-apertured bearing-block engaged in the upper end thereof, a drum jour-
25 naled on said shaft, ratchet-teeth thereon, a spring-detent adapted to engage said ratchet-teeth, a shaft journaled in said bearing-block and shaft, a crank-arm on each end thereof, a rod connecting the lower crank-arm with the
30 detent, means adapted to limit the movement thereof and a spring-dog carried on the upper arm and adapted to engage said bearing-block and lock the detent out of engagement with said teeth, and a friction-brake adapted to be
35 operated by the foot of and acting to hold the drum from movement.

9. In a device of the class described the com-

bination with a frame, of a revoluble drum having ratchet-teeth thereon, an independently-revoluble sweep, means for locking the
40 drum to said sweep comprising a bent lever carried on the sweep adapted to engage the drum and a dog also carried on the sweep adapted to engage said teeth and means adapted to throw said dog into and out of engagement
45 with said teeth.

10. In a device of the class described an intermittently-revoluble drum, a revoluble sweep above the same, means thereon operated by the motor-power adapted to engage the
50 drum and lock it against reverse movement, a brake pivotally supported on the sweep in position to contact with the drum and means for operating said brake.

11. In a device of the class described the com-
55 bination with a rigid frame, of an intermittently-revoluble drum having ratchet-teeth thereon, a sweep, means thereon for controlling the reverse movement of the drum comprising a bent lever adapted to engage in the
60 upper surface thereof and a dog pivotally engaged on the sweep and acting to engage said teeth, a shaft extending longitudinally of the sweep, a lever pivoted on the sweep and engaging said shaft and means acting normally to
65 hold the dog out of engagement with said teeth.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

ADAM M. SMITH.

Witnesses:

JOHN S. LEATH,
HENRY L. GIBBS.