

No. 606,801.

Patented July 5, 1898.

J. CHALMERS, JR.
SWITCH AND SIGNAL MECHANISM.

(Application filed Nov. 11, 1897.)

(No Model.)

3 Sheets—Sheet 1.

FIG. 1.

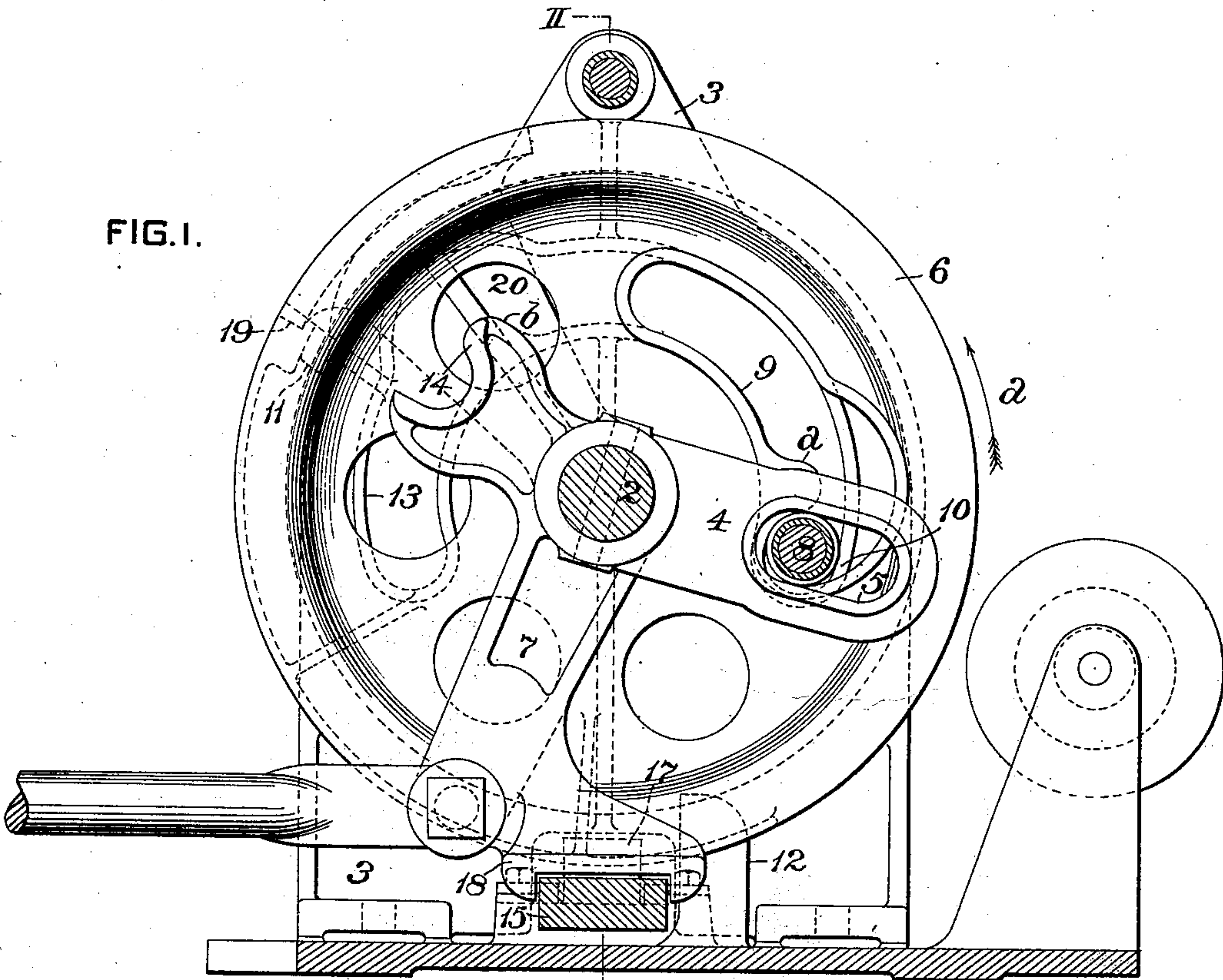
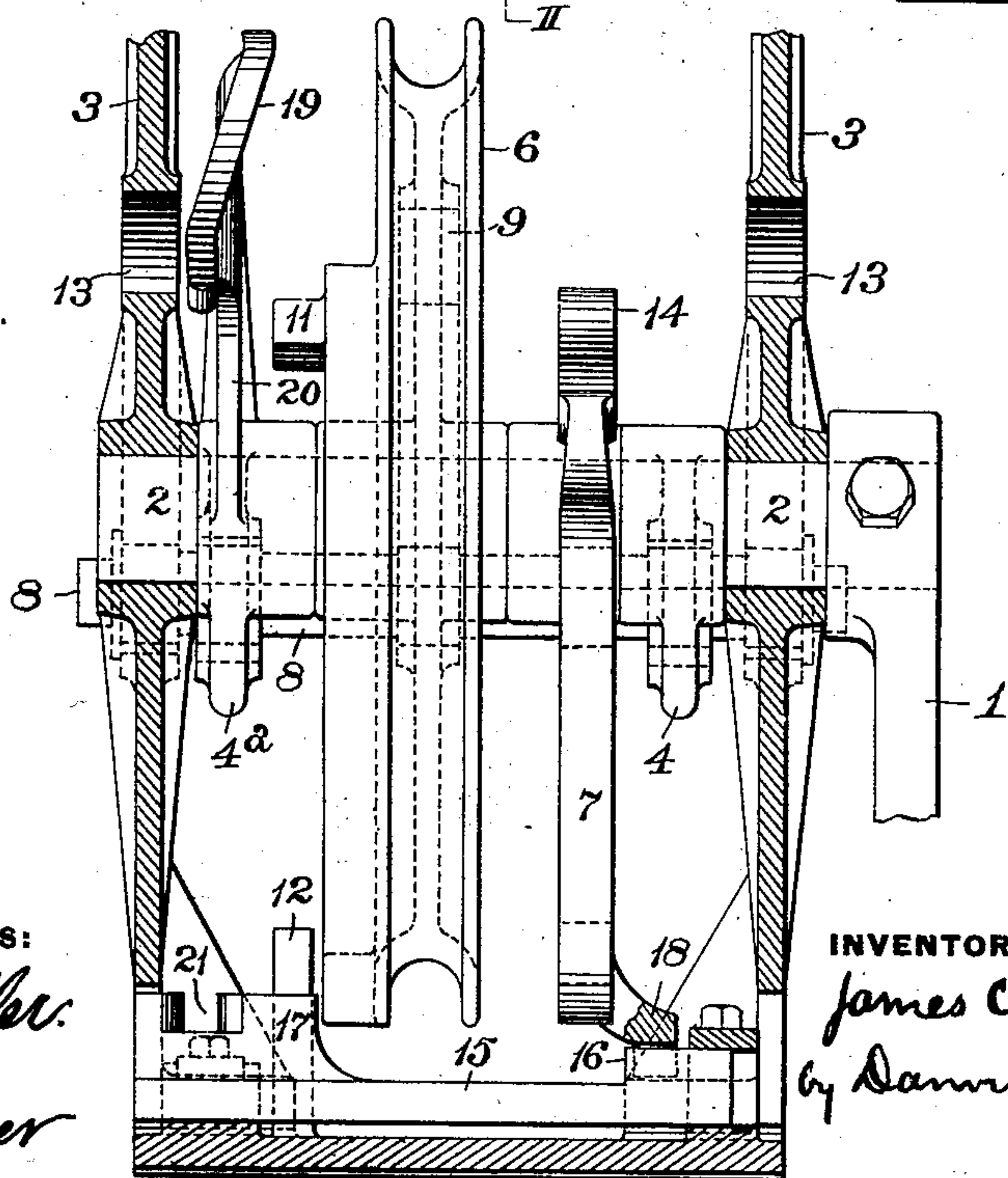


FIG. 2.



WITNESSES:

Chas. F. Miller.
J. E. Hatcher

INVENTOR,

James Chalmers Jr
by Saml. S. Wolcott

Att'y.

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FIG. 3.

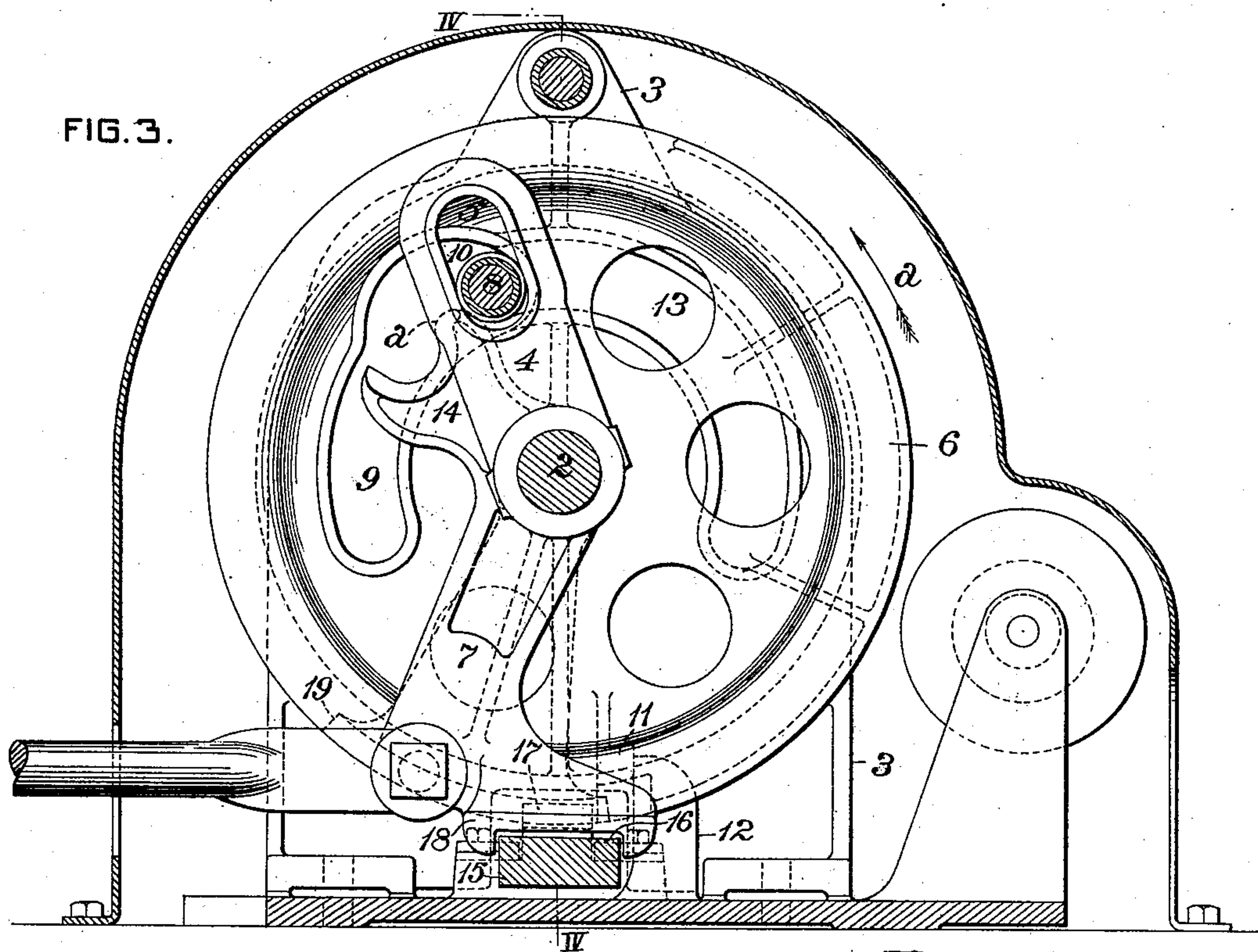
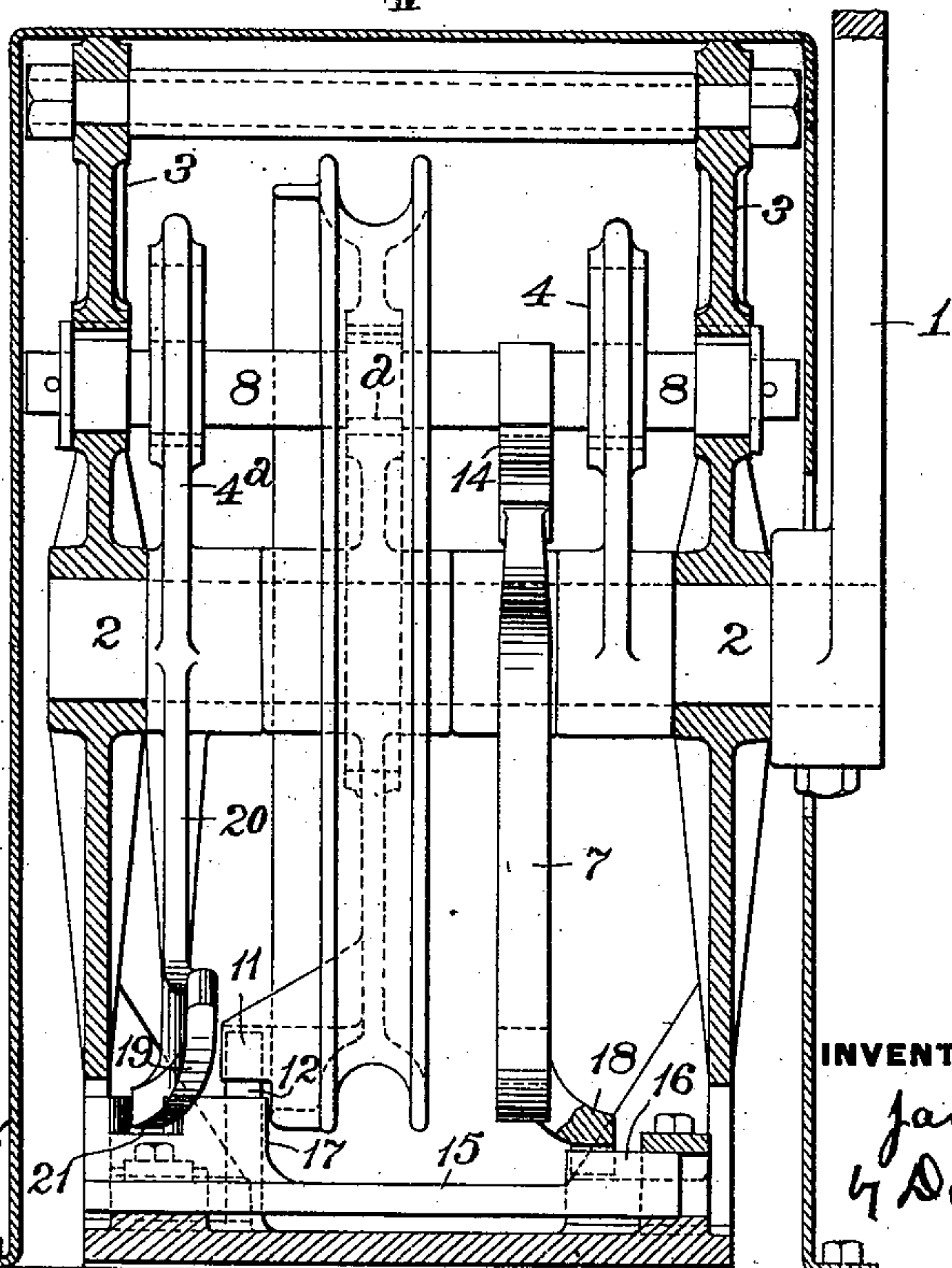


FIG. 4.



WITNESSES:

Chas. F. Miller.
J. E. Gairner

INVENTOR,

James Chalmers Jr
4 Danville S. W. Olcott
Att'y.

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FIG. 5.

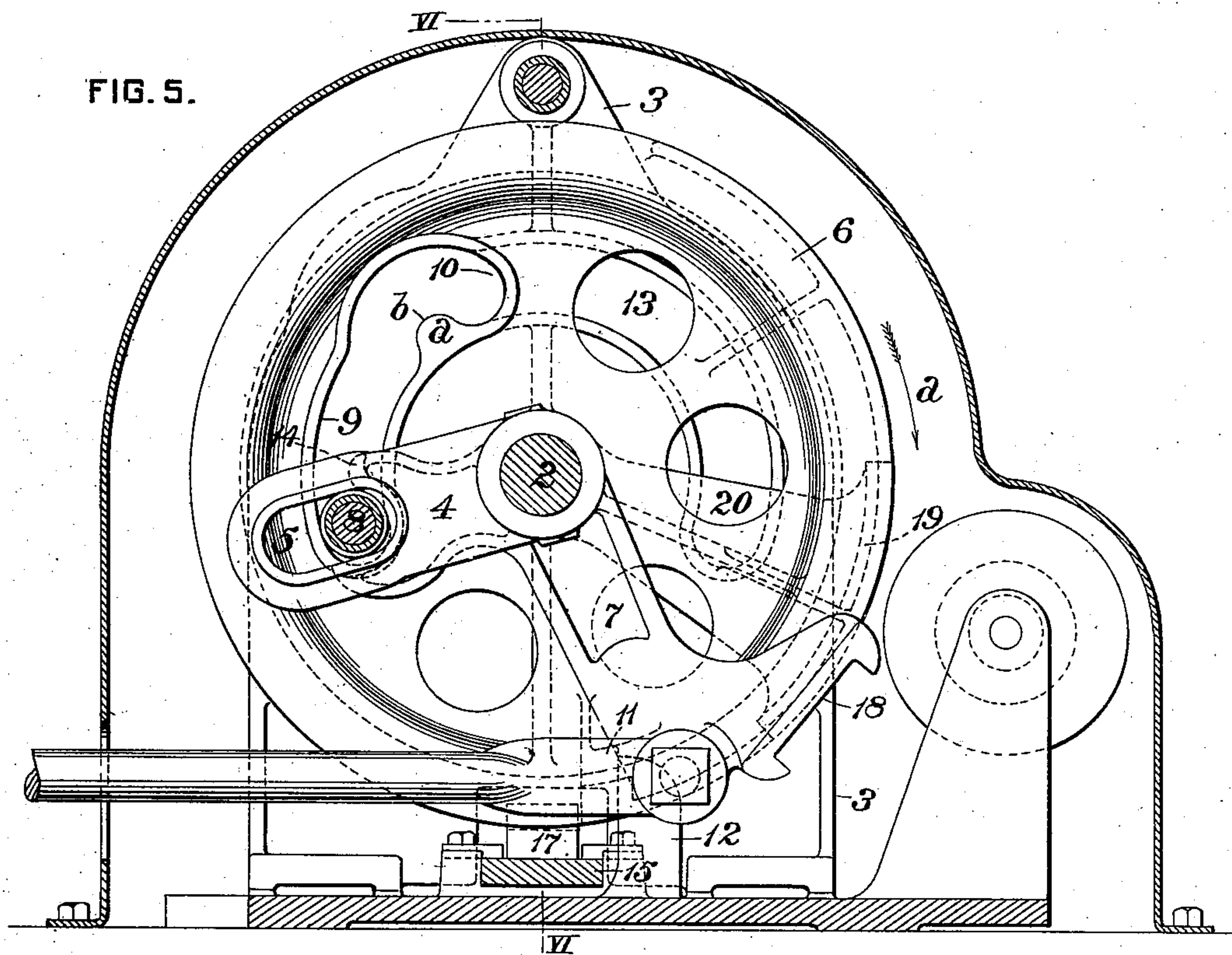
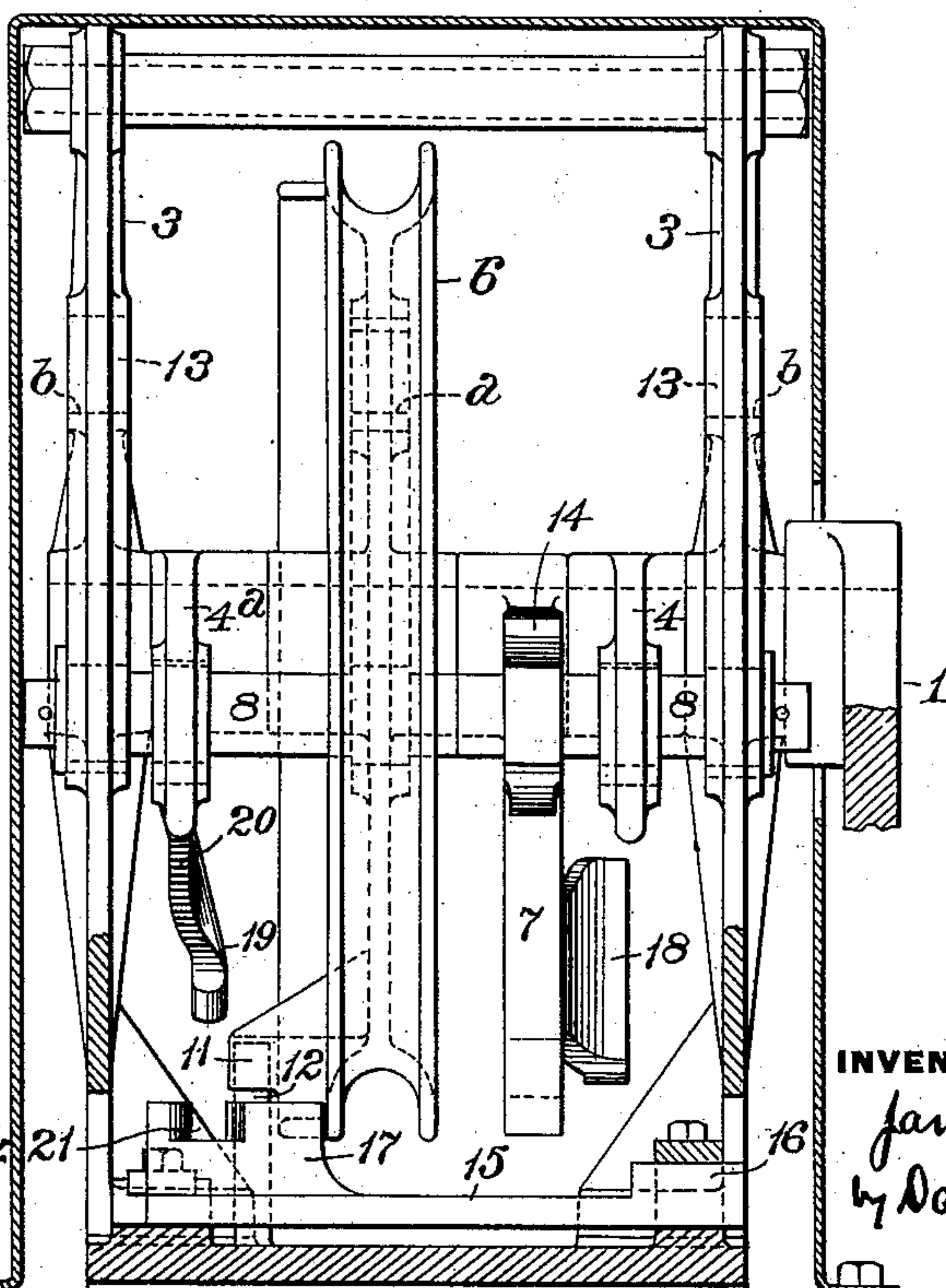


FIG. 6.



WITNESSES:

Chas. F. Miller
J. E. Gaither

INVENTOR,

James Chalmers Jr
by Darwin S. Wolcott

Att'y.

UNITED STATES PATENT OFFICE.

JAMES CHALMERS, JR., OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENN-
SYLVANIA.

SWITCH AND SIGNAL MECHANISM.

SPECIFICATION forming part of Letters Patent No. 606,801, dated July 5, 1898.

Application filed November 11, 1897. Serial No. 658,176. (No model.)

To all whom it may concern:

Be it known that I, JAMES CHALMERS, Jr., a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Switch and Signal Mechanism, of which improvements the following is a specification.

The invention described herein relates to certain improvements in switch and signal apparatus, and pertains more particularly to that class or kind known in the art as "ground-levers" and employed for the operation of outlying switches, where it is necessary or desirable to have the signal indicating the position of such switch located a considerable distance from the switch.

The invention has for its object a construction and arrangement of mechanism whereby the switch and signal may be shifted in the order or manner required by a continuous movement of a lever and the switch or signal, as the case may be, locked in its shifted position.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional side elevation of my improved mechanism, showing the position of the parts when the switch is at "clear main line" and the signal is in safety position. Fig. 2 is a sectional elevation, the plane of section being indicated by the line II II, Fig. 1. Figs. 3 and 5 are views similar to Fig. 1, showing the position of the parts in intermediate position and also in final position—i. e., with the switch "open to siding" and the signal in danger position. Figs. 4 and 6 are views similar to Fig. 2, which show, respectively, the position of the parts as in Figs. 3 and 5; the planes of section of said figures being indicated by the lines IV IV and VI VI of Figs. 3 and 5, respectively.

In the practice of my invention the lever 1 for operating the switch and signal is secured on one end of a shaft 2, which is mounted in suitable bearings in the side plates or frames 3 of the supporting case or shell. On the shaft within the side plates or frames are se-

cured the arms 4 and 4^a, provided at their outer ends with radial slots 5. A signal-operating wheel 6, provided with a grooved periphery for the reception of the wire or chain leading to the signal, is loosely mounted on the shaft 2, as is also an arm 7, which is connected in any suitable manner to the movable switch-rails, said wheel and arm being intermediate between the arms 4 4^a. A pin 8 is passed through the slots 5 and a slot 9 in the wheel 6. This slot in the wheel 6 is formed for a portion of its length concentric with the center of the wheel and the remaining portion shaped to form a socket or pocket 10, connecting with the main portion of the slot. By this construction the wheel 6 can be rotated by the arms 4 and 4^a as long as the pin 8 remains within the pocket 10. If the rotation of the wheel be checked by any means—as, for example, by a shoulder 11 formed on its side coming in contact with a stop 12 formed on the base of the frame—and the movement of the arms 4 4^a be continued, the pin 8 will move out of the pocket and into the main portion of the slot, along which it can move freely without shifting the wheel. While not necessary for the operation of the machine, it is preferred to form grooves 13 in the inner walls of the side plates 10, corresponding to the path of movement of the ends of the pin 8, which project into said grooves and are steadied and guided thereby.

With the wheel 6 and arms 4 4^a in the position shown in Fig. 1 a movement of the arms up and toward the left will cause the wheel 6 to move in the direction of the arrow *a*, as the pin 8 is within the pocket 10 of the slot in said wheel. By continued rotation of these parts the shoulder 11 on the wheel will be brought against the stop 12 and check the movement of the wheel, as shown in Figs. 3 and 4, and on the continued movement of the arms 4 and 4^a the pin 8 will ride up over the shoulder *a* in the slot in the wheel and pass into the main or regular portion of said slot, the pin moving out and in in the radial slots in the arms 4 and 4^a. The disengagement of the pin 8 from the pocket 10 and its movement toward the outer ends of the radial slots in the arms 4 and 4^a is assisted by shoulders

5 *b*, corresponding in shape and size to the shoulder *a*, and so located in the grooves 13 in the side plates 3 that when the wheel is checked by contact of the shoulder 11 with stop 12 they will be in alinement with the shoulder *a* in the slot of wheel 6. As the pin 8 passes out of the pocket 10 and into the main portion of the slot 9 it will move behind a horn or projection 14, formed on the end of an angular extension on the switch-shifting arm 7, so that said arm will be caused to move with the arms 4 and 4^a during the remaining portions of their movement, which is sufficient to effect a shifting of the switch-rails from normal or closed position to open position.

10 It is desirable, if not necessary, to lock the switch-rails in normal position—i. e., “clear main line”—and the signal in danger position. To effect these lockings, I provide a bar 15, arranged in suitable guides formed on the base-plate. This bar is provided with shoulders or projections 16 and 17, adapted to engage, respectively, notches formed in the switch-arm 7, or a projection 18, formed integral therewith, and with the projection or shoulder 11 or a notch formed in the periphery of the wheel 6. These projections 16 and 17 are so located that when one of them, as 16, is in engagement with the notch or lateral projection 18 on the arm 7 the other shoulder or projection 17 will be out of engagement with the wheel 6. The bar 15 is shifted to its different positions by a cam-plate 19, formed on the outer end of an arm 20, which is attached to the shaft 2, so as to move therewith, and is preferably formed integral with the arm 4^a. This arm 20, with its cam-plate, is so arranged on the shaft 2 with reference to the movement of the wheel 6 that when the projection 11 on said wheel comes in contact with the stop 12 the cam-plate will enter a notch 21, formed on the bar 15. During the movement of the shaft 2 with its arms 4 and 4^a necessary to effect the shifting of the pin 8 from the pocket 10 and to operative position behind the toe or projection 14 the cam-plate will effect such a transverse movement of the bar 15 as to shift the shoulder 16 out of engagement with the switch-operating arm and the shoulder 17 into engagement with the notch or projection on the signal-wheel 6, so that the wheel is locked and the switch-arm is free to move during the remaining movement of the shaft 2.

60 The position of the several parts of the mechanism just described after the signal has been shifted by the movement of the wheel 6 is shown in Figs. 3 and 4. It will be observed by reference to said figures that the pin 8 is at this time beginning to ride up on the projections *a* and *b*, and the cam-plate 19 has just entered the notch 21 in the bar 15. In Figs. 5 and 6 the several parts are shown when the switch has been shifted to “open siding.” While the parts are in this position, the wheel will remain locked and the switch-

arm in an unlocked position. By a reverse movement of the lever 1 the switch will be first shifted to “clear main line.” Then the bar will be shifted by its cam-plate to lock the switch-operating arm 7 and unlock the signal-wheel 6. During this locking and unlocking movement the pin 8 is moved in the slots in the arms 4 and 4^a back behind the shoulder *a* and into the pocket 10, so that by the continued movement of the lever 1 the wheel 6 will be moved to “clear the signal.”

It is characteristic of my improvement that by a single continuous movement of the operating-lever 1 from “normal” to “reverse” the signal is shifted to “danger,” the switch unlocked and then shifted to reverse position, and that the movement of the lever from “reverse” to “normal” the above operations are reversed. It is also characteristic of the improvement that the switch is unlocked only while the signal is at “danger.”

I claim herein as my invention—

1. In a switch and signal mechanism, the combination of a lever, a signal-shifting mechanism, a switch-shifting mechanism, a lock for said signal and switch mechanisms and connections from the lever to the switch and signal shifting mechanisms and the lock, so arranged that the said parts may be operated in due succession by a continuous movement of the lever in the same plane, substantially as set forth.

2. In a switch and signal mechanism, the combination of a shaft, driver-arms secured to said shaft, a signal-operating wheel and a switch-operating arm, the wheel and arm being loosely mounted on the shaft and connections from the driving-arms to the signal-wheel and switch-arm, whereby said parts may be operated in succession in the rotation of the shaft, substantially as set forth.

3. In a switch and signal mechanism, the combination of a shaft, driver-arms secured to said shaft, a signal-operating wheel, a switch-operating arm, the wheel and arm being mounted on the shaft, a lock for preventing the movement of the wheel and arm, and connections from the driving-arms to the signal-wheel, switch-arm and lock, whereby said parts may be operated in succession on the rotation of the shaft, substantially as set forth.

4. In a switch and signal apparatus, the combination of a shaft, slotted arms secured to said shaft, a signal-wheel loosely mounted on the shaft and provided with a slot having a pocket at one end, a pin arranged through the slots in the arms and wheel, and a switch-arm loosely mounted on the shaft and provided with a horn or projection adapted to engage the pin while moving along the slot in the wheel, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAMES CHALMERS, JR.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.