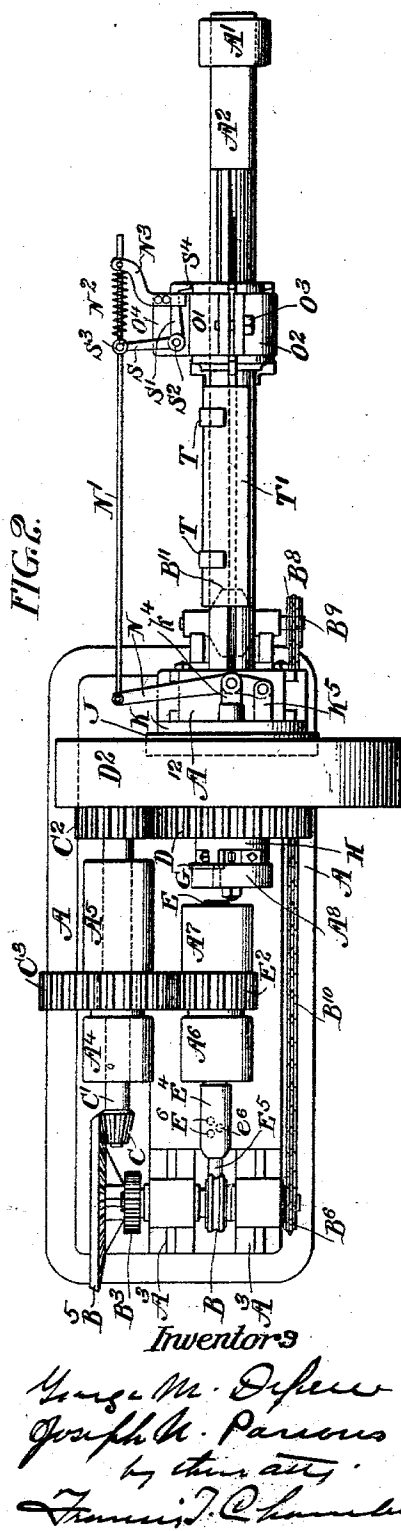
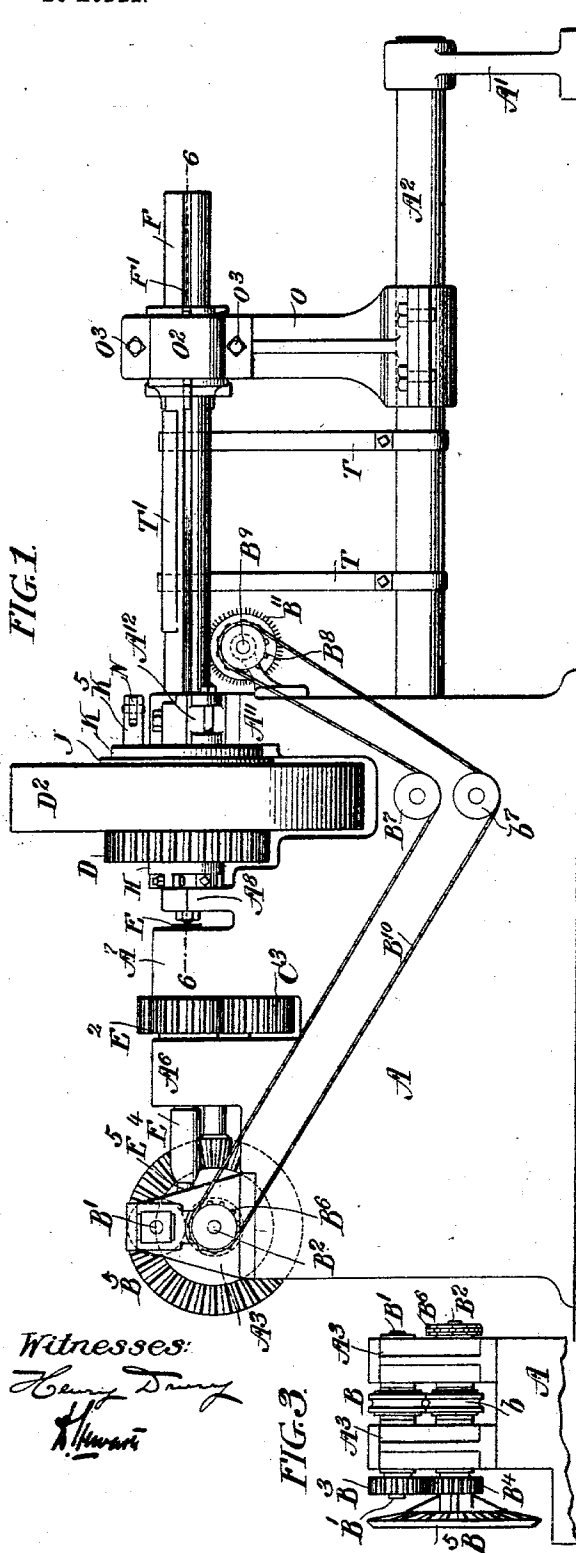


G. M. DEPEW & J. N. PARSONS.
WIRE CUTTING MACHINE.

APPLICATION FILED JUNE 11, 1901. RENEWED JUNE 21, 1902.

NO MODEL.

5 SHEETS—SHEET 1.



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NO MODEL.

5 SHEETS—SHEET 2.

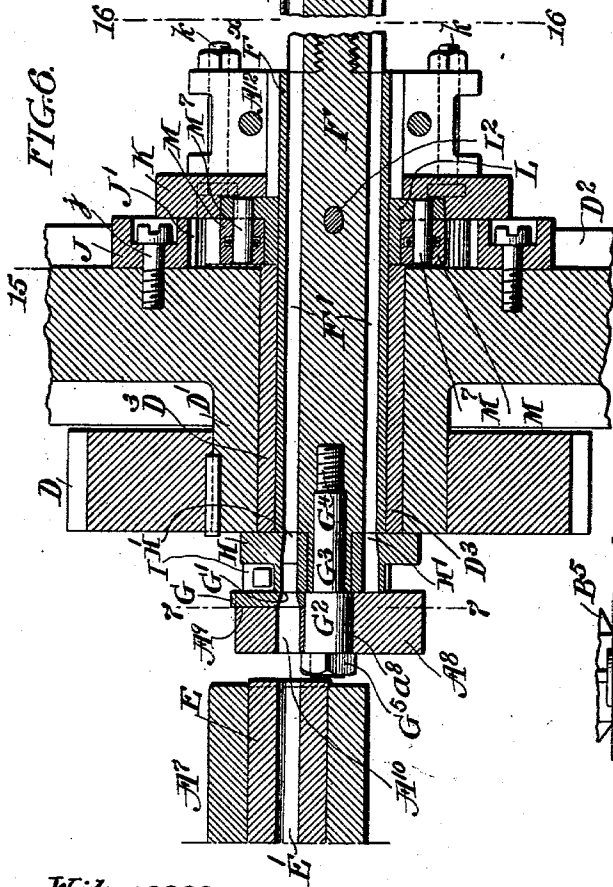
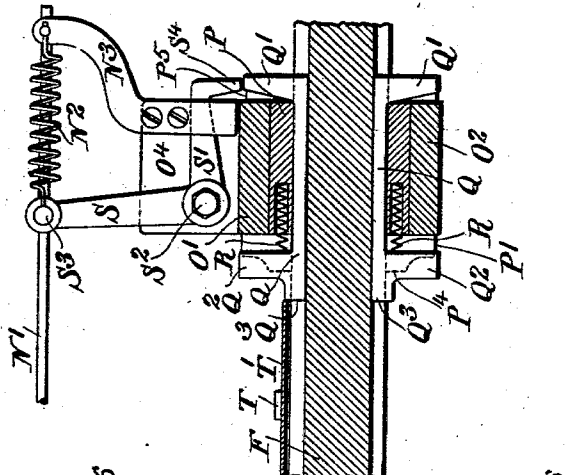


FIG. 3.

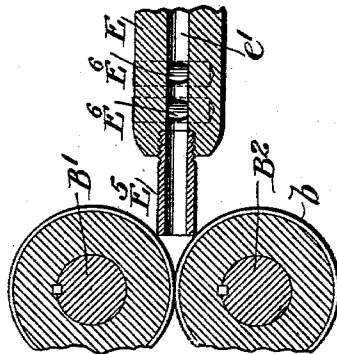
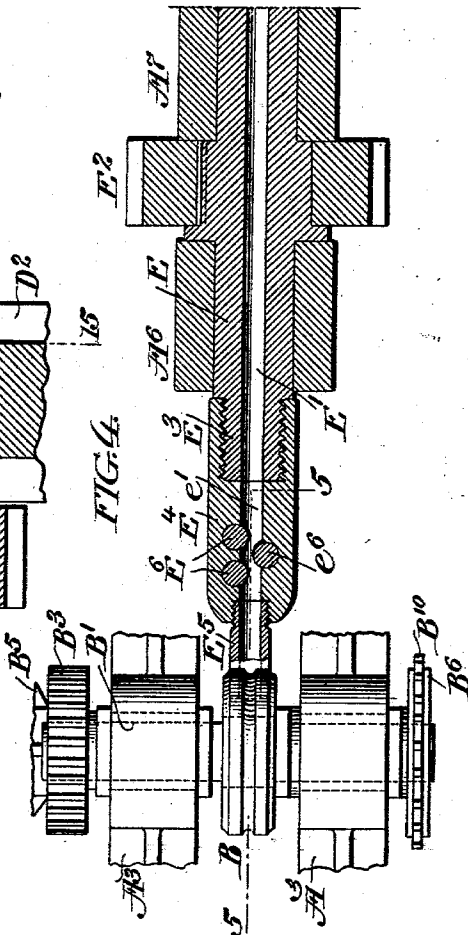


FIG. 4.



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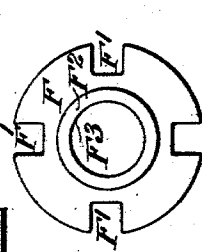
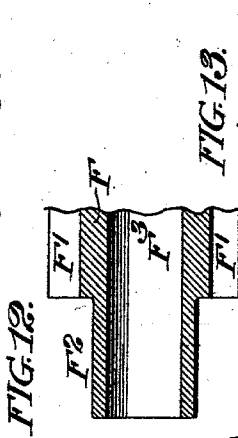
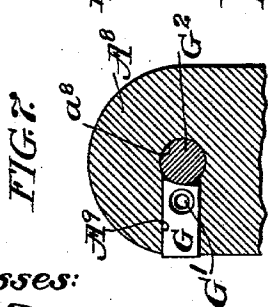
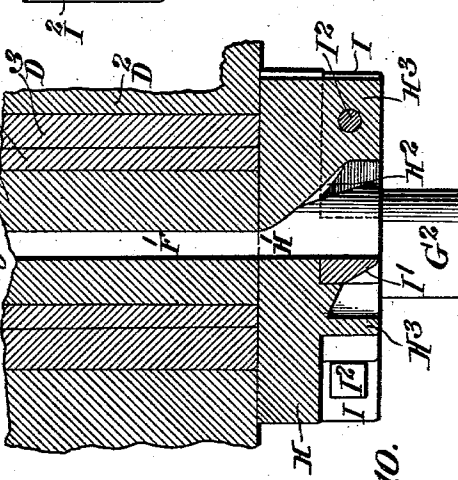
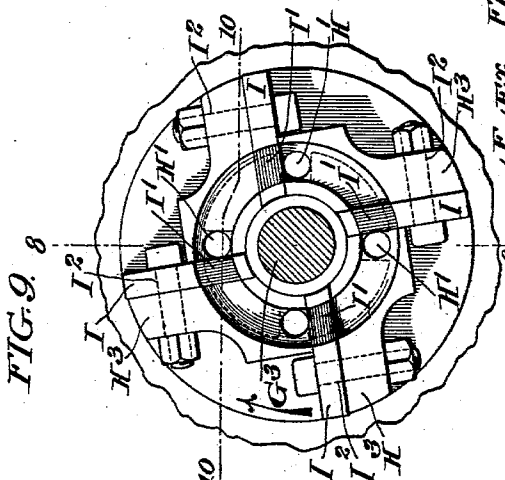
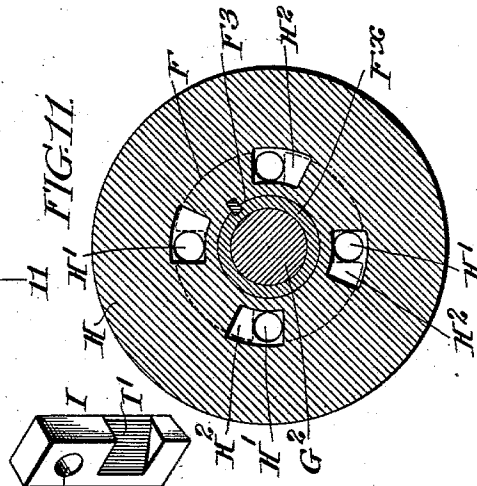
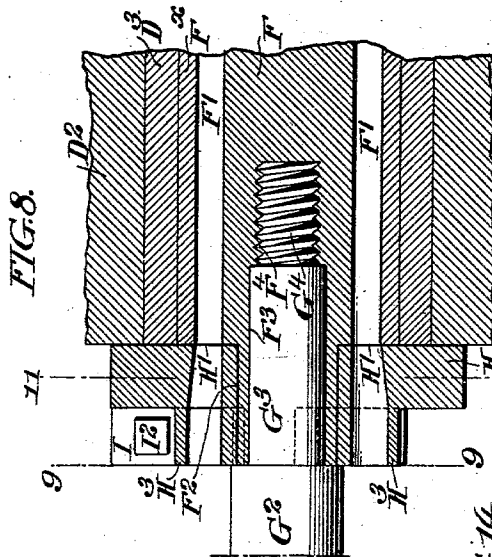
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NO MODEL.

5 SHEETS—SHEET 3.



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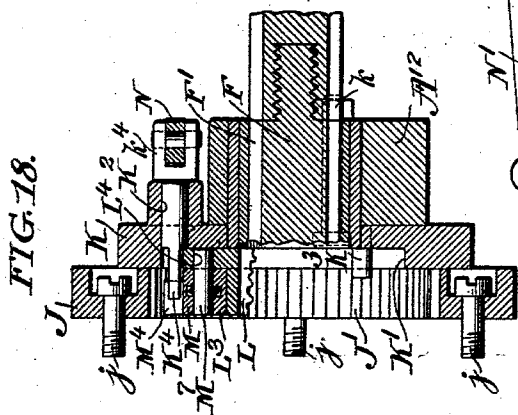
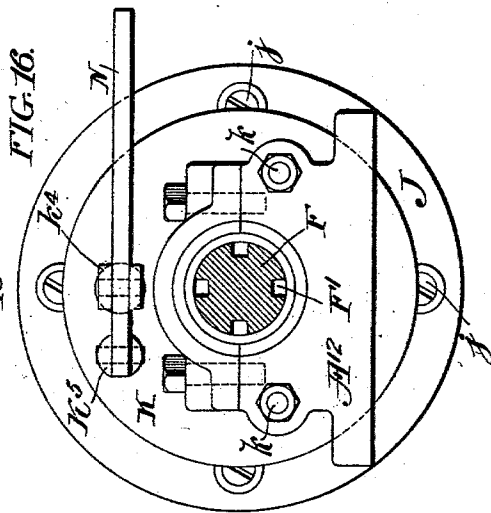
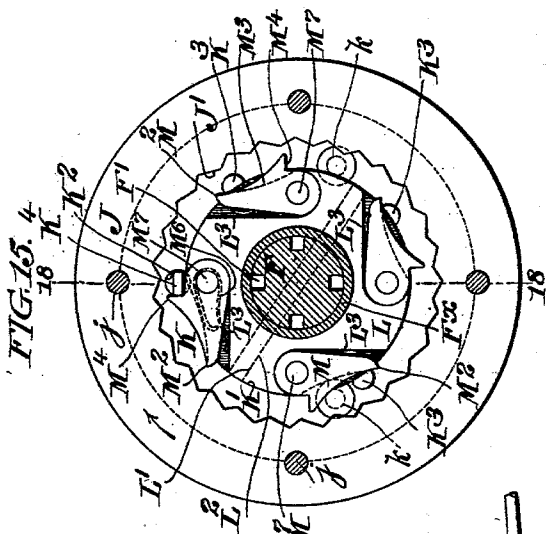
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NO MODEL.

5 SHEETS—SHEET 4.



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NO MODEL.

5 SHEETS—SHEET 5.

FIG. 24.

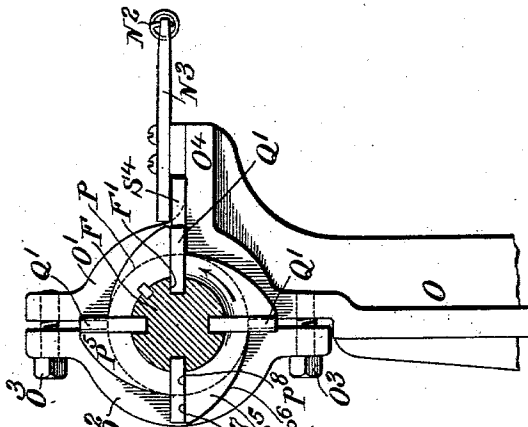


FIG. 22.

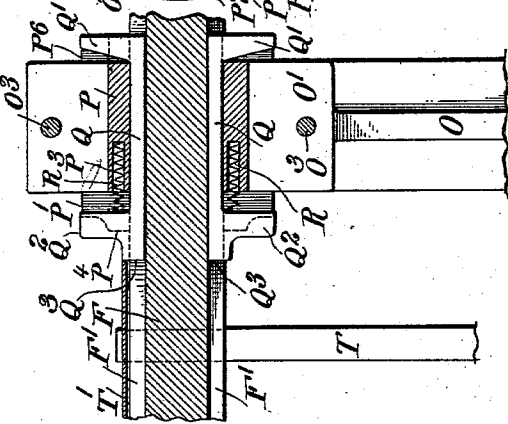


FIG. 23.

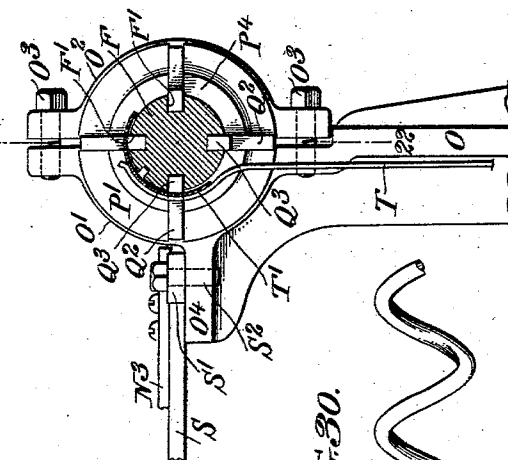


FIG. 30.



FIG. 27.

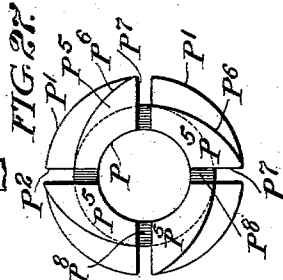


FIG. 25.

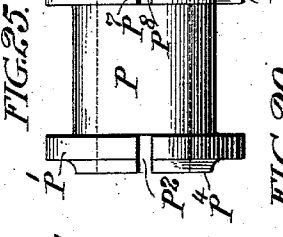


FIG. 26.

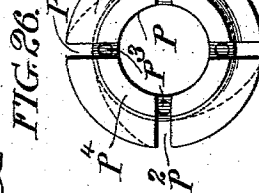


FIG. 28.

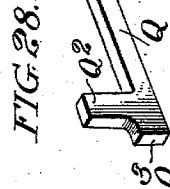


FIG. 29.



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WIRE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 717,553, dated January 6, 1903.

Application filed June 11, 1901. Renewed June 21, 1902. Serial No. 112,595. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. DEPEW, residing in Canandaigua, Ontario county, State of New York, and JOSEPH N. PARSONS, residing in Emsworth, Allegheny county, State of Pennsylvania, citizens of the United States of America, have invented certain new and useful Improvements in Wire-Cutting Machines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

Our invention relates to machinery for cutting a wire off in determined equal lengths, the object of our invention being to construct a simple and efficient machine for this purpose; and our invention consists in the combination, with feeding or feeding and bending mechanism, of intermittently-acting wire-cutters for severing the wire and in various details of construction, which will be best understood as described in connection with the drawings, in which our invention is illustrated in what we consider to be its best form, and in which—

Figure 1 is a side elevation of the machine; Fig. 2, a plan view; Fig. 3, an end elevation of the wire-feeding rolls and their connections; Fig. 4, a longitudinal sectional view through the twisting-spindle, showing also the feed-rolls in plan. Fig. 5 is a cross-section on the line 5 5 of Fig. 4. Fig. 6 is a sectional plan view taken on the section-line 6 6 of Fig. 1, the view being on an enlarged scale and the shaft F being partly broken away. Fig. 7 is a cross-sectional view on the line 7 7 of Fig. 6. Fig. 8 is a sectional view, on an enlarged scale, of part of the mechanism shown in Fig. 6. Fig. 9 is an end view of the cutters on the section-line 9 9 of Fig. 8. Fig. 10 is a cross-sectional view on the line 10 10 of Fig. 9. Fig. 11 is a cross-sectional view on the line 11 11 of Fig. 8. Fig. 12 is a longitudinal sectional view of the end of the shaft F, as shown also in Fig. 8. Fig. 13 is an end view of said shaft. Fig. 14 is a perspective view of one of the cutters secured on the end of the shaft. Fig. 15 is a face view of the clutch mechanism on the section indicated at 15 15 of Fig. 6. Fig. 16 is a rear view of the

clutch mechanism, taken on the section line 16 16 of Fig. 6. Fig. 17 is a side elevation of the clutch mechanism. Fig. 18 is a cross-sectional view of the clutch mechanism on the line 18 18 of Fig. 15. Fig. 19 is a face view of the dog-holding disk forming part of the clutch. Fig. 20 is a side elevation of this disk. Fig. 21 is a perspective view of one of the locking-dogs. Fig. 22 is a sectional view of the clutch-actuating mechanism, taken on the line 22 22 of Fig. 23. Fig. 23 is an end view of the mechanism shown in Fig. 22 viewed from the left-hand side. Fig. 24 is an end view of the same mechanism viewed from the right-hand side. Fig. 25 is a side elevation of the sleeve P. Fig. 26 is an end elevation of said sleeve viewed from the left-hand side; Fig. 27, an end elevation of the sleeve viewed from the right-hand side. Fig. 28 is a perspective view of one of the keys used in connection with the sleeve P. Fig. 29 is a view illustrating the action of the wire-bending devices on the wire, and Fig. 30 is an exaggerated view showing the character of the spiral twist imparted to the wire.

A indicates the frame of the machine; A', a supplemental support, between which and the main frame A is supported the stationary shaft A².

A³ indicates the frame and housing of the wire-feeding mechanism.

A⁴ and A⁵ are bearings for the shaft C'.

A⁶ and A⁷ are bearings for the spindle E.

A⁸ indicates a projection from the frame A, forming a bearing for the stud G² and also a support for one of the wire-cutting knives, a⁸ indicating the bearing for the stud G², A⁹ indicating the slot in which the knife is secured, and A¹⁰ indicating an opening through which the wire is fed to the knife.

A¹¹ indicates an extension of the frame A, supporting the bearings A¹² of the shaft F.

B and b indicate the wire-feeding rolls supported on shafts B' and B², said shafts being coupled together by the gear-wheels B³ and B⁴ and driven through the miter-wheel B⁵, secured on shaft B² by a miter-wheel C, secured on a shaft C', having its bearings in the projections A⁴ and A⁵, a gear-wheel C² at its op-

posite end, and a gear-wheel C³, secured between the bearings A⁴ and A⁵. The gear-wheel C³ is driven by a gear-wheel D, secured to the hub D' (see Figs. 2 and 6) of the main driving-pulley D², said wheel being supported on a bushing D³, which rests in turn on a sleeve F^x, secured on the shaft F.

As shown, we have secured a sprocket-wheel B⁶ to the end of the shaft B² and coupled it to a sprocket-wheel B³ on a shaft B⁹, supported directly beneath the shaft F (see Fig. 1) by a chain B¹⁰, passing under guide-shafts B⁷ b⁷. Secured on the shaft B⁹ is a friction-wheel B¹¹, conveniently made as a wire-brush, which runs against the under side of the shaft F.

E is a spindle supported in the bearings A⁶ and A⁷ and having a central perforation (indicated at E') and between the bearings a gear-wheel E², which is engaged and driven by the gear-wheel C³. As shown, the end of the spindle E is externally threaded at E³ and has screwed upon it the bending device E⁴, having a perforation e', which registers with the perforation E' of the spindle proper, and having inserted through it the benders E⁶ E⁶ e⁶, which extend into the perforation e', as shown in Fig. 4, and act to bend the wire as it passes through the perforation, as indicated in Fig. 29; but as the spindle and bending device are constantly revolving the benders are constantly traveling around the wire, and as a result a spiral twist is imparted to the wire of the character shown on an exaggerated scale in Fig. 30.

E⁵ is a guide-tube secured on the end of the bender E⁴ and extending close to the feed-rolls B b.

F is a shaft supported on the bearing A¹² and further supported by the bracket O, as shown in Fig. 1. This shaft is eccentric to the spindle E, as best shown in Fig. 6, and has formed in it a series of longitudinal peripheral grooves, (indicated at F' F',) four being shown in the drawings. The portion of the shaft extending through the hub of the pulley-wheel D² and the bearing A¹² has secured to it a sleeve, (indicated at F^x.) The end of the shaft F nearest to the twisting-spindle is formed with a sleeve F² and a central perforation F³, terminating in a threaded portion F⁴, as shown in Figs. 8, 12, and 13.

G (see Figs. 2, 6, and 7) indicates a wire-cutting blade inserted in the groove A⁹ of the bracket A⁸ and formed with a sharp-edged perforation, (indicated at G',) which registers with the perforation A¹⁰ in the bracket A⁸.

G² is a stud-bearing supported in the bearing-bracket A⁸ and having a bolt extension G³, which fits in the perforation F³ and screws into the threaded portion F⁴ at the end of the shaft F.

G⁵ is a nut screwing on the threaded extension of the stud-bearing G².

H (see Figs. 6, 8, 9, 10, and 11) is a knife-

supporting annulus fitted on and secured to the extension F² of the shaft F and having a series of grooves H', which register with the grooves F' in the shaft and have one side forming practically a continuation of a side of each groove F', as shown in Fig. 10, while the opposite side flares gradually away, as indicated at H².

H³ H³, &c., indicate arms on the annulus, adapted to receive and support a series of cutters I I, &c., secured to said arms, as by bolts I². The cutters I have their cutting edges substantially in line with one side of each groove F' and taper gradually backward, as indicated at I', merging into the tapered side H² of the slot.

J (see Figs. 6, 15, 16, 17, and 18) is a clutch-ring secured to the pulley-wheel D², as by screws j, and formed with internal serrations, as indicated at J'.

K is a disk fitting against the outer face of the clutch-ring J and secured, as by bolts k, to the bearings A¹². This disk is formed on its inner face with an annular groove, (indicated at K'.) It is also formed with a guiding-perforation (indicated at K²) and has projecting from its inner face a series of three fixed pins, (indicated at K³ K³, &c.)

K⁴ indicates a longitudinally-movable pin extending through the perforation K² and having at its outer end a pivot-receiving head, (indicated at k⁴.)

K⁵ is a lug extending from the back of the disk K.

L is an annular plate secured to the shaft F and its sleeve F^x, as by a pin L², extending through a perforation, (indicated at L'.) The annular disk L is formed with a series of dog-receiving recesses L³, with pivot-holes formed in them, as shown in Fig. 19.

M M, &c., are a series of dogs pivoted in the recesses L³ of the disk L by pins M⁷, passing through perforation M' in the dogs and the perforations L⁴ in the disk.

M² indicates the clutch-engaging end of the dog, the outer faces of which are formed on one side with grooves M³ and on the other side with projecting stop-holes M⁴. As shown, the dogs are also formed with spring-receiving slots M⁵, in which are situated springs M⁶, (see Fig. 15,) which act to throw the points of the dogs out into contact with the clutch-ring J.

N is a lever pivoted on the lug K⁵ as a fulcrum and pivotally connected with the head k⁴ of the movable pin K⁴. The end of the lever N is connected by a rod N' and a spring N² (see Fig. 2) with a bracket N³, secured on a projection O⁴ of the standard O, the spring acting to draw the rod N' outward and through it to draw the pin K⁴ outward.

The standard O, already mentioned, is adjustably secured to the stationary shaft A², so that it can be moved to whatever position on the shaft may be desired, said shifting

position regulating the length of wire to be cut off. At the top of the standard O is the bearing, (indicated at O',) having a detachable portion O² secured to it by the flanges, (indicated at O³.)

O⁴ is a projection from the standard O, having the function of supporting the bracket N³ and also the pivot of the lever S S'.

P is a sleeve fitting on the shaft F and supported in the bearing O' O². It is formed at one end (see Figs. 6 and 25) with a flange P', slotted, as indicated at P² P³, &c., to correspond with the slots in the shaft F, P⁴ indicating a slight annular projection of the sleeve beyond the flange P'. At the other side of the sleeve is formed a series of four cams P⁵ P⁶, &c., having faces P⁶ extending gradually from the surface of the sleeve and surfaces P⁷ falling abruptly from the higher point of the cam. These cams are separated by slots P⁸ P⁹, corresponding in position to the slots P².

Q Q, &c., are a series of keys fitting in the slots F' of the shaft F and lying within the sleeve P. They are formed at one end with projecting lugs Q², which extend into the slots P², and with adjacent projecting ends Q³. The keys are provided with outwardly-projecting lugs Q', which normally lie in contact with the abrupt faces P⁷ of the cams P⁵. The keys are somewhat longer than the breadth of the portion of the sleeve P lying between its flanges, and the keys are normally held in the position indicated in Fig. 22 by the action of springs R R, held in sockets P³, formed in the sleeve P.

S S' (see Figs. 2, 6, 23, and 24) represent a bell-crank lever pivoted to the plate O⁴ at S² and secured at S³ to the rod N'. The arm S' of the lever has a projecting finger S⁴, which normally lies on the top of one of the projecting flanges or fingers Q' and immediately above one of the slots P⁸, lying between the cams at the end of the sleeve P. The action of the spring N² is to push the finger S⁴ downward.

T T are arms secured on the stationary shaft A² and supporting a segmental shield, indicated at T'. (See figures indicated at 1, 2, 6, 22, and 23.) This sleeve, as shown in Fig. 23, extends over the uppermost slot F' and the adjacent slot in the direction of the movement of the shaft, but leaves the lowermost slot F' uncovered.

The operation of the feeding and twisting mechanism has been already sufficiently described. The wire after having been twisted passes through the perforation E' of the spindle E and into the perforation A¹⁰ in bracket A⁸ and thence through the perforated knife G into the flared end of the slot H' and thence into the registering slot F' in the shaft F, the wire being fed forward until it comes in contact with the projecting end Q³ of one of the keys Q, resting in slot F'. While the wire is being so fed forward, the clutch

parts are in the position shown in Fig. 15 and the clutch-actuated mechanism in the position shown in Fig. 6. The movable pin K⁴ being thrust in and engaging the heel extension M⁴ of one of the dogs, as shown in Fig. 15, while the other dogs are pressed inward by the action of the stationary pins K³, consequently the shaft F is disengaged from the driving-pulley D², which revolves freely upon it, the shaft being stationary and held in position by the pin K⁴. When the end of the wire comes in contact with the dog Q, it presses it outward or toward the right in Fig. 6 until its projecting finger Q' is pushed outward from beneath the finger S⁴ of the bell-crank lever S S', whereupon said lever, under the influence of the spring N², at once moves toward the right, the finger S⁴ moving down alongside of the abrupt face P⁷ of the cam P⁵ and into contact with the lower portion of the gradually-inclined face P⁶ of the next adjacent cam. This movement of the bell-crank lever permits the rod N' to move toward the right and to act upon the lever N, so as to draw the movable locking-pin K⁴ outward until it clears the heel projection M⁴ of the dog and permits said dog to move outward until it engages the serrated inner face of the clutch-ring J. This engagement immediately couples the driving-wheel D² with the shaft F, causing the shaft to move with the driving-wheel and the cutter I adjacent to the wire to move against it and sever it, in coaction with the cutter G', the shaft continuing to move through an angle of ninety degrees after the wire is severed and the feeding and twisting of the wire not being interrupted, as the severed end of the wire being fed forward moves over the tapered dog I' of the cutter I and over the flared portion of the groove H' into the next adjacent groove F' without appreciable or at least injurious deflection. As the shaft F revolves the finger S⁴ of the bell-crank lever S S' is gradually moved upward by the inclined face P⁶ of the cam P⁵, upon which it rests until the finger passing over the point of the cam rests upon the end of the finger Q' of the key Q in the next adjacent slot, the bell-crank lever, acting through the rod N' and lever N, thrusting the pin K⁴ inward, so that it engages the heel extension M⁴ of the next dog M, all the other dogs being at this time disengaged from the clutch-ring by the action of the pins K³, which act upon the grooves M³ of the dogs, as indicated in Figs. 15 and 21. The action of the pin K⁴ is therefore the double one of completing the disengagement of the clutch members and also of serving as a stop, whereby the motion of the shaft F when arrested after its movement through ninety degrees and when one of its grooves is in proper position to register with the twisting-spindle and receive the wire from it. The function of the shield T' is to hold the wire in the

groove F' while it is moving toward the clutch-actuating key Q and also to hold it in the groove after it has been severed and while the shaft is making the first portion of its ninety-degree revolution. At the end of this movement of the shaft the wire is no longer restrained by the shield T' and its outer end will drop down by its own weight, bringing the body of the wire into contact with the friction-wheel B¹¹, which draws it out from the rear portion of the slot F' in which it rests and frees it from the machine.

The twisting mechanism shown and above described, in connection with the cutting devices, is the sole invention of George M. Depew and forms the subject-matter of his application for Letters Patent, Serial No. 63,390, filed June 6, 1901.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a wire-cutting machine, the combination with feeding mechanism, of a shaft F having longitudinal peripheral slots F', said shaft being revoluble to bring each slot in turn into position to receive the wire from the feeding mechanism, a wire-cutter situated between the slotted shaft and the feeding mechanism and actuated by the movement of the shaft, a positively-driven device, a clutch arranged to couple and uncouple the shaft with said device, clutch-engaging mechanism actuated by the end of a wire moving in a slot of shaft F, and clutch-releasing mechanism actuated by the rotation of said shaft.

2. In a wire-cutting machine, the combination with feeding mechanism, of a shaft F having longitudinal peripheral slots F', said shaft being revoluble to bring each slot in turn into position to receive the wire from the feeding mechanism, a wire-cutter situated between the slotted shaft and the feeding mechanism and actuated by the movement of the shaft, a positively-driven device, a clutch arranged to couple and uncouple the shaft with said device, clutch-engaging mechanism actuated by the end of the wire moving in a slot of shaft F, and clutch-releasing and shaft-arresting mechanism actuated by the rotation of said shaft.

3. In a wire-cutting machine, the combination with feeding mechanism, of a shaft F having longitudinal peripheral slots F', said shaft being revoluble to bring each slot in turn into position to receive the wire from the feeding mechanism, a wire-cutter situated between the slotted shaft and the feeding mechanism and actuated by the movement of the shaft, a positively-driven device arranged to actuate the feeding mechanism, a clutch arranged to couple and uncouple the shaft with said device, clutch-engaging mechanism actuated by the end of the wire moving in a slot of shaft F, and clutch-releasing and shaft-arresting mechanism actuated by the rotation of said shaft.

4. In a wire-cutting machine, the combination with feeding mechanism, of a shaft F having longitudinal peripheral slots F', said shaft being revoluble to bring each slot in turn into position to receive the wire from the feeding mechanism, a stationary wire-cutter blade situated between the feeding mechanism and the slotted shaft, a series of wire-cutter blades secured to the slotted shaft with their edges substantially in line with one side of each slot and their backs tapering gradually to the opposite side of the next adjacent slot in the shaft, and means for intermittently revolving the shaft through an angle corresponding to the angular distance of the slots.

5. In a wire-cutting machine, the combination with feeding mechanism, of a shaft F having longitudinal peripheral slots F', said shaft being revoluble to bring each slot in turn into position to receive the wire from the feeding mechanism, a wire-cutter situated between the slotted shaft and the feeding mechanism and actuated by the movement of the shaft, a pulley D² supported and turning on shaft F, a clutch-ring J supported on pulley D², a disk L secured to shaft F and extending into ring J, two or more clutch-dogs M pivotally secured on disk L, said dogs having on their outer faces the projecting heels M⁴ and slots M³, stationary pins K³ projecting in between the clutch-ring and disk L so as to engage with the grooves M³ of the dogs and disengage them from the ring J as the dogs pass said pins, a longitudinally-movable stop-pin K⁴ also projectable into the space between the disk and ring and in its inner position arranged to engage the heel M⁴ of one of the dogs, and intermittently-acting mechanism for moving said pin K⁴.

6. In a wire-cutting machine, the combination with feeding mechanism, of a shaft F having longitudinal peripheral slots F', said shaft being revoluble to bring each slot in turn into position to receive the wire from the feeding mechanism, a wire-cutter situated between the slotted shaft and the feeding mechanism and actuated by the movement of the shaft, a positively-driven device, a clutch arranged to couple and uncouple the shaft with said device, a collar P surrounding the outer end of shaft F having a slotted flange P' at one end and a series of cams P⁵ separated by slots P⁸ at its other end, a series of keys Q having lugs Q' Q² extending into the slots in the collar P and the lugs Q' normally registering with the tops of cams P⁵, said keys being longitudinally movable in sleeve P and grooves F' and held in normal position by springs and movable therefrom by the thrust of the wire ends in grooves F', a clutch-actuating lever S S' S⁴ normally held in disengaging position by lug Q' of a key Q and under spring action tending to throw it down behind the adjacent cam P⁵, all substantially as specified.

7. In a wire-cutting machine, substantially as described, the combination with the rota-

table slotted shaft F with a shield T' serving to retain the wires in the slots as they are fed forward therein, said shield being shaped to release the wires as they are carried down by
 5 the movements of the shaft, and a revolving frictional wire-extractor B¹¹ acting on the wire at the lower portion of the grooves.

8. In a wire twisting and cutting machine, the combination with feed-rolls, of a revolving
 10 perforated spindle to receive the wire from the rolls, wire-benders arranged in the perforation of the revolving spindle to bend the wire as it passes them, and an intermit-

tently-acting cutter to sever the twisted wire in determined lengths.

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