

(No Model.)

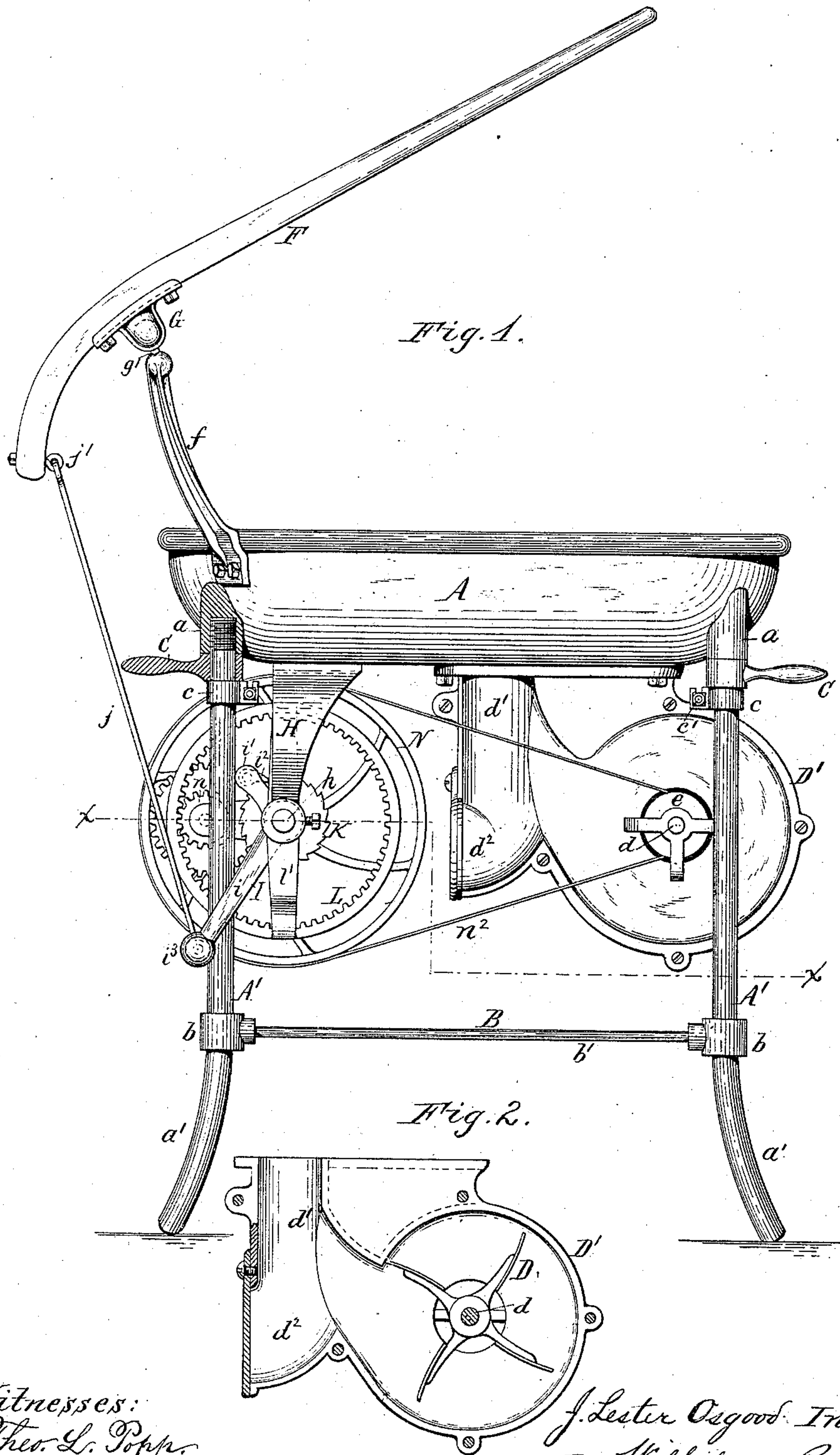
3 Sheets—Sheet 1.

J. L. OSGOOD.

FORGE.

No. 311,358.

Patented Jan. 27, 1885.



Witnesses:
Theo. L. Popp.
Geo. C. Pitman.

J. Lester Osgood, Inventor.
By Wilhelm & Bonner.
Attorneys.

(No Model.)

J. L. OSGOOD.

3 Sheets—Sheet 2.

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Fig. 3.

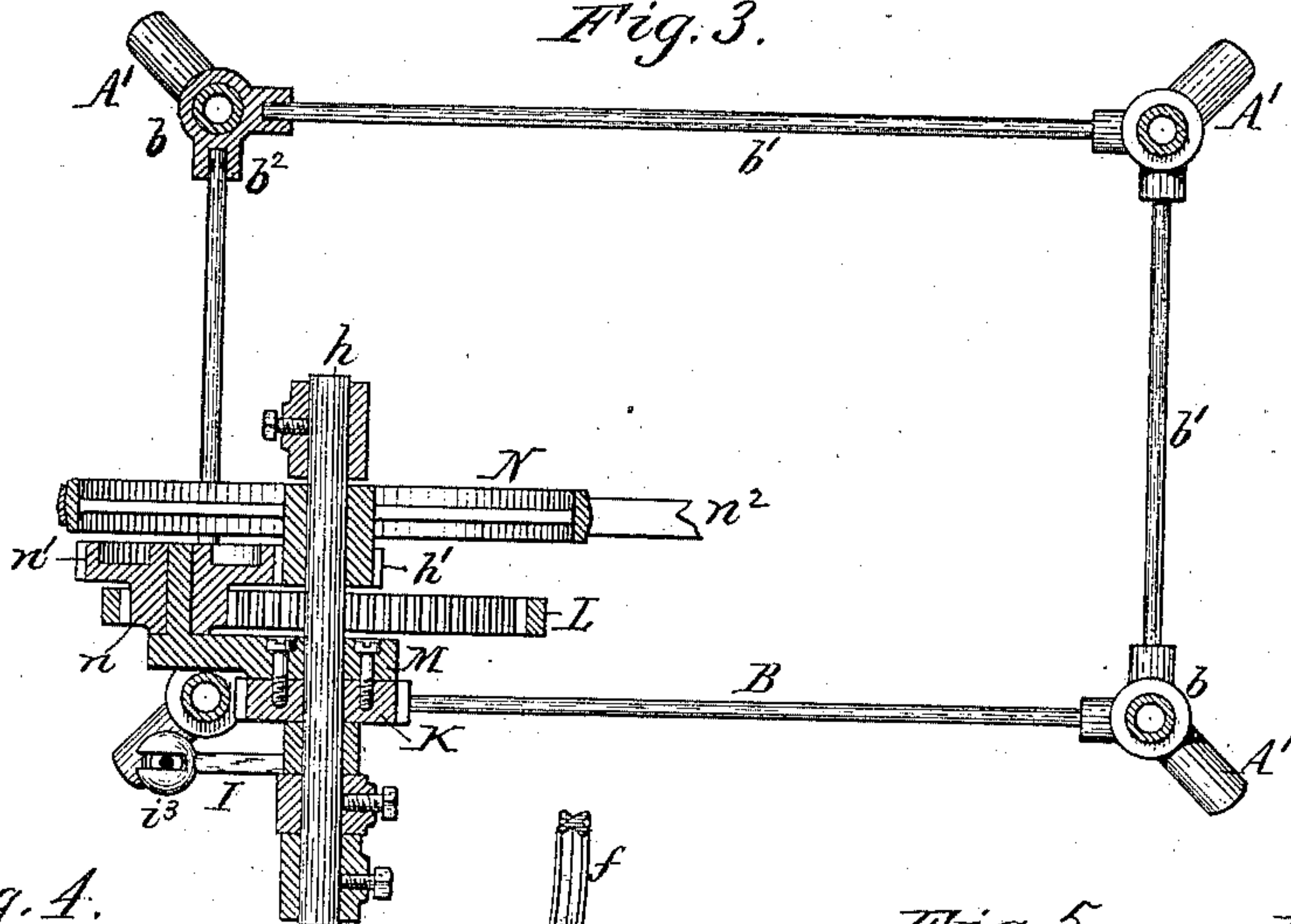


Fig. 4.

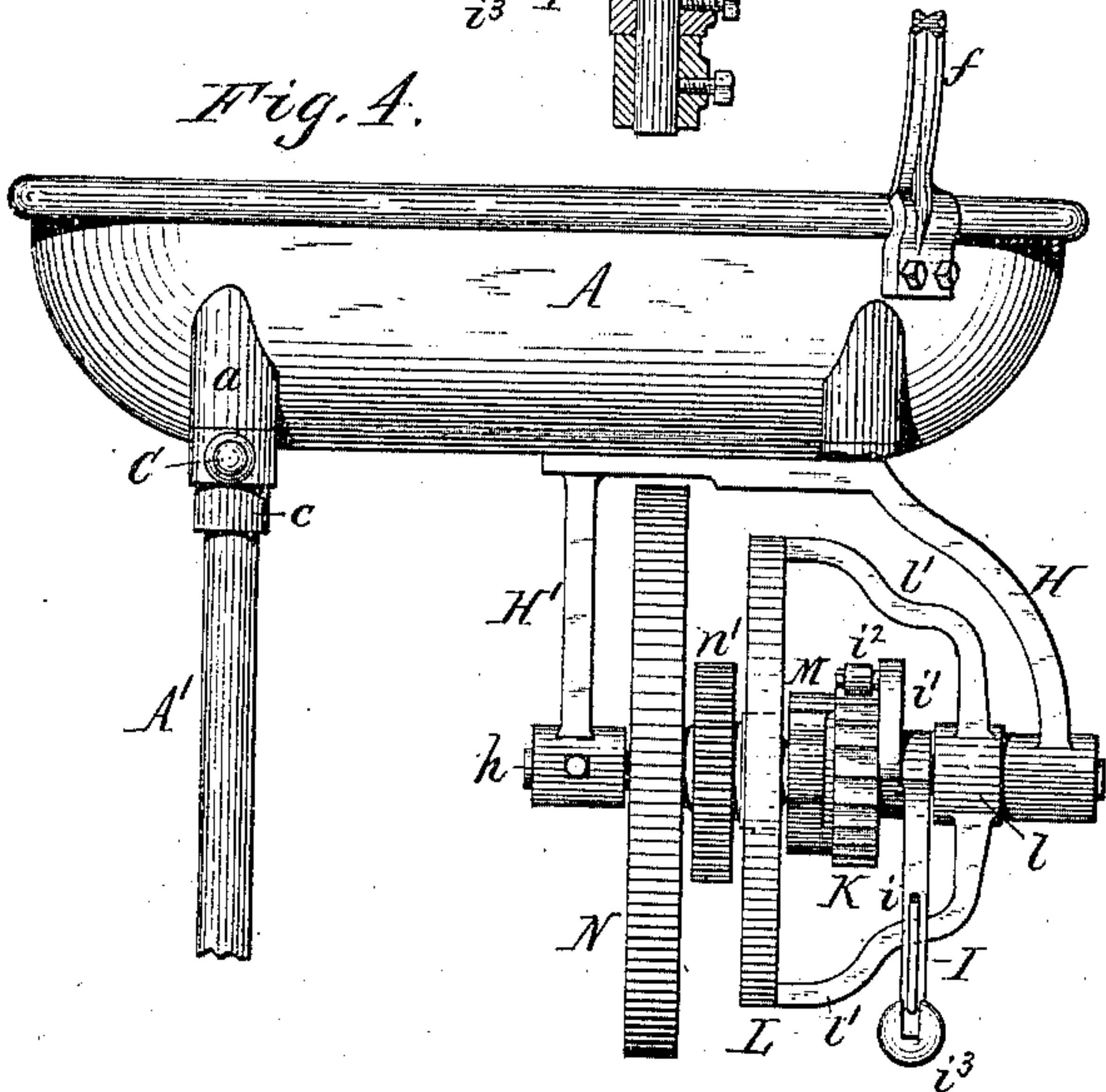


Fig. 5.

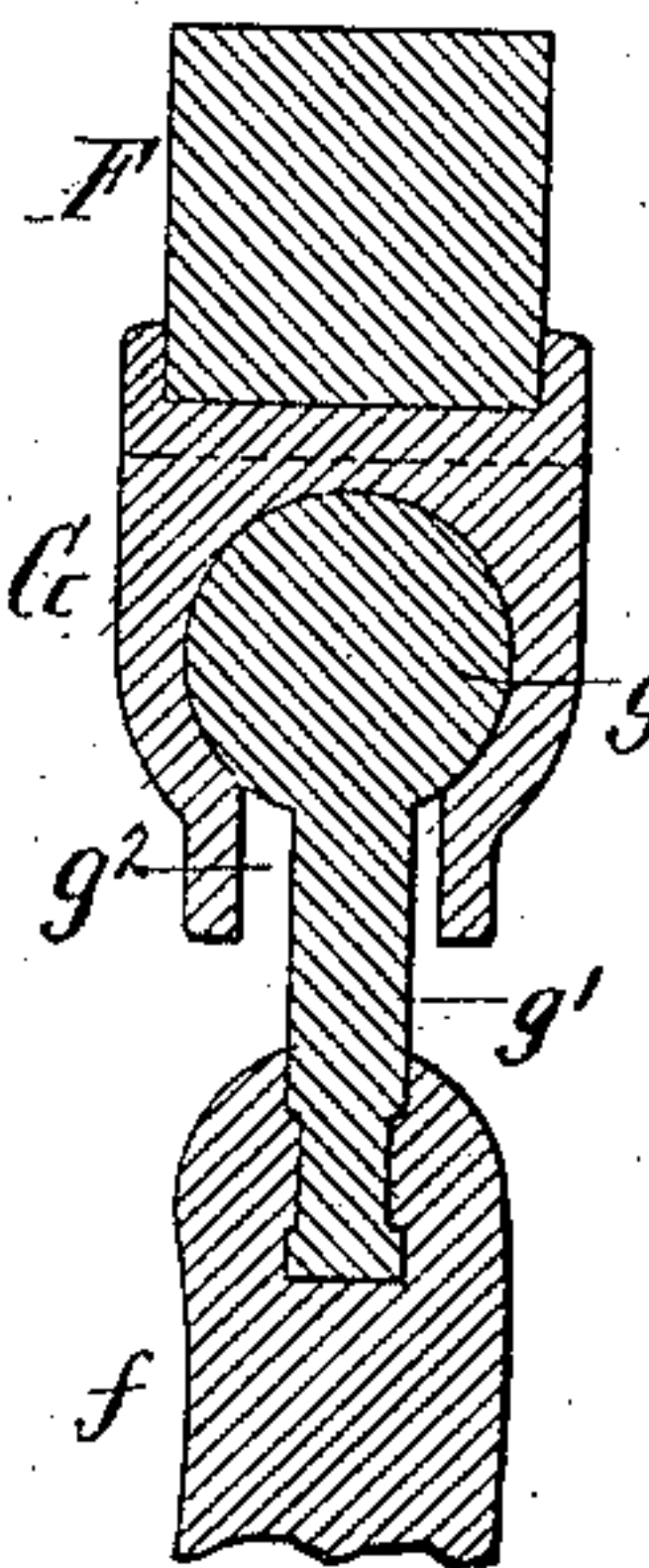


Fig. 6.

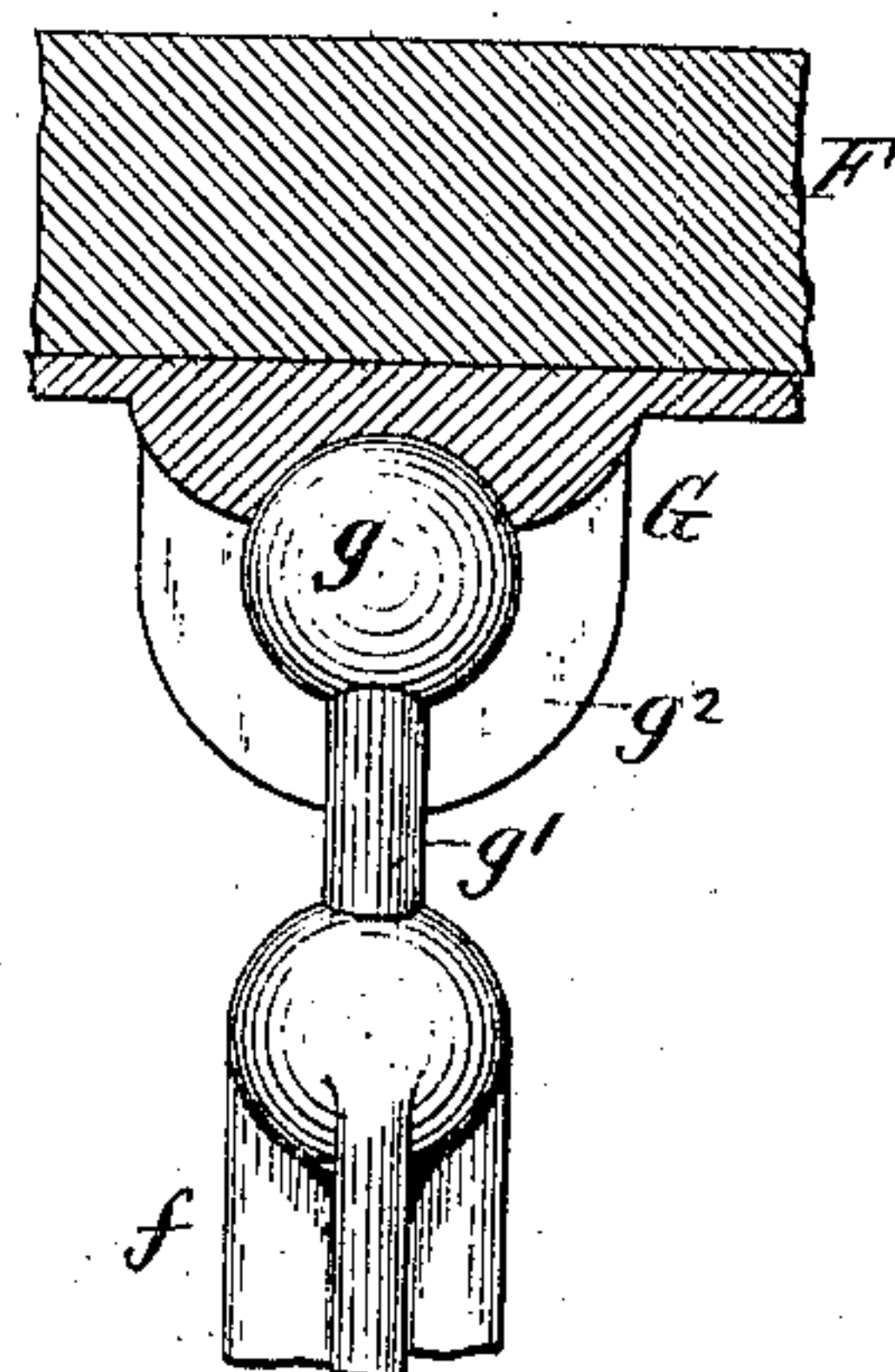


Fig. 9.

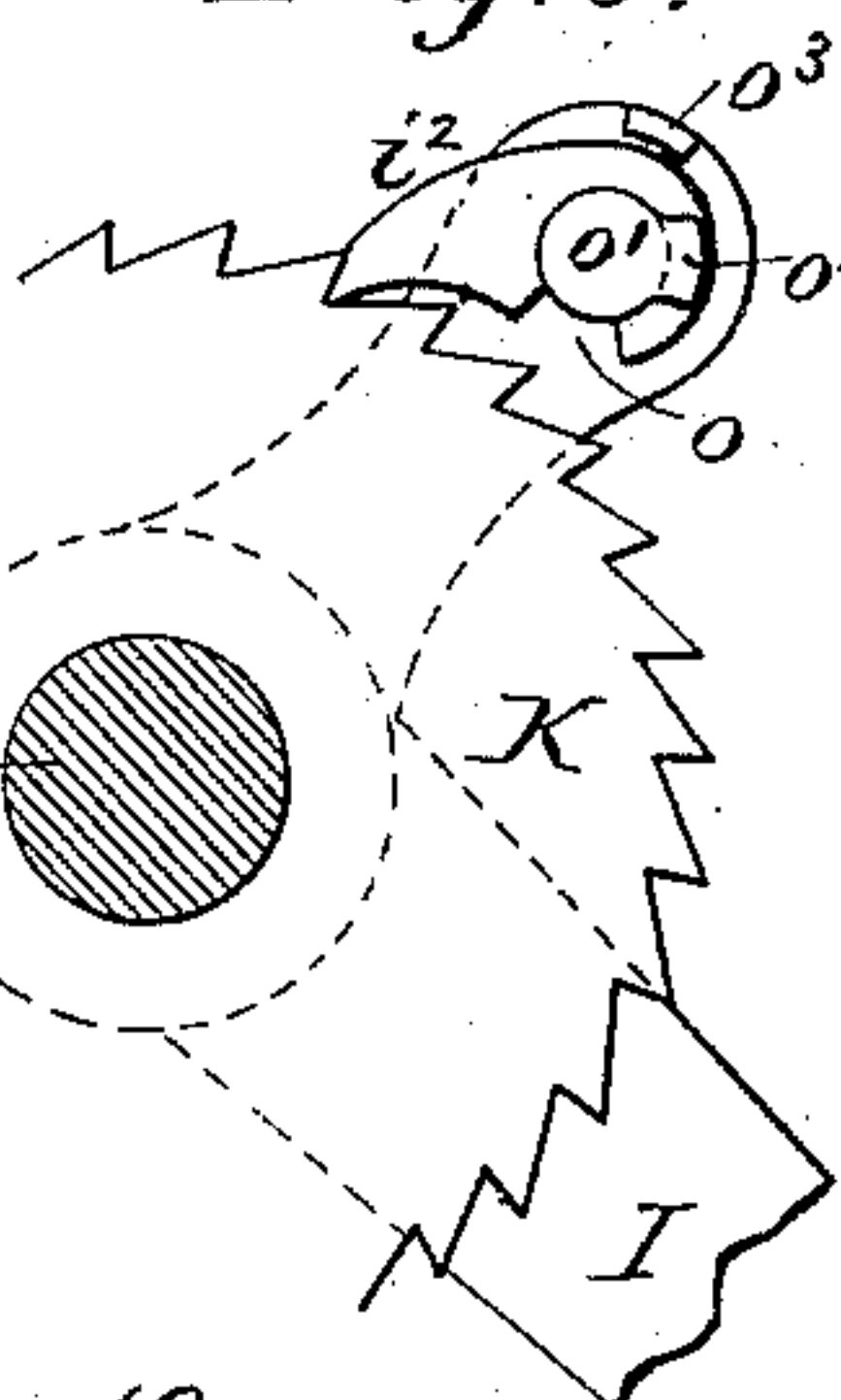


Fig. 10.

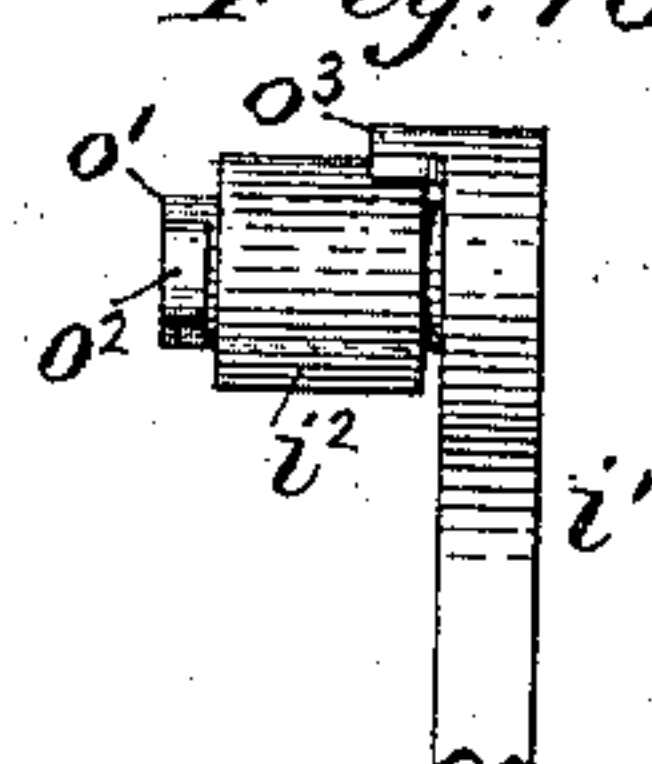


Fig. 11.

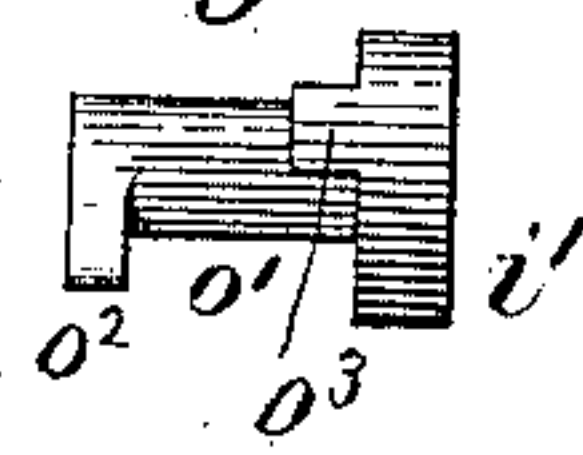
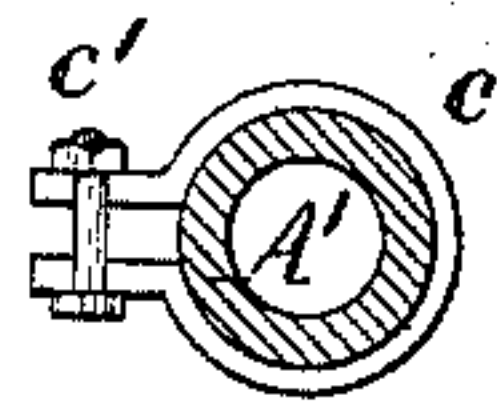


Fig. 12.



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Fig. 13.

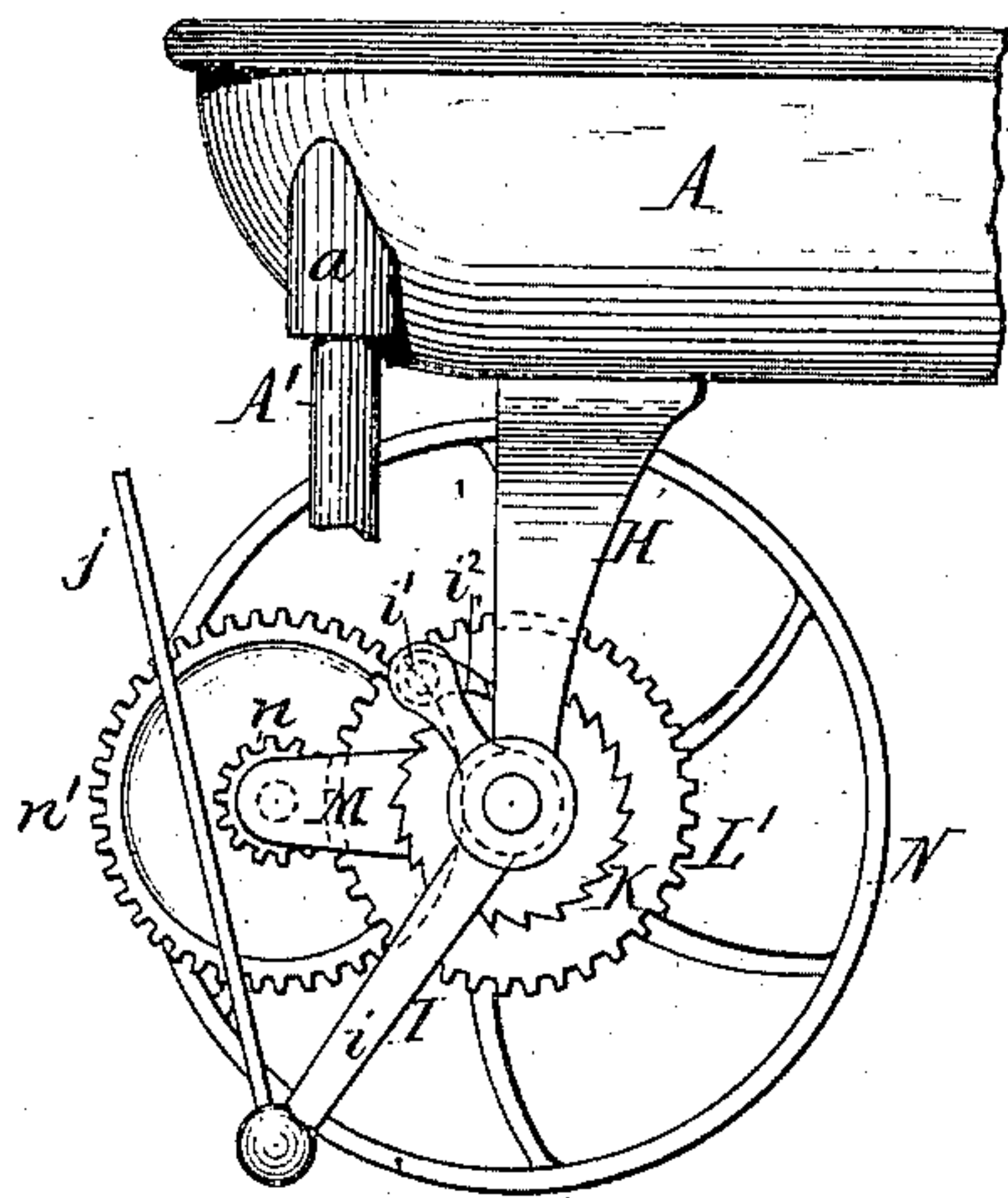


Fig. 14.

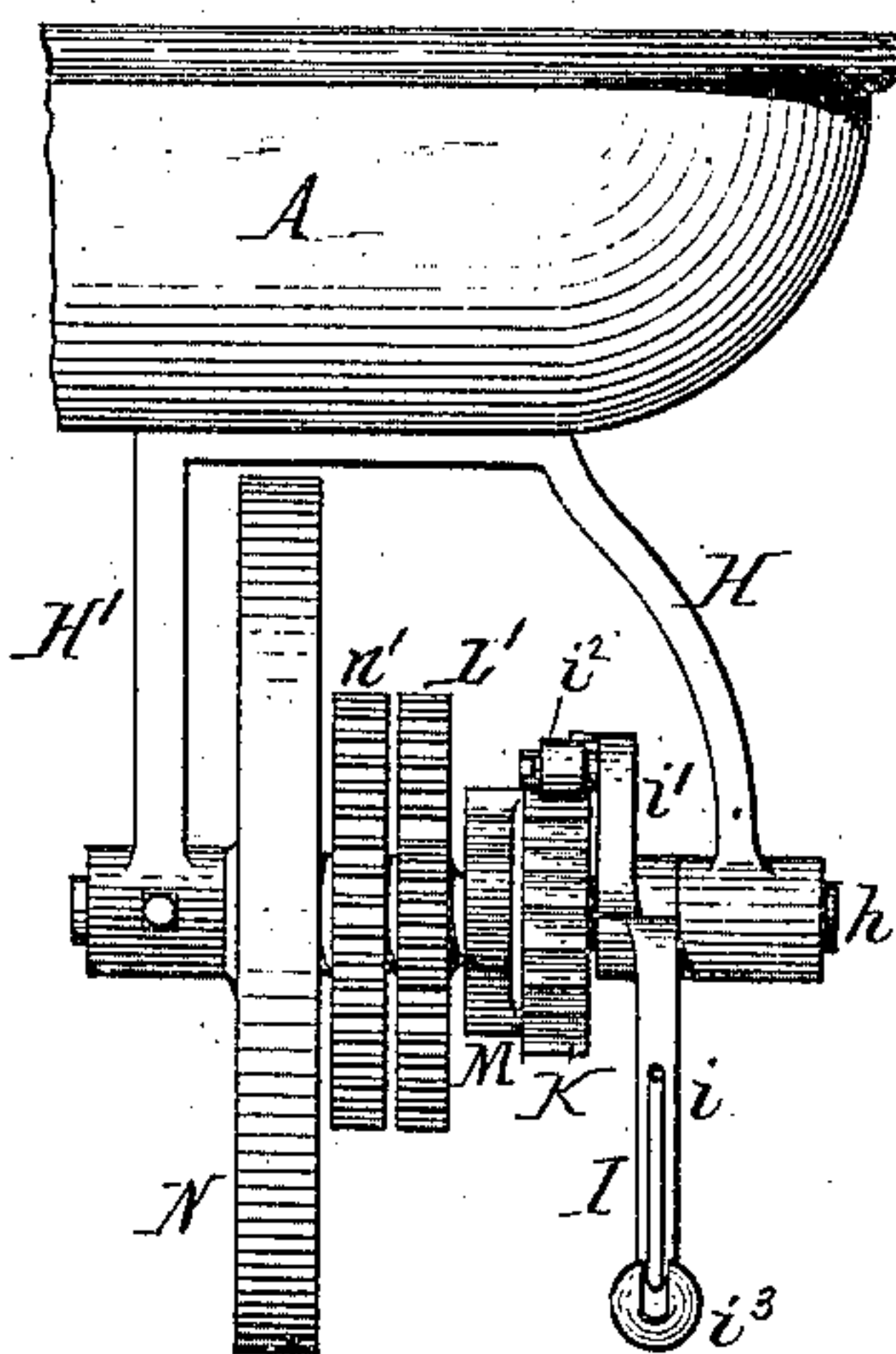


Fig. 15.

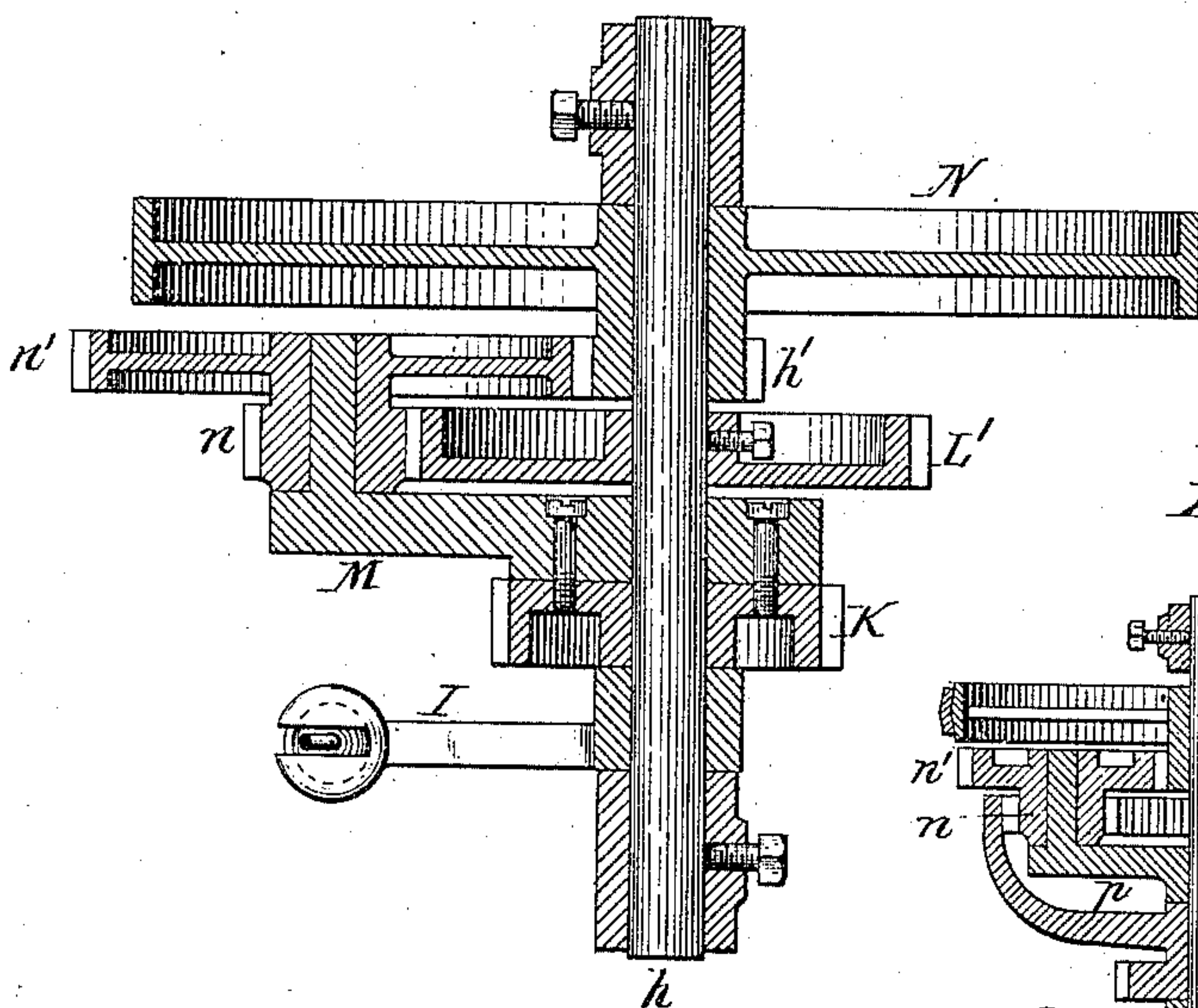
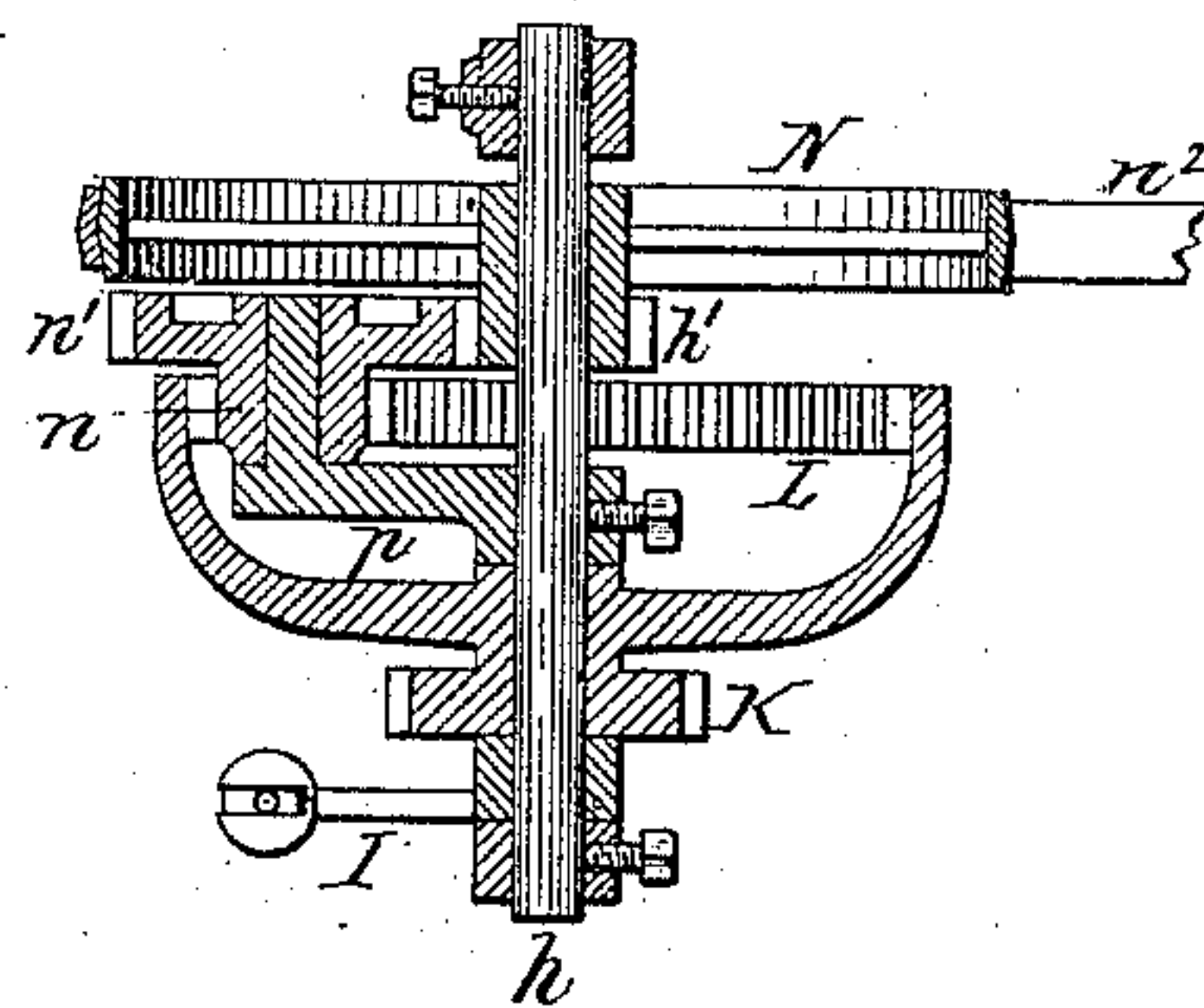


Fig. 16.



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UNITED STATES PATENT OFFICE.

J. LESTER OSGOOD, OF BUFFALO, NEW YORK, ASSIGNOR TO WILLIAM F. WENDT, OF SAME PLACE.

FORGE.

SPECIFICATION forming part of Letters Patent No. 311,358, dated January 27, 1885.

Application filed November 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, J. LESTER OSGOOD, of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Portable Forges, of which the following is a specification.

This invention relates more particularly to an improvement in that class of portable forges which are provided with a rotary blower; and it has for its object to produce the requisite rapid rotary movement of the blower by a multiplying-gear without the employment of a counter-shaft, thereby rendering the machine more compact and simplifying its construction, and also to simplify and improve the construction of the parts whereby the multiplying-gear is actuated from the handle, and to improve the support on which the bowl of the forge rests.

My invention consists, to these ends, of the improvements in the construction of the forge, which will be hereinafter fully set forth and pointed out in the claims.

In the accompanying drawings, consisting of three sheets, Figure 1 is a side elevation of a machine provided with my improvements. Fig. 2 is a detached elevation of the blower. Fig. 3 is a horizontal section in line *x x*, Fig. 1. Fig. 4 is a fragmentary elevation of the multiplying-gear and connecting parts at right angles to Fig. 1. Fig. 5 is a cross-section, and Fig. 6 a sectional elevation of the support to which the handle is pivoted. Fig. 7 is a longitudinal section, and Fig. 8 a cross-section, of the joint, whereby the connecting-rod is connected with the pawl-lever. Fig. 9 is a detached side elevation of the pawl and ratchet. Fig. 10 is a front elevation of the pawl, and Fig. 11 a top plan view of the pivot to which the pawl is attached. Fig. 12 is a horizontal section of one of the legs; Fig. 13, a side elevation; Fig. 14, an end elevation, and Fig. 15 a horizontal section on an enlarged scale, showing a modified construction of the multiplying-gear. Fig. 16 is a horizontal section showing another modified construction of the multiplying-gear.

Like letters of reference refer to like parts in the several figures.

A represents the bowl or hearth of the forge,

which may be of any well-known or suitable construction, and *a* are lugs formed on the under side of the bowl A for the reception of the legs A', which are screwed with their upper ends into these lugs. The legs A' are preferably constructed of wrought-iron tubes, and have their lower ends bent outwardly, as represented at *a'*.

B represents a stiffening-frame, whereby the lower portions of the legs are connected and secured in their proper relative position. This frame consists of sleeves *b*, which surround the legs, and rods *b'*, which connect the sleeves *b*. The latter are provided with sockets *b²*, in which the ends of the rods or bars *b'* are rigidly secured by casting the sleeves and sockets on the ends of the four rods, the latter being placed in the molds preparatory to casting the sleeves and sockets. The frame B is consequently rigid, and provided at its four corners with cylindrical sleeves, which are adapted to be slipped over the upper straight portions of the legs before the latter are secured to the bowl.

C are handles which are attached to the legs A' for facilitating the transportation or handling of the forge. These handles are each provided with a cylindrical socket which surrounds the upper portion of the leg, and are held on the legs below the lugs *a* of the bowl by means of divided collars *c*, which are clamped on the legs by screw-bolts *c'*.

For the purpose of applying the legs to the bowl, the latter is inverted. The handles C are placed on the lugs *a*, the collars *c* on the handles C, and the frame B on the collars *c*. The legs are then passed through the sleeves *b* of the frame B, collars *c* and handles C, and screwed into the lugs *a*. Upon inverting the bowl and placing the legs on the floor the frame B is slipped down on the legs until it reaches the lower diverging portions of the legs, which portions arrest the farther downward movement of the frame B, and by their elasticity securely bind the frame on the legs in the position represented in the drawings. The lower portions of the legs are in this manner rigidly held by the frame B.

D represents the blower; *d*, the shaft to which the wings of the blower are secured;

D', the casing which incloses the wings of the blower, and d' the tuyere-tube provided with the usual pocket, d^2 , for the reception of the ashes. e represents the pulley secured to the blower-shaft d .

F represents the handle or lever by which the blower is set in motion, and f represents the bracket which supports the fulcrum of the lever F, and which is secured to the bowl A. The lever F is pivoted to the bracket f by a ball-and-socket joint, which permits of the requisite vertical and lateral movement of the handle. This ball-and-socket joint consists of a spherical knuckle, g , which is secured to the upper end of the bracket f by a shank, g' , cast into the end of the bracket, and a spherical socket, G, which is secured to the lower side of the handle and provided on its under side with a longitudinal recess, g^2 , which permits the socket to play on the shank g' . The socket G is preferably cast on the knuckle g by first coating the knuckle with a thin layer of shellac and sand or similar material, which will prevent the socket from adhering to the knuckle in casting. The knuckle so prepared is then placed in the mold of the socket, when the metal is poured into the mold, and the socket cast. When the metal has become cold, the coating of sand is readily removed from the knuckle by moving it in the socket, and the parts so united form a fulcrum-support for the handle, which has a sufficiently-accurate fit for this purpose.

H H' represent hangers secured to the under side of the bowl A, and h is a horizontal shaft which is arranged parallel with the blower-shaft d , and rigidly secured within the hangers H H' by set-screws or otherwise.

I represents a bell-crank rock-lever, which is mounted loosely on the shaft h , and which has its long arm i connected with the short arm of the lever F by a rod, j , while its short arm i' is provided with a pawl, i^2 . The upper end of the rod j is connected with the lever F by an eyebolt, j' , and the lower end of the rod j is connected with the arm i of the bell-crank lever I by a ball-and-socket joint. The latter is composed of a spherical knuckle, j^2 , cast on the lower end of the rod j , and a spherical socket, i^3 , which is formed on the arm i and cast around the knuckle j^2 in the same manner which has been above described with reference to the ball-and-socket joint which forms the fulcrum of the lever F.

K represents a ratchet-wheel with which the pawl i^2 engages, and which is mounted loosely on the shaft h on the inner side of the rock-lever I.

L represents a stationary gear-rim provided with internal cogs or teeth and rigidly secured in place by a hub, l , which is fastened to the shaft h and connected with the gear-rim L by arms l' .

M represents a crank which is secured on the inner side of the ratchet-wheel K, and the pin of which rotates within the stationary internal gear-rim, L.

n is a pinion which turns loosely on the crank M, and meshes with the gear-rim L, and n' is a gear-wheel which is formed in one piece with the pinion n , and made of larger diameter than the pinion.

N is a belt-pulley which is mounted loosely on the shaft h , and h' is a pinion formed on the hub of the pulley N, and meshing with the gear-wheel n' .

n^2 is an endless belt which runs around the pulleys N and e .

It is obvious that by the reciprocating movement of the rock-lever I a continuous rotary movement is imparted to the ratchet-wheel K, and this movement is transmitted to the belt-pulley N and the blower-shaft by the gear-wheels above described, in such manner as to produce a movement of increased speed in the pulley N in proportion to the relative dimensions of the gear-wheels whereby these parts are connected. The pawl i^2 is provided on its under side with a notch, o , and the pin o' on which the pawl is mounted is provided on its end with a lip, o^2 , with which the notch in the pawl can be made to coincide when the ratchet-wheel has been removed, so that the pawl is attached to the pin o' by slipping the pawl with its notch o over the lip o^2 of the pin o' before the pawl is applied to the ratchet-wheel, and then turning the pawl up to its working position and applying it to the ratchet-wheel, as represented in Fig. 9. When the pawl rests on the ratchet-wheel, the latter prevents the pawl from dropping down to that position in which it can be removed from the pin o' , and the pawl is thereby securely held on the pin o' during the operation of the machine.

o^3 represents a lip formed on the short arm i' of the bell-crank lever I, and projecting over the back of the pawl for the purpose of preventing the pawl from being raised higher than is necessary to clear the teeth of the ratchet-wheel when the machine is in operation, thereby preventing the pawl from being turned backwardly out of engagement with the ratchet-wheel.

In the modified construction of the multiplying-gear represented in Figs. 13, 14, and 15, the internal gear-rim, L, is replaced by an external gear-rim, L', which is secured to the shaft h by a set-screw passing through its hub.

In the modified construction represented in Fig. 16 the gear-wheels $n n'$ are mounted on a stationary arbor, which is secured to the shaft h by an arm, p , and the internal gear-rim, L, is secured to the ratchet-wheel K and turns with the latter on the arbor h . The increase of velocity produced by this device is comparatively small, and it is therefore not as desirable as the devices previously described.

A rotating pulley or crank may be substituted, if desired, for the pawl and ratchet mechanism for actuating the gear mechanism.

It will be seen that in my improved mechanism for driving the blower all of the gear-wheels which transmit the motion from the

ratchet-wheel to the primary pulley are mounted on the same shaft or arbor, thereby avoiding the use of a counter-shaft and rendering the mechanism very simple and compact.

5 Instead of actuating the lever to which the pawl is attached by a separate lever, F, the pawl-lever itself may be extended and be moved back and forth for setting the blower in motion; but this construction, although it
10 may be used in blacksmiths' blowers, is not desirable in a forge.

If the parts are so proportioned that the speed of the pinion h' is sufficient for actuating the blower without the further increase
15 derived from the belt-pulleys N and e , these belt-pulleys may be omitted and the pinion h' may be directly connected with the blower-shaft, when the mechanism whereby the pinion h' is rotated is arranged in the same axial
20 line with the blower-shaft, instead of on one side thereof, as represented in the drawings.

I claim as my invention—

1. The combination, with the bowl or hearth, of legs having lower diverging portions, and a rigid frame provided with sleeves surrounding said legs and adapted to be held
25 in place by the diverging lower portions of the legs, substantially as set forth.

2. The combination, with the bowl or
30 hearth, of legs having lower diverging portions and a rigid frame, B, connecting the lower portions of the legs, and composed of bars b' , and sleeves b , cast on the ends of said bars, substantially as set forth.

35 3. The combination, with the bowl or hearth, of legs A' , handles C, and divided collars c , whereby the handles are supported on the legs, substantially as set forth.

4. In a portable forge, the combination,
40 with the bowl or hearth, of an actuating-lever and a ball-and-socket joint, whereby said lever is supported on the bowl or hearth, substantially as set forth.

5. The combination, with the bowl or
45 hearth, of a bracket, f , provided with a spherical knuckle, g , and a lever, F, provided with a spherical socket, G, substantially as set forth.

6. The combination, with the bowl or
50 hearth, of a bracket, f , provided with a spherical knuckle, g , and a lever, F, provided with a spherical socket, G, cast around the knuckle g , substantially as set forth.

7. The combination, with the bowl or
55 hearth and blower, of an actuating-lever, F, ratchet-wheel K, pawl-lever I, connecting-rod j , and a ball-and-socket joint, whereby said connecting-rod is attached to the pawl-lever, substantially as set forth.

8. The combination, with the bowl or 60 hearth and blower, of an actuating-lever, a ball-and-socket joint, forming the fulcrum of the actuating-lever, a pawl-lever, and a ball-and-socket joint whereby the connecting-rod is connected with the pawl-lever, substan- 65 tially as set forth.

9. The combination, with the rotary fan, driving pulleys and belt, and ratchet mechanism, of the hand-lever F, connecting-rod j , having a spherical knuckle, j^2 , and pawl-le- 70 ver I, provided with a spherical socket, i^3 , cast around the knuckle j^2 , substantially as set forth.

10. The combination, with the rotary fan, driving pulleys and belt, and ratchet-wheel 75 K, of the pawl-lever I, having pin o' , provided with a lip, o^2 , and a pawl, i^2 , constructed with a notch, o , substantially as set forth.

11. In a portable forge, the combination, with a hearth and blower, of a ratchet-wheel, 80 K, to which the power is applied, a pinion, h' , from which the power is transmitted to the blower, (both wheels being mounted on the same axis or arbor,) and a connecting-gear mechanism whereby motion is transmitted 85 with increased velocity from the ratchet-wheel K to the pinion h' , substantially as set forth.

12. The combination, with the rotary fan and driving pulleys and belt, of the pawl- 90 lever I, ratchet-wheel K, and arbor h , the crank M, secured to the ratchet-wheel, a pinion, n , and gear-wheel n' , secured together and attached to the crank M, a stationary gear-rim, L, and a pinion, h' , substantially as set 95 forth.

13. The combination, with the rotary fan and driving pulleys and belt, of the pawl-le- 100 ver I, ratchet-wheel K, and arbor h , the crank M, secured to the ratchet-wheel, a pinion, n , and gear-wheel n' , secured together and attached to the crank M, a stationary gear-rim, L, a pinion, h' , and pulley N, secured to the pinion h' , substantially as set forth.

14. The combination, with the pawl-lever I, 105 ratchet-wheel K, and arbor h , of the crank M, secured to the ratchet-wheel, a pinion, n , and gear-wheel n' , secured together and attached to the crank M, a stationary gear-rim, L, a pinion, h' , a pulley, N, secured to the pinion 110 h' , a blower, D D', pulley e , and endless belt n^2 , substantially as set forth.

Signed this 9th day of November, 1883.

J. LESTER OSGOOD.

Witnesses:

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CARL F. GEYER.