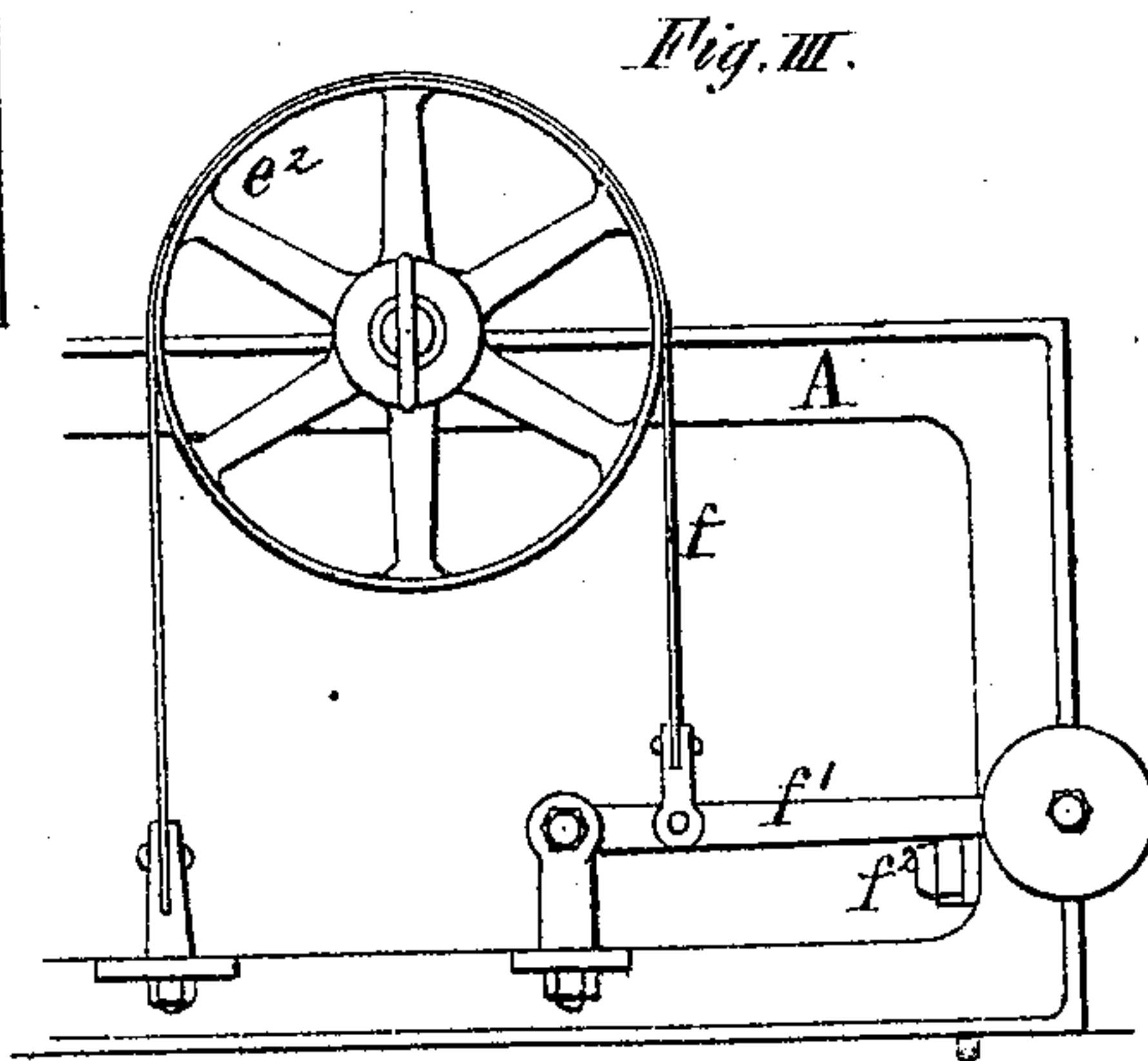
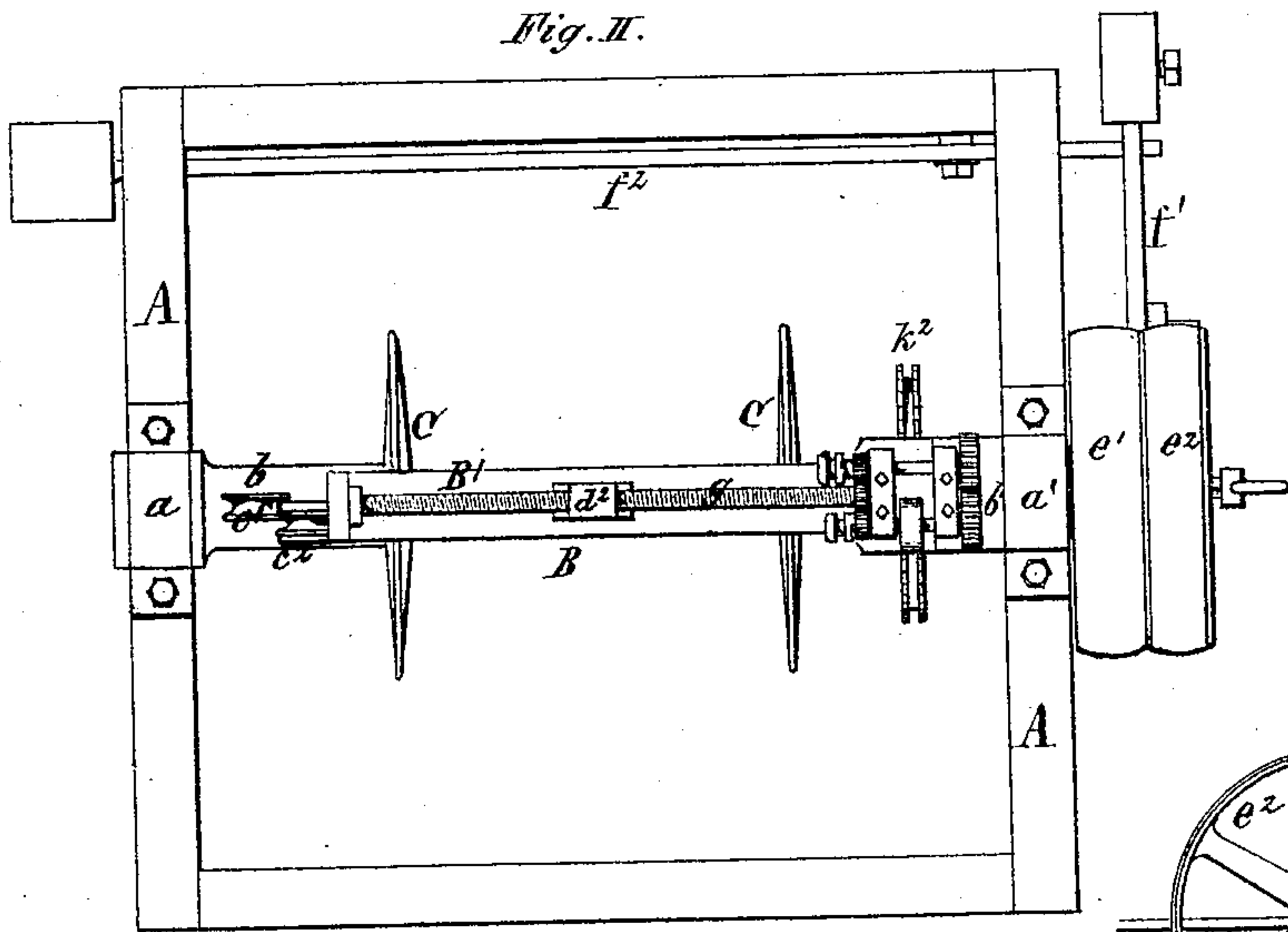
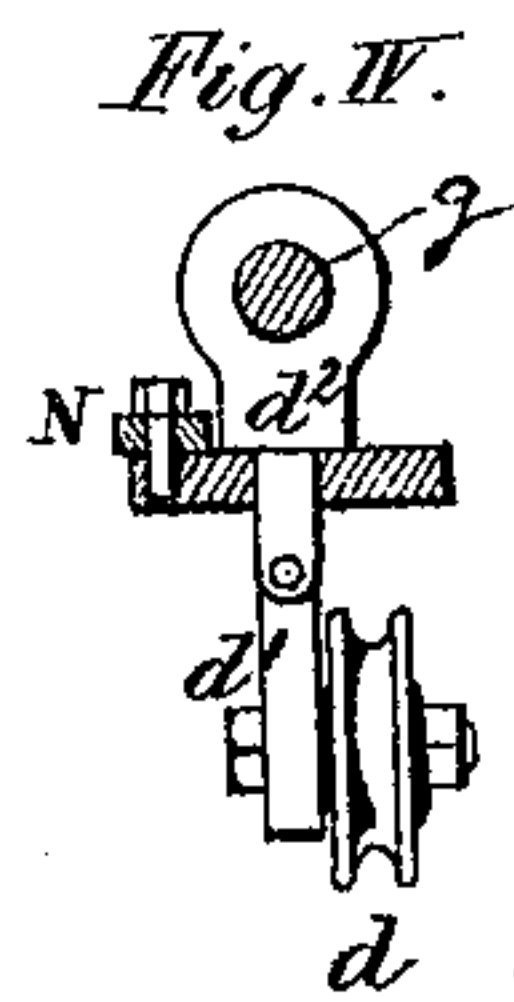
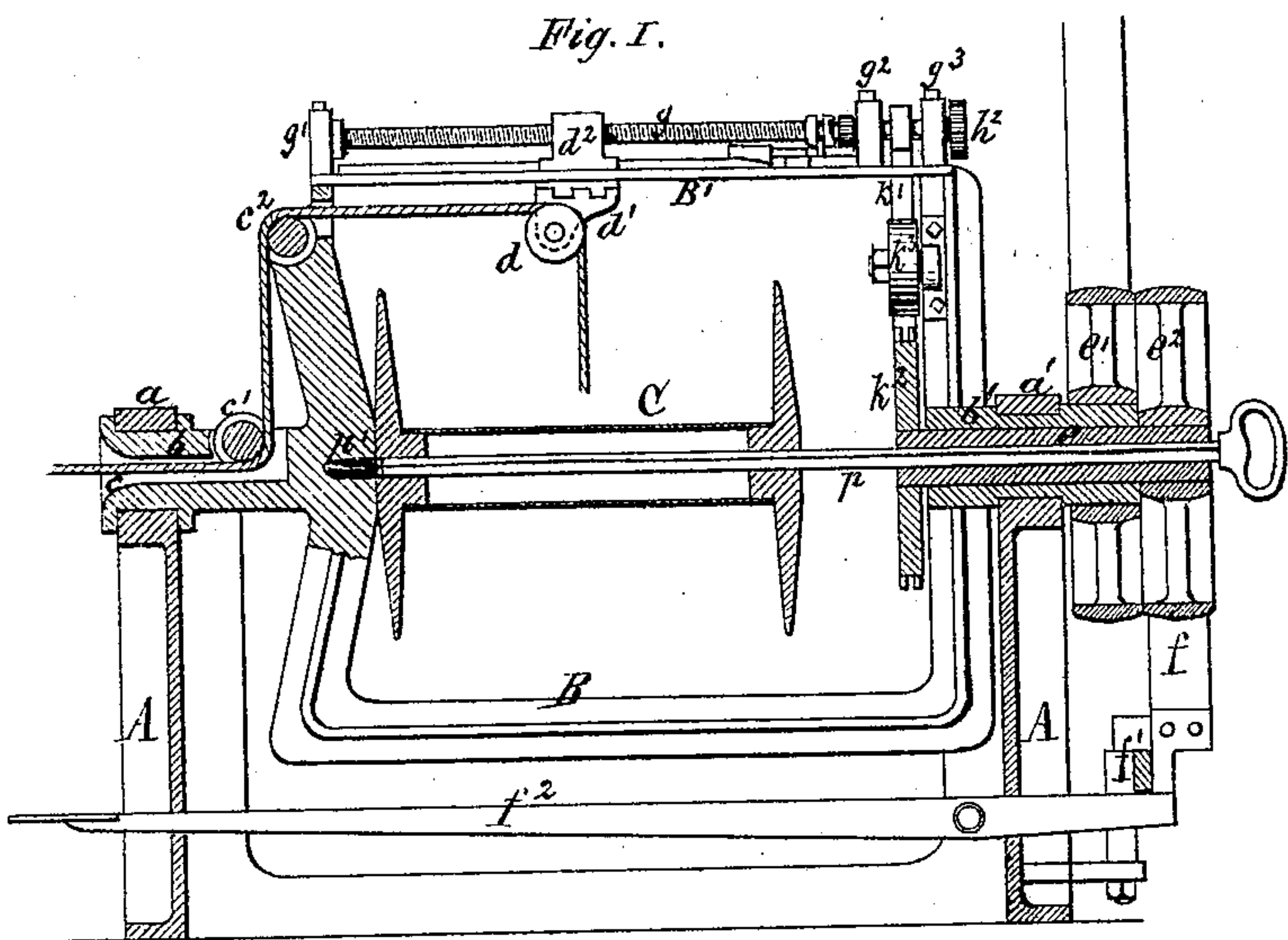


G. B. HAYES.

Twisting and Spooling Machines.

No. 132,155.

Patented Oct. 15, 1872.



E. R. Hayes Inventor.

Edward Wilhelm
Jno. J. Donner

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Fig. V.

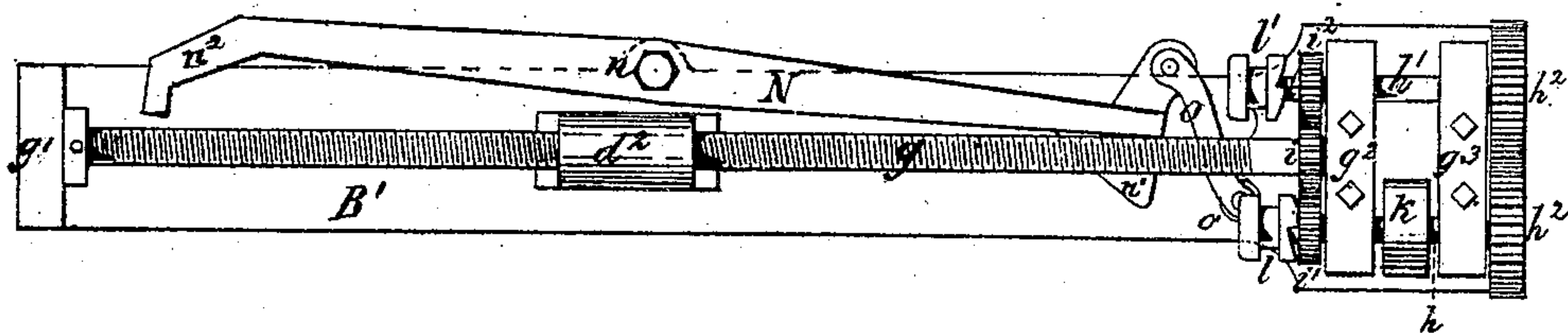


Fig. VI.

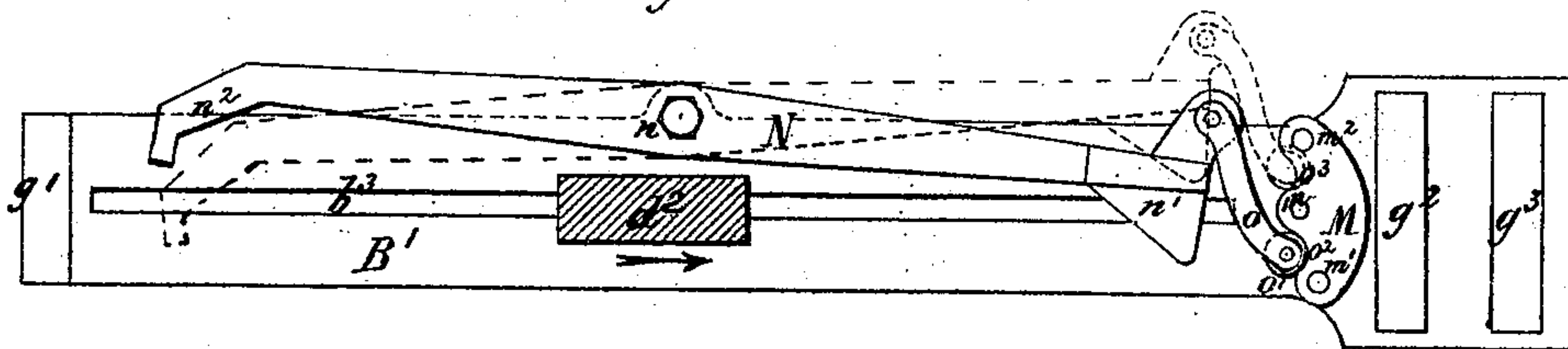


Fig. VII.

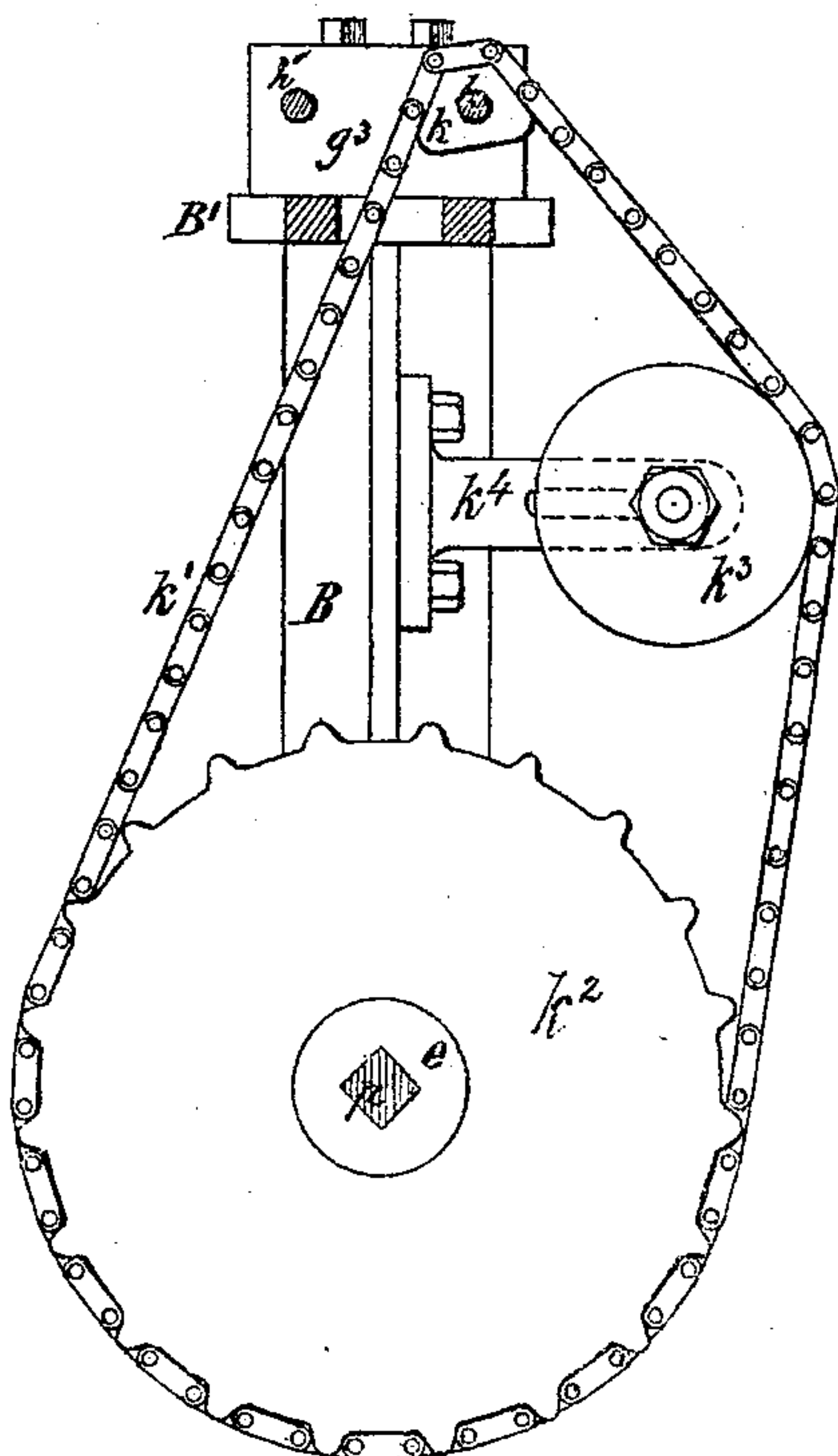
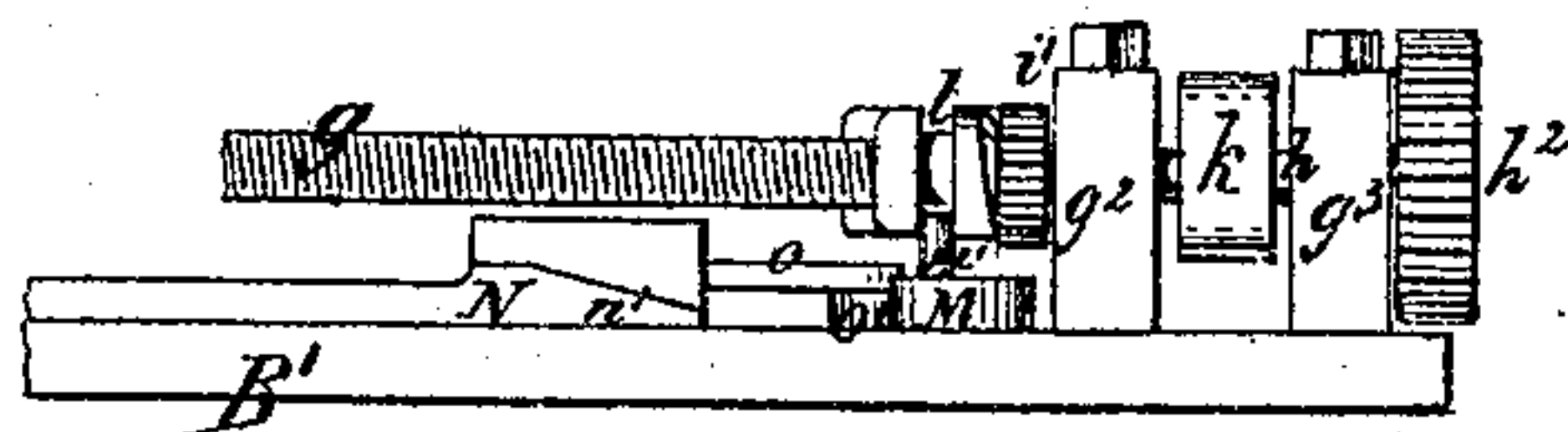


Fig. II.



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Witnesses

UNITED STATES PATENT OFFICE

GEORGE B. HAYES, OF BUFFALO, NEW YORK.

IMPROVEMENT IN TWISTING AND SPOOLING MACHINES.

Specification forming part of Letters Patent No. 132,155, dated October 15, 1872.

To all whom it may concern:

Be it known that I, GEORGE B. HAYES, of the city of Buffalo, in the county of Erie and State of New York, have invented certain new Improvements in Machines for Twisting and Spooling Hay-Rope, of which the following is a specification:

My improvements relate to that kind of machines which are employed for producing the hay-rope or cord used in foundries in the construction of cores for castings. My invention consists, first, in the combination, with the flier-frame, of a hollow journal, central shaft, and power-transmitting mechanism for rotating the screw which operates the traveling-roller; second, in combination, with the distributing or traveling roller and screw for operating the same, of the reversing mechanism, hereinafter described; third, in the combination, with the flier-frame and traveling-roller, of a slotted guide-bar, a roller-support sliding thereon, and a screw-shaft for operating the latter; fourth, in the combination, with the flier-frame and spool, of a coupling-rod for connecting the spool to the flier-frame, so as to allow of its being readily attached or detached.

In the accompanying drawing, consisting of two sheets, Figure I is a sectional elevation of a rope-machine provided with my improvements; Fig. II is a top-plan view thereof; Fig. III is a fragmentary end elevation; Fig. IV is a detached view of the traveling-roller; Fig. V is a plan view, on an enlarged scale, of the mechanism by which the motion of the traveling-roller is regulated; Fig. VI is a fragmentary elevation thereof; Fig. VII is a plan view of the mechanism by which the motion of the traveling-roller is reversed; and Fig. VIII is a detached view of the mechanism by which motion is transmitted to the screw operating the traveling-roller.

Like letters designate like parts in each of the figures.

A represents the stationary main frame of the machine, and B the revolving flier-frame supported on the former by hollow journals b b^1 resting in bearings a a^1 . The flier-frame B is nearly rectangular, one of its horizontal portions being a flat bar, B' , provided with a longitudinal slot, b^3 , Fig. VII. C is the spool upon which the rope is wound. It is arranged in the flier-frame so that its axis coincides with

the axis of rotation of the latter, and is secured thereto in a manner hereinafter to be explained. The journal b of the flier-frame is constructed with an axial recess or bore, c , for the introduction of the rope, as clearly shown in Fig. I. c^1 is a guide-roller, arranged in the journal b in line across the bore c , and c^2 is a similar roller arranged in the corner of the flier-frame near the portion B' thereof. d is the traveling-guide roller, by which the rope is distributed upon the spool. It is attached to a hanger, d^1 , hinged to a sliding piece, d^2 , moving on the portion B' of the flier-frame in the slot b^3 of the same. The journal b^1 of the flier-frame is hollow, so as to receive a shaft, e , which projects out of said journal on both sides. e^1 e^2 are two pulleys, secured respectively to the outer ends of the journal b^1 and shaft e , as clearly shown in Fig. I. Motion is imparted to the pulley e^1 by the driving-belt, while the pulley e^2 is provided with a band-brake, f , operated by a weighted arm, f^1 , and foot-lever f^2 , for a purpose hereinafter to be explained. (See Figs. I, II, and III.) g is a screw arranged longitudinally above the portion B' of the flier-frame, and supported in bearings g^1 g^2 attached thereto. It passes through the sliding piece d^2 , to which the traveling-roller d is hinged, so that by its rotation said sliding piece and roller are moved back and forth. h and h^1 are short shafts arranged parallel to the screw g on each side thereof, and supported in the bearings g^2 g^3 , and geared together by two spur-wheels h^2 . i is a spur-wheel secured to the screw g , and i^1 i^2 two spur-wheels meshing therewith and turning loosely on the shafts h and h^1 , respectively. The shaft h carries a chain-pulley, k , triangular or of other suitable shape, to which motion is transmitted by the endless chain k^1 , from the chain-wheel k^2 , secured to the inner projecting end of the shaft e . k^3 is a tension-pulley, over which the chain k^1 passes. It is adjustably attached to a slotted bracket, k^4 , secured to the flier-frame B. l l' , Figs. V and VI, are two clutch-couplings sliding on keys on the shafts h h^1 , respectively, the spur-wheels i^1 i^2 being provided with suitable projections or teeth to engage therewith. In Fig. V, VI, and VII, N is the shifting-lever, arranged under the clutch-couplings l l' , pivoted to the portion B' of the flier-frame at m , and provided with two upwardly-projecting pins, m^1 m^2 ,

which engage with said clutch-couplings. N is the reversing-lever pivoted to the portion B' of the flier-frame at n on one side of the slot b^3 , its arms extending to near the ends of this slot. The lever N is constructed with two inclined or tapering ends, n^1 n^2 , one of which always obstructs the slot b^3 . o is a spring-arm pivoted to the end of the lever N near the shifting-lever M, and provided at its end with a roller, o^1 , which can be made to engage with either one of two curved recesses, o^2 o^3 , formed in the shifting-lever M. p is a square rod or bar passing longitudinally through the shaft e and spool C, and entering the flier-frame at p' with a round portion, so as to connect the spool securely thereto, while enabling the spool to move independently of the flier-frame. By withdrawing the rod p the spool is detached from the flier-frame.

The operation of my improved machine is as follows: When power is applied to the pulley e^1 by the driving-belt, and the brake-pulley e^2 is released by applying the pressure of the foot to the lever f^2 , the flier-frame B is revolved in its bearings, and the shaft e , chain-wheel k^2 , and spool C, are carried along by frictional contact, so that their relative position to the flier-frame, and the parts attached thereto, remains unchanged. During such movement of the flier-frame there is no rope wound upon the spool, and the chain k^1 , shafts h h^1 , and screw g being at rest there is no motion imparted to the traveling-roller d . The operation of the machine is consequently limited to the twisting of the rope, which latter is introduced in the axis of revolution of the flier-frame, and carried over the fixed guide-rollers c^1 c^2 and traveling-roller d to the spool C, as clearly shown in Fig. I. When a piece of rope of suitable length has been formed, the operator who holds the loose end of the rope in his hands releases the foot-lever f^2 , when the weighted arm f^1 applies the brake to the pulley e^2 , whereby the shaft e , chain-wheel k^2 , and spool C are arrested in their movement. The flier-frame B now travels on, while the spool C remains stationary, which causes the rope to be wound upon the latter. The chain-wheel k^2 remains stationary while the shaft h , attached to the flier-frame, continues its movement. The shaft h is revolved by means of the chain k^1 and pulley k transmitting motion to shaft h^1 by the wheels h^2 . When the parts

are in the position represented in Figs. V and VI the shaft h transmits motion to the screw g by the spur-wheels i i^1 , the spur-wheel i^1 being coupled to the shaft by the clutch-coupling l . The screw g being in this manner revolved, the slide d^2 , to which the traveling-roller d is hinged, is moved in the slot b^3 in the direction of the arrow, Fig. VII. This progressive motion of the roller d is so timed that the rope is evenly wound upon the spool by the same. When the sliding piece d^2 strikes the inclined end n^1 of the reversing-lever N, the latter is swung on its pivot so as to assume the position indicated in dotted lines, Fig. VII, whereby the roller of the spring-arm o is withdrawn from the recess o^2 of the lever M, and is made to engage with the recess o^3 thereof.

By this operation the lever M is shifted in such manner that the clutch-coupling l' is thrown into gear with the spur-wheel i^2 while the coupling l and wheel i^1 are disengaged. The direction in which the screw g revolves is thereby reversed, which causes the slide d^2 and roller d to travel backward toward the other end of the slot b^3 . When the sliding piece d^2 strikes the other inclined end of the lever N its motion is again reversed in a similar manner.

When a spool has been filled with rope the coupling-rod p is withdrawn so as to release the spool, and an empty one put in its place, in an obvious manner.

I claim as my invention—

1. The combination, with the flier-frame and its hollow journal b^1 , of the shaft e , pulley k^2 , chain k^1 , pulley k , and shaft h , substantially as hereinbefore set forth.

2. The combination, with the flier-frame, screw-shaft g , clutch-couplings l l' , and connecting-gear for actuating said shaft, of the shifting-lever M and reversing-lever N, provided with spring arm o , substantially as hereinbefore set forth.

3. The combination, with the flier-frame and slotted guide-bar B', of the screw-shaft g , traveling-roller d , and sliding support d^2 , substantially as hereinbefore set forth.

4. The combination, with the flier-frame, of the spool C, shaft e , and coupling-bar p , substantially as hereinbefore set forth.

GEO. B. HAYES.

Witnesses:

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JNO. J. BONNER.