

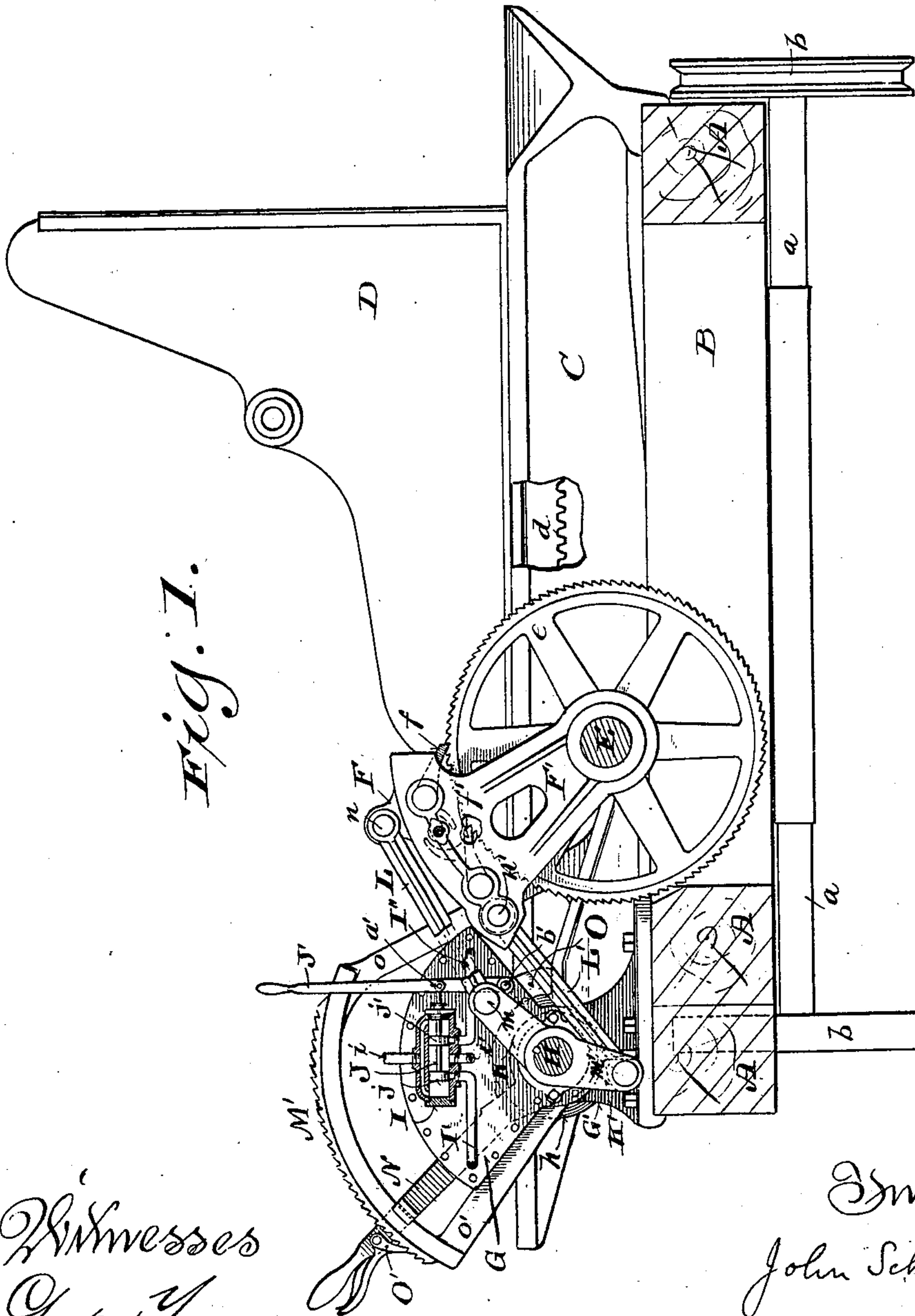
No. 679,037.

Patented July 23, 1901.

J. SCHERER.
SAWMILL SET WORKS.
(Application filed May 11, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Businesses
Geo. W. Young.
B. C. R. Off.

Inventor
 John Scherer
 By H. G. Underwood
 Attorney

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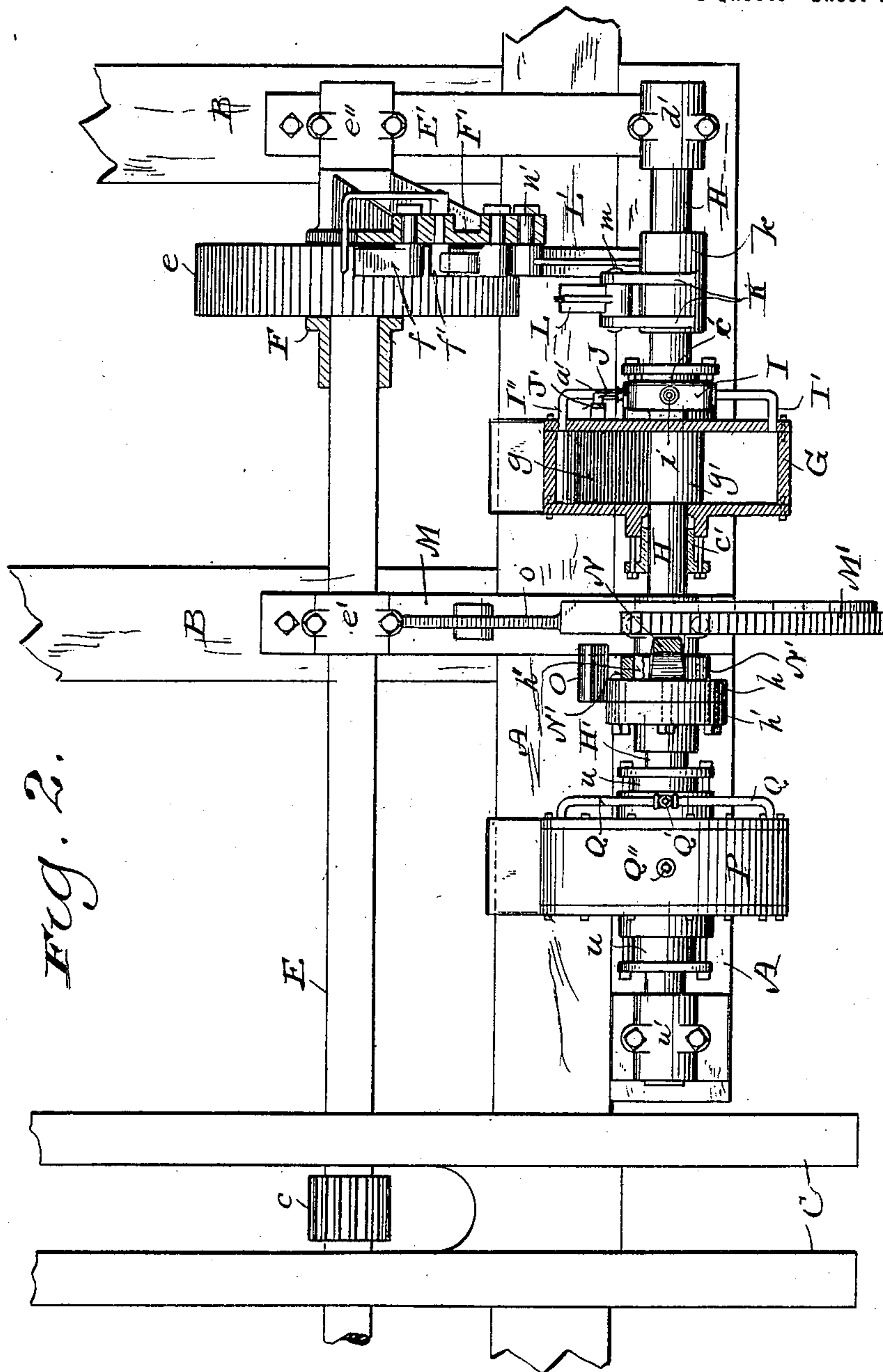


Fig. 2.

Witnesses:
Geo. W. Loney
B. C. Roloff

Inventor
John Scherer
By H. G. Underwood
Attorney

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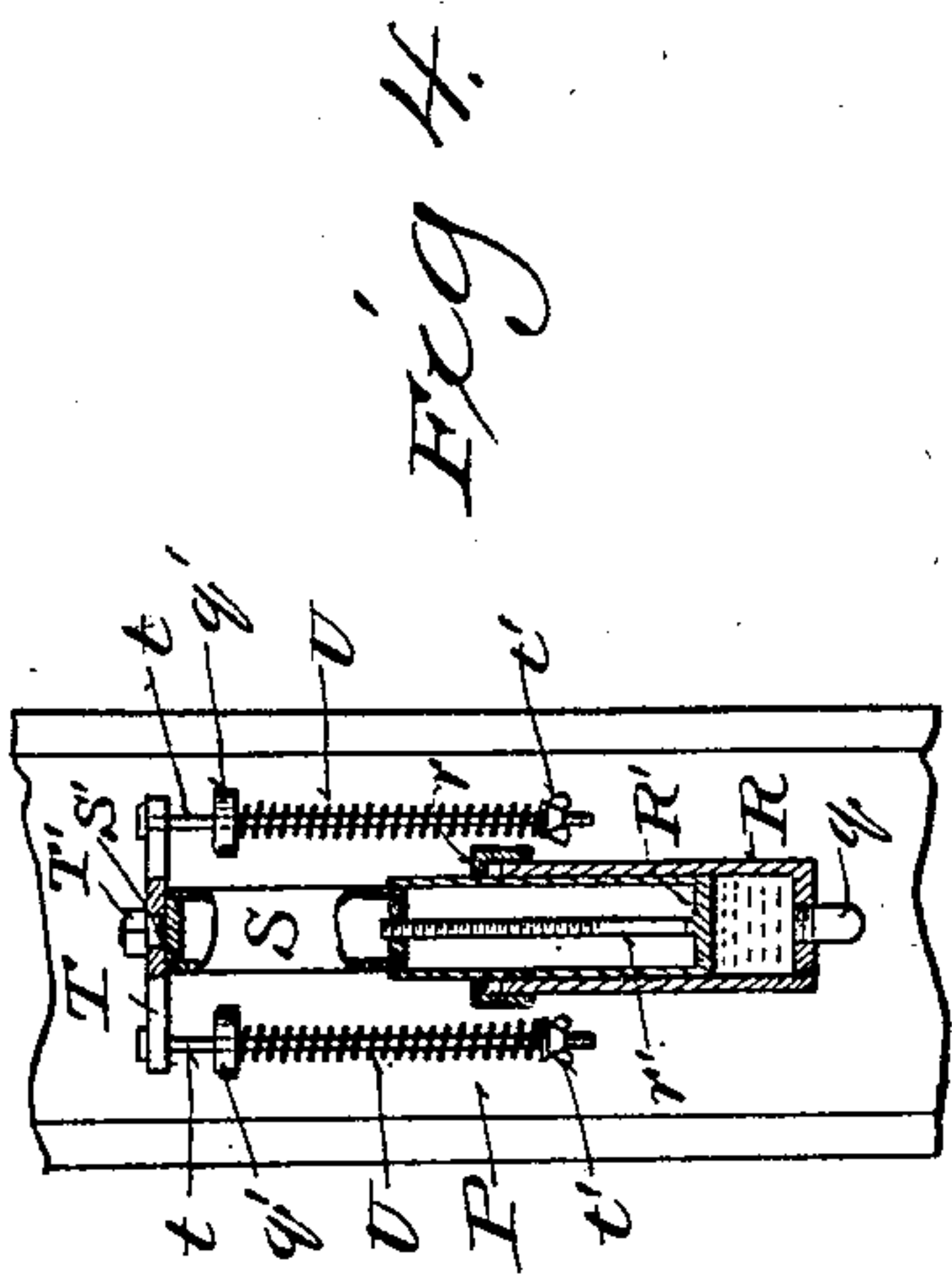


Fig. 4.

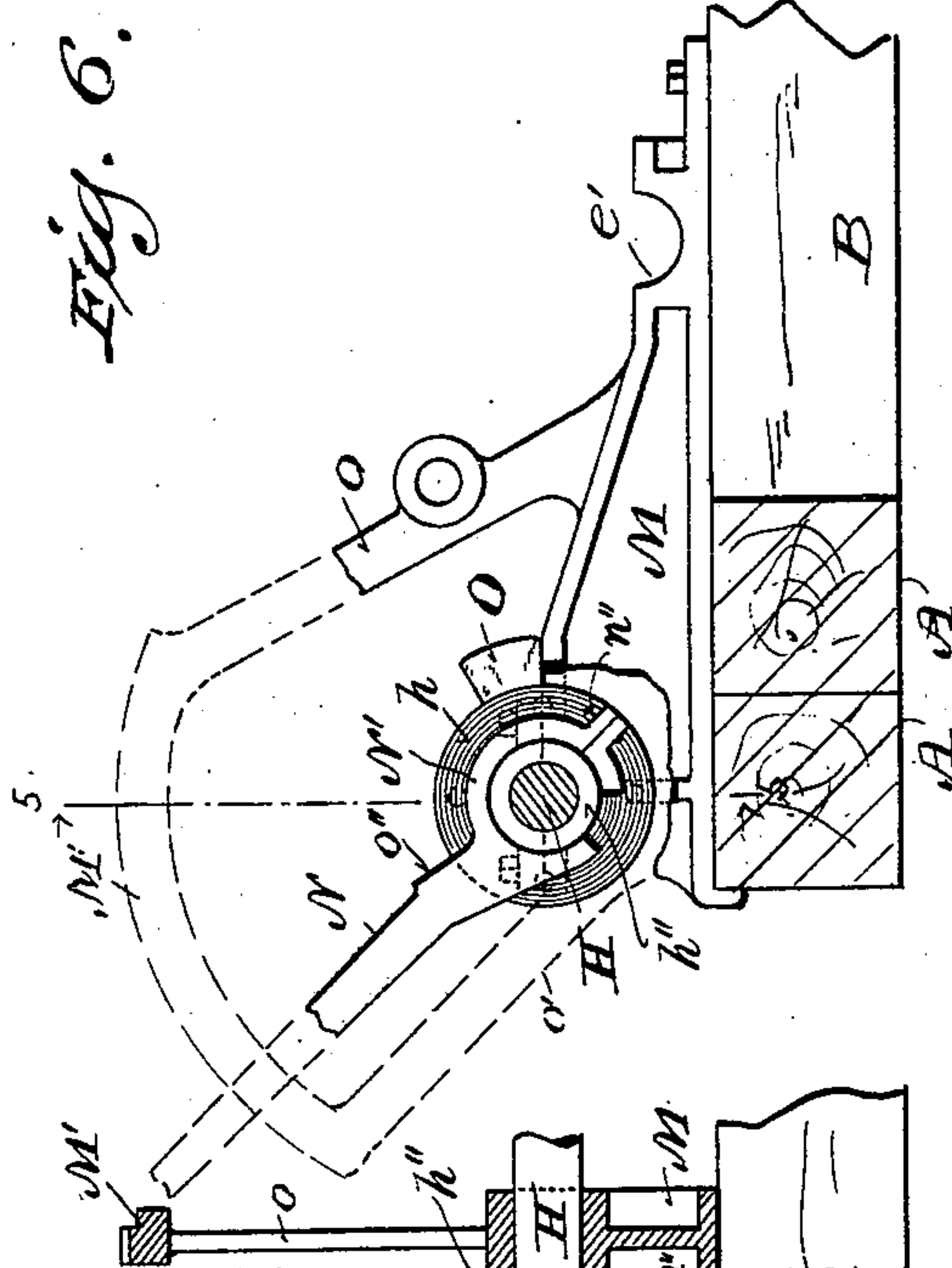


Fig. 6.

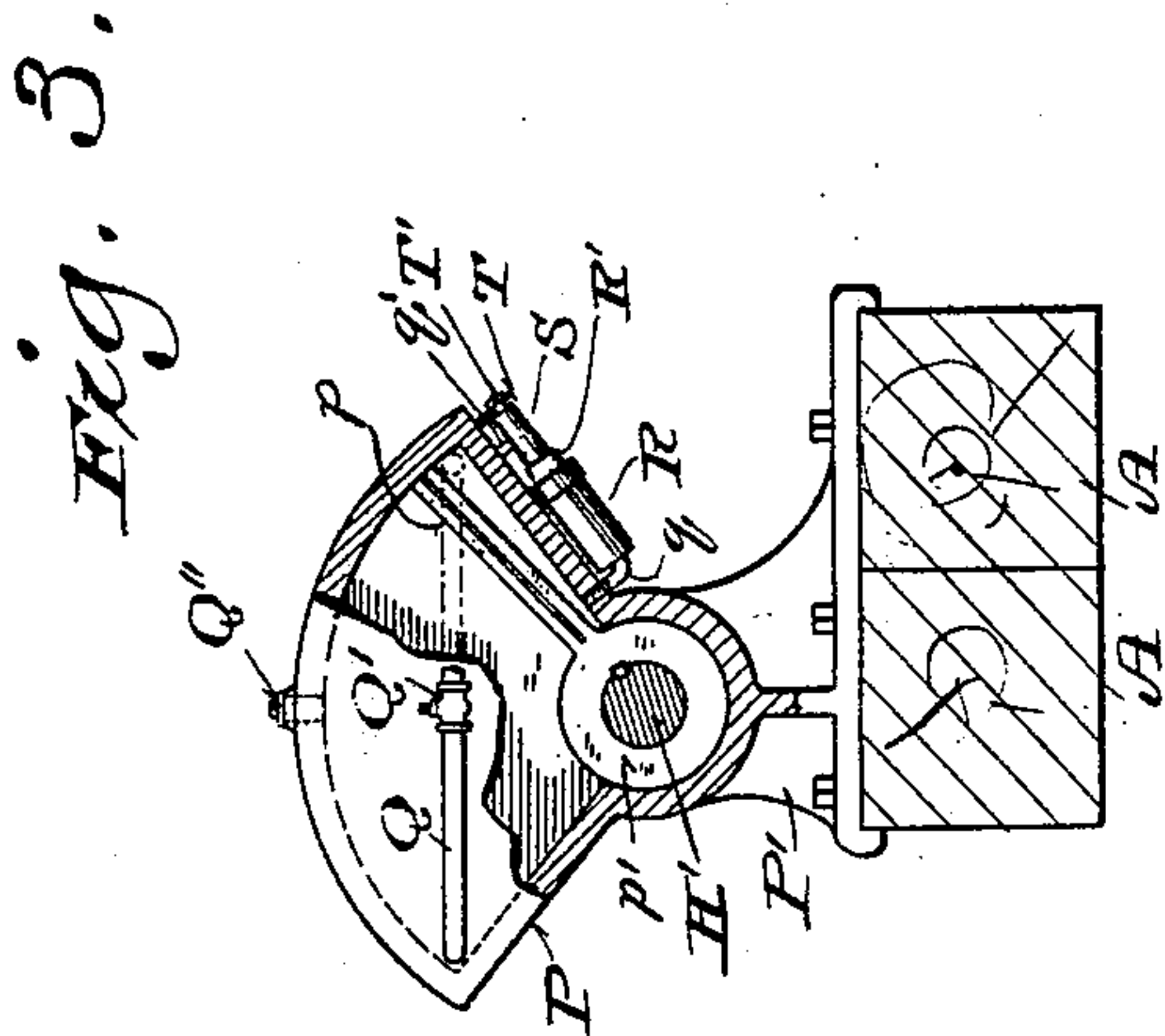


Fig. 3.

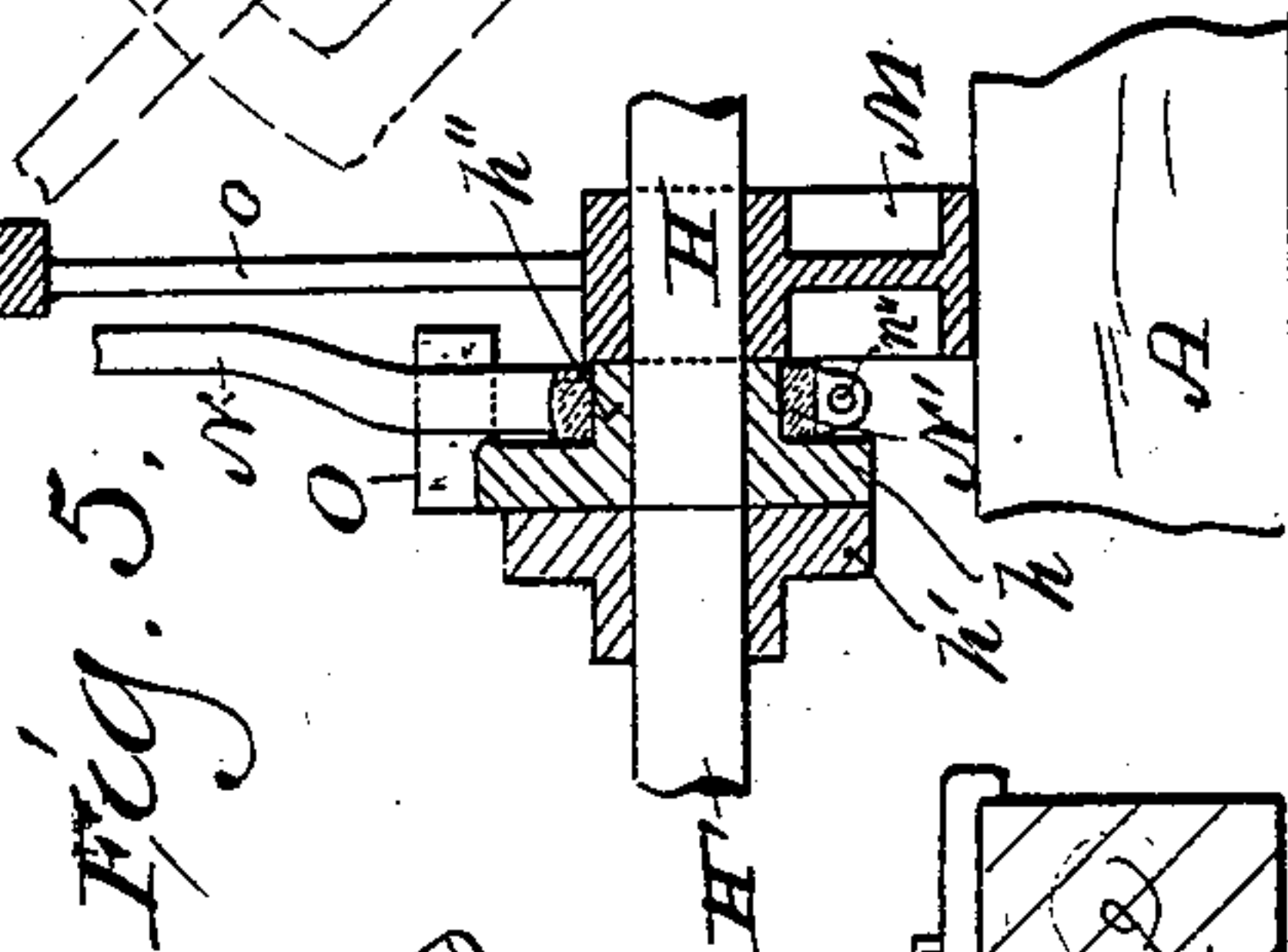


Fig. 5.

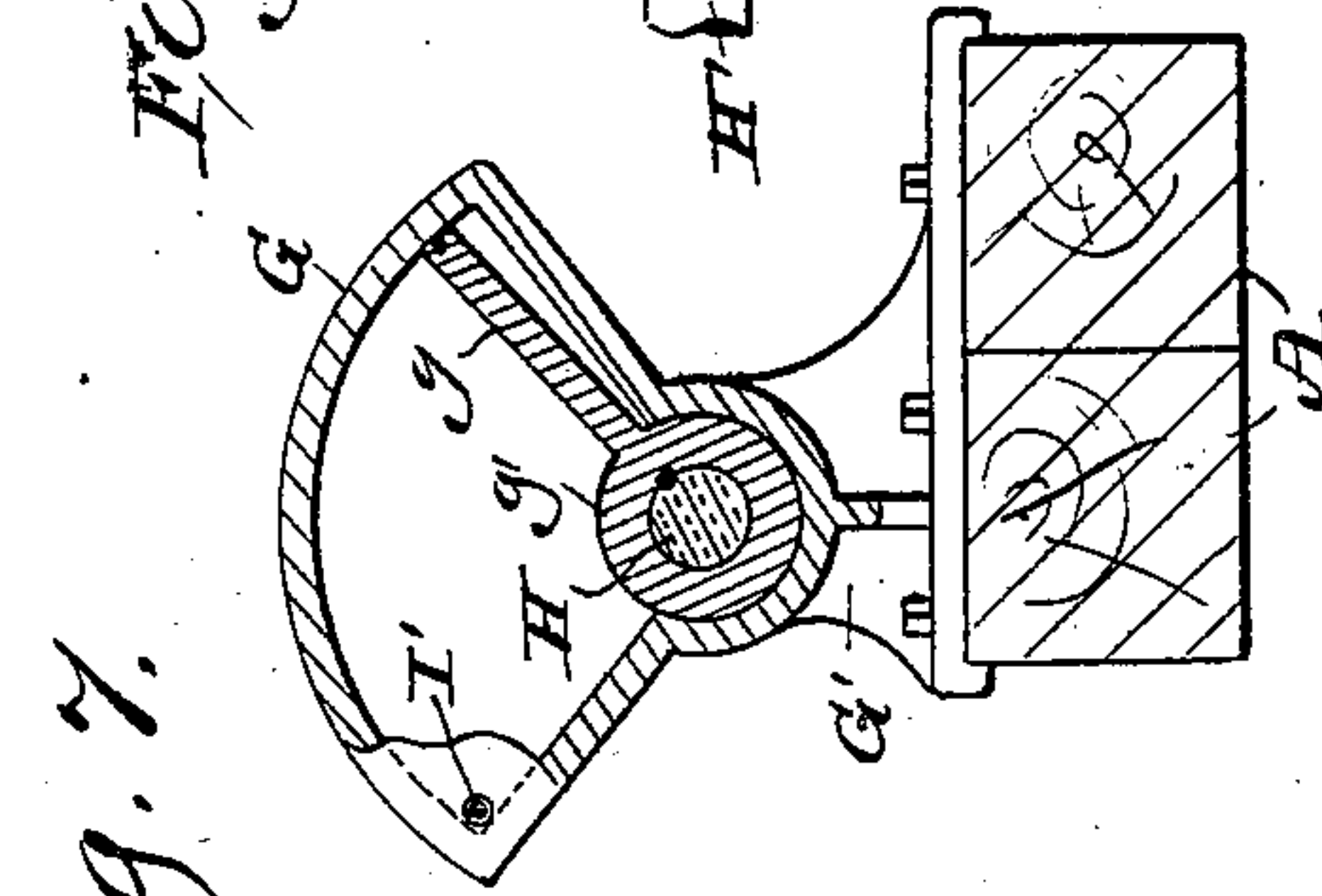


Fig. 7.

Witnesses:
Geo. H. Young,
B. C. R. Laff.

Inventor
John Scherer,
By H. G. Underwood
Attorney,

UNITED STATES PATENT OFFICE.

JOHN SCHERER, OF MENEKAUNEE, WISCONSIN.

SAWMILL SET-WORKS.

SPECIFICATION forming part of Letters Patent No. 679,037, dated July 23, 1901.

Application filed May 11, 1900. Serial No. 16,300. (No model.)

To all whom it may concern:

Be it known that I, JOHN SCHERER, a citizen of the United States, and a resident of Menekaunee, in the county of Marinette and State of Wisconsin, have invented certain new and useful Improvements in Sawmill Set-Works; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has especial reference to the class of sawmill set-works operated by steam; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a view in side elevation of portions of a carriage and the set-works mounted thereon embodying my present invention, parts being broken away or in section to better illustrate certain details of construction. Fig. 2 is a partly-sectional plan view of the same. Fig. 3 is a partly-sectional detail view of an oil-chest and adjacent parts forming part of my invention. Fig. 4 is a detail partly-sectional view of a regulating attachment on said oil-chest. Fig. 5 is a detail sectional view taken on the line 5 5 of Fig. 6. Fig. 6 is a broken view illustrating details of construction of the stop mechanism. Fig. 7 is a sectional view of the steam-chest and the oscillating piston contained therein.

Referring to the drawings, A A represent the transverse sills, and B B the longitudinal sills, of a log-carriage of ordinary construction, provided with the usual axles *a* and track-wheels *b*.

C represents the head-block, and D the knee, longitudinally movable thereon, said knee having a longitudinally-disposed rack *d* on its under side for engagement with the pinion *c* on the shaft E, which has its outer bearing in box *e''* on a base-plate E', secured to the sills, all of these parts being of common and well-known construction, as is the ratchet-wheel *e*, fast on said shaft E, the plates F F', loose on said shaft, and the dogs *ff'*, carried by said plates, the dogs on the plate F' only being shown in the present drawings.

G represents a sector-shaped steam-chest, and *g* an oscillating piston therein, whose hub *g'* is keyed to a shaft H, and H' is an-

other shaft in line with the said shaft H, to which it is firmly united by couplings *h h'*, as shown.

I represents a valve-casing having open pipes I' I'' connecting the same with the said steam-chest, an inlet-pipe *i* for the live steam, and an exhaust-pipe *i'* for the exhaust, all as best shown in Figs. 1 and 2. The steam-chest G is formed with a base G', secured to the rear transverse sills A A. The said base is interiorly shaped to form a bearing for the piston-hub *g'*, the shaft H passes through stuffing-boxes *c' c'* on the steam-chest, and the outer end of said shaft has bearing in a box *d'* on base-plate E'.

J represents a valve-stem, and *j j'* valves thereon within the described valve-casing I, said valve-stem J projecting through one suitably-stuffed end of said valve-casing and being pivotally attached, as shown at *a'*, to the upright lever J', the lower end of said lever being itself pivotally attached, as shown at *b'*, to the adjacent outer face of the described steam-chest G. Keyed to the shaft H, adjacent to said steam-chest, is a hub *k*, from which pairs of upper and lower arms K K' project at obtuse angles to each other, forming a crank. L L' represent connecting-rods between the said crank-arms and the described dog-carrying plates F F' loose on the shaft E, the pivot-bolts of the rod L being shown at *m n* and those of the rod L' being marked *m' n'* and only the upper end or projecting ear of the plate F being shown in Fig. 1 and the loose hub of said plate being shown in Fig. 2, the balance of said plate, (which corresponds in construction to plate F',) as well as the similar dogs carried by plate F, being omitted from the drawings, so as not to obscure the adjacent parts which are therein shown.

M designates a base-plate secured to one of the inner longitudinal sills B and extending over the outer transverse sill A of the log-carriage, (said plate M being provided with a suitable box or bearing *e'* for the described shaft E,) and rigidly secured to and rising from said base-plate are backwardly-extending arms *o o'*, united by a curved rack-bar M'.

N is a stop-lever whose lower end is formed into a strap N', split and held together by bolt *n''*, so as to be loosely mounted on the

hub h'' of the coupling h , which coupling is further provided with a stop-lug O , adapted to contact at proper times with the properly-shaped edge o'' of said stop-lever N , which lever carries a spring-controlled dog O' for engagement with any particular tooth on the rack M' to which it had been set in the desired adjustment.

P represents an oil-chest of sector shape corresponding exactly to shape of the described steam-chest G , and like same the oil-chest is formed with a base P' , secured to the same sills $A A$ and interiorly shaped to form a bearing for the hub p' of an oscillating piston p , said hub being keyed to the described shaft H' . Q represents an open-ended oil-pipe communicating with the interior of the said oil-chest at the extreme ends thereof beyond the throw of the piston g , said pipe being provided with a regulating-valve Q' at its center, and Q'' designates the oil-inlet, having a suitable closure.

R represents a supplementary oil-chamber of preferably cylindrical form supported at one end and outside of the oil-chest Q , and having a pipe q leading from the bottom of the chamber R to and within the adjacent lower end of said oil-chest.

R' is a hollow or tubular close-bottomed open-topped plunger fitting within the chamber R , and having a central screw-threaded rod r' projecting up from the bottom thereof, the said plunger fitting closely within the said chamber and passing through a stuffing-box r , secured to the upper end of said chamber R . S is a hollow or tubular casing fitting within said plunger and closed at top and bottom, except for a screw-threaded bore in the bottom plate to receive the described screw-threaded rod r' , and having a screw S' projecting upwardly from the top plate thereof. T is a cross-head having a central perforation for the reception of the said screw S' , which receives a nut T' to keep the said parts tightly together, and the said cross-head is further provided with perforations therethrough adjacent to each end thereof for the reception of bolts $t t$, screw-threaded at their lower ends, which bolts also pass through holes in the lugs $q' q'$ projecting outwardly from the end of the oil-chest, after which the said bolts receive spiral springs $U U$, held in place and adjusted as to their tension by means of nuts $t' t'$ on the described lower screw-threaded ends of said bolts.

The described shaft H' passes through stuffing-boxes $u u$ on the oil-chest P , and the extreme free end of said shaft has its bearing in a box u' on the outer transverse sill A .

The operation of my invention will be readily understood from the foregoing description of its construction, taken in connection with the accompanying drawings. The functions and method of operation of the head-blocks and knees of sawmill set-works, and of their ratchet wheels and dogs are so

well known as not to call for any extended description. When the desired width of cut has been determined, the lever N is moved to the required position and held therein by the engagement between the dog O' of said lever and the proper tooth on the rack-bar M' , and then the lever J' is moved in the proper direction by the operator, which moves the valve stem J , pivotally attached to said lever, and the valves $j j'$ on said stem, thereby opening up communication for the live steam from the inlet-pipe i to one of the valve-ports and permitting the steam to pass through either pipe I' or pipe I'' , (according to the direction in which the lever J' is moved,) and enter one end of the steam-chest G , back of the oscillating piston g , and move said piston to the limit of its throw. Let it be supposed that the parts of my machine are in the relative positions shown in Figs. 1, 3, 6, and 7, with the oscillating pistons g and p of the steam and oil chests at their extreme forward positions and the stop-lever N set as shown, with the shafts $H H'$ thrown over forward until the stop-lug O on the shaft-coupling h is against the opposed surface of the base-plate M . Now when the lever J' is moved back toward the rear of the machine this moves the valves $j j'$ back also, and the valve j' uncovers the forward port in the valve-casing l and permits the steam to pass through pipe I'' and enter the forward end of the steam-chest G and force the piston g back, the same action of the lever J' uncovering the rear port and permitting the steam or air in the chest to exhaust through pipe I' and exhaust-pipe i' as the piston g is forced to the rear end, and at the same time the same backward movement takes place with the piston p in the oil-chest P , (as both pistons are keyed to their respective shafts H and H' and said shafts rigidly coupled together,) which forces the oil in the oil-chest P through the pipe Q from the rear end to the front end of the said oil-chest, this backward movement of the shafts being continued until the described coupling-lug O comes in contact with the described edge o'' of the stop-lever N , and this movement of the said shafts throws the crank-arms K' and connecting-rod L' and dog-carrying plate F' forward, causing the dogs $f f'$ of said plate to partly rotate the ratchet-wheel e , fast on the shaft E , the consequent movement of said shaft rotating its pinion e , in mesh with the rack d on the under side of the knee D , and advancing the latter in the well-known manner. Similarly when the lever J' is brought forward the pistons in the steam and oil chests are moved forward and the shafts $H H'$ will rock forward or in reverse direction from that first described, the crank-arms K , connecting rod L and dog-carrying plate F , which were carried back by the former operation, now being moved forward, so that the dogs on plate F will engage with the teeth on the ratchet-wheel e and partly rotate same as before, while

the crank-arm K', connecting rod L' and dog-carrying plate F', will be drawn back, and so on alternately and continuously.

The oil in the oil-chest P acts as a cushion or buffer to control the movement of the oscillating piston in the steam-chest G, and thereby insures a regular and even movement of the knee D, the passage of the oil through the pipe Q from one end of the oil-chest to the other being regulated by means of the described valve Q'. Originally the oil-chest P is filled through the oil-inlet Q''; but it is difficult to prevent leakage and waste of oil in use, and in order to insure that the said oil-chest may be kept full during the operation of the set-works, so that the usefulness of this device may not be impaired, I have devised the regulating attachment best shown in Fig. 4, the construction of which has been already described. Before commencing the operation of the set-works not only is the oil-chest P filled, as already stated, but the external or supplementary oil-chamber R is likewise filled, the hollow or tubular plunger R' being correspondingly raised, with its central rod r' screwed up within the hollow or tubular casing S to the required degree, and the proper tension put upon the springs U U by the nuts t' t' on the lower ends of the described bolts t t. When all these parts are adjusted as desired, the tendency of the said springs U U will be to expand, and as the upper ends of the springs bear against the fixed lugs q' q' this will draw said bolts t t and their cross-head T downward, thereby causing the plunger R' to always bear with considerable pressure upon the oil beneath it in the chamber R and force said oil out through the always-open pipe q into the oil-chest P to replace any oil that has escaped therefrom, the described construction of the device permitting its parts to be adjusted and regulated as desired from time to time to maintain the proper pressure upon the oil in the chamber R so long as any remains therein.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a sawmill set-works, the combination with the traveling log-carriage, and head-block, of a longitudinally-moving knee, having a rack on its under side, an inner transverse shaft carrying a pinion for engagement with said rack; a ratchet-wheel fast on said shaft; a pair of plates loose on said shaft, carrying dogs for engagement with said ratchet-wheel; an outer transverse shaft, made in two parts, and united by couplings; a stop-lug on said couplings; a contact-surface opposed to said stop-lug; a curved rack-bar; a stop-lever loose on said outer transverse shaft, and provided with means for engagement with said curved rack-bar, and a contact edge opposed to the said stop-lug; upper and lower projecting crank-arms on said outer transverse shaft; connecting-rods between

said crank-arms and said dog-carrying plates; a steam-chest and an oil-chest, one disposed on each side of said curved rack-bar; an oscillating piston in each chest, each piston being keyed to said outer transverse shaft; an open-ended oil-pipe communicating with the opposite ends of the said oil-chest beyond the throw of the oscillating piston therein; a regulating-valve in said oil-pipe; a valve-casing having steam inlet and exhaust pipes, and a pair of steam-ports; open-ended steam-pipes, each communicating with one of said ports, and with one end of said steam-chest, beyond the throw of the oscillating piston therein; a lever, having pivoted thereto a valve-stem projecting through one end of said valve-casing, and a pair of valves secured to said stem, within said casing, for controlling the steam-ports therein.

2. In a sawmill set-works, the combination with the traveling log-carriage, head-block, longitudinally-moving knee having a rack on its under side, inner transverse shaft with ratchet-wheel and pinion fast thereon, and dog-carrying plates loose thereon, curved rack-bar and set-lever for engagement therewith, of an outer transverse shaft carrying crank-arms pivotally connected to said dog-carrying plates, and a pair of corresponding sector-shaped chests, one for steam and one for oil, each containing an oscillating piston, whose hub is keyed to said outer transverse shaft, said hubs having bearings in said steam and oil chests, and valved pipe connections between the opposed ends of each of said chests, beyond the throw of the oscillating pistons therein.

3. In a sawmill set-works, the combination with the traveling log-carriage; head-block; longitudinally-moving knee, having a rack on its under side; inner transverse shaft with ratchet-wheel and pinion fast thereon, and dog-carrying plates loose thereon; curved rack-bar and set-lever for engagement therewith; and an outer transverse shaft carrying crank-arms pivotally connected to said dog-carrying plates; of a sector-shaped steam-chest having an oscillating piston keyed to said outer transverse shaft, and a corresponding sector-shaped oil-chest, having a like oscillating piston keyed to said shaft, and valve-controlled pipe connections between the opposed ends of each of said chests beyond the throw of the oscillating pistons therein, and a lever, pivotally attached to the outer face of said steam-chest, and also pivotally attached to the stem of the valve in the said pipe connections between the opposed ends of the said steam-chest together with a supplemental oil-chamber supported exterior to one end of said oil-chest, and having an open pipe connection with the interior thereof, and a spring-actuated plunger for automatically forcing the oil in said supplemental chamber into the said oil-chest, to replace any oil that has escaped from the latter and insure that said oil-chest always contains the proper quantity for

effective service during the operation of the set-works.

4. In a sawmill set-works, the combination with the traveling log-carriage, head-block, 5 longitudinally-moving knee, having a rack on its underside; inner transverse shaft with ratchet-wheel and pinion fast thereon, and dog-carrying plates loose thereon; curved rack-bar and set-lever for engagement there- 10 with; and an outer transverse shaft carrying crank-arms pivotally connected to said dog-carrying plates; of a pair of corresponding sector-shaped chests, one for steam and one for oil, each containing an oscillating piston, 15 whose hub is keyed to said outer transverse shaft, said hubs having bearings in said steam and oil chests, and valved pipe connections between the opposed ends of each of said chests, beyond the throw of the oscillating 20 pistons therein; a lever pivotally attached to the outer face of said steam-chest, and also pivotally attached to the stem of the valve in the said pipe connections between the opposed ends of the said steam-chest; a supplementary oil-chamber supported at one end 25 and outside of said oil-chest, and having an open pipe, leading from the bottom of said oil-chamber to and within the adjacent lower end of said oil-chest; perforated lugs projecting outwardly from the said end of the oil-chest; a hollow close-bottomed open-topped 30 plunger fitting within said oil-chamber, and having a central screw-threaded rod projecting up from its closed bottom; a casing, fitting within said plunger, and provided with 35 a screw-threaded bore for the reception of said screw-threaded rod; a cross-head, secured to said casing, and having perforations

adjacent to each end; bolts passing through said perforations, and through the perfora- 40 tions in the said lugs, and having screw-threaded lower ends; spiral springs surrounding said bolts, below the said perforated lugs; and nuts on the lower ends of said bolts for regulating the tension of said springs. 45

5. In a sawmill set-works, the combination with knees and means to adjust them, of a rock-shaft connected to and actuating said knee-adjusting means and having a rock-arm, 50 and an oscillating piston, a casing in which said piston oscillates, means to apply fluid-pressure alternately to opposite sides of said piston, a set-lever and a stop, said set-lever and stop coacting with said rock-arm to limit the strokes of the rock-shaft. 55

6. In a sawmill set-works, the combination with knees and means to adjust them, of a rock-shaft and fluid-pressure mechanism to oscillate the same, said rock-shaft connected to and operating said knee-adjusting means, 60 an oscillating cushioning-piston on said rock-shaft, a segmental casing in which said cushioning-piston operates, said segmental casing being adapted to contain a cushioning fluid and having a channel to permit the passage 65 of the fluid from one side of the cushioning-piston to the other, and means to regulate the passage of said fluid through said channel.

In testimony that I claim the foregoing I have hereunto set my hand, at Menekaunee, 70 in the county of Marinette and State of Wisconsin, in the presence of two witnesses.

JOHN SCHERER.

Witnesses:

L. J. EVANS,
E. F. ROBERTS.