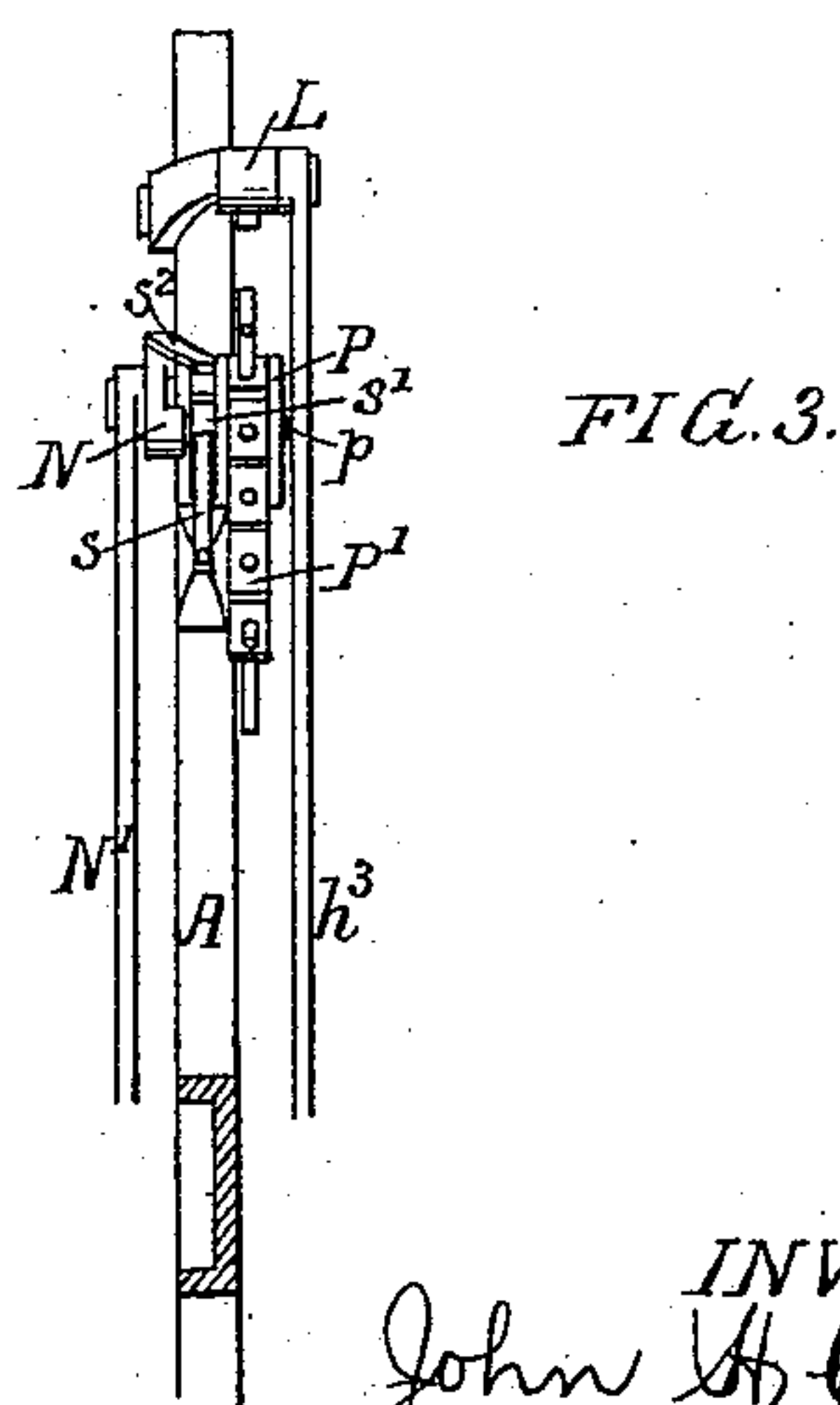
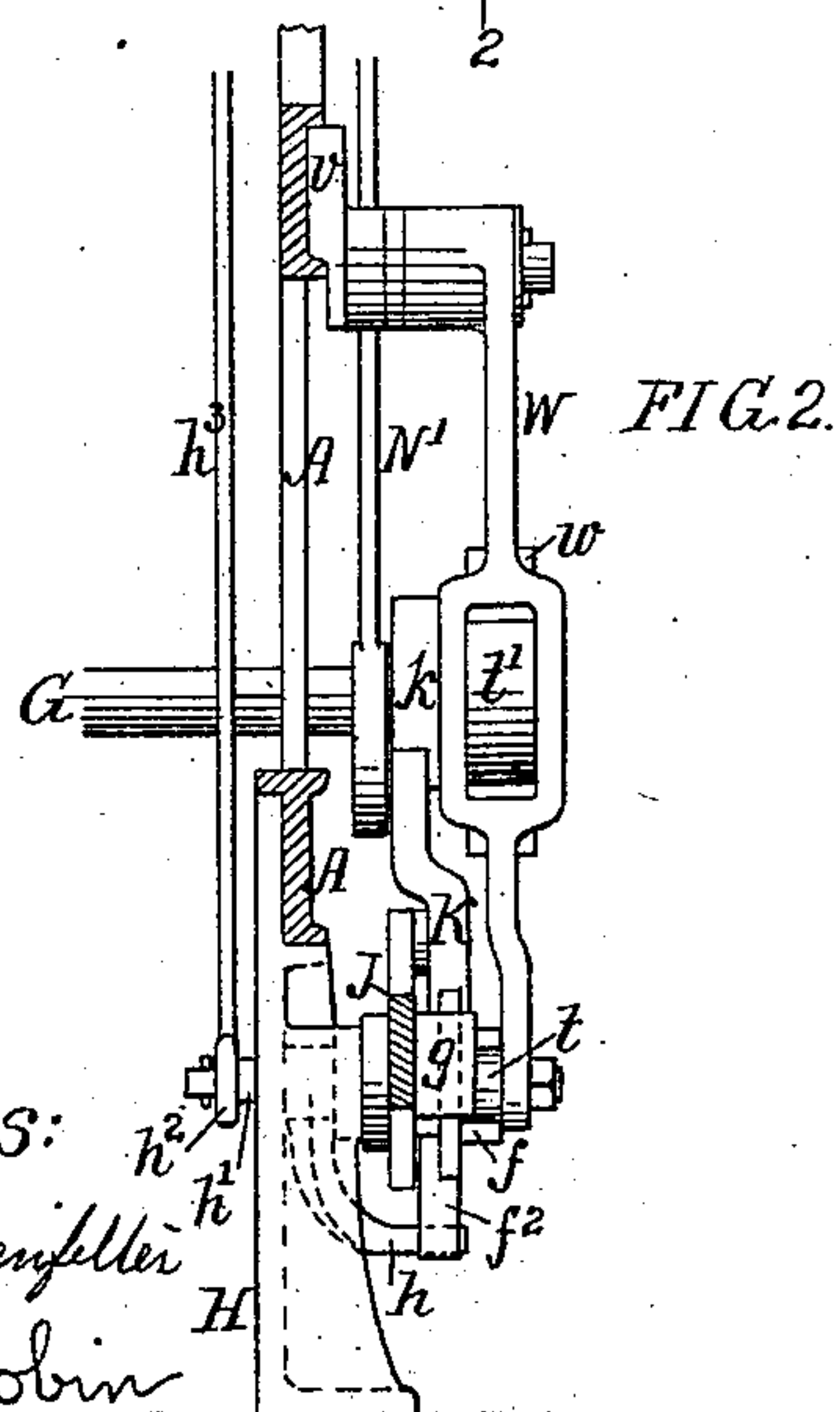
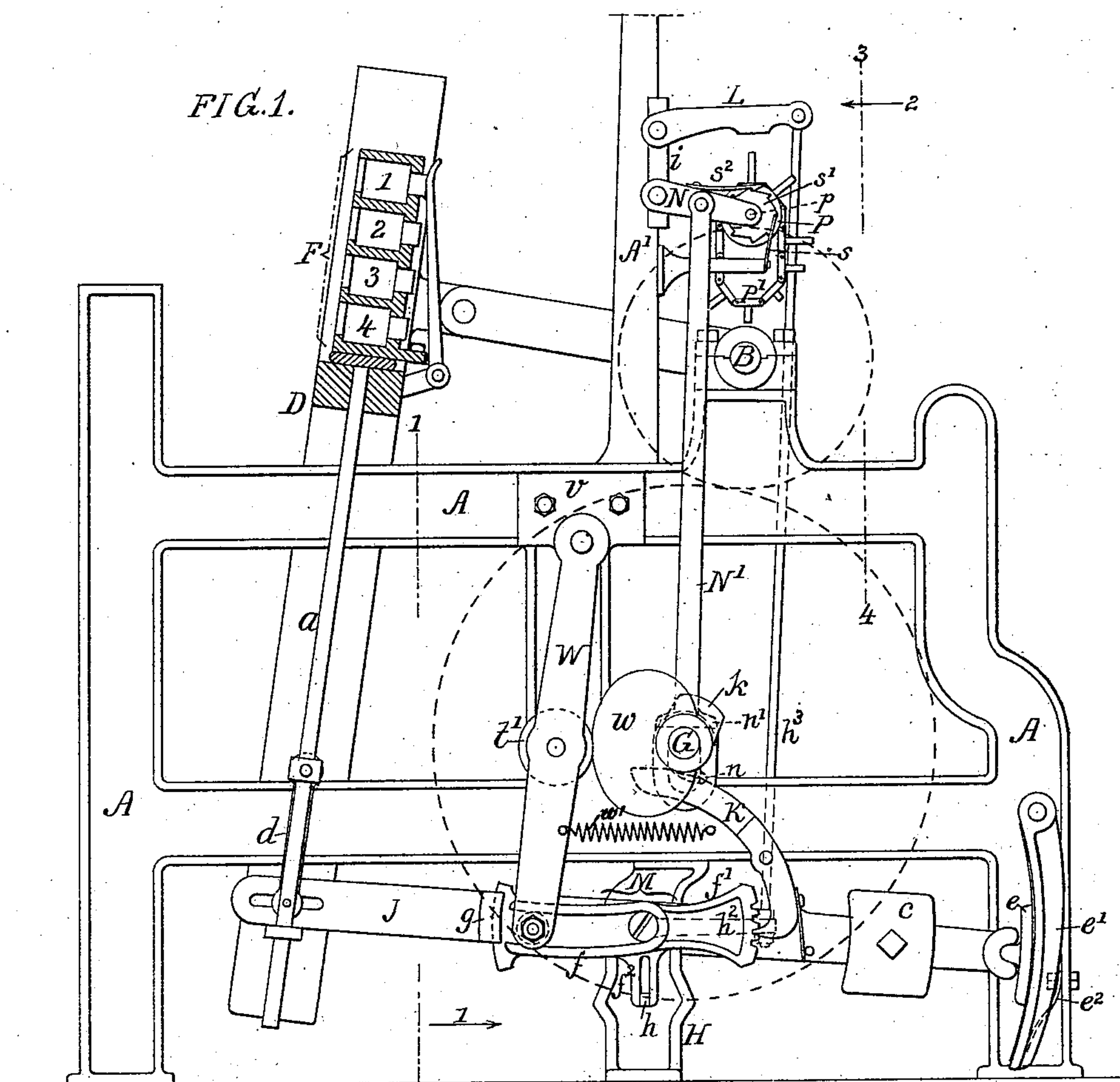


J. H. CROWLEY.

SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.

No. 313,578.

Patented Mar. 10, 1885.



WITNESSES:

Harry L. Ashenfelter
James J. Tobin

INVENTOR:

John H. Crowley
by his Attorneys
Howson and Son

(No Model.)

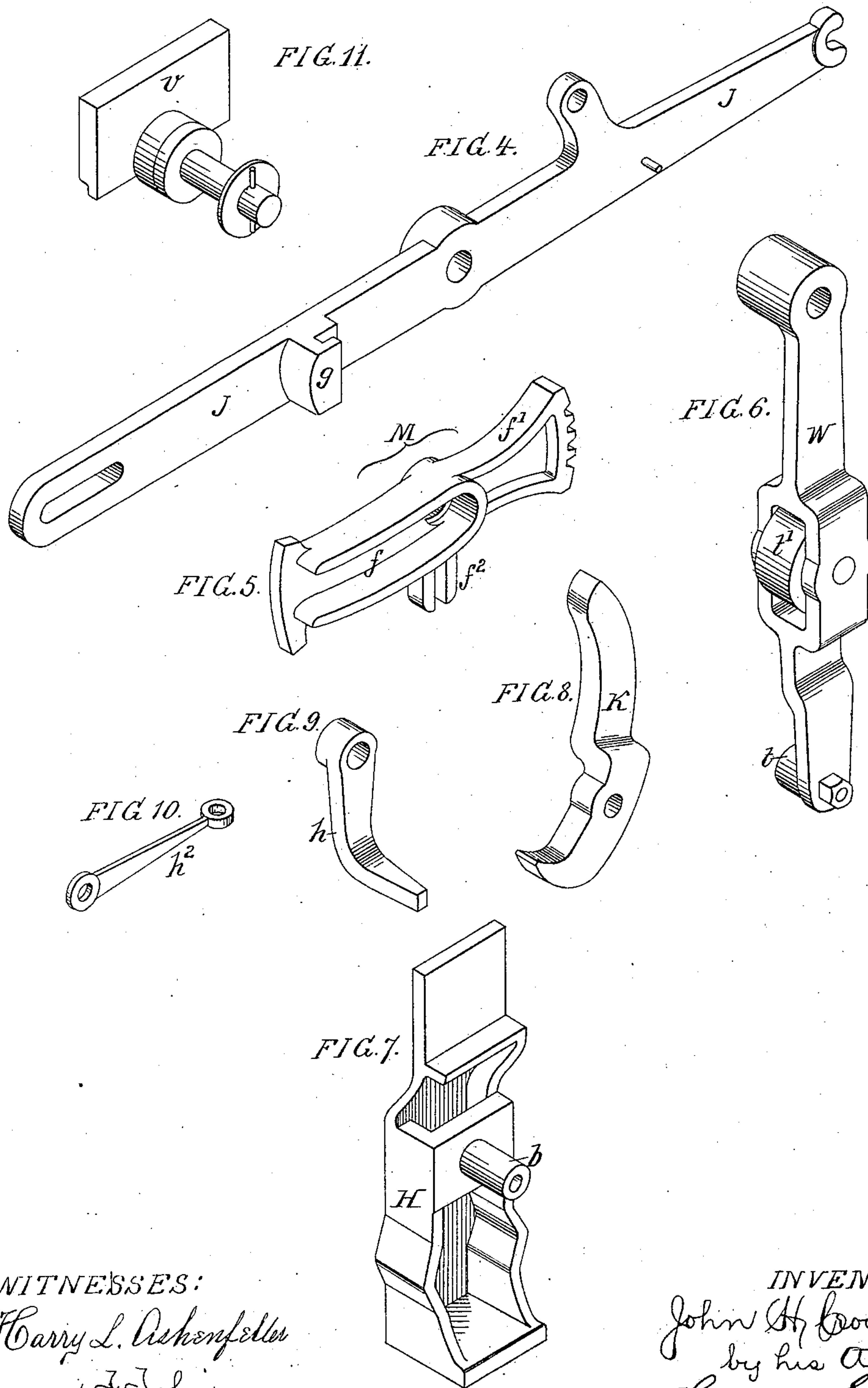
4 Sheets—Sheet 2.

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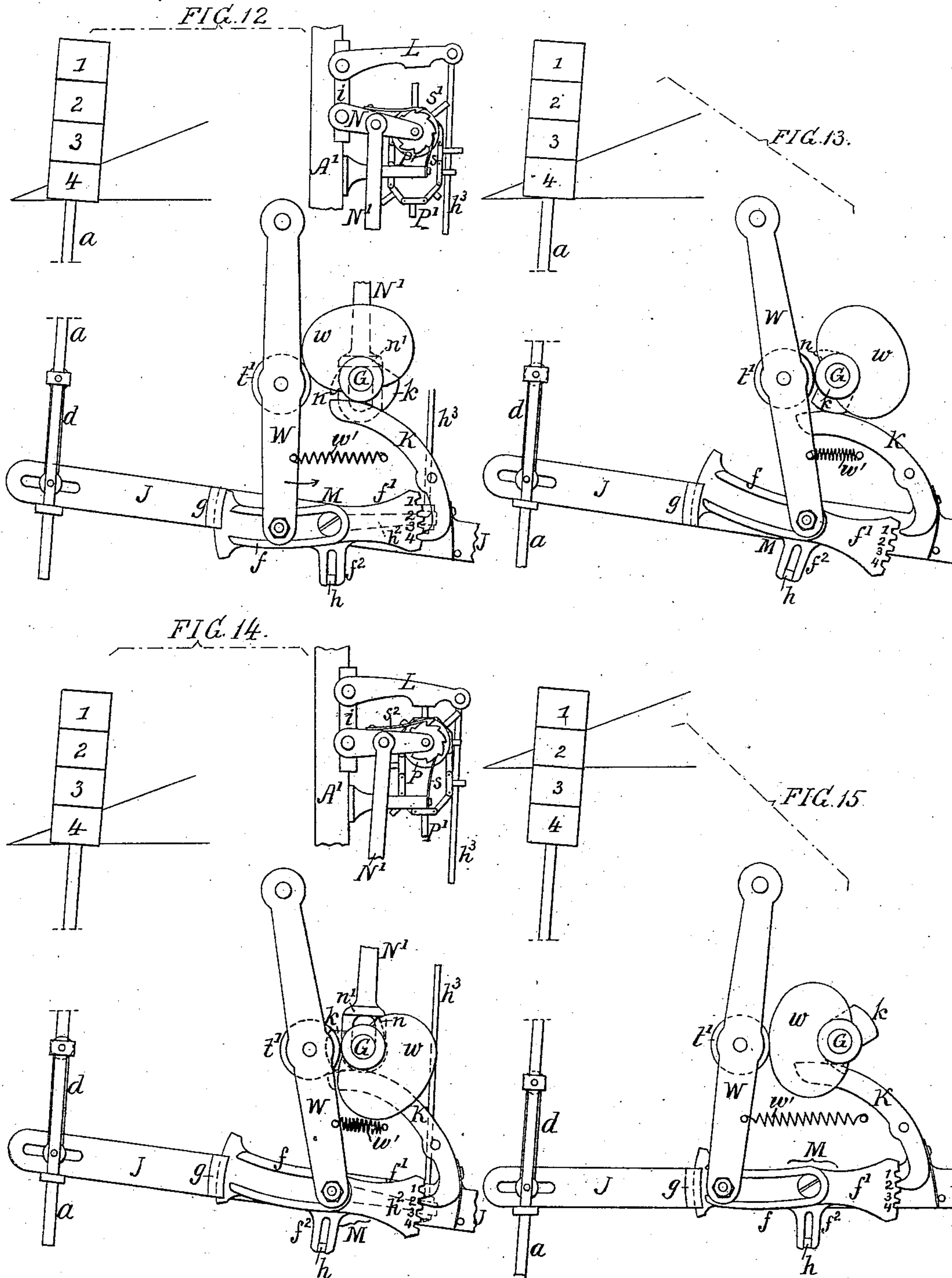
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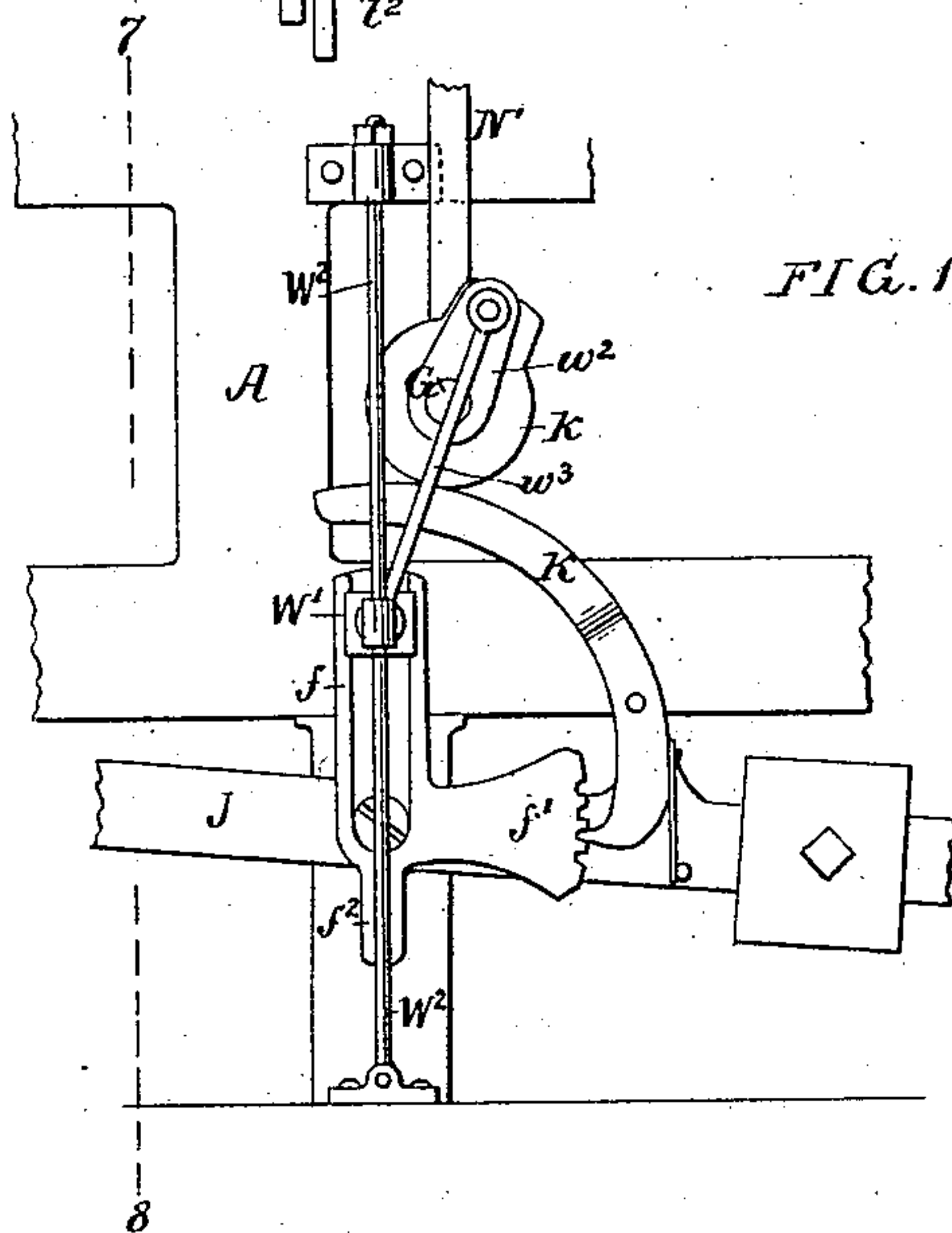
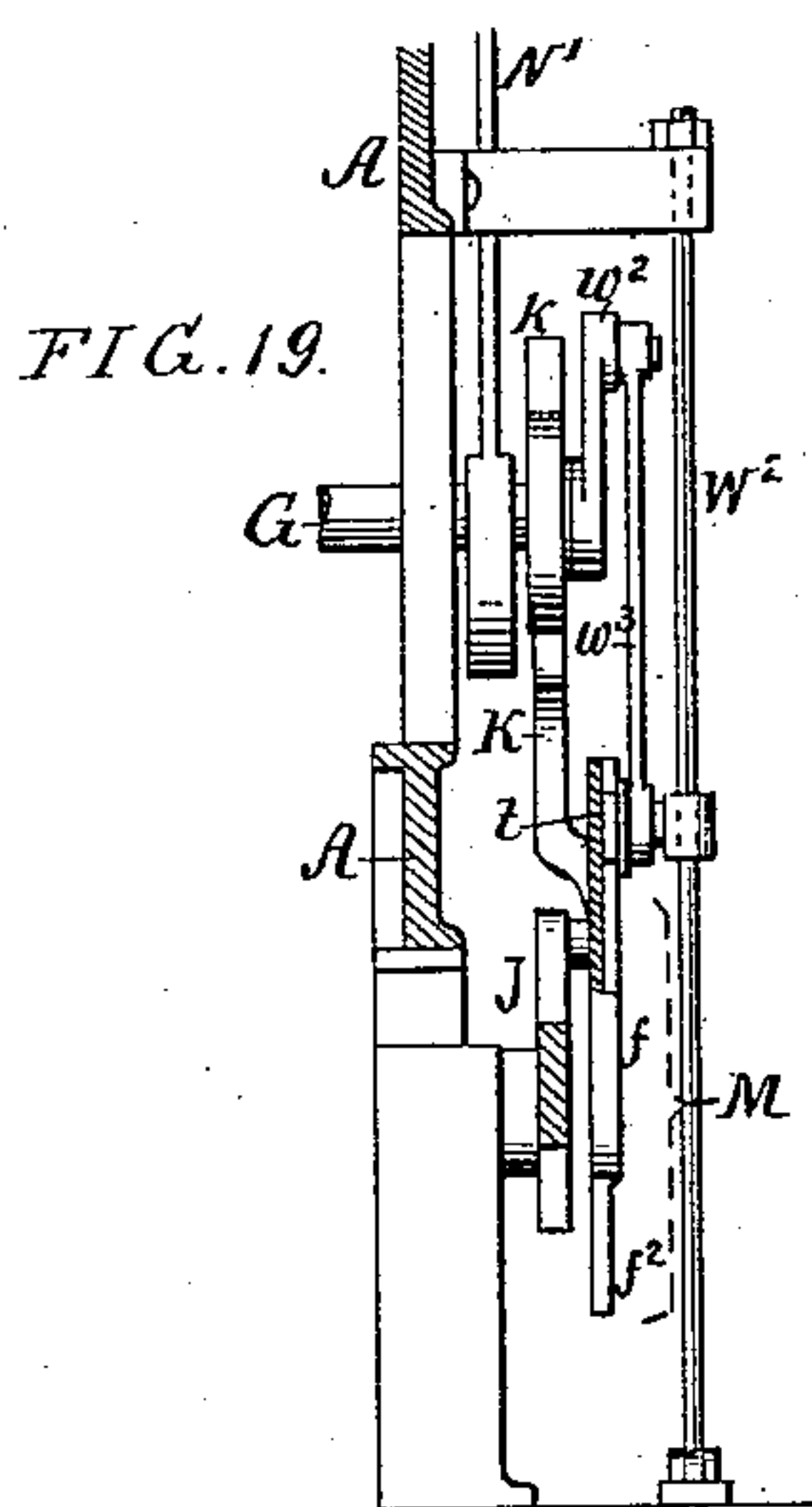
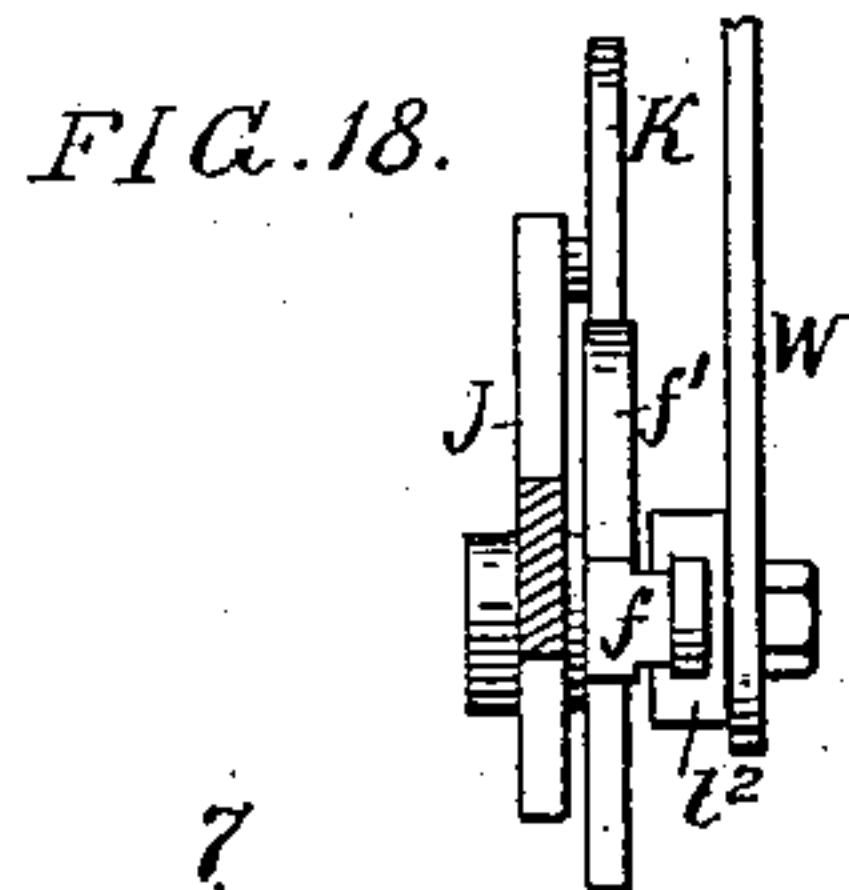
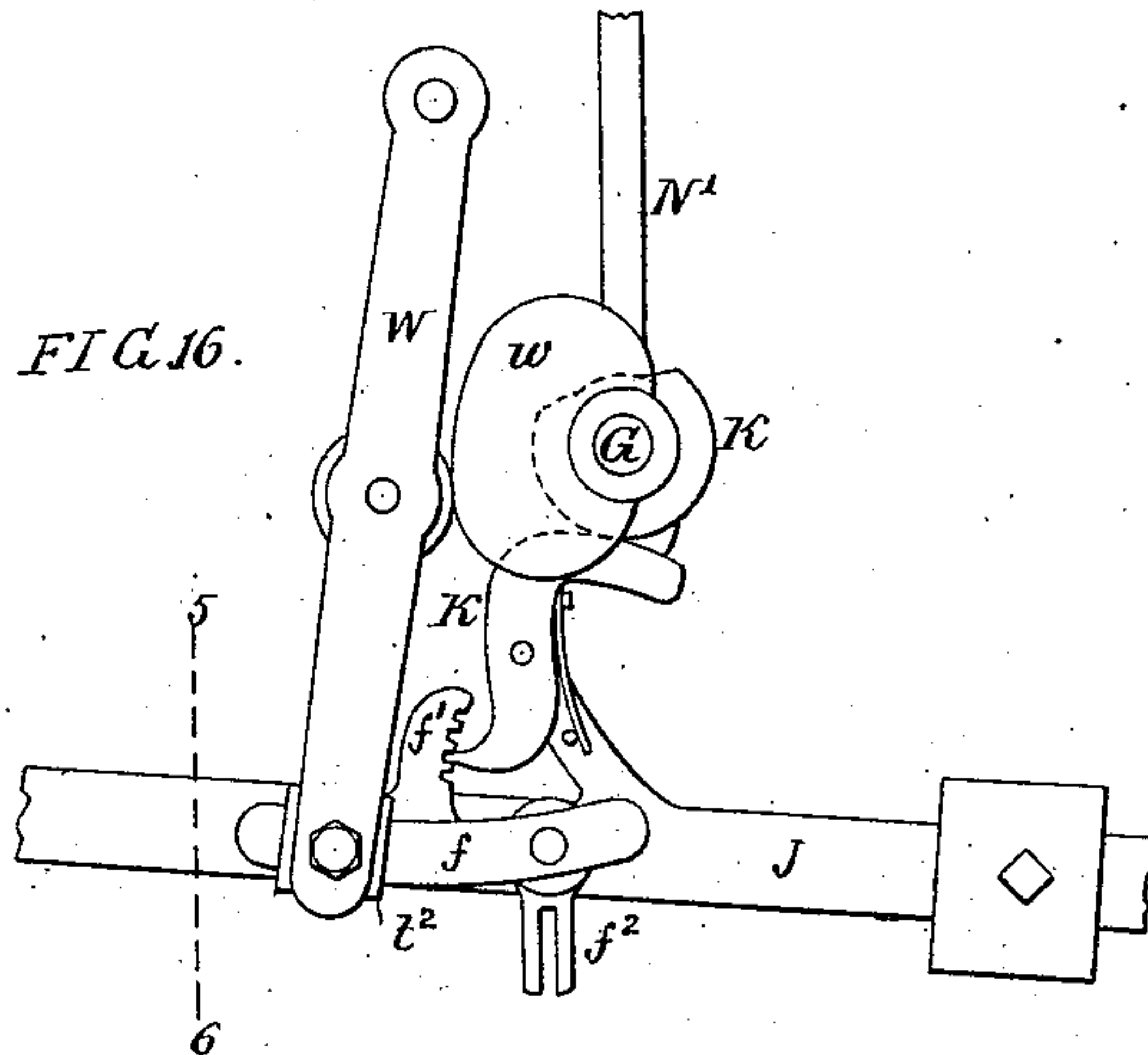
4 Sheets—Sheet 4.

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WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN H. CROWLEY, OF PHILADELPHIA, PENNSYLVANIA.

SHUTTLE-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 313,573, dated March 10, 1885.

Application filed June 18, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. CROWLEY, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Shuttle-Box-Operating Mechanism for Looms, of which the following is a specification.

The object of my invention is to provide simple, compact, and efficient mechanism for operating the shuttle-boxes of a loom; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a partly sectional side view of sufficient of a loom to illustrate my invention; Fig. 2, a transverse section on the line 1 2, Fig. 1, looking in the direction of the arrow 1; Fig. 3, a transverse section on the line 3 4, Fig. 1, looking in the direction of the arrow 2; Figs. 4 to 11, Sheet 2, perspective views of parts of the devices; and Figs. 12 to 15, Sheet 3, diagrams illustrating the operation of the devices; Figs. 16 to 19, Sheet 4, being views illustrating modifications of my invention.

A represents one of the side frames of the loom; B, the crank-shaft; D, the pivoted lay connected thereto; F, the drop-boxes; *a*, the guided drop-box rod, and G the cam-shaft driven from the crank-shaft B by spur-gearing, as shown by dotted lines.

To a pin, *b*, on a standard, H, bolted to the lower part of the frame A, is hung the drop-box lever J, one end of which is connected by a link, *d*, to the rod *a*, the opposite end having a counter-weight, *c*, and a pivoted brake-shoe, *e*, adapted to a segmental arm, *e'*, which is hung to the frame, and is acted upon by a spring, *e''*, so as to exercise a braking or retarding influence on the movement of the lever J.

Hung to the pin *b* is a lever, M, one arm, *f*, of which is grooved, and is guided by a recessed rib, *g*, on the lever J, the other arm, *f'*, of the lever having a segmental end, in which are formed a series of notches for the entrance of the end of the short arm of a catch-lever, K, hung to a projection on the lever J, the long arm of said lever K being under the influence of a cam, *k*, on the shaft G. The lever M has a third arm, *f''*, which is slotted for the

reception of the end of a bent arm, *h*, secured to a rock-shaft, *h'*, which is adapted to a bearing in the standard H, and has another arm, *h''*, connected by a rod, *h'''*, to an arm, L, hung to a bracket, *i*, on a vertical standard, A', of the frame. The bracket *i* carries another arm, N, to which is connected a rod, N', the lower end of which is slotted for adaptation to the shaft G, and has a toe, *n'*, upon which acts a cam, *n*, on said shaft. The outer end of the arm N carries a spindle, *p*, on which turns a wheel, P, carrying a pattern-chain, P', the pins of which act upon the arm L, as described hereinafter, a spring-pawl, *s*, acting on a ratchet-wheel, *s'*, on the wheel, and serving to turn said wheel part way around on each descent of the arm N, a retaining-pawl, *s''*, on the latter preventing back movement of the wheel.

To the grooved face of the arm *f* of the lever M is adapted an anti-friction roller, *t*, carried by the lower end of an arm, W, hung at the upper end to a pin on a bracket, *v*, secured to the frame A, another roller, *t'*, on the arm W, being under the influence of a cam, *w*, on the shaft G, against which cam the said roller *t'* is caused constantly to bear by means of a spring, *w'*, connected at one end to the arm and at the other to a suitable stud on the frame A.

The operation of the device is as follows, reference being had to Figs. 12 to 15 of the drawings: Supposing that the boxes have been raised to their full extent, as shown in Fig. 12, the lowest box, 4, being in line with the shuttle-race, the lowest notch, 4, of the lever M in engagement with the catch-lever K, the pattern-wheel and chain at the limit of their downward movement, and the arm W approaching the limit of its inward movement so as to bring the roller *t* in line with the fulcrum-pin *b* of the levers J and M, where it will offer no resistance to the vibration of said lever M. The first step in effecting a change of boxes after the roller *t* has reached a position in line with the fulcrum *b* is the release of the lever M from the control of the catch-lever K, which is effected by the action of the cam *k* on said lever, as shown in Fig. 13. As soon as the notched arm *f'* of the lever M is free from the control of the catch-

lever it drops, its weight, assisted by the weight of the arms h^2 and L and rod h^3 , overcoming the weight of the arm f of the lever, and thus bringing the top notch, 1, in line with the end of the catch-lever. (See Fig. 13.)
 5 Supposing that it is desired to lower to the extent of three boxes—that is to say, so as to bring the box 2 in line with the shuttle-race—when the pattern-chain P' is elevated by the
 10 action of the cam n on the rod N' and arm N, a pin on said chain strikes the lever L and raises the same, this movement being transmitted through the medium of the rod h^3 , arm h^2 , shaft h' , and arm h to the lever M, and being
 15 sufficient in extent to bring the notch 2 of the arm f' in line with the catch-lever, which is then released from the control of the cam k , enters the notch, and locks the lever M to the drop-box lever J. (See Fig. 14.) The arm f
 20 of the lever M is thus brought into a position which is eccentric in respect to the arc of a circle, in which the lower end of the arm W moves, and as the latter arm is thrust outward under the action of the cam w the said
 25 arm f , under control of the roller t , is depressed, a like movement being imparted to the drop-box lever, and the lowering of the boxes to the proper extent being thus effected. (See Fig. 15.) If it is desired to raise
 30 the drop-boxes, the lever M is adjusted so that its arm f is inclined downward from the path of the roller t , hence as the arm W is swung outward the lever M, and with it the drop-box lever, will be raised. It will thus be seen
 35 that the movement of the drop-box lever is due to the eccentricity of the arm f in respect to the path of the roller t , the extent of the eccentricity, and the consequent extent of movement imparted to the lever on each vibration of the arm W, being controlled by the
 40 pattern-chain P' .

Various modifications of the devices shown within the scope of my invention will readily suggest themselves to those familiar with the construction of looms. For instance, a simple
 45 arm, f , instead of a lever, M, may be used. The lower end of the arm W, instead of having a pin or roller adapted to a grooved arm, f , may have a block adapted to embrace said
 50 arm, and instead of being carried by a vibrating arm said pin, roller, or block may be carried by a reciprocating slide operated by a crank or its equivalent, either directly or through the medium of intervening gearing.
 55 Where I use the term "pin," therefore, it should be understood as including a pin, roller, block, or other device for controlling the arm f . In Sheet 4 of the drawings I have shown four views embodying these modifications, Figs. 16 and 17 being side views, and
 60 Figs. 18 and 19 sections, respectively, on the line 5 6, Fig. 16, and 7 8, Fig. 17. In Figs. 16 and 18 the arm f' projects from the side of a pivoted arm, f , which is embraced by a

block, t^2 , at the lower end of the arm W, the character of the locking-lever K being changed to accord with the changed position of the arm f' . In Figs. 17 and 19 the arm f of the lever M is at right angles to the arm f' , and receives a pin, t , projecting from a slide, W' , which is guided on a vertical rod, W^2 , and is reciprocated by a crank, w^2 , on the shaft G, said crank being connected to the slide by a rod, w^3 .

The operation of these devices is practically the same as those shown in Figs. 1 to 15, and will be readily understood without further detailed description.

I claim as my invention—

1. Drop-box mechanism in which are combined a drop-box lever, an arm, f , pivoted in line with the fulcrum of the lever, a pin or equivalent device controlling said arm, means for vibrating or reciprocating the pin, and mechanism whereby the arm f is adjusted and locked to or released from the drop-box lever, as set forth.

2. The combination of the drop-box lever J, an arm, f , pivoted in line with the fulcrum of the lever, a pivoted arm, W, having a pin adapted to a groove in the arm f , a cam for vibrating said arm W, and means, substantially as described, for adjusting the arm f and for locking the same to and releasing it from the lever J, as set forth.

3. The combination of the drop-box lever J, the lever M, fulcrumed in line with the same, the catch-lever K, hung to the lever J and adapted to engage with the arm f' of the lever M, a cam for actuating said lever K, means for adjusting the lever M, a pin or equivalent device controlling the arm f of the lever, and mechanism for vibrating or reciprocating said pin, as set forth.

4. The combination of the drop-box lever J, the lever M, fulcrumed in line therewith, the arm L, connected to said lever M, the pattern-chain for acting on said arm L, a pin or equivalent device controlling the lever M, and means, substantially as described, for vibrating or reciprocating said pin for operating the pattern-chain and for locking the lever M to and releasing it from the lever J, as set forth.

5. The combination of the drop-box lever, the lever M, mechanism for locking the latter to and releasing it from the drop-box lever, the arm L, connected to the lever M, the pattern-chain wheel, and mechanism for rotating, raising, and lowering the latter, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. CROWLEY.

Witnesses:

HARRY L. ASHENFELTER,
HARRY SMITH.