No. 695,013. Patented Mar. 11, 1902.

K. UCHERMANN.

COIN FREED TELEPHONE APPARATUS.

(Application filed Dec. 7, 1900.)

(No Model.) 7 Sheets—Sheet 1.

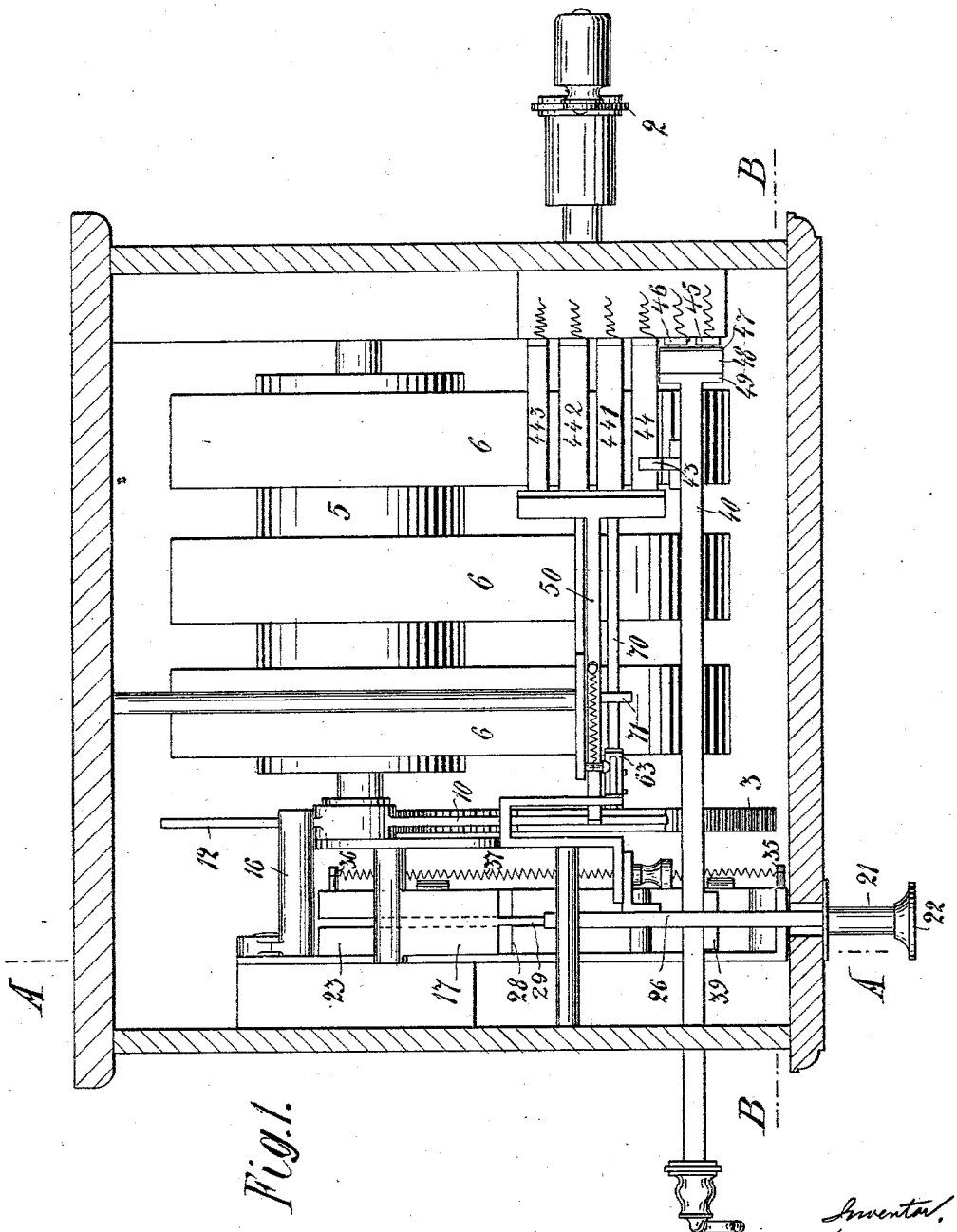

Fig. 1.

Witnesses:
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Inventor,
Karl Uchermann.
by Munn & Co.
Atty.

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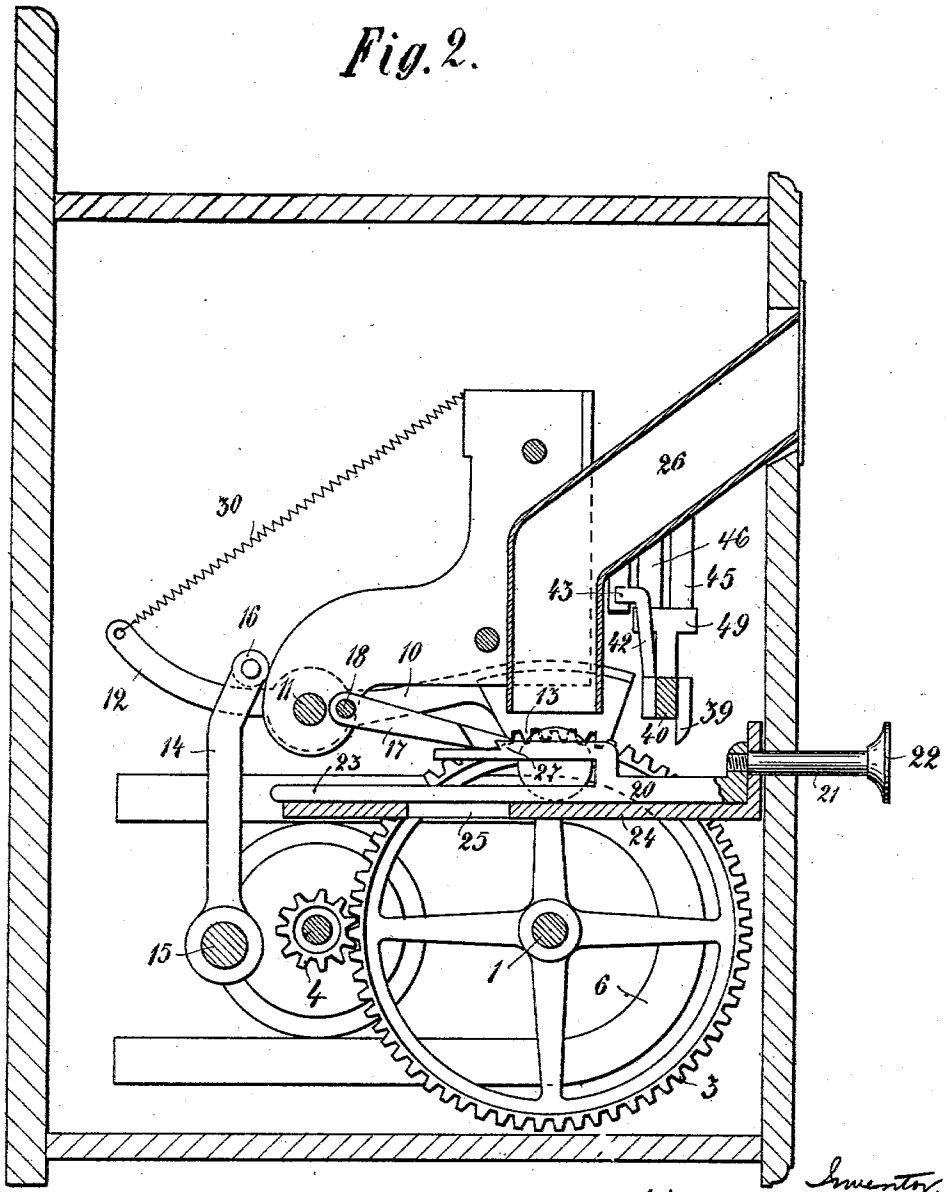
(No Model.) 7 Sheets—Sheet 2.

Fig. 2.



Witnesses:
B. H. Sommers

Inventor:
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No. 695,013. Patented Mar. 11, 1902.

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COIN FREED TELEPHONE APPARATUS.

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(No Model.) 7 Sheets—Sheet 3.

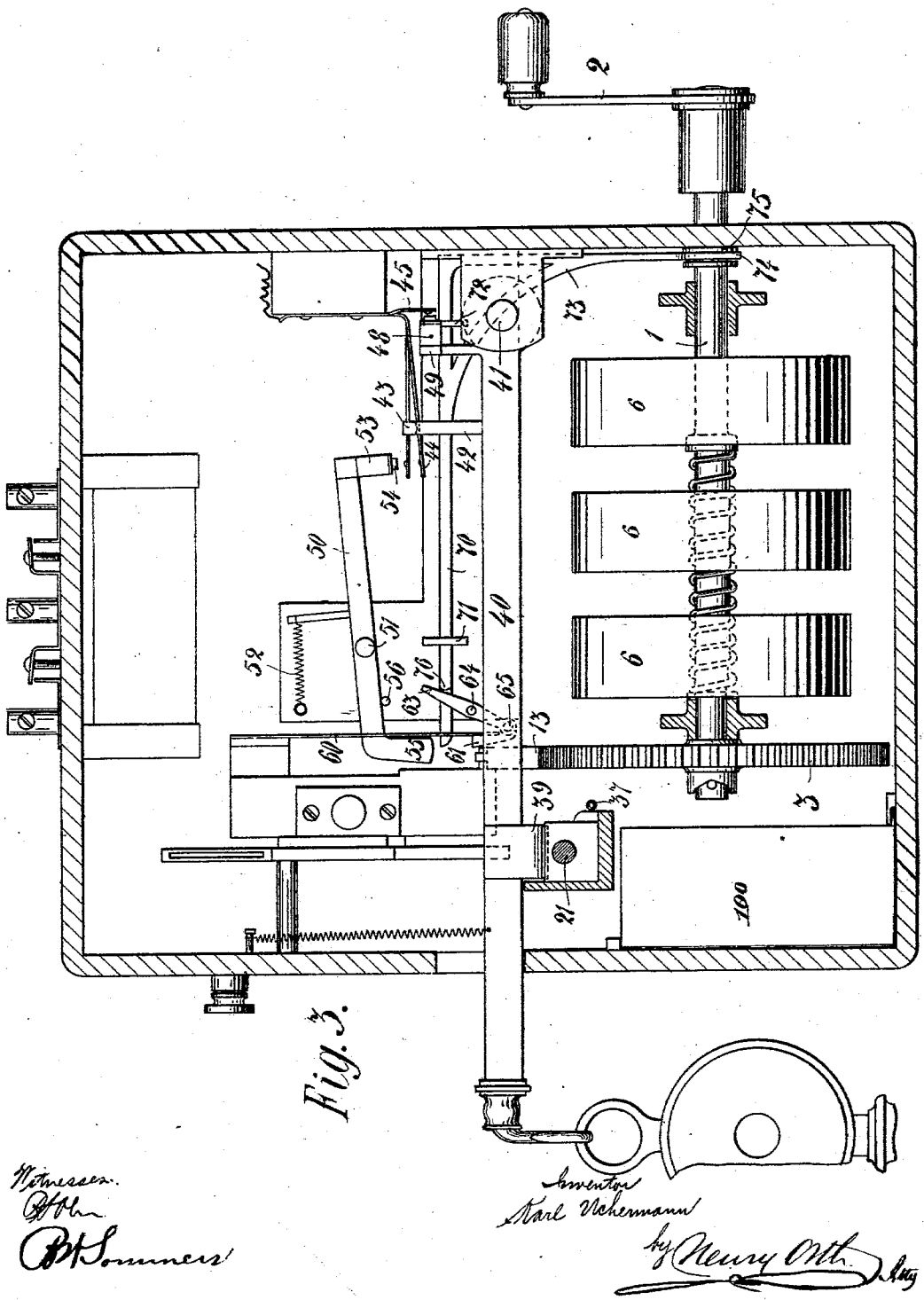

Fig. 3.

Witnesses.
B. Sommers

Inventor
Karl Uchermann
by Henry Orth Atty

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COIN FREED TELEPHONE APPARATUS.

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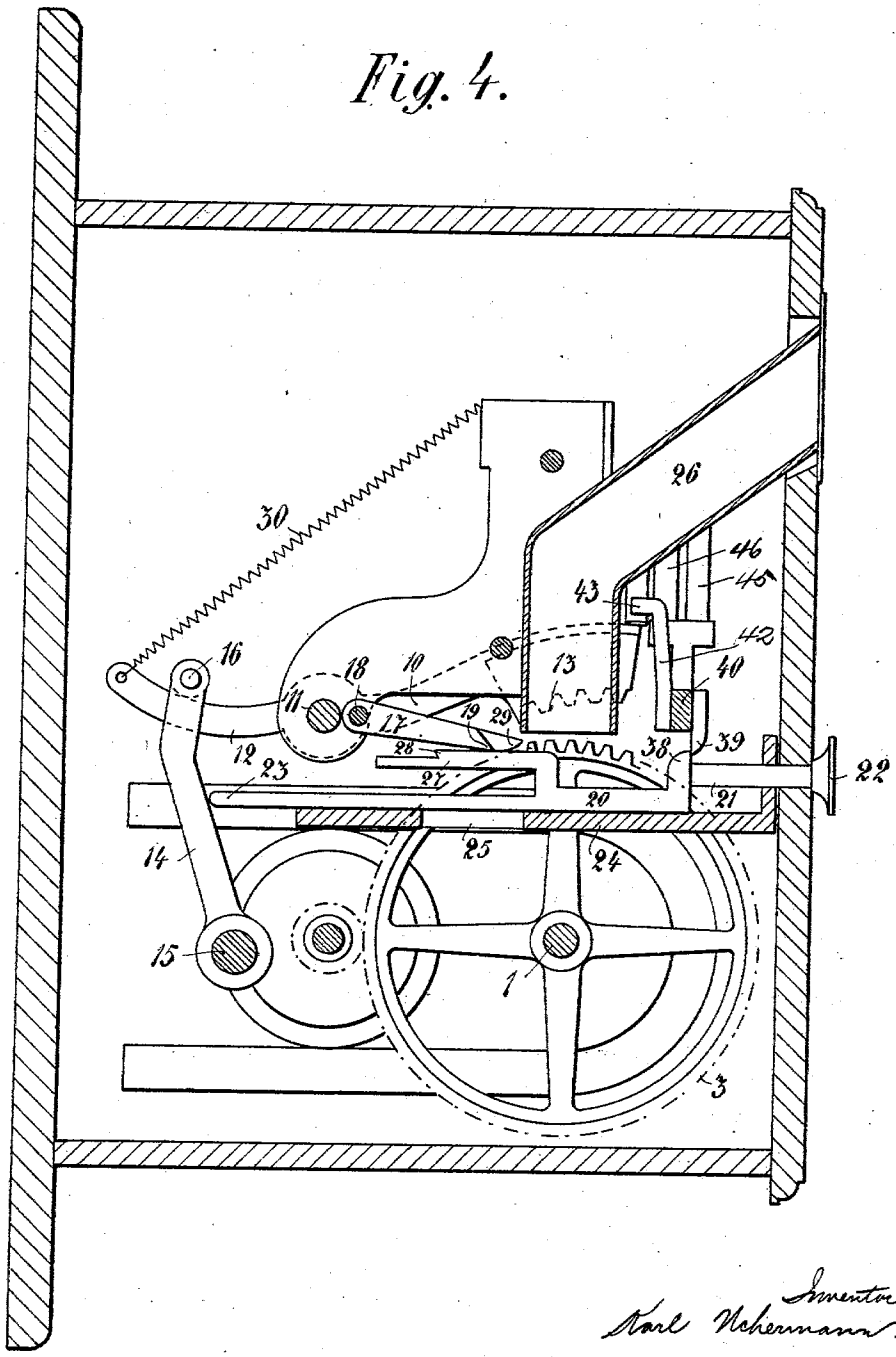
Fig. 4.



Witnesses:
H. Ober
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No. 695,013. Patented Mar. 11, 1902.

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COIN FREED TELEPHONE APPARATUS.

(Application filed Dec. 7, 1900.)

(No Model.) 7 Sheets—Sheet 5.

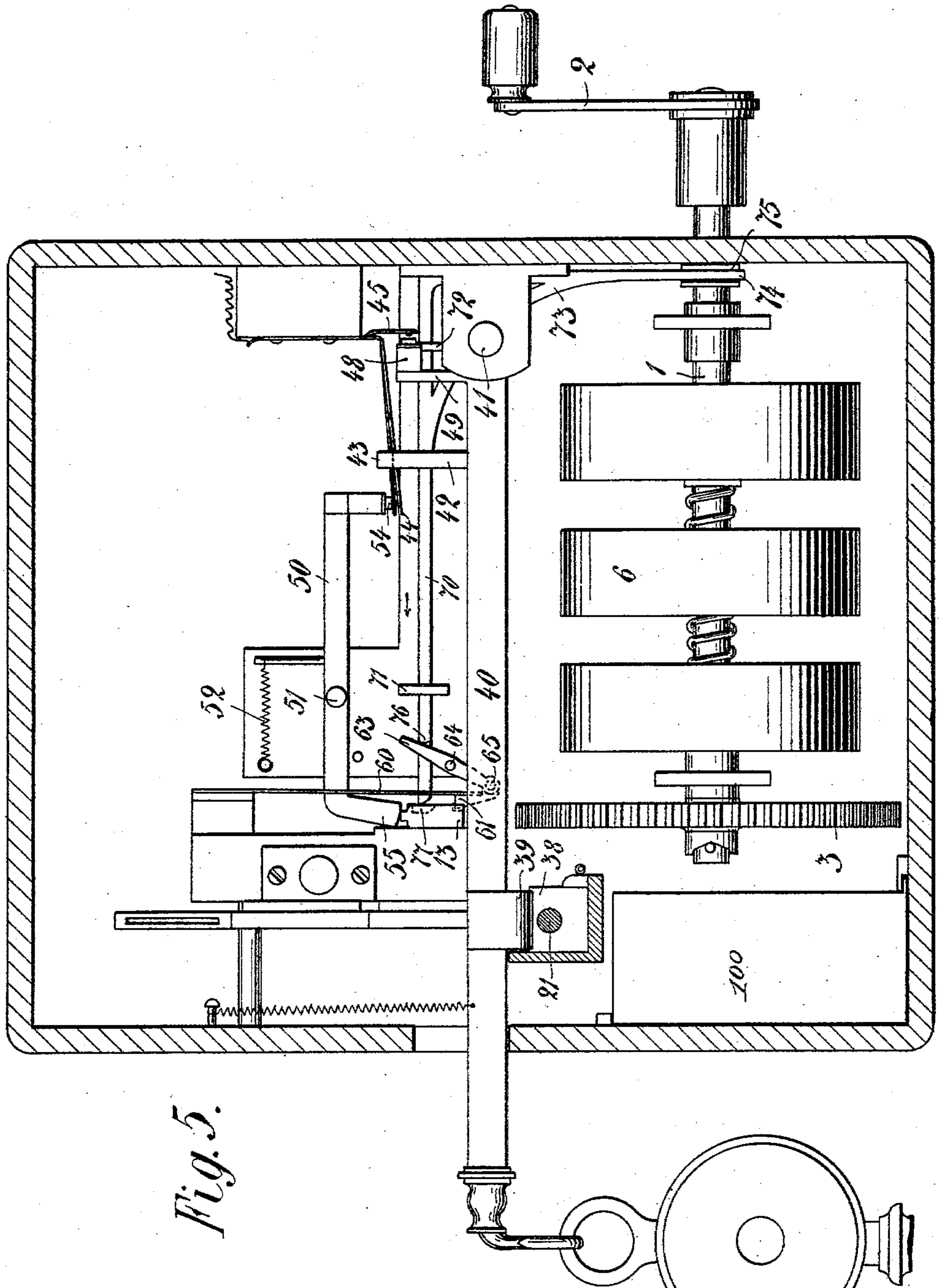

Fig. 5.

Witnesses:
J. A. Ober
B. K. Sommers

Karl Uchermann, Inventor.
by Neuwirth, Atty.

No. 695,013. Patented Mar. 11, 1902.

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COIN FREED TELEPHONE APPARATUS.

(Application filed Dec. 7, 1900.)

(No Model.) 7 Sheets—Sheet 6.

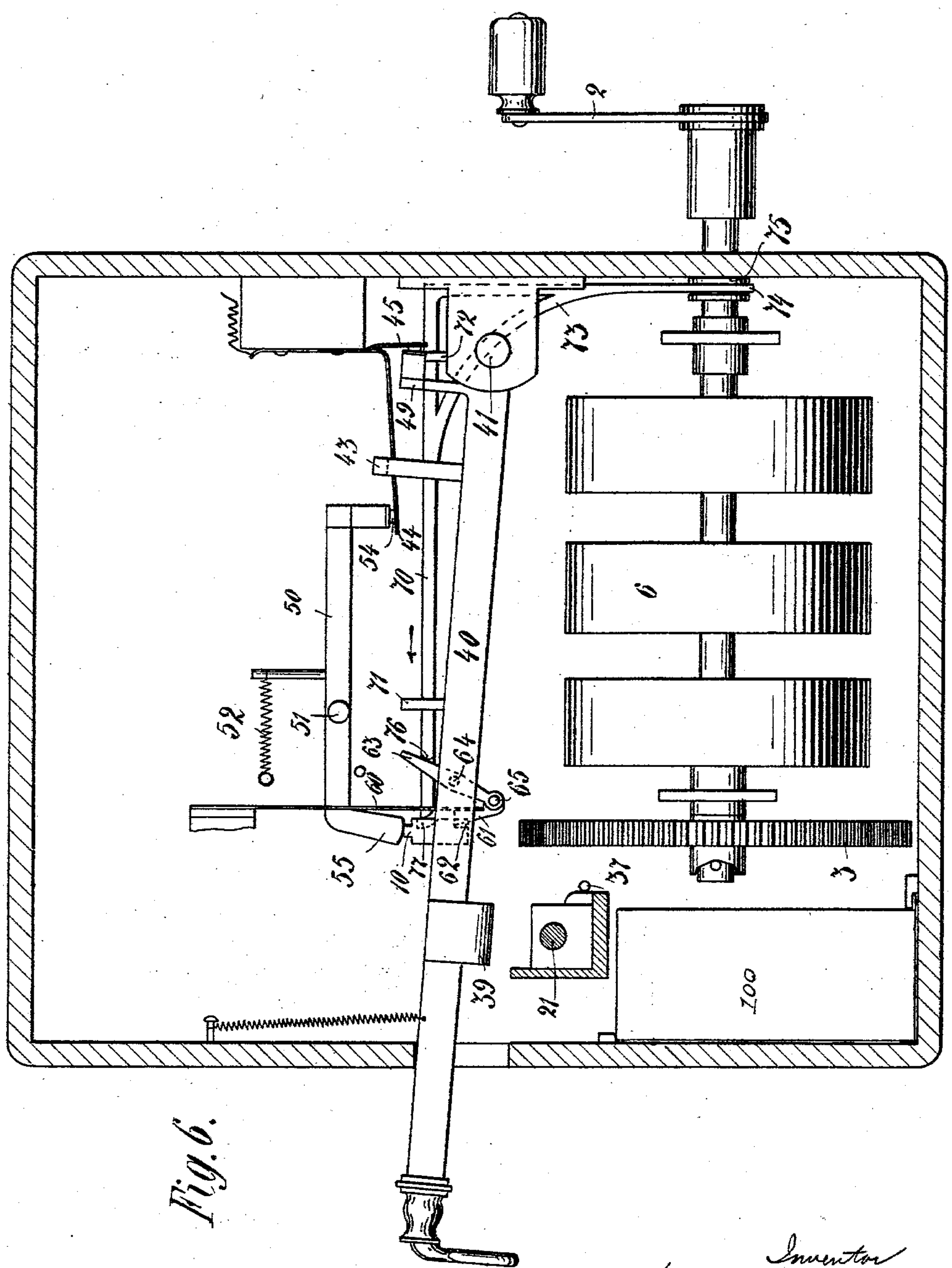

Fig. 6.

Witnesses:
[signature]
R. W. Sommers

Inventor
Karl Uchermann.
by Henry Orth
Atty.

No. 695,013. Patented Mar. 11, 1902.

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COIN FREED TELEPHONE APPARATUS.

(Application filed Dec. 7, 1900.)

(No Model.) 7 Sheets—Sheet 7.

Fig. 7a.

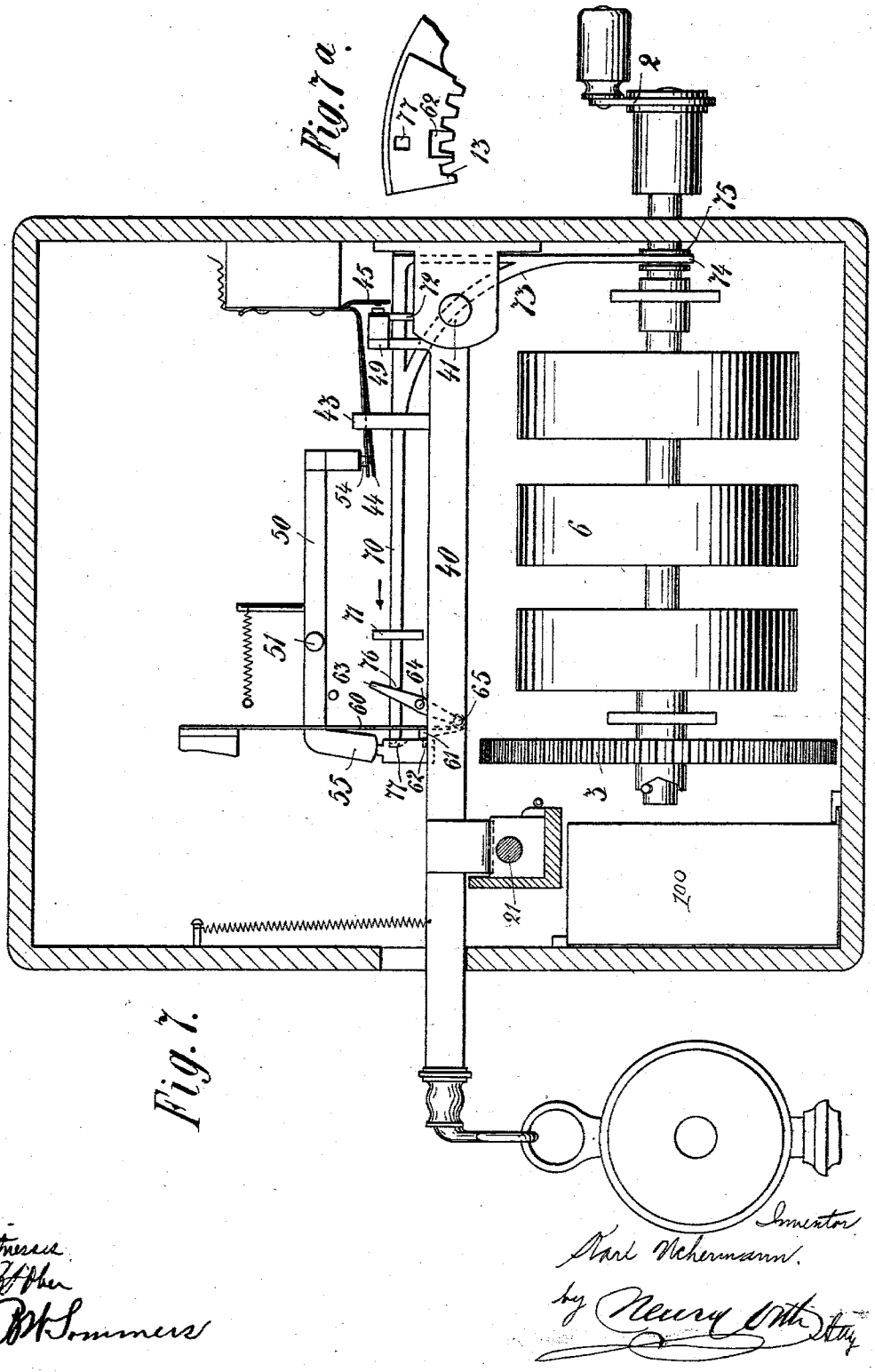

Fig. 7.

Witnesses
[illegible]
[illegible] Sommers

Inventor
Karl Uchermann.
by [illegible] Atty

UNITED STATES PATENT OFFICE.

KARL UCHERMANN, OF CHRISTIANIA, NORWAY.

COIN-FREED TELEPHONE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 695,013, dated March 11, 1902.

Application filed December 7, 1900. Serial No. 39,089. (No model.)

To all whom it may concern:

Be it known that I, KARL UCHERMANN, a subject of the King of Sweden and Norway, residing at Christiania, Norway, have invented certain new and useful Improvements in Coin-Freed Telephone Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

My invention relates to coin-freed telephone apparatus; and it consists in means and arrangements and combinations of parts whereby the operative parts of a telephone apparatus are arrested and freed in an absolutely non-failing manner and whereby the operation and construction of this kind of apparatus are greatly improved.

My invention may be carried out in different ways as to the mechanical details. In the following I will, however, describe as an example of construction a preferred form for carrying out the invention, reference being had to the annexed drawings, in which—

Figure 1 represents a horizontal section through a telephone apparatus, showing a plan view of the mechanism. Fig. 2 is a vertical section about on the line A A, Fig. 1. Fig. 3 is a vertical section about on the line B B. In these figures the parts are shown in their normal position, a coin being shown inserted resting in the coin-receiving slide. Fig. 4 is a vertical section similar to Fig. 2, the parts being shown in the position when the coin-receiving slide has been pushed inwardly, thereby freeing the mechanism, so the crank-axle may be turned to call the central station. Fig. 5 is a view similar to Fig. 3, but showing the parts in the position explained with reference to Fig. 4. Fig. 6 is a similar view showing the parts in their position after the microphone has been removed from the switch-arm, in which position the parts remain during the use of the telephone. Fig. 7 is a similar view showing the parts in their position when the conversation has been finished, the microphone hung on the switch-arm, and the crank turned for producing the break-off signal. Fig. 7ª is a detail of the arresting-lever for the crank-axle.

1 is the crank-axle, 2 the crank for turning the same, and 3 a toothed wheel mounted on the axle, said wheel engaging with a wheel 4 on the inductor-axle.

5 represents the inductor, and 6 its magnets. This arrangement is the usual, it may be of any desired construction and need no explanation, it should be noted however, that the crank-axle as usual is arranged so as to perform a small longitudinal movement upon turning the axle a part of a revolution, and before putting the wheel 3 in rotation. For reasons which will be easily understood hereinafter the crank should not be keyed to the axle, but held to the same by way of friction in any well-known way.

Referring more particularly to Figs. 2 and 4, 10 is a lever, fulcrumed at 11 and having one arm 12 projecting backwardly and the other arm provided with a toothed sector 13, which engages with the aforesaid wheel 3 or another wheel on the crank-shaft or on the inductor-shaft. 30 is a spring that tends to draw the arm 12 upwardly. 20 is a slide having a stud 21 projecting through the front of the apparatus and being on its end provided with a pusher 22. The slide has an inward projection 23 and rests on a bed 24, in which is a slot 25 above a coin-receiving box 100, Figs. 3, 5, 6, and 7. 26 is the channel through which it is led down on the bed 24 immediately in front of the slide 20. The slide 20 also has a slotted projecting member 27, with a notch 28. Engaging with this member is an arm 17, which is fulcrumed at 18, it being formed at its point 19 like a pawl and having a central projection 29, which is rounded on its under face and which lies in the path of the coin. 14 is a swinging arm, fulcrumed at 15 and having a lateral projection 16, which rests on the top side of the arm 12 of the arresting-lever 10. The shank of this arm lies in the path of the projection 23 of the slide 20. 39 is a downward projection on the telephone switch-arm 40, and 38 is a lug on the coin-slide 20. The latter is rounded on its inward face, the former on its outward face. The operation of these parts is as follows: When no coin is inserted, the pawl-arm 17

rests with its point 19 on the lower face or level of the member 27, and if the slide is pushed forward by pressing on the knob 22 the notch 28 will hit against the point 19 and further movement will not be possible. As the arresting-lever 10 is in engagement with the wheel 3, the crank-axle cannot be turned in this position of the parts. If power is exerted for turning the axle, the crank will turn on the axle on account of its being fastened by friction to the same. If a coin has been placed in the apparatus through the channel 26 and the slide 20 then pushed inwardly, the coin will hit the round under side of the projection 29 on the arm 17 and this arm be lifted, so that its point 19 will come above the notch 28 of the member 27, and the slide 20 now can be moved to the position shown in Fig. 4, whereby the projection 23 of the slide will push the arm 14 inwardly. This movement of the arm 14 causes, by means of the roller 16, a depression of the arm 12, whereby the toothed segment 13 will be raised out of engagement with the wheel 3. When the slide 20 is pushed to its inward position, Fig. 4, the projection 39 will snap behind the lug 38 on the slide 20, and thereby preventing its going back. A spring 37 between the lugs 35 and 36 tends to draw the slide in an outward direction. The crank-axle 1 is now free to turn.

In the following shall now be explained the mechanisms used for securing the renewed arresting of the crank-axle after the use of the telephone, reference being had especially to Figs. 3, 5, 6, and 7. 40 is the telephone switch-arm, which is pivoted at 41 and has an upright projection 42, with a lateral hook 43, that projects above a spring 44, forming the contact-piece for establishing the circuit for the all-armor calling-current. There are other such springs 441, 442, and 443, arranged sidewise behind the spring 44, forming contact-pieces for the ground-wires, &c. (See also Fig. 1.) 45 and 46 are springs forming the contacts for the speaking-current, a contact-piece 47 being, by means of an insulating-block 48, carried by an upright 49 on the switch-arm 40. 50 is a lever pivoted at 51 and being kept by means of the spring 52 normally in the position shown in Fig. 3. This lever has an insulating-head 53, which carries contact-pieces 54, corresponding with the springs 44 441 442 443. At the other end the lever 50 has a downward projection 55, which is in the path of the aforesaid arresting-lever 10. Normally the lever 50 rests on a stop 56; but when the arresting-lever 10 is lifted it takes the contact-lever 50 with it and brings it over from the position Fig. 3 to the position Fig. 5. The spring-contacts 441, 442, and 443 will thereby be depressed and contact established; but the spring 44 will still be held so far down by the hook 43 that contact will not be established between 54 and 44, this taking place not before the switch-arm 40 raises (upon lifting the microphone off the arm, see Fig. 6.) In this position the telephone is ready for a conversation. 60 is a spring-latch, its hook 61 engaging into a notch 62 in the side of the arresting-lever 10. 63 is a lever pivoted at 64 and pivotally connected at 65 with the lower end of the spring-latch 60. 70 is a slide which is guided so as to be able to make a small horizontal movement in guides 71 and 72. It has a downward extension 73, which reaches between two collars 74 75 on the crank-axle. When the crank-axle is turned, it will, as before mentioned, make a short longitudinal movement, and thereby move the slide 70 in the direction of the arrow. The slide has a setoff or shoulder 76, which is in contact with the upper arm of the lever 63. The end of the slide terminates in close proximity to the side of the arresting-lever 10, this lever having at this place a notch or recess 77. The working of these parts is as follows, (their normal position being as shown in Fig. 3:) When the arresting-lever 10 goes up, the spring-latch falls, with its hook 61, into the notch 62 of the arresting-lever, Fig. 5. This latch mechanism does not, however, at this time come into positive function, as the lever 10 is locked in its elevated position by way of the arm 14 and slide 20, the latter being prevented from returning to its normal position by the lug 39 on the switch-arm, the same being, as will be seen in Fig. 4, in front of the lug 38 on the slide. Now the crank is turned to call the central station and thereupon the microphone removed from the switch-arm, which latter, as usual, is then lifted up by its spring. When the switch-arm rises, the slide 20 is thereby released and is drawn to its normal position by the spring 37. The arresting-lever 10 would thereby, be it not for the latch-hook 61, have dropped down drawn by its spring 30. The latch mechanism however now catches hold of the arresting-lever as shown in Fig. 6, which is the position of parts during the conversation. When the same is finished and the microphone being on the switch-arm, the following will take place on turning the crank for ringing off: The slide 70 will be moved so much forward that its point reaches into the recess 77 in the arresting-lever. Simultaneously the lever 63 will be tilted so much that it will draw the spring-latch hook 61 out of its notch. This position of parts is shown in Fig. 7. As the distance between the acting faces of the hook and the slide-point is a little smaller than the distance between the corresponding faces of the notches, the said movement will bring the arresting-lever to drop a short distance, being the above-named difference. When the turning of the crank ceases, the slide 70 will return to its normal position, whereby the point of the slide is withdrawn from the recess and the arresting-lever drops down in engagement with the wheel, all parts in normal position.

Remark: The action just described of the latch mechanism only takes place on the second ringing, because when the first ringing takes place the arresting-lever is kept by the coin-receiving slide, so the two latches can move freely in and out of their notches without causing the described step movement of the arresting-lever.

I claim—

1. In a coin-freed telephone apparatus, an inductor, a wheel connected thereto, an arresting-lever provided with two notches and arranged to prevent the motion of said wheel and inductor, and capable of being moved to allow their operation, a spring-latch arranged to temporarily engage one of said notches and a positively-moved latch arranged to engage the other, substantially as set forth.

2. In a coin-freed telephone apparatus, an inductor, a wheel connected thereto, an arresting-lever provided with two notches and arranged to prevent the motion of said wheel and inductor, and capable of being moved to allow their operation, a spring-latch arranged to engage one of said notches and a second latch arranged to engage the other, and a lever for releasing the spring-latch operated by the second-mentioned one, substantially as set forth.

3. In a coin-freed telephone apparatus, the combination with the signaling device, of means to engage and prevent the operation of said signaling device, a slide arranged to disengage the means and to receive a coin, and a detent for said slide, said detent moved out of operative position by the coin when the slide is moved with the coin in it, substantially as set forth.

4. In a coin-freed telephone apparatus, the combination with the signaling apparatus, of a crank-operated cog-wheel geared thereto, a lever arranged to engage the teeth of said wheel to prevent its rotation, a swinging arm acting on one end of the lever, a slide adapted to receive a coin and move the swinging lever, whereby the signaling apparatus is released, a detent to prevent the complete movement of said slide and moved out of operative position by the coin when the slide is operated, substantially as set forth.

5. In a coin-freed telephone apparatus, the combination with the signaling apparatus, of a crank-operated cog-wheel geared thereto, a pivoted spring-held lever arranged to engage with one end the teeth of said wheel to prevent its rotation, a swinging arm acting on the other end of said lever, a spring-held slide provided with a notch and a coin-slot adapted to receive a coin and move the swinging arm to actuate the lever to release the signaling apparatus, a pawl arranged to engage the notch in said slide to stop it when it is moved without a coin and moved out of operative relation by the coin in said slide, substantially as described.

6. In a coin-freed telephone apparatus, the combination with the signaling apparatus, of means for preventing the operation thereof, a spring-held slide provided with a notch adapted to receive a coin and cause the release of the signaling apparatus, a pawl arranged to engage the notch when the slide is moved without a coin therein, an automatic switch arranged to prevent the complete return of said slide after discharging its coin and to close the talking-circuit when the receiver is removed from said lever, substantially as set forth.

7. In a coin-freed telephone apparatus, the combination with the signaling apparatus and the signaling and talking circuits, of a lever to prevent the actuation of the signaling apparatus, a spring-held slide adapted to receive a coin and cause said lever to release the signaling apparatus and a spring-held contact-lever simultaneously operated to close the signaling-circuit, substantially as set forth.

8. In a coin-freed telephone apparatus, the combination with the signaling and talking circuits, of a lever arranged to prevent the actuation of the signaling apparatus, a slide arranged to receive a coin and to cause the movement of said lever to release the signaling apparatus, a contact-lever operated by the first-mentioned one arranged to close the signaling-circuit, an automatic switch arranged to close the talking-circuit and means operated thereby to simultaneously cut out the signal-circuit when the telephone is lifted therefrom, substantially as set forth.

9. In a coin-freed telephone apparatus, the combination with the signaling apparatus and the signaling and talking circuits, of a lever arranged to prevent the actuation of the signaling apparatus, means for moving said lever to release the signaling apparatus, a spring-latch to hold said lever from engagement with the signaling apparatus, a spring-held contact-lever actuated by the first-mentioned one and arranged to close the signaling-circuit, an automatic switch arranged to close the talking-circuit and simultaneously cut out the signaling-circuit, and means operated from the signaling apparatus to release said spring-latch, substantially as set forth.

10. In a coin-freed telephone apparatus, the combination with the signaling apparatus and its operating crank-axle, of a lever arranged to arrest the operation thereof and provided with two notches, a spring-latch arranged to take into one of said notches, a positively-moved latch taking into the other notch, means for operating the latter, a pivoted lever connected to the spring-latch, means on the positively-moved latch for actuating the pivoted lever, substantially as set forth.

11. In a coin-freed telephone apparatus, the combination with the signaling apparatus, an operating crank-axle therefor arranged to have a slight longitudinal motion, of a lever arranged to arrest the operation of the signaling apparatus and provided with two notches, a spring-latch arranged to engage

one of said notches, a positively-moved latch provided with an offset operated by the crank-axle, a pivoted lever yieldingly secured at one end to the spring-latch, the other end of said lever actuated by the offset on the positively-moved latch, substantially as set forth.

12. In combination, a telephone signaling apparatus, a lever normally arranged to prevent the operation thereof, a slide, means for operating said slide to release the lever, a spring-held lever actuated by the first-mentioned one to close the signaling-circuit, an automatic switch arranged to close the talking and simultaneously cut out the signaling circuit, and means for releasing the first-mentioned lever by ringing off on the signaling apparatus.

13. In a coin-freed telephone apparatus, an inductor, an arresting-lever provided with two notches and arranged to prevent the motion of said inductor and capable of being moved to allow its operation, a spring-latch arranged to engage one of said notches and a second latch arranged to engage the other, the distance between the acting faces of the hook and latch being less than the distance between the corresponding faces of the notches, and means for operating the latches, for the purpose specified.

14. In a coin-freed telephone apparatus, the combination with the signaling and the signaling and talking circuits, of a crank-operated cog-wheel geared to the signaling apparatus, a pivoted spring-held lever provided with two notches and arranged to engage with one end the teeth of said wheel to prevent its rotation, a swinging arm acting on the other end of said lever, a spring-held slide provided with a notch and a coin-slot adapted to receive a coin and move the swinging arm to actuate the lever to release the signaling apparatus, a pawl arranged to engage the notch in said slide to stop it when it is moved without a coin and moved out of operative relation by the coin in said slide, a spring-latch arranged to engage one of the notches in the lever, a positively-moved latch arranged to engage the other and provided with an offset, a pivoted lever yieldingly secured at one end to the spring-latch, the other end of said lever actuated by the offset on the positively-moved latch, a spring-held lever actuated by the first-mentioned lever and arranged to close the signaling-circuit, and an automatic switch arranged to close the talking-circuit and simultaneously cut out the signaling-circuit, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

KARL UCHERMANN.

Witnesses:
HENRY BORDEWICH,
AUGUST OLSEN.