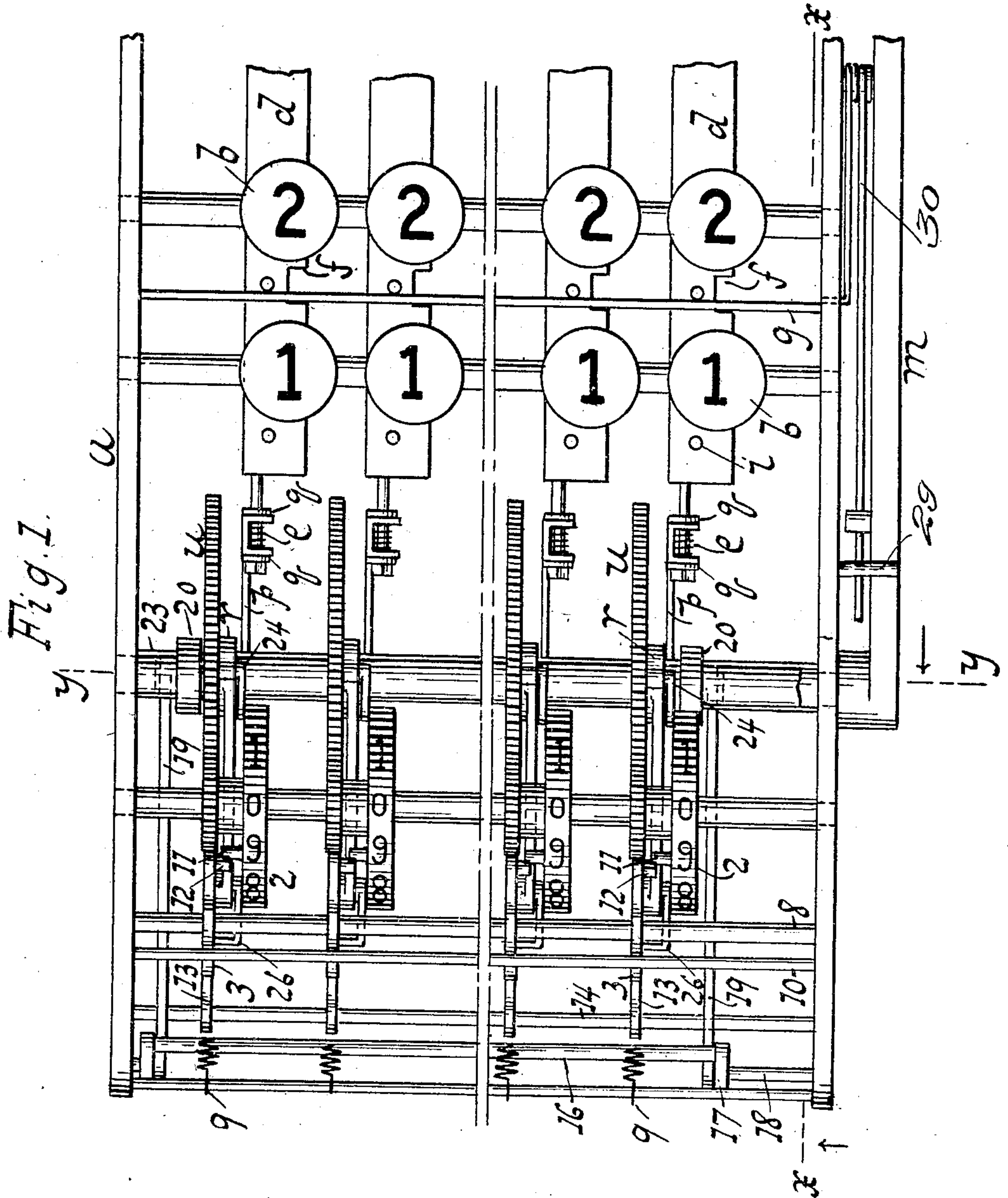


W. P. QUENTELL.
CALCULATING MACHINE.
APPLICATION FILED MAY 4, 1908.

912,729.

Patented Feb. 16, 1909.
4 SHEETS—SHEET 1.



WITNESSES:

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Christian Almstaedt

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William P. Quentell

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4 SHEETS—SHEET 2.



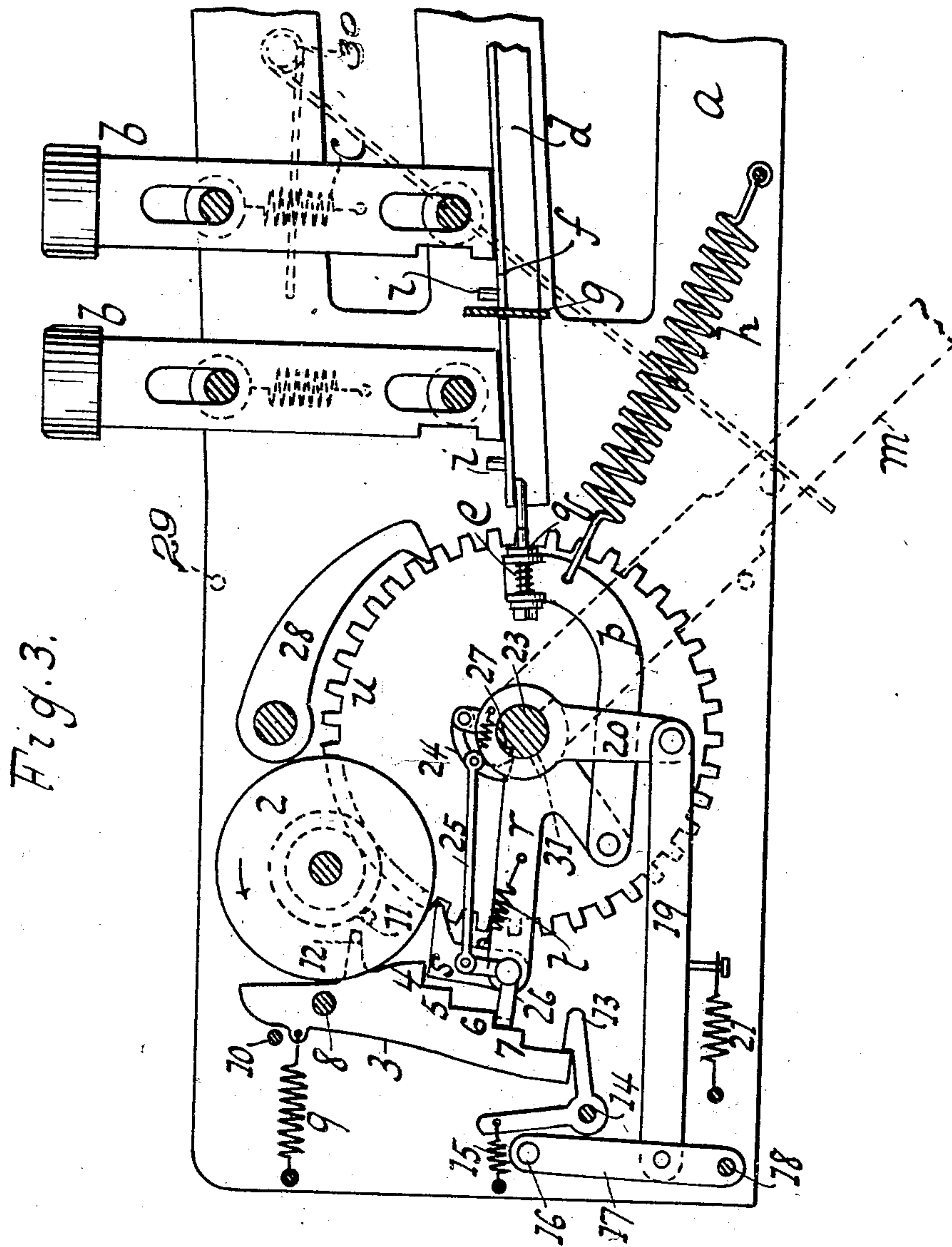
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4 SHEETS—SHEET 4.

Fig. 4.

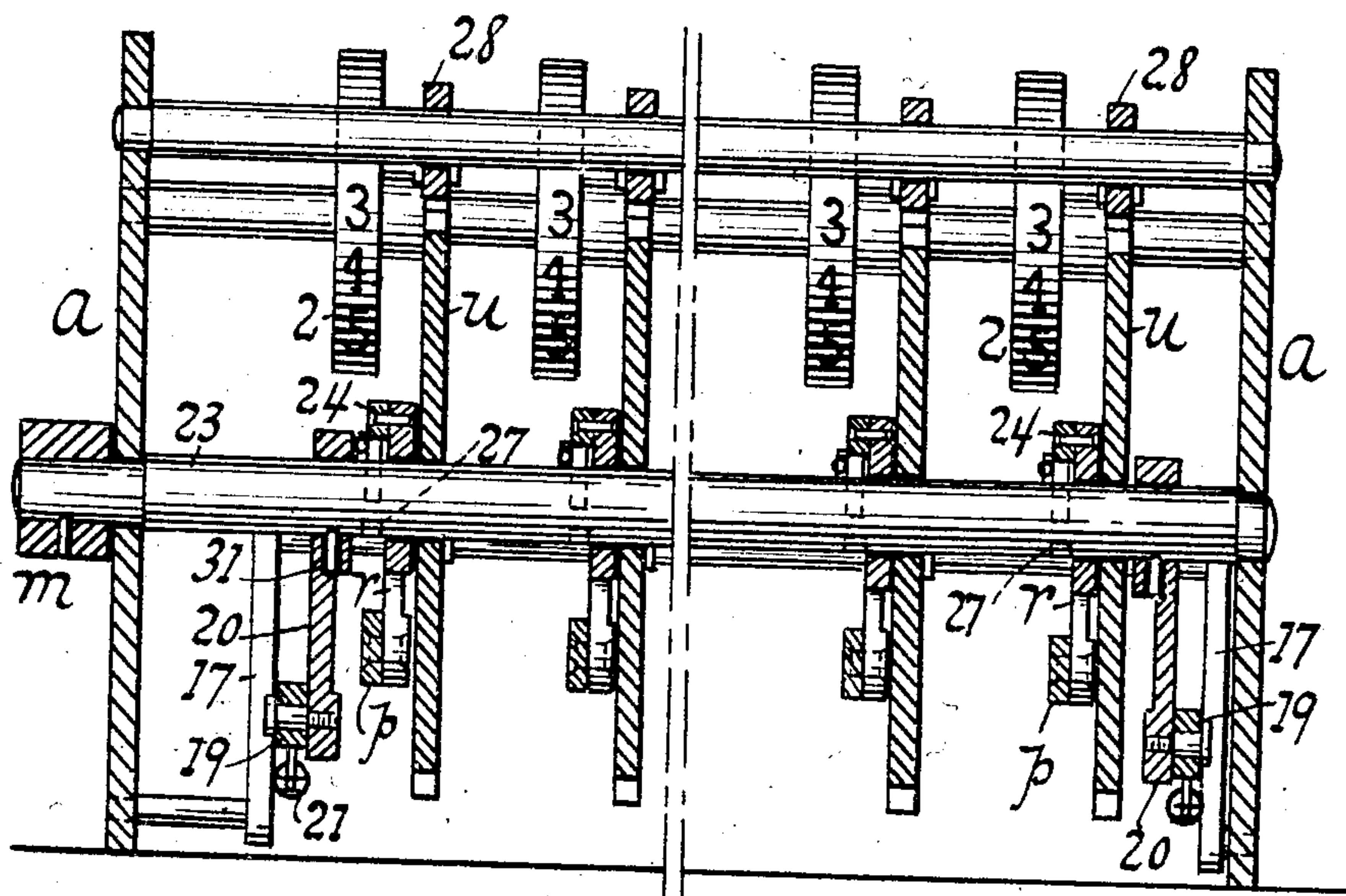


Fig. 5.

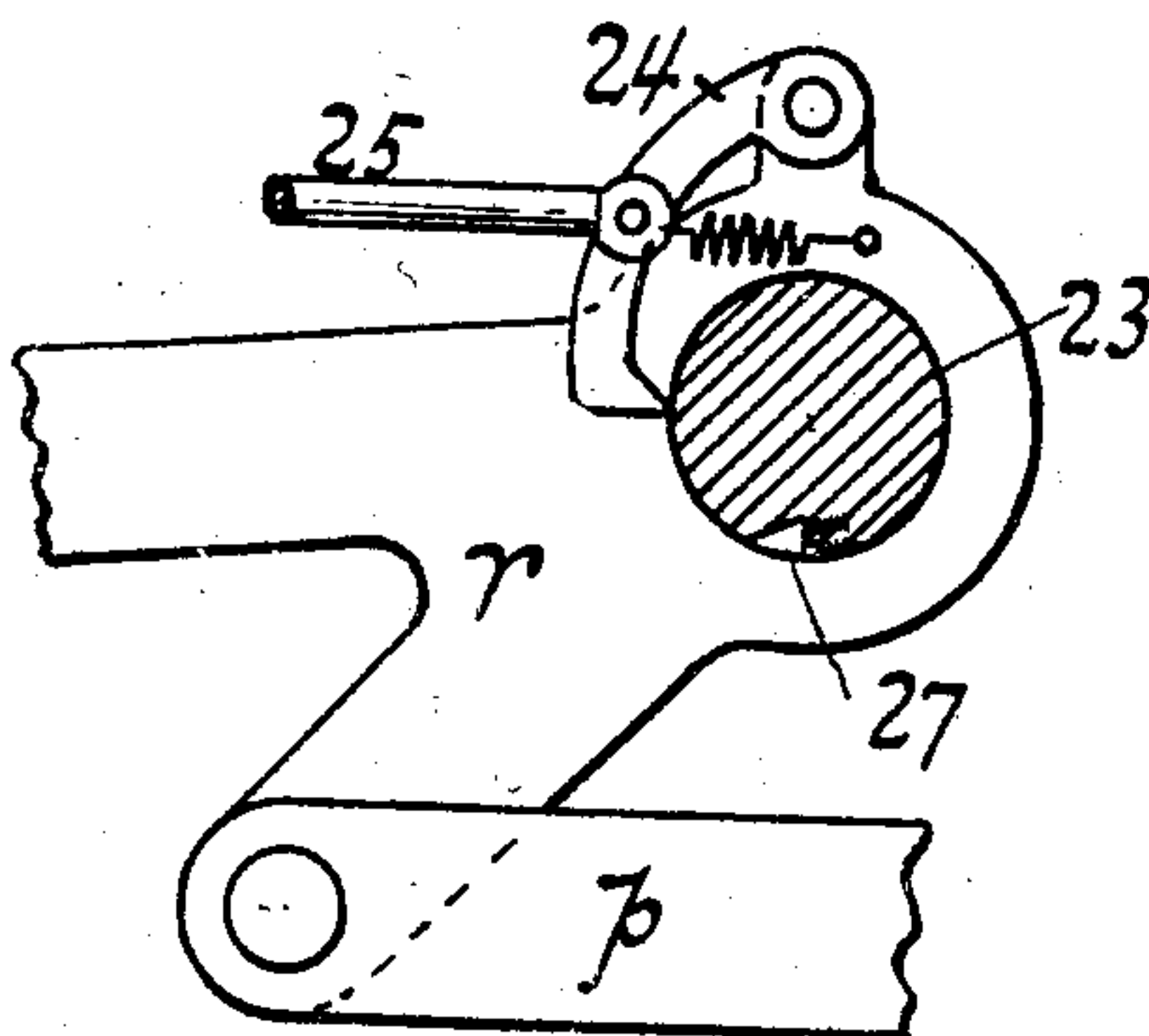
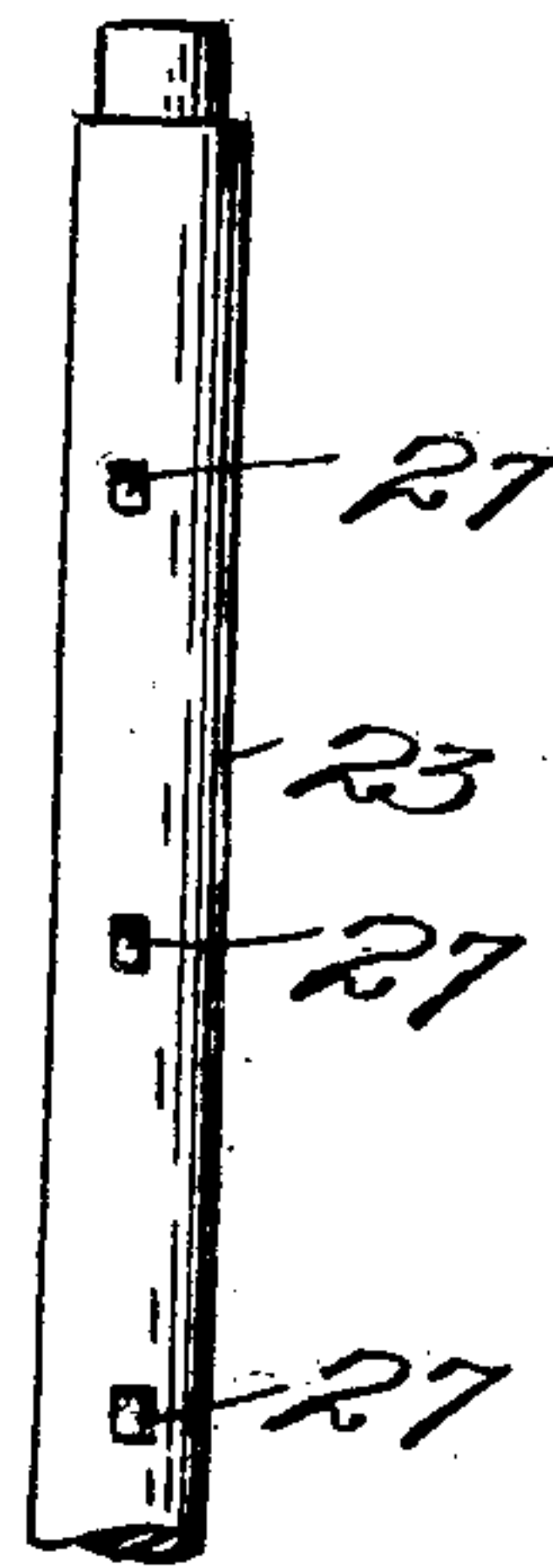


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM P. QUENTELL, OF STAMFORD, CONNECTICUT.

CALCULATING-MACHINE.

No. 912,729.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed May 4, 1908. Serial No. 430,825

To all whom it may concern:

Be it known that I, WILLIAM P. QUENTELL, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented new and useful Improvements in Calculating - Machines, of which the following is a specification.

The object of this invention is to provide certain improvements in the details of construction of calculating machines set forth in the following specification and claims and illustrated in the annexed drawing in which:—

Figure 1 is a plan view of a calculating machine embodying this invention. Fig. 2 is a side elevation of Fig. 1 with one side of the frame sectioned off to expose certain parts. Fig. 3 is a view like Fig. 2 with parts in a different position than in Fig. 2. Fig. 4 is a section along line *y y* Fig. 1. Fig. 5 shows a drive shaft with adjacent parts. Fig. 6 is an inverted plan view of a shaft showing the spiral or stepped arrangement of notches.

In this drawing is shown a frame *a* in which a series or rows of keys *b* can move up and down. The description of one key with its operation explains the others. Each key is normally held raised or returned by a spring *c* connected to a suitable point or bar of the machine. The lower end of the key *b* bears upon the horizontal portion of a bar *d* formed of a piece of angle iron. The rear end of the bar *d* is mounted for sliding and rocking motion in a suitable part of the frame of the machine as shown in U. S. Letters Patent No. 888262 granted to myself May 19, 1908, but inasmuch as such structure forms no part of the present invention it is thought unnecessary to illustrate and describe it here.

Attached to the forward end of the vertical portion of the bar *d* is a rod which has a swivel bearing or connection in a connecting piece *p* which can be readily formed of sheet or flat metal bent with two lips to form a bearing for the swivel end of bar *d* and between which the spring *e* can be coiled about the end part of bar *d*. Washers *q* placed each side of the lips onto the bar *d* will prevent the latter pulling out of place but at the same time allow the same to swivel.

When a key *b* is depressed its lower end bears upon the horizontal part of the bar *d*

and the latter is caused to rock on its pivots. This releases the shoulder *f* of a notch formed in the horizontal portion of the bar from engagement with a detent *g* and the bar *d* is caused by a spring *h*, having one end connected to the connecting piece *p* and its other end connected to a suitable part of the frame of the machine, to move longitudinally toward the rear of the machine. The spring *e* tends to turn the bar *d* back on its swivel to its normal position as it is moved longitudinally in the opposite direction by the drive lever *m* as presently explained. As the bar *d* is returned the catch *f* again engages the detent *g*.

The connecting piece *p* is connected to a pawl carrier *r* shaped like a bell crank lever and on which the pawl *s* is mounted. Pawl *s* is pivoted or swings on the pawl carrier and is held by spring *t* in engagement with transmission gear *u* which conveys motion to a pinion part of the number wheel 2.

On the depression of a key the spring *h* pulls back the bar *d* a certain distance for one of its pins *i* to lock into a notch in the key stem to hold the latter depressed and the pawl *s* clicks back a certain number of teeth of gear *u* according to the number of the depressed key. As the drive lever or handle *m* is actuated to return the pawl carrier the pawl takes into the gear teeth *u* and moves such gear one or more steps as called for. The pawl is arrested by a stop 3 which comprises four steps or arresting points marked respectively 4, 5, 6, 7 the function of which will presently appear. The stop 3 is mounted on pivot or stud 8 and a spring 9 tends to hold one end portion of the stop against a pin 10.

Each number wheel 2 has the usual notations 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. In a series of such wheels of course provision must be made as each revolution of a wheel is being completed to carry over or impart a movement or step to the wheel of the next higher denomination.

Each number wheel carries a finger 11 which as it is carried about taps or presses the nose 12 of stop piece 3 to tilt the latter to move stop shoulder 5 back clear of the pawl *s* and allow the latter to move along an additional step or the distance of one tooth or number.

The stop 3 is normally held by spring 9 in position for its step 5 to arrest the movement of the pawl *s* (Fig. 2). But when finger 11

taps nose 12 the lower end of stop 3 is swung back so that catch 13 can hook over the stop 3 Fig. 3 and hold the step 5 back for the pawl *s* to be arrested against the step 4.

5 The hook 13 is in form of a bell crank lever fulcrumed at 14 and spring 15 tends to cause the hook 13 to snap into engagement with stop piece 3. The release or unhooking of part 13 is effected by bar 16 on arms 17
10 mounted one at each side of the machine. The arms 17 pivot on cross bar 18 and are swung by links 19 and arms 20.

The spring *h* draws back the connection *p* with carrier *r* for pawl *s* to click back a
15 greater or less number of teeth. On the return of the carrier and pawl the teeth with the number wheel are advanced a corresponding degree. The return movement of the connection *p* is effected by drive lever *m*
20 fixed to a rock shaft 23.

The carrier *r* is mounted loosely about shaft 23 and on said carrier is pivoted a pawl or catch 24 which passing alongside the carrier contacts with the shaft 23. This pawl
25 is connected by link 25 with bell crank lever 26 fulcrumed on carrier *r*. When the spring *h* moves carrier *r* in one direction the catch 24 slides over the smooth part of the circumference of shaft 23 toward notch 27 in such
30 shaft. Upon the drive lever *m* being depressed the shaft 23 is rocked to bring notch 27 to catch 24 and return carrier *r* with pawls.

By the spring *h* pawl *s* is caused to click over the teeth of its gear wheel but when
35 moving in the opposite direction the pawl *s* takes into its gear to rotate the same. Such gear can rotate in but one direction as a lock pawl 28 is suitably provided.

In order to carry each carrying arm *r* of
40 each column to its stop position where it is arrested by stop 3 and in order to carry over from one column to another, it is necessary to carry each arm *r* successively to its stop 3 and then release shaft 23 from the arm *r* of
45 the lower column and still keep said shaft in engagement with arm *r* of the higher columns and then release each higher column successively. As each column is released each spring *h* snaps its bar *d* against stop *g*
50 thus holding the arm *r* in its normal position.

The movement of each arm *r* to the stop 3 and the subsequent release of each shaft 23 from the arm *r* is effected by shaft 23 bringing
55 its notch 27 to engage pawl 24 and moving arm *r* until bell crank lever 26 contacting with the stop shoulder 7 or 6 causes this bell crank to lift pawl 24 out of engagement with shaft 23. This will allow shaft 23 to continue moving and successively operate each
60 higher column. For this purpose the notch 27 of each lower column is shown somewhat in advance of or out of line with the notch at each higher column. Such non
65 aligned or stepped arrangement of notches

27 in shaft 23 is attempted to be indicated by dotted lines in Fig. 5. As the drive lever *m* moves shaft 23 to bring notches or shoulders 27 to catches 24 the unit column having
70 its number mechanism set slightly in advance of the tens column the first named column will have its parts completely set somewhat in advance of the complete setting of the succeeding column. Similarly for the
75 successive setting of columns of higher denomination. The return of driver *m* to stop stud 29 is effected by spring 30. On shaft 23 is a pin or projection 31 which extends into a slot in the hollow hub of arm 20
80 which surrounds shaft 23 in form of a sleeve to form a loose connection. As the shaft 23 is returned under the action of spring 30 the pin 31 striking the right hand terminal of the slot in sleeve or ring shaped hub will
85 swing arm 20 to the right and impart a like movement to the link 19 and bail or arms 17 for rod 16 to swing catch 13 against the action of spring 15. This movement will free or unlock latch 13 from stop piece 3 so
90 that spring 9 can return the stop piece from the retracted position Fig. 3 to the position shown in Fig. 2.

What I claim is:—

1. In a calculating machine a series of columns of calculating mechanisms, a main
95 actuating shaft, individual connections between each column and shaft, means for automatically locking the connection of each column to the shaft and means for automatically and successively unlocking said con-
100 nections from the shaft.

2. The combination in an adding machine, of an actuating shaft, number wheels, connections between the shaft and number
105 wheels, catch portions carried by the shaft and pawls for engaging the catch portions and carried and operated by said connections.

3. In an adding machine an actuating shaft, number wheels, arms actuated by said shaft, means for connecting and disconnecting
110 the arms and shaft, connections between said arms and number wheels for transmitting motion from the arms to the number wheels and movable steps in the paths of the arms for allowing different degrees
115 of movement to the arms, each step being moved by the number wheel of a lower column to allow carry over to a higher column.

4. In an adding machine an actuating shaft, number wheels, arms actuated by said
120 shaft, means for connecting and disconnecting the arms and shaft, connections between said arms and number wheels for transmitting motion from the arms to the number wheels, movable stops for the arms moved
125 by the number wheel of lower columns, and means for holding the stop in the position into which it has been shifted by the number wheel.

5. In an adding machine an actuating 130

shaft, number wheels, arms actuated by said shaft, means for connecting and disconnecting the arms and shaft, connections between said arms and number wheels for transmitting motion from the arms to the number wheels, movable stops for the arms moved by the number wheel of lower columns, and means for holding the stop in the position into which it has been shifted by the number wheel, and means for releasing said stop from said position.

6. In an adding machine a number wheel with driving mechanism comprising a carrying arm and pawl, a shaft on which the carrying arm is loosely mounted, a catch carried by the arm for engaging the shaft, a lever for freeing the catch from the shaft, and a stop piece for arresting the pawl carrying arm and for actuating the lever to free the catch.

7. In an adding machine a number wheel with driving mechanism comprising a carrying arm and pawl, a shaft on which the carrying arm is loosely mounted, a catch carried by the arm for engaging the shaft, a lever for freeing the catch from the shaft, and a stop piece for arresting the pawl carrying arm and for actuating the lever to free the catch, said number wheel being made to engage the stop piece to shift the same and a latch for holding the stop piece when shifted.

8. In an adding machine a number wheel with actuating mechanism therefor, a drive shaft for said mechanism, means for connecting and disconnecting the actuating mechanism and shaft, a stop for the actuating mechanism, means for shifting the stop, a latch for the stop, and a releasing arm for the latch having a loose connection with the drive shaft.

9. In an adding machine a drive shaft, a number wheel having its actuating mechanism loose on the shaft, a catch for releasably connecting the actuating mechanism and shaft, a stop for the actuating mechanism, a latch for the stop, a releasing mechanism for the latch loosely mounted on the shaft and having a pin and slot connection therewith.

10. A calculating machine comprising a shaft, a pawl carrying arm mounted on said shaft, means for releasably connecting the arm and shaft means for releasing said connecting means, and calculating mechanism actuated by the pawl carrying arm.

11. In a calculating machine a main shaft having a shoulder, a catch portion made to engage the shoulder, a pawl carrying arm on

which the catch is mounted, a pawl on the arm, a number wheel actuated by the pawl, a bell crank lever on the arm, and a stop for arresting the pawl and engaging the bell crank lever to release the catch.

12. An adding machine comprising a drive shaft, a pawl actuating arm loosely mounted on the shaft and shaft engaging means carried by said arm, said shaft having shoulders for engagement by said engaging means, said shoulders being arranged out of line to allow successive arms on the shaft to successively complete their movements.

13. An adding machine comprising a main shaft, an actuating arm, locking means carried by the arm and made to connect the shaft and arm, a stepped stop piece for unlocking the lock, said stop piece being shiftable to vary the steps engaged by the locking means for unlocking at different periods.

14. An adding machine comprising a number wheel with actuating gear and pawl, an actuating arm for the pawl, locking means carried by the arm, a shaft engaged by the locking means and on which shaft the arm is loosely mounted, a bell crank lever carried by the arm and connected to the locking means, a stop actuated by the number wheel and made to engage the bell crank lever, a latch for engaging the stop when actuated by the number wheel, a release for the latch, an actuating arm for the release loosely mounted on the shaft, and a loose connection for uniting the actuating arm and shaft.

15. An adding machine comprising a number wheel with actuating gear and pawl, an actuating arm for the pawl, locking means carried by the arm, a shaft engaged by the locking means and on which shaft the arm is loosely mounted, a bell crank lever carried by the arm and connected to the locking means, a stop having various portions for engaging the actuating arm and bell crank lever, actuating means for shifting the stop for other portions thereof to engage the arm and lever, a latch for engaging the stop when shifted, a releasing bail for the latch, and an actuating arm for the releasing bail.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM P. QUENTELL.

Witnesses:

CHRISTIAN ALMSTAEDT,
EDWARD WIESNER.