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PROVISIONAL SPECIFICATION.

Improvements in Mechanical Toys.

I, CORNELIS FREDERIK ALEXANDER RÖELL of the Lyric Club Leicester Square in the County of Middlesex a Jonkheer of the Kingdom of Holland do hereby declare the nature of this invention to be as follows:—

The invention relates to improvements in mechanical toys and has for its object primarily to actuate boxing figures in such manner that their movements will appear more natural than heretofore.

For this purpose I mount the figures upon the upper ends of vertical rods located at the back thereof and rising through long slots formed in a stage or platform which slots extend rearward of the figures in order to permit them to fall on their backs at the desired times and I connect the lower ends of these rods to sliding or swinging bars by hinge joints so that the endway movement of the sliding bars will also give motion to the boxing figures and throw them forward and backward as in the act of boxing.

I give motion to the sliding bars and consequently to the figures by means of levers which are mounted upon axes of motion and at one end are slotted to receive studs or axes fixed upon the sliding bars whilst at the other end they are forked to embrace wheels formed with cams, projections, or teeth upon the two faces thereof so that in the revolution of these cam wheels the forked levers will be rocked upon their axes and a to and fro motion will thus be communicated through the sliding bars to the boxing figures.

The cam wheels are fixed upon a shaft or axis and are each provided upon their inner side or face with ratchet teeth with which engage pawls carried by a drum or pulley mounted loosely upon the cam wheel shaft and around this drum or pulley is coiled several times a cord or chain one end of which is carried up over a guide pulley and has attached thereto a weight which furnishes the motive power whilst the other end of the cord or chain passes to the exterior of the case or frame and is provided with a knob or button by which the cord may be drawn forward and the weight raised.

During this forward movement of the cord the pawls of the drum or pulley slip upon the ratchet teeth without giving motion to the cam wheels but upon the cord or chain being released and the weight allowed to act the pawls of the drum will engage the ratchet teeth of the cam wheels and give motion thereto and thus to the boxing figures.

By reason of the long slots in the platform to the rear of the figures the latter would fall upon their backs if not supported in some manner and in order to prevent the figures so falling except at the desired times I employ sliding stop bars which cross the long slots of the platform and form stops to the vertical rods supporting the figures thus limiting the backward movement thereof but leaving sufficient play for the normal working of the figures and these stop bars are drawn forward across the slots by the latter part of the forward movement of the cord or chain.

In order to cause the figures to be thrown down upon their backs as if from a knock down blow I give a gradual backward movement to the stop bars shortly before the weight has completely run down and I accomplish this by means of a knot or enlargement upon the cord or chain which comes against a lever at its lower end mounted upon an axis of motion and at its upper end flexibly connected with a sliding plate which imparts a delayed motion to a bar or yoke which at its ends is loosely pin jointed to the stop bars.

This arrangement of parts would simultaneously withdraw both the stop bars

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from across the slots of the platform and would cause both figures to fall upon their backs after a given period of time but in order to cause either one of such figures to so fall whilst the other remains erect and that accidentally or irregularly I give motion to the stop bars through the bar or yoke hereinbefore referred to and I employ a stop disc which is fixed upon an axis mounted in bearings with capability of revolution and is formed with a circle of holes or apertures therein preferably irregularly spaced and alternated with cupped recesses to receive the ends of the stop bars so that upon rotary motion being given to the disc and the stop bars carried inward one of them will pass through an aperture or hole in the disc and the other of them will pass into and be arrested by one of the cupped recesses.

In order to impart the necessary rotary motion to the stop disc I fix upon the shaft or axis thereof a drum provided with skeleton pockets which will retain say a penny but permit say a halfpenny to fall through and I place this drum beneath the money shoot and with its axis central thereof so that a penny passed into the machine will upon falling into the drum rotate it either to the right or left and with varying speed according to the position of the pocket which is immediately beneath the money shoot and the stop disc will thus at every operation of the machine be irregularly moved.

By these means as the stop bars are carried backward one or other of them will pass through an aperture or hole of the stop disc and the other of them will enter one of the cupped recesses and will be thereby held against further movement so that it cannot be entirely withdrawn from the corresponding slot of the platform to allow of the figure falling backward whilst that stop bar which has entered a hole or aperture of the stop disc will continue its backward movement until it is entirely withdrawn from across the corresponding slot of the platform so as to allow of the free passage of the vertical rod supporting the corresponding figure when such figure will fall over on to its back.

Or in lieu of the stop disc I may employ perforated bars set in motion by the weight of the coin or by a moving part of the machine.

In order to raise the fallen figure at the required time I employ cams or eccentrics which are held in their normal position by a spring and which receive a partial rotation upon the last part of the forward movement of the cord or chain by means of the sliding plate hereinbefore referred to and one of the cams or eccentrics thus acts upon the vertical rod supporting the fallen figure and raises it into its normal position previous to the stop bar being moved across the corresponding slot of the platform in the outward movement of such bars and the sliding plate after giving the required motion to the cams or eccentrics becomes disengaged therefrom and permits the cams to resume their normal position.

Or in lieu of the eccentrics I may employ levers or cams moved by the weight of the coin or by a moving part of the machine in order to raise the fallen figure.

To prevent the machine being operated except upon the insertion of the proper coin I fix upon the axis of the drum or pulley a locking ratchet wheel into which takes a stop pawl which is mounted upon a centre of motion and beyond such centre is by a link or connecting rod connected with one end of a bell crank lever which is mounted upon a centre of motion and the other end of which enters the money shoot through a slot and crosses the path of the coin.

By these means upon the insertion of a coin into the machine the stop pawl will be moved out of engagement with the locking ratchet wheel and the cord or chain may be drawn forward and the machine wound up.

The full descent of the bell crank lever and the consequent release of the coin is prevented, until the machine is fully wound up in order that the weight of the coin may keep the stop pawl out of engagement with its ratchet wheel by means of a detent which is at the end of the outward movement of the cord or chain withdrawn by some moving part of the machine thus releasing the coin and locking the cord or chain through the drum or pulley against further outward movement until another coin is inserted.

In order to prevent fraud by the repeated partial winding up of the machine

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whilst the stop pawl is by the coin held out of engagement with the drum or pulley I fix upon the axis of such drum another ratchet wheel the teeth of which are cut in the opposite direction to those of the locking ratchet wheel and I employ in connection therewith a pawl which through the drum or pulley locks the cord or chain against inward movement until the machine is fully wound up when a projection upon a moving part of the machine holds the pawl disengaged until the machine has run down.

In lieu of giving motion to the stop disc by the weight of the coin actuating a drum as hereinbefore described I may give the necessary impulse to the stop disc from some moving part of the machine.

I preferably employ a counting apparatus in connection with a moving part of the machine to register the number of coins passed into the same.

I would here remark that in lieu of a weight I may employ a spring, electricity or other motive power in order to impart the necessary movements to the figures.

It will be evident that the mechanism hereinbefore described or part thereof may be employed in connection with other objects than boxing figures.

Dated this 12th day of September 1890.

WHITE & WOODINGTON,
27, Southampton Buildings, London, Agents.

COMPLETE SPECIFICATION.

Improvements in Mechanical Toys.

I, CORNELIS FREDERIK ALEXANDER RÖELL of the Lyric Club Leicester Square in the County of Middlesex a Jonkheer of the Kingdom of Holland do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

The invention relates to improvements in mechanical toys and has for its object primarily to actuate boxing figures in such manner that their movements will appear more natural than heretofore.

For this purpose I mount the figures upon the upper ends of vertical rods located at the back thereof and rising through long slots formed in a stage or platform which slots extend rearward of the figures in order to permit them to fall on their backs at the desired times and I connect the lower ends of these rods to sliding or swinging bars by hinge joints so that the endway movement of the sliding bars will also give motion to the boxing figures and throw them forward and backward as in the act of boxing.

I give motion to the sliding bars and consequently to the figures by means of levers which are mounted upon axes of motion and at one end are slotted to receive studs or pins fixed upon the sliding bars whilst at the other end they are forked to embrace wheels formed with cam projections or teeth upon the two faces thereof so that in the revolution of these cam wheels the forked levers will be rocked upon their axes and a to and fro motion will thus be communicated through the sliding bars to the boxing figures.

The cam wheels are fixed upon a shaft or axis and are each provided upon their inner side or face with ratchet teeth with which engage pawls carried by a drum or pulley mounted loosely upon the cam wheel shaft, and around this drum or pulley is coiled several times a cord or chain one end of which is carried up over a guide pulley and has attached thereto a weight which furnishes the motive power whilst the other end of the cord or chain passes to the exterior of the case or frame and is provided with a knob or button by which the cord may be drawn forward and the weight raised.

During this forward movement of the cord the pawls of the drum or pulley slip upon the ratchet teeth without giving motion to the cam wheels but upon the cord

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or chain being released and the weight allowed to act the pawls of the drum will engage the ratchet teeth of the cam wheels and give motion thereto and thus to the boxing figures.

By reason of the long slots in the platform to the rear of the figures the latter would fall upon their backs if not supported in some manner and in order to prevent the figures so falling except at the desired times I employ sliding stop bars which cross the long slots of the platform and form stops to the vertical rods supporting the figures thus limiting the backward movement thereof but leaving sufficient play for the normal working of the figures and these stop bars are drawn forward across the slots by the latter part of the forward movement of the cord or chain.

In order to cause the figures to be thrown down upon their backs as if from a knock down blow I give a gradual backward movement to the stop bars shortly before the weight has completely run down and I accomplish this by means of a knot or enlargement upon the cord or chain which comes against a lever at its lower end mounted upon an axis of motion and at its upper end flexibly connected with a sliding plate which imparts a delayed motion to a bar or yoke which at its ends is loosely pin jointed to the stop bars.

This arrangement of parts would simultaneously withdraw both the stop bars from across the slots of the platform and would cause both figures to fall upon their backs after a given period of time but in order to cause either one of such figures to so fall whilst the other remains erect and that accidentally or irregularly I give motion to the stop bars through the bar or yoke hereinbefore referred to and I employ a stop disc which is fixed upon an axis mounted in bearings with capability of revolution and is formed with a circle of holes or apertures therein preferably irregularly spaced and alternated with cupped recesses to receive the ends of the stop bars so that upon rotary motion being given to the disc and the stop bars carried inward one of them will pass through an aperture or hole in the disc and the other of them will pass into and be arrested by one of the cupped recesses.

In order to impart the necessary rotary motion to the stop disc I fix upon the shaft or axis thereof a drum provided with skeleton pockets which will retain say a penny but permit say a halfpenny to fall through and I place this drum beneath the money shoot and with its axis central thereof so that a penny passed into the machine will upon falling into the drum rotate it either to the right or left and with varying speed according to the position of the pocket which is immediately beneath the money shoot and the stop disc will thus at every operation of the machine be irregularly moved.

By these means as the stop bars are carried backward one or other of them will pass through an aperture or hole of the stop disc and the other of them will enter one of the cupped recesses and will be thereby held against further movement so that it cannot be entirely withdrawn from the corresponding slot of the platform to allow of the figure falling backward whilst that stop bar which has entered a hole or aperture of the stop disc will continue its backward movement until it is entirely withdrawn from across the corresponding slot of the platform so as to allow of the free passage of the vertical rod supporting the corresponding figure when such figure will fall over on to its back.

Or in lieu of the stop disc I may employ perforated bars set in motion by the weight of a coin or by a moving part of the machine.

In order to raise the fallen figure at the required time I employ cams or eccentrics which are held in their normal position by a spring and which receive a partial rotation upon the last part of the forward movement of the cord or chain by means of the sliding plate hereinbefore referred to and one of the cams or eccentrics thus acts upon the vertical rod supporting the fallen figure and raises it into its normal position previous to the stop bar being moved across the corresponding slot of the platform in the outward movement of such bars and the sliding plate after giving the required motion to the cams or eccentrics becomes disengaged therefrom and permits the cams to resume their normal position.

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Or in lieu of the eccentrics I may employ levers or cams moved by part of the machine in order to raise the fallen figure.

To prevent the machine being operated except upon the insertion of the proper coin I fix upon the drum or pulley a locking ratchet wheel into which takes a stop pawl which is mounted upon a centre of motion and beyond such centre is by a link or connecting rod connected with one end of a bell crank lever which is mounted upon a centre of motion and the other end of which enters the money shoot through a slot and crosses the path of the coin.

By these means upon the insertion of a coin into the machine the stop pawl will be moved out of engagement with the locking ratchet wheel and the cord or chain may be drawn forward and the machine wound up.

The full descent of the bell crank lever and the consequent release of the coin is prevented until the machine is fully wound up in order that the weight of the coin may keep the stop pawl out of engagement with its ratchet wheel by means of a detent which is at the end of the outward movement of the cord or chain withdrawn by some moving part of the machine thus releasing the coin and locking the cord or chain through the drum or pulley against further outward movement until another coin is inserted.

In order to prevent fraud by the repeated partial winding up of the machine whilst the stop pawl is by the coin held out of engagement with the drum or pulley I fix upon the axis of such drum another ratchet wheel the teeth of which are cut in the opposite direction to those of the locking ratchet wheel and I employ in connection therewith a pawl which through the drum or pulley locks the cord or chain against inward movement until the machine is fully wound up when a projection upon a moving part of the machine holds the pawl disengaged until the machine has run down.

In lieu of giving motion to the stop disc by the weight of the coin actuating a drum as hereinbefore described I may give the necessary impulse to the stop disc from some moving part of the machine.

I preferably employ a counting apparatus in connection with a moving part of the machine to register the number of coins passed into the same.

I would here remark that in lieu of the weight I may employ a spring, electricity or other motive power in order to impart the necessary movements to the figures.

It will be evident that the mechanism hereinbefore described or part thereof may be employed in connection with other objects than boxing figures.

And in order that the said invention may be more clearly understood and readily carried into effect I will proceed aided by the accompanying drawings more fully to describe the same.

DESCRIPTION OF THE DRAWINGS.

Figure 1 is a front elevation with the front of the case partly broken away and some other parts removed of a mechanical toy constructed according to my invention and showing the mechanism in the position it would assume at the end of the performance.

Figure 2 is a vertical transverse section thereof taken on the line 1—1 of Figure 1.

Figure 3 is a horizontal section taken on the line 2—2 of Figure 2 with the stage or platform broken away in order to expose the mechanism.

Figure 4 is a vertical longitudinal section of the cam wheels and co-acting drum or pulley.

Figure 5 is a vertical transverse section taken on the line 3—3 of Figure 4 and looking to the left.

Figure 6 is a detail view of the detent for preventing the discharge of the coin until the machine is fully wound up.

Figure 7 is a similar view of the pawl for preventing the repeated partial winding up of the machine and the device for disengaging the same.

Figure 8 is a front elevation of the stop disc and co-acting parts separately

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showing the stop bars in the position they would assume at the commencement of the performance.

Figure 9 is a side elevation thereof.

Figure 10 is a sectional plan thereof.

Figure 11 is a side view of a modified device for giving motion to the stop disc and

Figure 12 is an elevation of a modified device to be employed in lieu of the stop disc.

In the several figures in which like parts are indicated by similar letters of reference

a represents the case of the machine; *b* represents the ground line stage floor or platform which is supported upon side beams *a*¹; and *b*¹ represents several vertical posts fixed to the floor *b* and supporting a rope *b*² in imitation of a boxing ring; *b*^{*} represents a screen or background and *c* represents the boxing figures.

The boxing figures *c* are each mounted upon the upper end of a vertical rod or holder *c*¹ located at the back thereof and rising through long slots *b*³ formed in the stage or platform *b* and these slots *b*³ are extended rearward of the figures in order to permit them to fall over on to their backs at the desired times whilst at other times the motion of the figures *c* is limited by means of stop bars *g* hereinafter more fully described and which act as fulcra to the vertical rods *c*¹.

The lower ends of the vertical rods *c*¹ are by hinge joints *c*² each connected to a separate sliding bar *c*³ mounted in guides *c*⁴ formed in brackets *c*^{*} fixed to the underside of the platform *b* so that the endway movement of the sliding bars *c*³ will also give motion to the boxing figures *c* and throw them forward and backward as in the act of boxing.

The necessary motion is given to the sliding bars *c*³ and consequently to the boxing figures *c* by means of levers *d* which are mounted upon axes of motion *d*¹ carried by a plate *b*^{5*} of a bracket *b*⁵ fixed to the bottom of a frame *b*⁴ which is suspended from the underside of the floor or platform *b* and supports most of the working parts.

The levers *d* are at their upper ends formed with slots *d*² to receive studs or pins *c*⁵ fixed upon the sliding bars *c*³ whilst at their lower ends they are provided with forks *d*³ to embrace wheels *e* formed with irregularly shaped and spaced cams projections or teeth *e*¹ upon the two faces thereof so that in the revolution of the cam wheels *e* the forked levers *d* will be rocked upon their axes *d*¹ and a to and fro motion will thus be communicated through the sliding bars *c*³ to the boxing figures *c*.

The cam wheels *e* are fixed upon a horizontal shaft *e*² which at its ends is mounted with capability of revolving in bearings *e*^{2*} formed in the side walls of the frame *b*⁴ and the cam wheels *e* are each provided upon its inner side or face with a ring of ratchet teeth *e*³ with which engage spring pawls *e*⁵ carried by a drum or pulley *e*⁴ mounted loosely upon the cam wheel shaft *e*² and around the drum or pulley *e*⁴ are coiled several turns of a cord or chain *f* one end of which passes under a guide pulley *f*¹ fixed upon a shaft *f*^{1*} at its ends mounted with capability of revolving in bearings *f*^{1**} formed in the side walls of the frame *b*⁴ it thence passes up to and over guide pulleys *f*² carried by projections *a*² from the back wall of the case *a* and the depending end of the cord or chain *f* has attached thereto a weight *f*³ which furnishes the requisite motive power whilst the other end of the cord *f* passes through an aperture *a*³ in the front of the case *a* and terminates in a pull *f*⁴ by which the cord *f* may be drawn forward and the weight *f*³ raised.

By this arrangement of parts upon drawing forward the cord *f* by the aid of the pull *f*⁴ the weight *f*³ will be raised into the position indicated by the dotted lines in Figure 1 and the drum or pulley *e*⁴ will during such movement revolve loosely upon the cam wheel shaft *e*² without giving motion thereto whilst upon the release of the pull *f*⁴ the weight *f*³ will through the cord *f* drum or pulley *e*⁴ pawls *e*⁵ and ratchet teeth *e*³ give rotary motion to the shaft *e*² and discs or wheels *e* and thereby impart the desired movements to the boxing figures *c*.

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By reason of the length of the slots b^3 in the platform b to the rear of the figures c the latter would be liable to fall upon their backs at any time if not supported in some manner and in order to prevent the figures c so falling except at the desired times, and to furnish fulcra for the vertical rods c^1 sliding stop bars g are employed
 5 whose outward motion is limited by stops c^{*2} and which at one end work in guides c^{*1} formed upon a plate c^{**} fixed to the underside of the platform b and at the other end work in guides g^* formed in brackets g^* fixed to the underside of the platform or stage b and these bars cross the long slots b^3 of the platform or stage b and form stops to the vertical rods c^1 supporting the figures c thus limiting the
 10 backward movement thereof but leaving sufficient play for the normal working of the figures and these stop bars g are drawn forward across the slots b^3 of the platform or stage b by the latter part of the forward movement of the cord or chain f as hereinafter more fully described.

In order to cause the figures c to be thrown down upon their backs as if from a
 15 knock-down blow a delayed but gradual inward movement towards the back of the machine is given to the stop bars g shortly before the weight f^3 has completely run down as hereinafter more fully described so that the stop bars g are withdrawn from across the slots b^3 of the platform or stage b and the figures c are at liberty to fall backward.

Motion is given to the sliding stop bars g through a bar or yoke g^2 which at its
 20 ends is formed with slots g^3 to engage pins or studs g^1 fixed to the stop bars g and this yoke g^2 is formed with an offset g^4 provided with a downwardly projecting stud g^4 which enters a long slot h^1 formed in a sliding plate h which is provided with an offset h^2 upon its underside formed with an open ended slot h^{*2} to receive a
 25 pin i^* carried by the upper end of a lever i which at its lower end is mounted and rocks upon an axis of motion i^1 fixed to the bracket b^5 and this lever i is formed with an eye or boss i^2 through which passes the cord or chain f provided with knots or enlargements f^* f^{**} the former of which comes against the lever i when the weight f^3 has nearly run down and gives a short traverse at the last
 30 moment of the performance to the stop bars g whilst the latter f^{**} comes against the lever i in the reverse motion of the cord during the winding up of the weight f^3 and thus restores the stop bars g to their outward positions the long slot h^1 of the sliding plate h permitting a certain extent of motion of the sliding plate h previous to any outward movement being communicated to the stop bars g
 35 for the purpose hereinafter explained.

This arrangement of parts would cause both figures c simultaneously to fall upon their backs after a given period of time but in order to cause either one of such figures to fall whilst the other remains erect and that accidentally or irregularly the following device is employed.

40 At the rear of the machine and within the traverse of the stop bars g is located a stop disc j which is fixed upon a shaft or axis j^1 mounted with capability of revolution in bearings formed in brackets j^{1*} fixed to the underside of the floor b and this stop disc j is formed with a circle of holes or apertures j^2 therein preferably irregularly spaced and alternated with cupped recesses j^3 arranged
 45 singly or in clusters according to the extent of the spaces between the holes or apertures j^2 to receive the ends of the stop bars g but a recess j^3 is located opposite each aperture j^2 so that upon rotary motion being given to the stop disc j and the stop bars g carried inward one of them will pass through one or other of the apertures or holes j^2 in the disc j and the other of them will pass into and be
 50 arrested by the corresponding cupped recess j^3 .

In order to impart the necessary rotary motion to the stop disc j and thus change the position of the apertures j^2 I fix upon the shaft j^1 a second but imperforate disc j^4 which is connected with and separated from the stop disc by a distance ring j^5 forming a central boss and at a suitable distance from the boss are arranged
 55 several bars j^6 thus constituting a drum with skeleton pocket: j^* formed by the bars j^6 and the boss j^5 .

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The bars j^6 of the skeleton pockets j^* are so placed with relation to the boss j^5 that they will retain say a penny and permit say a halfpenny to fall through and this drum is placed beneath a money shoot l and with its axis central thereof so that a penny passed into the machine through the usual money slot a^1 will be conducted by the shoot k into the shoot l and will upon falling from the shoot k into the drum rotate it either to the right or left and with varying speed according to the position of the particular pocket j^* which is immediately beneath the money shoot k and the stop disc j will thus at every operation of the machine be irregularly moved after which the coin will pass into the money compartment r .

By these means as the stop bars g are carried inward towards the back of the case a by the cord f lever i sliding plate h and yoke g^2 one or other of such stop bars g will encounter a recess j^3 of the stop disc j and will be thereby held against further movement so that it cannot be entirely withdrawn from across the corresponding slot b^3 of the platform or stage b to allow of the figure c falling backward whilst the other of such stop bars g will enter a hole or aperture j^2 of the stop disc j and will continue its backward movement until it is entirely withdrawn from across its corresponding slot b^3 of the platform or stage b so as to allow of the free passage of the vertical rod e^1 supporting the corresponding figure c when such figure will fall over on to its back as if from a knock-down blow.

In order to raise the fallen figure at the required time cams or eccentrics m are employed which are fixed upon a shaft m^1 at its ends mounted with capability of revolving in bearings m^* formed in the side walls of the frame b^4 and upon the shaft m^1 is fixed a boss m^2 provided with an offset m^3 to which is attached one end of a spring m^4 the other end of which is attached to a bracket m^5 fixed to the underside of the floor b and the eccentrics m are thus by means of the spring m^4 held in their normal position whilst projections m^5 from the side walls of the frame b^4 are employed to act as stops to the eccentrics m and thus prevent the same being carried beyond their normal position.

Upon the boss m^2 is formed a second offset m^7 which upon the latter part of the outward movement of the cord or chain f is acted upon by a spring latch h^3 carried by the sliding plate h to give a partial rotation to the shaft m^1 and eccentrics m and one of the cams or eccentrics m is thus caused to act upon the vertical rod e^1 of that figure c which has fallen and raise it into its normal position and by reason of the long slot h^1 in the sliding plate h this action takes place previous to the stop bar g which has passed into an aperture j^2 of the stop disc j being moved across the corresponding long slot b^3 of the platform or stage b in the outward movement of the cord or chain f and the required time is thus allowed for the raising of the fallen figure.

After giving the required rotary movement to the shaft m^1 and eccentrics m the spring latch h^3 passes over the then depressed offset m^7 thus permitting the eccentrics m to resume their normal position whilst upon the inward movement of the cord or chain f and sliding plate h the spring latch h^3 slips past the offset m^7 of the boss m^2 without giving motion to the shaft m^1 .

Or in lieu of the eccentrics m levers or cams actuated by a moving part of the machine may be employed in order to raise the fallen figures as will be readily understood.

To prevent the machine being operated except upon the insertion of the proper coin I fix upon the drum or pulley e^1 a locking ratchet wheel e^2 formed with four or other number of teeth into which takes a stop pawl n^1 which is mounted upon a centre of motion n^{4*} carried by the bracket b^5 and beyond the centre n^{4*} the stop pawl n^1 is cranked and formed with a slot n^{4**} to receive the lower looped end n^{3*} of a link or connecting rod n^3 which at its upper end is pin jointed to one arm n^1 of a bell crank lever n which is mounted upon a centre of motion n^* and the other arm n^2 of which enters the money shoot l through a slot l^1 therein and normally projects into the path of the coin.

By these means upon the insertion into the machine of a coin x the arm n^2 of the

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bell crank lever n will be depressed a given distance and the stop pawl n^4 will be moved out of engagement with the locking ratchet wheel e^6 and the cord or chain f may then be drawn forward and the machine wound up.

The full depression of the arm n^2 of the bell crank lever n and the consequent release of the coin x is prevented until the machine is fully wound up in order that the weight of the coin may keep the stop pawl n^4 out of engagement with its ratchet wheel e^6 by means of a detent o which is hung upon a centre of motion o^* fixed to the bracket b^5 and is provided with a tooth o^1 which normally engages a stud n^{4***} upon the pawl n^4 and the detent o is formed with an offset o^2 provided with a notch or recess therein in which works a stud or projection i^3 from the lever i so that at the end of the outward movement of the cord or chain f the stud i^3 will come against the detent o and withdraw the detent tooth o^1 from the stud n^{4***} of the stop pawl n^4 thus releasing the coin x which will then fall into the money compartment r after which the stop pawl n^4 will resume its normal position in engagement with the locking ratchet wheel e^6 when the cord or chain f will be locked against further outward movement until another coin is inserted into the machine.

In order to prevent fraud by the repeated partial winding up of the machine whilst the stop pawl n^4 is by the coin held out of engagement with the locking ratchet wheel e^6 of the drum or pulley e^4 such drum has fixed thereon another ratchet wheel e^7 the teeth of which are cut in the opposite direction to those of the locking ratchet wheel e^6 and in connection therewith a pawl p is employed which is mounted upon an axis of motion p^* carried by the bracket b^5 and which through the drum or pulley e^4 locks the cord or chain f against inward movement until the machine is fully wound up when the pawl p is disengaged from the ratchet wheel e^7 by a stud p^3 projecting from a sliding plate p^2 and which acts upon the inclined face p^1 of the pawl p .

The sliding plate p^2 at one end works between guide pins p^{2**} fixed to the bracket b^5 and at the other end works between the lever i and the detent o and is formed with a long slot p^4 to receive the stud i^3 of the lever i which thus imparts a delayed motion in both directions to the sliding plate p^2 so that the pawl p will be raised out of engagement with the ratchet wheel e^7 when the machine is fully run down.

In lieu of giving motion to the stop disc j by the weight of the coin actuating a drum as hereinbefore described the necessary impulse thereto may be given from a moving part of the machine as represented for example at Figure 11.

In this example the lever i is provided with a stud i^{*1} which in the outward traverse of the cord or chain f acts upon the tail q^1 of a lever q which is mounted upon an axis of motion q^* causing the end of the lever q which is formed with a lightly sprung latch q^2 to sweep past and act upon a ratchet wheel j^3 fixed upon the shaft j^1 of the stop disc j and thus impart a rotary impulse to such disc whilst in the inward traverse of the cord or chain f the stud i^{*1} of the lever i acts upon an inclined projection q^3 from the lever q and raises it in readiness for the next operation the latch end q^2 readily slipping past the ratchet wheel j^3 .

In the example given at Figure 12 vertically moveable plates or bars j are employed in lieu of the stop disc and these plates are provided with perforations j^2 and recesses j^3 in a similar manner to the stop disc j whilst they work in guides j^{**} and at their lower ends are coupled by a bar j^4 mounted upon a shaft or centre of motion j^5 which has fixed thereon a pendulous weight and the bar j^4 receives an impulse from a lever q in a similar manner to that represented at Figure 11 in order to give an oscillating movement thereto and a vertical reciprocating movement to the perforated plates j or the required impulse might be given thereto by the weight of the coin passing through the money shoot k as will be readily understood.

Any well known and suitable counting apparatus is preferably employed in connection with a moving part of the machine to register the number of coins passed into the same.

Röell's Improvements in Mechanical Toys.

I would here remark that in lieu of the weight f^3 I may employ a spring, electricity or other motive power in order to impart the necessary movements to the figures and if desired I may dispense with the coin freed or coin operating mechanism and means for receiving coin and make a complete toy without such devices and in cases where it is desired to impart an accidental movement to a single figure or object I may employ only one stop bar and corresponding parts. 5

I would further remark that although I have described my invention in connection with boxing figures it is equally applicable wholly or in part to foiling and other figures or objects as will be readily understood and that whilst I have shown and described the best details that I am at present acquainted with for carrying my invention into effect I do not confine myself strictly thereto as it is evident that the same may be varied without departing from the peculiar character of my invention. 10

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:— 15

1. In a mechanical toy the combination of a sliding stop bar or bars, means for traversing the same and a moveable perforated stop disc or a moveable perforated stop plate or plates substantially as herein shown and described and for the purpose stated. 20

2. In a mechanical toy the combination of a sliding stop bar or bars means for traversing the same a moveable perforated stop disc or a moveable perforated stop plate or plates and means for changing the position thereof substantially as herein shown and described and for the purpose stated. 25

3. In a mechanical toy the combination of a sliding stop bar or bars means for traversing the same a moveable perforated stop disc and a drum set in motion by the falling coin for changing the position of such disc substantially as herein shown and described.

4. In a mechanical toy a moveable stop disc or stop plate or plates formed with a number of apertures and recesses therein substantially as herein shown and described and for the purpose stated. 30

5. In a mechanical toy the combination of a sliding stop bar or bars, means for traversing the same, a moveable perforated stop disc or a moveable perforated stop plate or plates means for changing the position thereof, coin operating means for preventing the winding up of the machine until after the insertion of a coin, means for preventing the discharge of the coin until the completion of such winding and means for preventing the partial rewinding of the machine substantially as herein shown and described and for the purpose stated. 35

6. The general combination and arrangement of parts constituting a mechanical toy substantially as herein shown and described. 40

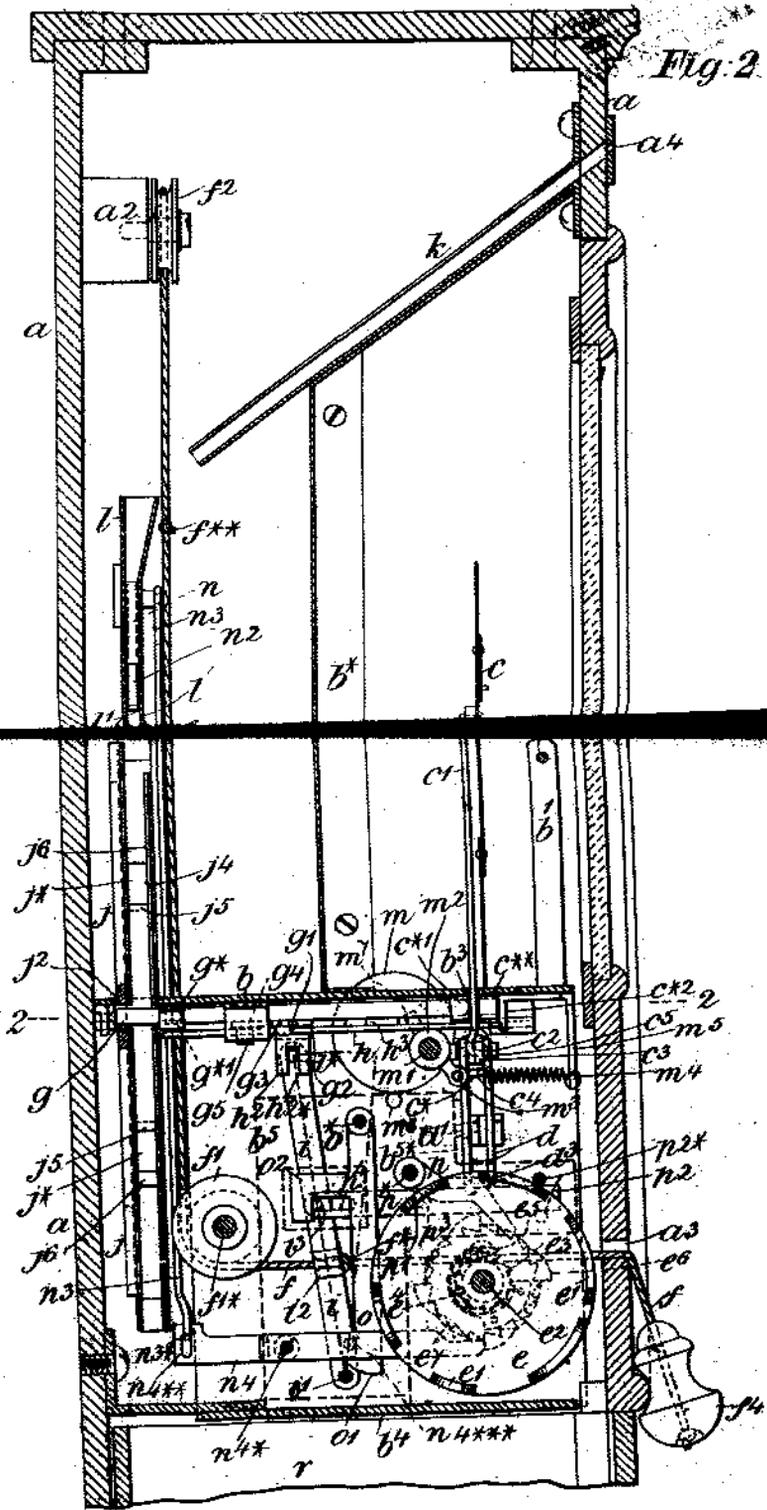
Dated this 12th day of June 1891.

WHITE & WOODINGTON,
27, Southampton Buildings, London, Agents.

[This Drawing is a reproduction of the Original on a reduced scale.]

(1 SHEETS)
SHEET 2.

Mellor & Sons, Printers, etc.



A.D. 1880. Dec. 12. N. 14,393.
ROELL'S CONCRETE RECONSTRUCTION.

Mellor & Sons, Printers, etc.

Fig. 8.

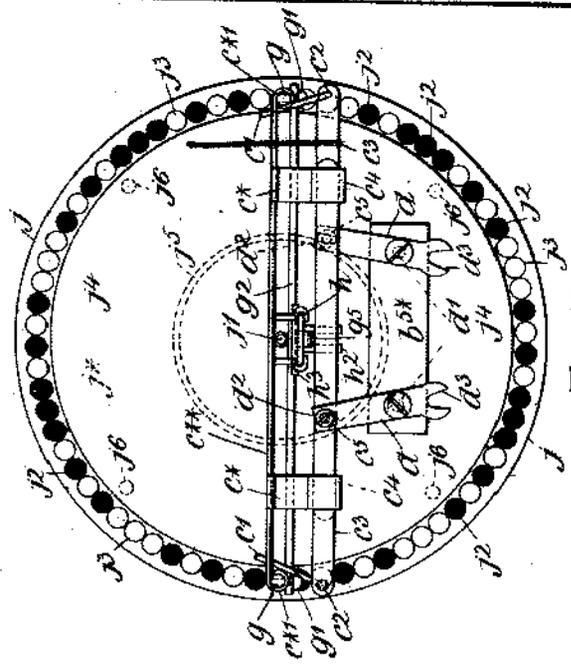


Fig. 10.

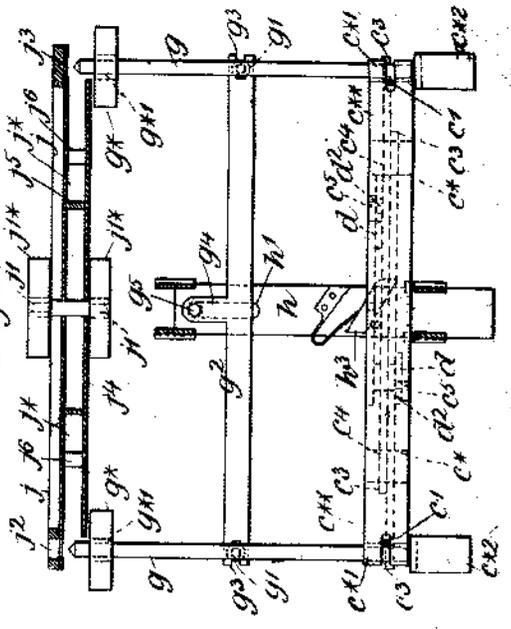


Fig. 9.

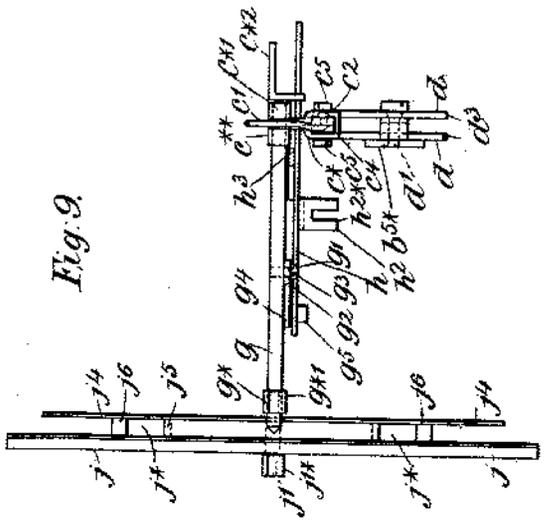


Fig. 12.

