

No. 672,035.

Patented Apr. 16, 1901.

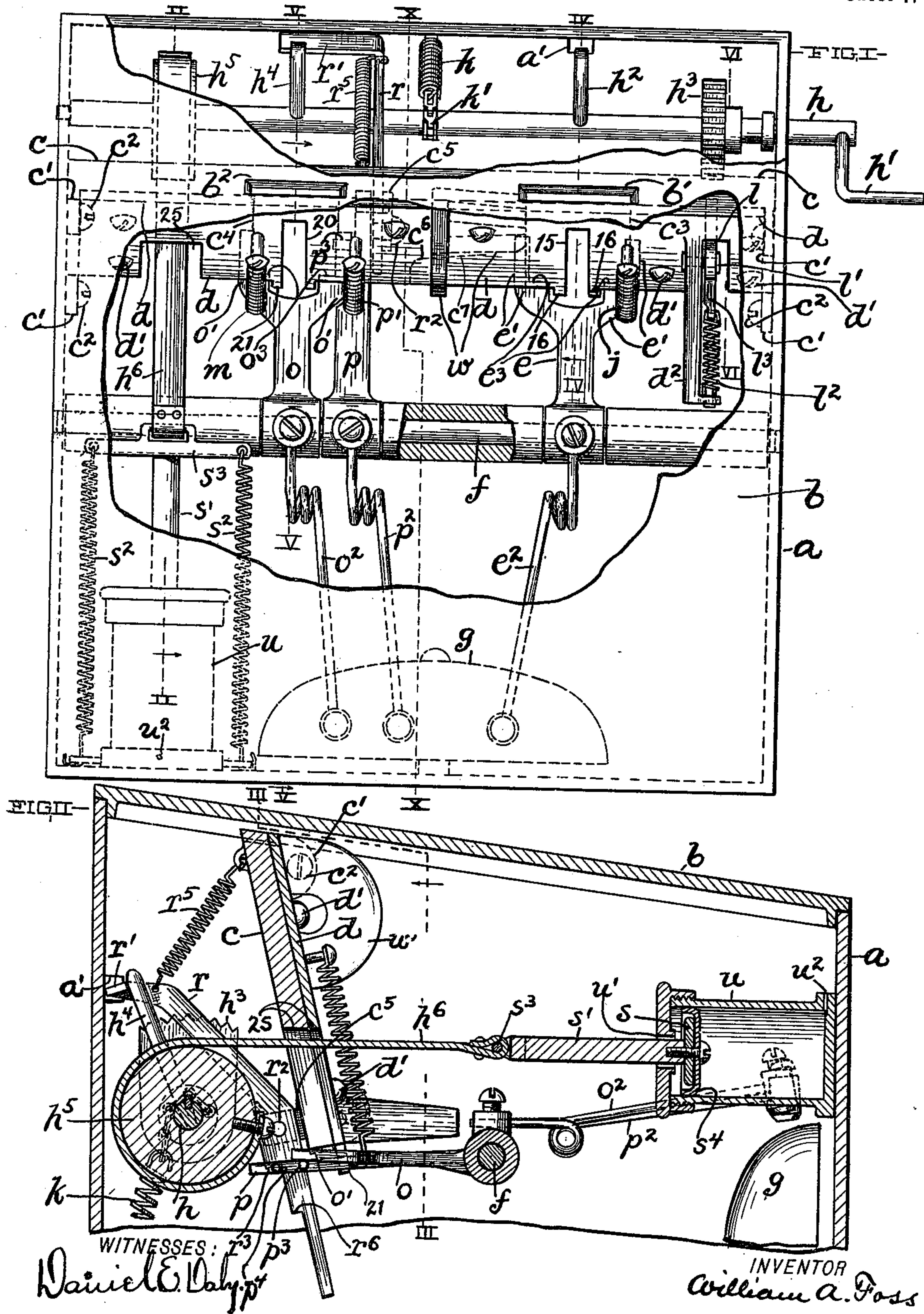
W. A. FOSS.

TOLL COLLECTING MACHINE FOR TELEPHONES.

(Application filed Sept. 17, 1900.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:
Daniel E. Daly
A. H. Farratt

INVENTOR
William A. Foss
BY
Snyder & Wozner
his ATTORNEYS

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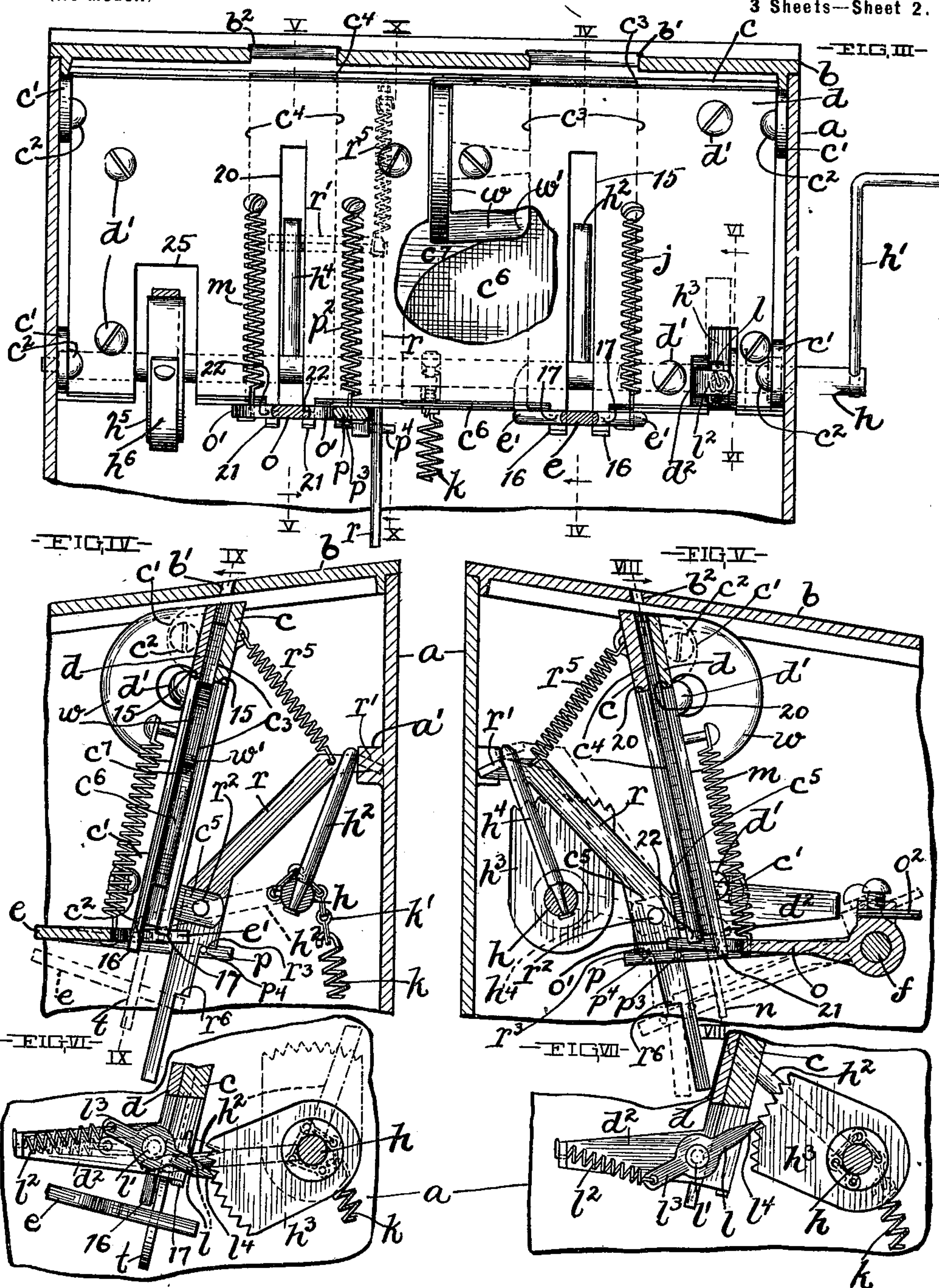
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WITNESSES:

Daniel E. Daby.

A. H. Parratt

INVENTOR

William A. Foss

BY

Vyncke & Dorer
his ATTORNEYS

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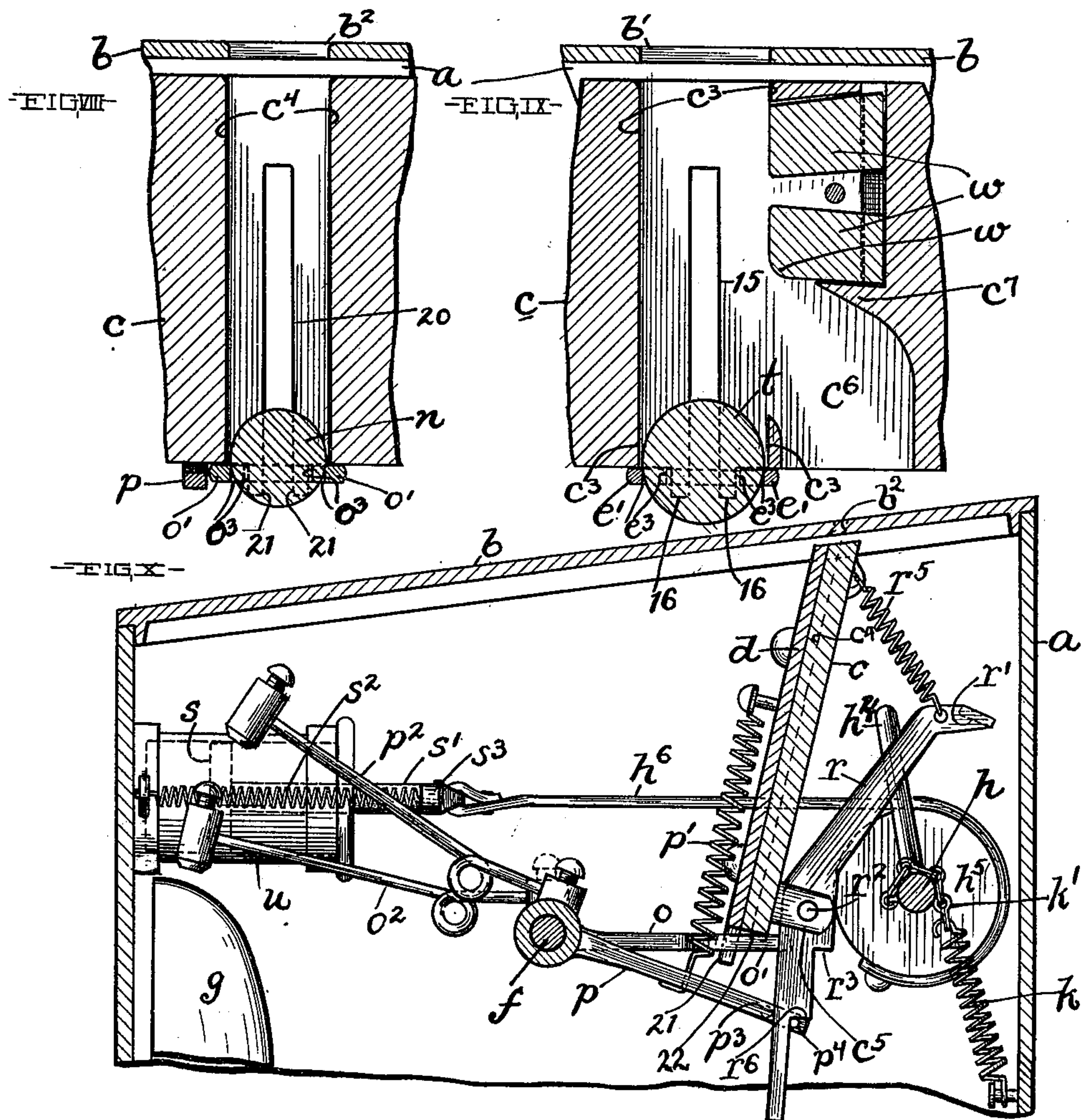
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3 Sheets—Sheet 3.



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Daniel E. Daly.

A. H. Farratt

INVENTOR

William A. Foss

BY

Synch & Dorer
his ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM A. FOSS, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN
TOLL TELEPHONE COMPANY, OF SAME PLACE.

TOLL-COLLECTING MACHINE FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 672,035, dated April 16, 1901.

Application filed September 17, 1900. Serial No. 30,323. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. FOSS, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Toll-Collecting Machines for Telephones; and I do hereby declare the following to be full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in toll-collecting machines for telephones.

One object of this invention is to provide a toll-collecting machine of the character indicated with two coin-receiving and coin-conducting channels arranged a suitable distance apart for conveying into the machine different toll-representing coins or checks having different dimensions, respectively, and being of a low denomination and higher denomination, respectively, and to have different mechanisms instrumental in the operation of a signaling device and extending in under the different toll-collecting passage-ways, respectively, and to have each of said mechanisms arranged as required to arrest a toll-representing coin or check conducted by the adjacent channel preparatory to the operation of the said mechanism through the medium of the coin or check arrested by the said mechanism.

Another object of the invention is to provide a signaling-gong in common for both of the signaling-device-operating mechanisms, to have each of said mechanisms comprise a suitably-applied forked lever tiltable in an upright plane and provided with a hammer having the arrangement required to render it capable of striking and sounding the gong, and to have two toll-conducting channels leading from above and arranged to discharge the toll-representing coin or check edgewise upon the fork of the different forked levers, respectively, and to have two suitably-operated and suitably-supported oscillating arms arranged adjacent to the different forked levers, respectively, and to arrange each of the said oscillating arms as required to render it capable of engaging from above a toll-representing coin or check lodged upon the adjacent forked lever, and thereupon through the

medium of the said coin or check operate the said lever as required to effect a sounding of the gong.

Another and important object of the invention is to employ the toll-operated signaling-device-operating mechanism that is engaged and directly operated by the toll-representing coin or check of higher denomination in the operation of another mechanism instrumental in the production of a secondary signal, and thereby distinguish the signal accompanying the deposit of a coin or check of higher denomination from the single signal accompanying the deposit of the coin or check of lower denomination.

Another object of the invention is to combine with the channel employed in conducting a toll-representing coin or check of lower denomination into the machine another channel leading from one side of and in open relation with the first-mentioned channel and a magnet having such arrangement relative to the said channels that a slug of iron or steel or other magnetic material introduced into the toll-receiving or main channel is attracted by the magnet and diverted from the main channel into the branch or side channel, and consequently prevent the operation of the machine by the said slug.

With these objects in view and to the end of realizing other advantages hereinafter appearing the invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a top plan of a toll-collecting machine embodying my invention, and portions are broken away and in section in this figure to more clearly show the construction. Fig. II is a left-hand side elevation of the machine, largely in vertical section, on line II II, Fig. I. Fig. III is a front side elevation, in vertical section, on line III III, Fig. II, and portions are broken away in this figure to more clearly show the construction. Fig. IV is a right-hand side elevation, largely in section, on line IV IV, Figs. I and III. Fig. V is a left-hand side elevation, largely in section, on line V V, Figs. I and III. Fig. VI is a right-hand side elevation in section on line VI VI,

Figs. I and III, except that in Fig. VI the toothed sector and engaging latch are shown in a different position. Fig. VII is an elevation in section corresponding with Fig. VI, except that in Fig. VII the toothed sector and engaging latch are shown in a different position. Fig. VIII is a rear side elevation in section on line VIII VIII, Fig. V. Fig. IX is a rear side elevation in section on line IX IX, Fig. IV. Fig. X is a right-hand side elevation on line X X, Figs. I and III, except that in Fig. X parts of the mechanism employed in the production of a secondary signal are shown in a different position.

Referring to the drawings, *a* designates the inclosing case of my improved machine, and *b* represents the top of said case, which top is provided at or near its rear portion with two slots *b'* and *b''*, arranged in line and a suitable distance apart between the right-hand and left-hand side walls of the case. The toll-representing coins or checks required in the operation of the machine are introduced at the aforesaid slots, that differ in size. The slot *b'* has the dimensions required to admit only a toll-representing nickel or a coin or check having the dimensions of a nickel. The slot *b''* has the dimensions required to admit only a toll-representing dime or a coin or check having the dimensions of a dime.

Two upright plates *c* and *d* extend between the right-hand and left-hand side walls of the case *a*, within the upper and rear portion of the said case and underneath the slots *b'* and *b''* of the top of the case. The rear plate *c* is provided at each end with forwardly-projecting lugs or ears *c'*, secured, preferably, by means of screws *c''* to the side walls of the case *a*. The plate *c* is rigid, therefore, with and removable from the case *a*. The plate *c* is provided upon its forward side with two upright channels *c''* and *c'''*, leading from the upper edge of the said plate downwardly to the plate's lower edge. The plate *c* slopes, preferably, somewhat downwardly and forwardly. The plate *d* lies against the forward side of the plate *c* and extends across the channels *c''* and *c'''*. The plate *d* extends, preferably, from the upper edge to the lower edge of the plate *c* in an upright direction and extends, preferably, from the lugs or ears *c'* of one end of the plate *c* to the ears or lugs *c'* of the other end of the said plate *c* in a horizontal direction. The plate *d* is secured to the plate *c*, preferably removably, by means of screws *d'*, that are applied at such places as will not cause them to obstruct the aforesaid channels.

The channel *c''* registers with the toll-receiving slot *b'* and has the dimensions required to render it capable of receiving from the said slot a nickel or corresponding toll-representing coin or check and conducting the toll to and upon the two forwardly and rearwardly extending parallel arms *e'* and *e''* of a forked lever *e*, that has its said arms extending below the channel *c''* and arranged

such a distance apart as is required to render the said arms capable of arresting a proper toll-representing coin or check conducted by the said channel and prevent the said coin or check dropping directly from the said channel into the lower portion or toll-collecting chamber of the case *a*, but permit a smaller coin or check to pass downwardly between them into the said chamber. The fork of the lever *e* normally has such position relative to the lower end of the channel *c''* that a coin or check lodging upon the said lever shall not be out of the said channel, as shown very clearly in Fig. IX, wherein *t* represents a coin or check arrested by the said lever.

The lever *e* is loosely mounted or fulcrumed at the forward end of the shank-forming portion of the lever's fork a suitable distance forward of the lower end of the channel *c''* upon a rod *f*, that is arranged horizontally and extends between and is supported from the left-hand and right-hand side walls of the case *a*. The lever *e* in its normal position extends horizontally rearwardly from the said rod. The lever *e* at its fulcrum is provided with a forwardly-extending spring-hammer *e''*, that has the arrangement required to render it capable of striking and thereby sounding a gong *g*, that is secured in any approved manner to the forward side wall of the case *a*. A suitably-applied coil-spring *j*, arranged forward of the plate *d* and having opposite ends thereof attached to the said plate and to the lever *e*, respectively, acts to retain the said lever and the attached gong-sounding hammer in their normal position.

An oscillating shaft *h* is arranged horizontally between and supported from the right-hand and left-hand side walls of the case *a*, preferably about centrally between the lower portion of the plate *c* and the rear wall of the case. The shaft *h* extends through the right-hand side wall of the case *a* and at the outer side of the said wall is provided with a crank *h'* for operating the same. The shaft *h*, next rearward of the channel *c''*, is provided with an upright arm *h''*, that in the normal position of the shaft engages a lug *a'*, (see Figs. I and IV,) formed upon the rear side wall of the case *a*, and the said lug *a'* and the aforesaid lever-arm *h''* constitute, therefore, a stop for limiting the oscillation of the shaft to the right or rearwardly. A suitably-applied spring *k*, (see Figs. I, II, and III,) preferably a coil-spring, acts to retain the shaft *h* in its normal position. The spring *k* is arranged uprightly below the shaft, has its lower end attached to the case *a*, and has its upper end attached to one end of a chain *k'*, whose opposite end is attached to the shaft, which chain leads from the spring to and over the rear side of the shaft and winds upon the shaft, so as to place the spring under tension upon turning the shaft to the left or forwardly. The shaft *h* is free to be oscillated forwardly, as already indicated, and the arrangement of parts and the length of the

shaft-arm h^2 are such that when a nickel or proper toll-representing coin or check has been conducted to and arrested by the toll-arresting arms or members of the lever e , as shown in Fig. IX, a forward oscillation of the shaft h against the action of the spring k will cause the arm h^2 of the said shaft to descend upon and engage the upper edge of the said coin or check and thereupon, upon a continuation of the shaft's oscillation in the same direction, result in the depression of the said coin or check, and consequently in a downward tilting of the toll-bearing lever e , until the said lever has been tilted downwardly far enough to permit the toll to pass rearwardly off the lever below the channel c^3 , and the shaft-arm h^2 is long enough to render it capable of extending through the channel h^3 during the toll-depressing and toll-ejecting operation of the said arm, so as to cause the said arm to overhang the forward side of the toll-representing coin or check and enable the said arm to crowd the said coin or check rearwardly off the toll-bearing lever e . In dotted lines, Fig. IV, the lever e is shown tilted downwardly far enough to free the toll-representing coin or check t , that is also shown in dotted lines in the said figure, and I would here remark that the downward and forward slope of the channel c^3 causes any coin or check lodging upon the said lever to be correspondingly held until the toll is discharged from the lever, and consequently facilitates the discharge of the toll from the lever by the shaft-arm h^2 . As soon as the toll arrested by the lever e has alighted from the lever, as hereinbefore described, the spring j promptly returns the lever into its normal position, and the spring k insures a prompt return of the shaft h into its normal position upon the operator's release of the said shaft after having operated it as required to operate the signal through the medium of the toll-representing coin or check. Obviously the gong-sounding hammer e^2 is during the toll-ejecting operation of the shaft-arm h^2 elevated or removed farther from the opposing gong or sound-yielding body, and upon the release of the said lever the action of the spring j results in forcibly throwing the aforesaid hammer against the said sound-yielding body, and thereby signaling or notifying the telephone-exchange that the proper toll has been introduced into the machine beyond the control of the person desiring to use the telephone provided with the said machine.

The forward and rear side walls of the channel c^3 —that is, those portions of plates c and d that form the said walls—are slotted vertically, as at 15, from the lower edges of the plates upwardly to accommodate the location and operation of the shaft-arm h^2 . Preferably the said forward and rear slotted walls of the channel c^3 are provided at the channel's lower end with two depending lugs 16 16 and 17 17, respectively. The lugs 17 17 and the lugs 16 16 are arranged at opposite sides, respectively,

but in close proximity to the sweep of the shaft-arm h^2 , so that any coin or check arrested by the lever e will be detained upon the said lever until the said shaft-arm is ready to commence its ejecting operation. The rear lugs 17 are preferably somewhat shorter than the forward lugs 16, so that the aforesaid coin or check shall during the oscillation of the shaft-arm h^2 become free to pass under the lugs 17, while it is still overlapped upon its forward side by the lugs 16. I would here remark that a coin or check arrested by the lever e lodges upon the said lever next to rearwardly-facing shoulders e^3 , with which the said lever (see Figs. I and IX) is provided, and that the said shoulders e^3 and the lugs 16 positively prevent forward displacement of the toll upon the lever e .

A toothed sector h^3 is fixed or operatively mounted upon the right-hand end of the shaft h , preferably between the shaft-arm h^2 and the right-hand side wall of the case a . In the normal position of the parts the sector h^3 projects upwardly from the shaft, as shown in Figs. I and II and in dotted lines, Fig. VI.

A vertically-tiltable latch l , that extends forwardly and rearwardly of the machine, is arranged horizontally forwardly of the sector-bearing portion of the shaft. The latch l is pivoted, as at l' , parallel with the shaft h to the plate d at the inner end of a bracket or arm d^2 , that projects forwardly from and is rigid with the said plate. A coil-spring l^2 is arranged forwardly of the latch and has opposite ends attached to an arm l^3 of the latch and to the bracket d^2 , respectively. The spring l^2 acts to retain the latch in its normal position, wherein the tooth l^4 , in which the sector-facing or free end of the latch terminates, is arranged radial to the shaft and in the horizontal plane that contains the said shaft. The arrangement of parts is such that during the forward oscillation of the sector h^3 the forward side edge of the sector comes into engagement with the top of the tooth of the latch and thereupon tilts the said latch downwardly against the action of the spring l^2 , as shown in solid lines, Fig. VI, and has its serrated periphery riding over the latch, and the shaft cannot be returned into its normal position until the sector has been oscillated far enough to become disengaged from the latch after the toll introduced into the machine and employed in the operation of the gong-striking mechanism has fallen into the toll-collecting lower portion of the case a from the said mechanism. Similarly during the rearward oscillation or return of the sector into its normal position the rear side edge of the sector engages the under side of the tooth of the latch and thereupon tilts the latch upwardly against the action of the spring l^2 , as shown in Fig. VII, and has its serrated periphery riding over the latch, and the shaft cannot be returned into its normal position until the sector has been oscillated far enough to become disengaged from the latch. This mechanism, that com-

prises the sector h^3 and the latch l and the spring l^2 , prevents successful tampering with the machine to the end of operating the machine without losing control of the toll.

- 5 The mechanism or apparatus employed in producing the primary signal following the introduction of the proper toll-representing coin or check into the channel c^4 is substantially the same as the mechanism or apparatus employed in producing the signal following the introduction of a proper toll-representing coin or check into the channel c^3 , and I would hence remark that the channel c^4 registers with the toll-receiving slot b^2 and has the dimensions required to render it capable of receiving from the said slot a dime or corresponding toll-representing coin or check and conducting the toll to and upon two forwardly and rearwardly extending parallel arms o' and o' of a forked lever o , that has its said arms extending below the channel c^4 and arranged the distance apart required to render them capable of arresting a proper toll-representing coin or check conducted by the said channel to the said lever and prevent the said coin or check dropping directly from the said channel into the lower portion or toll-collecting chamber of the case a , but permitting a smaller coin or check to pass downwardly between them into the said chamber. The lever o has such position normally relative to the lower end of the channel c^4 that a coin or check lodging upon the fork of the said lever shall not be out of the said channel, as shown very clearly in Fig. VIII, wherein n represents the coin or check arrested by the said lever. The lever o is loosely mounted or fulcrumed at the forward end of the shank-forming portion of the lever's fork, a suitable distance forwardly of the lower end of the channel c^4 , upon the rod f , that, as already indicated, is arranged horizontally and extends between and is supported from the left-hand and right-hand side walls of the case a . The lever o in its normal position extends horizontally rearwardly from the said rod. The lever o at its fulcrum is provided with a forwardly-extending spring-hammer o^2 , that has the arrangement required to render it capable of striking and thereby sounding the gong g , that, as already indicated, forms a part of the signal-producing mechanism operated upon supplying a toll-representing coin or check to the channel c^3 . A suitably-applied coil-spring m , arranged forward of the plate d and having its opposite ends attached to the said plate and to the lever o , respectively, acts to retain the said lever and the attached gong-sounding hammer in their normal position.
- 60 The shaft h , next rearward of the channel c^4 , is provided with an upright arm h^4 , that in the normal position of the shaft (see Figs. I, II, and V) engages an arm r' , projecting laterally of and leftwardly from the upper end of an upright forwardly and rearwardly tilting latch r , that is pivoted, as at r^2 , at or near its central portion horizontally and parallel

with the shaft h to a lug c^5 , projecting rearwardly from and formed upon the lower portion of the plate c between the channels c^3 and c^4 . The latch-arm r' in the normal position of the parts engages the rear side wall of the case a , and the said arm r' and the said wall constitute a stop for limiting the oscillation of the shaft-arm h^4 to the right or rearwardly.

The arrangement of parts and the length of the shaft-arm h^4 are such that when a dime or proper toll-representing coin or check has been conducted to and arrested by the toll-arresting arms or members o' of the lever o , as shown in Fig. VIII, a forward oscillation of the shaft h against the action of the spring m will cause the arm h^4 of the said shaft to descend upon and engage the upper edge of the said coin or check and thereupon by a continuation of the oscillation of the shaft in the same direction result in the depression of the said coin or check, and consequently in a downward tilting of the toll-bearing lever o until the said lever has been tilted downwardly far enough to permit the toll to pass rearwardly off the lever below the channel c^4 , and the shaft-arm h^4 is long enough to render it capable of extending through the channel c^4 during the toll-depressing and toll-ejecting operation of the said arm, so as to cause the said arm to overhang the forward side of the toll-representing coin or check and enable the said arm to crowd the said coin or check rearwardly off the toll-bearing lever o . In dotted lines, Fig. V, the lever o is shown tilted downwardly far enough to free the toll-representing coin or check n , that is also shown in dotted lines in the said figure, and I would here remark that the downward and forward slope of the channel c^4 causes any coin or check lodging upon the said lever to be correspondingly held until the toll is discharged from the lever, and consequently facilitates the discharge of the toll from the lever by the shaft-arm h^4 . As soon as the toll arrested by the lever o has alighted from the lever, as heretofore described, the spring m promptly returns the lever into its normal position, and the spring k insures a prompt return of the shaft h into its normal position upon the operator's release of the said shaft after having operated it as required to operate the signal through the medium of the toll-representing coin or check. Obviously the gong-sounding hammer o^2 is during the toll-ejecting operation of the shaft-arm h^4 elevated or removed farther from the opposing gong or sound-yielding body, and upon the release of the said lever the action of the spring m results in forcibly throwing the aforesaid hammer against the said sound-yielding body, and thereby signaling or notifying the telephone-exchange that the proper toll has been introduced into the machine beyond the control of the person desiring to use the telephone provided with the said machine.

The forward and rear side walls of the chan-

nel c^4 —that is, those portions of plates c and d that form the said walls—are slotted vertically, as at 20, from the lower edges of the plates upwardly to accommodate the location and operation of the shaft-arm h^4 . Preferably the said forward and rear walls of the channel c^4 are provided at the lower end of the channel with two depending lugs 21 21 and 22 22, respectively. The lugs 22 22 and the lugs 21 21 are arranged at opposite sides, respectively, of but in close proximity to the sweep of the shaft-arm h^4 , so that any coin or check lodged upon the lever o will be detained upon the said lever until the said shaft-arm is ready to commence its ejecting operation. The rear lugs 22 are preferably somewhat shorter than the forward lugs 21, so that the aforesaid coin or check shall, during the oscillation of the shaft-arm h^4 , become free to pass under the lugs 22, while it is still overlapped upon its forward side by the lugs 21. It will be observed also that a coin or check arrested by the lever o lodges upon the said lever next to the rearwardly-facing shoulder or shoulders o^3 with which the arms o' of the lever o (see Figs. I and VIII) are provided, and that the shoulders o^3 and the lugs 21, depending from the forward wall of the channel c^4 , positively prevent forward displacement of the toll upon the lever o .

The mechanism or apparatus employed in producing the secondary signal following the primary signal produced upon the introduction of the proper toll-representing coin or check into the channel c^4 and operated through the medium of the mechanism employed to produce the said primary signal comprises a lever p , that is loosely mounted or fulcrumed at the right-hand side of the lever o upon the rod f . The lever p in its normal position extends horizontally rearwardly from the said rod, and at its fulcrum is provided with a forwardly-extending spring-hammer p^2 , that has the arrangement required to render it capable of striking and thereby sounding the gong g . A suitably-applied coil-spring p' , arranged forward of the plate d and having its opposite ends attached to the said plate and to the lever p , respectively, acts to retain the said lever and the attached gong-sounding hammer in their normal position. The lever p upon its left-hand side and near its rear end is provided with a laterally-projecting pin or member p^3 , that extends in under and into contact or close proximity to the lower side and near the free end of the right-hand arm o' of the lever o . The lever p upon its right-hand side and near its rear end is provided with a laterally-projecting pin or member p^4 , that extends in under and into contact or close proximity to the downwardly-facing shoulder r^3 , that is formed upon the rear side of the lower arm of the latch r a short distance below the fulcrum of the latch, as shown in Figs. II, IV, and V. The latch r is held in its normal position (shown in Figs. I, II, III, and V) by the shaft-arm h^4 against the ac-

tion of the spring r^5 , that has opposite ends attached to the latch and to the plate c , respectively. In the normal position of parts, therefore, the spring r^5 is under tension, and consequently when the shaft h is oscillated forwardly the arm h^4 releases the latch subject to the action of the spring r^5 , and the depression or downwardly tilting of the lever o by a toll-representing coin or check lodged upon the said lever will result in the depression of the lever p , and thereby cause the pin or member p^4 of the latch to ride down the rearwardly-facing surface of the latch in the direction of another downwardly-facing shoulder r^6 , that is formed upon the latch between the shoulder r^3 and the lower or free extremity of the lower arm of the latch, and the arrangement of parts is such that the lever p is lowered far enough during the operation of the lever o to result in a further action of the latch by the spring r^5 to the extent required to cause the shoulder r^6 of the latch to overhang the pin or member p^4 of the lever p , and thereby cock the hammer p^2 of the lever p in its elevated position, and of course the arrangement of parts is such that the said hammer shall be in position to be cocked before the pin or member p^3 of the lever p becomes disengaged during the downward movement of the lever o from the said lever p . The hammer p^2 is shown cocked in Fig. X. Obviously, therefore, the hammer p^2 remains cocked after the toll-representing coin or check instrumental in the operation of the lever o has been discharged from the said lever and is held in its cocked position by the spring r^5 until the shaft-arm h^4 , during the return of the shaft h into its normal position by the spring k , has again come into engagement with the arm r' of the latch r and actuated the said latch into its normal position against the action of the spring r^5 , and obviously the said actuation of the latch into its normal position will result in the disengagement by the shoulder r^6 of the latch from the pin or member p^4 of the lever p , and thereby release the said lever subject to the action of the spring p' that then operates in effecting the striking of the gong g by the hammer p^2 and results in the production of another or secondary signal and informs or notifies the telephone-exchange that a toll-representing coin or check of high denomination has been introduced into the machine beyond the control of the operator.

It will be observed that the latch r retards the operation of the signal; but to prevent such an unduly rapid oscillation of the shaft h as would tend to run the secondary signal into the primary signal I provide means for retarding, after the production of the primary signal, the return of the shaft into its normal position, and thereby positively retard the production of the secondary signal, and the means for thus slowing the oscillation of the shaft into its normal position comprises, preferably, the following: A pulley h^5 (see

Fig. II) is operatively mounted or fixed upon the shaft h in any approved manner. A belt h^6 is fixed at one end to the peripheral surface of the said pulley and leads forwardly from the top of the pulley to the piston-rod s' , to which the opposite end of the belt is attached in any approved manner. The piston s is arranged within and adapted to operate endwise of a cylinder u , that is arranged horizontally and forwardly and rearwardly of the machine and is suitably supported from the forward wall of the case a . The plates c and d are slotted, as at 25, to accommodate the location and operation of the belt h^6 . In the normal position of the parts, as shown in Figs. I and II, the belt is coiled almost a full turn upon the engaging pulley, and two springs s^2 and s^2 , that are arranged at opposite sides, respectively, of the cylinder, (see Fig. I,) are attached at their forward ends to the cylinder or to any stationary object and have their rear ends attached to opposite ends, respectively, of a cross-head s^3 , with which the outer end of the piston-rod is provided and to which the belt is preferably directly attached. The said springs are under tension in the normal position of the parts, and the piston is then within the rear end of the cylinder next to or near the rear or shaft-facing head of the cylinder. The cylinder u has an air-inlet u' , (see Fig. II,) that is formed by making the aperture in the rear or shaft-facing cylinder-head, through which the piston-rod extends, somewhat larger than the cross-sectional area of the rod. The piston s is provided with packing s^4 , that is arranged to form a fluid-tight joint between the piston and the surrounding wall of the cylinder's chamber during the movement of the piston rearwardly or toward the shaft and is loose relative to the said wall during the movement of the piston forwardly or away from the shaft. The cylinder at its forward head is provided with a very small air-vent u^2 . By this construction it will be observed that the movement of the piston toward the air-vent u^2 , which movement occurs during the forward oscillation of the shaft h , is unobstructed, because the piston's packing is arranged to yield so as to permit the escape of air at the edge of the piston into the rear end of the cylinder, and air in advance of the piston can also escape at the air-vent u^2 . During the movement of the piston toward the air-vent u^2 air not only passes into the rear end of the cylinder at the edge of the piston, but around the piston-rod at the air-inlet n' , and the rear shaft-facing surface of the piston is under ordinary atmospheric pressure. When the piston, having been moved into the forward end of the cylinder, is actuated in the opposite direction during the oscillation of the shaft into its normal position the air-pressure upon the forward side or face of the piston is less than the air-pressure upon the opposite side of the piston, because the air-vent u^2 is so small that it, during the rear-

ward movement of the piston toward the shaft, feeds air slowly into the cylinder, and the piston's packing forms a fluid-tight joint between the piston and the cylinder, so that air can only enter the cylinder in advance of the piston's face at the said air-vent, and the said movement of the piston in the direction of the shaft is also against the action of the springs s^2 , so that it will be observed that the return of the shaft h into its normal position by the spring k after being released by the operator, or even when purposely and unnecessarily manipulated by the operator during its return movement, can only be moved comparatively slowly, so that the production of the secondary signal cannot be effected until after the completion of the primary signal.

The operation of the machine by a toll-representing coin or check of the lower denomination will of course occur much more frequently than the operation of the machine by a coin or check of higher denomination, and to prevent the mechanism instrumental in the production of the signal indicative of the deposit of a coin or check into the machine through the channel c^3 from being operated by a slug of steel, iron, or other magnetic material I have provided a magnet w , preferably a permanent magnet, between and suitably secured to the plates c and d at the left-hand side of the upper portion of the channel c^3 , (see Figs. I, III, and IV,) and I would here remark that the plates c and d are of brass or other non-magnetic material. A side or branch channel c^6 leads laterally below the magnet from and is in open relation with the channel c^3 and has its outlet at the lower edges of the plates c and d . A magnetic slug dropping into the channel c^3 is attracted by the magnet to the left-hand side of the channel, and the momentum of the dropping slug will cause the slug to slide along and in under the magnet and be diverted from the channel c^3 into the side or branch channel, and the magnet at the junction of the two channels c^3 and c^6 is rounded, as at w' , to facilitate the diversion of the slug into the side channel. The plates c and d are of course suitably cut away to accommodate the location of the magnet, and the plate c , that is made of brass or other non-magnetic material, as already indicated, has a portion c^7 thereof extending in under the magnet to within a suitable distance of the main channel c^3 and forms a guide for preventing a slug diverted into the side channel from being detained by the magnet and instead guiding the slug to the outlet of the said side channel. The inertia of the moving slug is great enough to cause the slug to move along the magnet to and in under the said slug-guiding member c^7 of the plate c , whence the slug drops through the lower portion of the side channel into the lower portion of the case a .

What I claim is—

1. In a toll-collecting machine of the character indicated, a channel arranged to receive

the toll-representing coin or check and conduct it downwardly, a gong or sound-yielding body, a tiltable lever provided with a hammer arranged as required to render it capable of striking the sound-yielding body, which lever has such position relative to the channel's discharging end as will render it capable of normally arresting a proper coin or check conducted downwardly by the channel, means acting to retain the lever in its normal position, a suitably-operated oscillating arm having a sweep extending through the channel, and registering slots in the forward and rear walls of the channel to accommodate the location and operation of the oscillating arm.

2. In a toll-collecting machine of the character indicated, an upright channel, a gong or sound-yielding body, a tiltable lever provided with a hammer arranged as required to render it capable of striking the sound-yielding body, which lever has such position, relative to the channel's lower end, as will render it capable of normally arresting a proper toll-representing coin or check conducted downwardly by the channel and permit a coin or check of diametrically smaller size to pass downwardly without being arrested by the lever, means acting to retain the lever in its normal position, a suitably-operated oscillating arm arranged rearwardly of the channel and having a sweep extending through the channel, registering slots in the forward and rear walls of the channel to accommodate the location and operation of the oscillating arm, substantially as shown, for the purpose specified.

3. In a toll-collecting machine of the character indicated, an upright channel, a gong or sound-yielding body, a tiltable lever provided with a hammer arranged as required to render it capable of striking the sound-yielding body, which lever has such position, relative to the channel's lower end, as will render it capable of normally arresting a proper toll-representing coin or check conducted downwardly by the channel and permit a coin or check of diametrically smaller size to pass downwardly without being arrested by the lever, means acting to retain the lever in its normal position, a suitably-operated oscillating arm arranged rearwardly of the channel and having a sweep extending through the channel, registering slots in the forward and rear walls of the channel to accommodate the location and operation of the oscillating arm, lugs formed upon and depending from the channel's rear wall at opposite sides, respectively, of the slot therein, and lugs depending from the channel's forward wall at opposite sides, respectively, of the slot therein and extending below the aforesaid rear lugs, substantially as shown, for the purpose specified.

4. In a toll-collecting machine of the character indicated, an upright channel, a gong or sound-yielding body, a tiltable forked lever having the shank-forming portion of its fork provided with a hammer that is arranged as

required to render it capable of striking the sound-yielding body, which lever has the arms of its fork arranged such a distance apart at and in such position relative to the channel's lower end as will render them capable of normally arresting a proper toll-representing coin or check conducted downwardly by the channel and permit a coin or check of diametrically smaller size to pass downwardly between the said arms, a suitably-applied spring acting to retain the said lever in its normal position, a suitably-operated oscillating arm arranged rearwardly of the channel and having a sweep extending through the channel and between the arms of the lever's fork, registering slots in the forward and rear walls of the channel to accommodate the location and operation of the oscillating arm, lugs formed upon and depending from the channel's rear wall at opposite sides, respectively, of the slot therein, and lugs depending from the channel's forward wall at opposite sides, respectively, of the slot therein and extending below the aforesaid rear lugs, all substantially as shown, for the purpose specified.

5. A toll-collecting machine of the character indicated, comprising a lever mechanism instrumental in the production of a signal and arranged to be operated through the medium of a toll-representing coin or check introduced into the machine, a passage-way for conducting the said coin or check to and into engagement with the said lever mechanism, means whereby the coin or check arrested by the said mechanism is caused to operate the said mechanism, and another lever mechanism instrumental in the production of another or secondary signal, and having a member arranged to be operated by and during the operation of the first-mentioned lever mechanism.

6. A toll-collecting machine of the character indicated, comprising mechanism instrumental in the production of a signal and arranged to render it capable of arresting a proper toll-representing coin or check introduced into the machine, means for engaging and actuating the arrested coin or check in the direction required to free the coin or check from and operate the said mechanism, another mechanism instrumental in the production of another or secondary signal, and means whereby the second-mentioned mechanism is operated by and during the operation of the first-mentioned mechanism.

7. A toll-collecting machine of the character indicated, comprising an upright channel for conducting a toll-representing coin or check, mechanism instrumental in the production of a signal and arranged as required to render it capable of arresting a proper toll-representing coin or check introduced into and conducted by the said channel, means for engaging and actuating the arrested coin or check in the direction required to free the coin or check from and operate the said mech-

anism, another mechanism instrumental in the production of another or secondary signal, and means whereby the second-mentioned mechanism is operated by and during the operation of the first-mentioned mechanism.

8. A toll-collecting machine of the character indicated, comprising an upright channel, a suitably-applied lever instrumental in the production of a signal and arranged to arrest a proper toll-representing coin or check introduced into and conducted by the said channel, means for engaging and actuating the arrested coin or check to free the coin or check from and operate the said lever, another lever instrumental in the production of a signal and having a pin or member extending in under and arranged to be operated by the first-mentioned lever, means acting to retain the levers in their normal position, and mechanism whereby the completion of the operation of the second-mentioned lever is delayed until after the first-mentioned lever has completed its operation, substantially as and for the purpose set forth.

9. In a toll-collecting machine of the character indicated, the combination, with a toll-actuated lever instrumental in the production of a signal and arranged to arrest the toll introduced into the machine, and a suitably-operated oscillating shaft provided with the arm h^4 for engaging and actuating the arrested toll and free the toll from and operate the said lever, and another lever p instrumental in the production of another signal and having a projecting pin or member p^3 extending in under the first-mentioned lever, and having another pin or member p^4 projecting in the opposite direction, of the upwardly and downwardly extending tilting latch r having the arm r' and the notch r^6 , and the suitably-applied spring r^5 , all arranged and operating substantially as shown, for the purpose specified.

10. In a machine of the character indicated, the combination, of the suitably-supported shaft h , a pulley h^5 operatively mounted upon the shaft, a belt h^6 engaging the pulley, a suitably-applied spring k attached to the shaft and acting to rotate the shaft in the direction required to wind the belt upon the pulley, a cylinder u arranged at one side of and a suitable distance from the pulley-bearing shaft, with one end thereof facing in the direction

of the shaft, an air-conducting aperture u' formed in the shaft-facing end of the cylinder, a small air-vent u^2 formed in the opposite end of the cylinder, a piston within the cylinder and normally at the shaft-facing end of the cylinder, and being provided with a packing arranged to form a tight joint between the piston and the surrounding wall of the chamber of the cylinder during the movement of the piston in the direction of the shaft-facing end of the cylinder, the piston-rod connecting the piston with the aforesaid belt, and means acting to move the piston in the direction of the air-vent-containing end of the said cylinder, substantially as shown, for the purpose set forth.

11. In a machine of the character indicated, the combination of the suitably-supported shaft h , a pulley h^5 operatively mounted upon the shaft, a belt h^6 engaging the pulley, a suitably-applied spring attached to the shaft and acting to rotate the shaft in the direction required to wind the belt upon the pulley, a cylinder u arranged at one side of and a suitable distance from the pulley-bearing shaft with one end thereof facing in the direction of the shaft, an air-conducting aperture u' formed in the shaft-facing end of the cylinder, a small air-vent u^2 formed in the opposite end of the cylinder, a piston within the cylinder and normally at the shaft-facing end of the cylinder and provided with a packing arranged to form a tight joint between the piston and the surrounding wall of the chamber of the cylinder during the movement of the piston in the direction of the shaft-facing end of the cylinder, the piston-rod establishing connection between the piston and the aforesaid belt and having the cross-head s^3 attached to the belt, and two suitably-applied springs normally under tension and arranged at opposite sides, respectively, of the piston-rod and attached, at one end, to opposite ends, respectively, of the cross-head, and fixed, at the other end, to any stationary object, substantially as shown, for the purpose specified.

Signed by me at Cleveland, Ohio, this 8th day of September, 1900.

WILLIAM A. FOSS.

Witnesses:

C. H. DORER,
A. H. PARRATT.