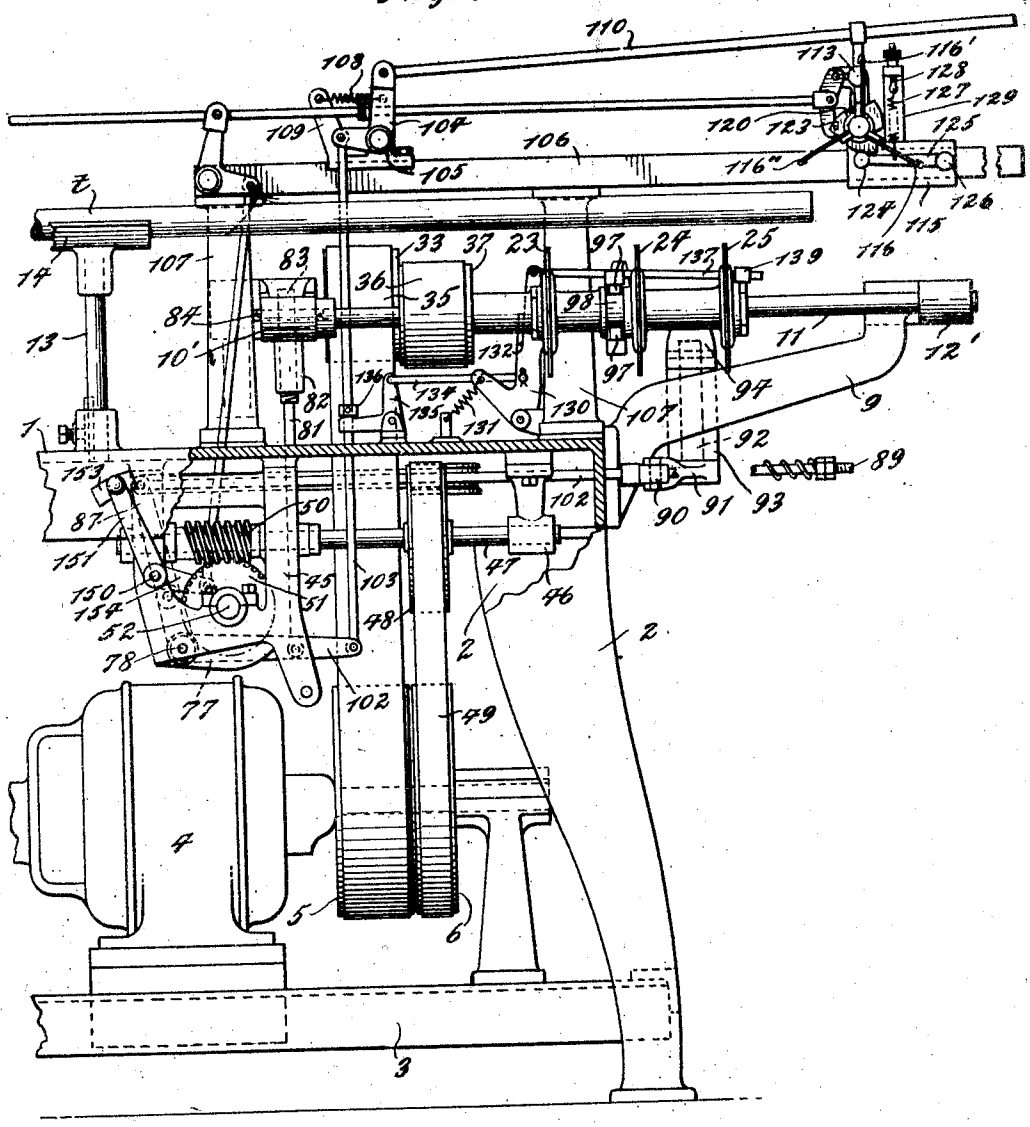
Jan. 8, 1929. 1,698,230

E. M. HAWKINS

TUBE CUTTING MACHINE

Filed June 13, 1927 4 Sheets-Sheet 1

Fig. 1.



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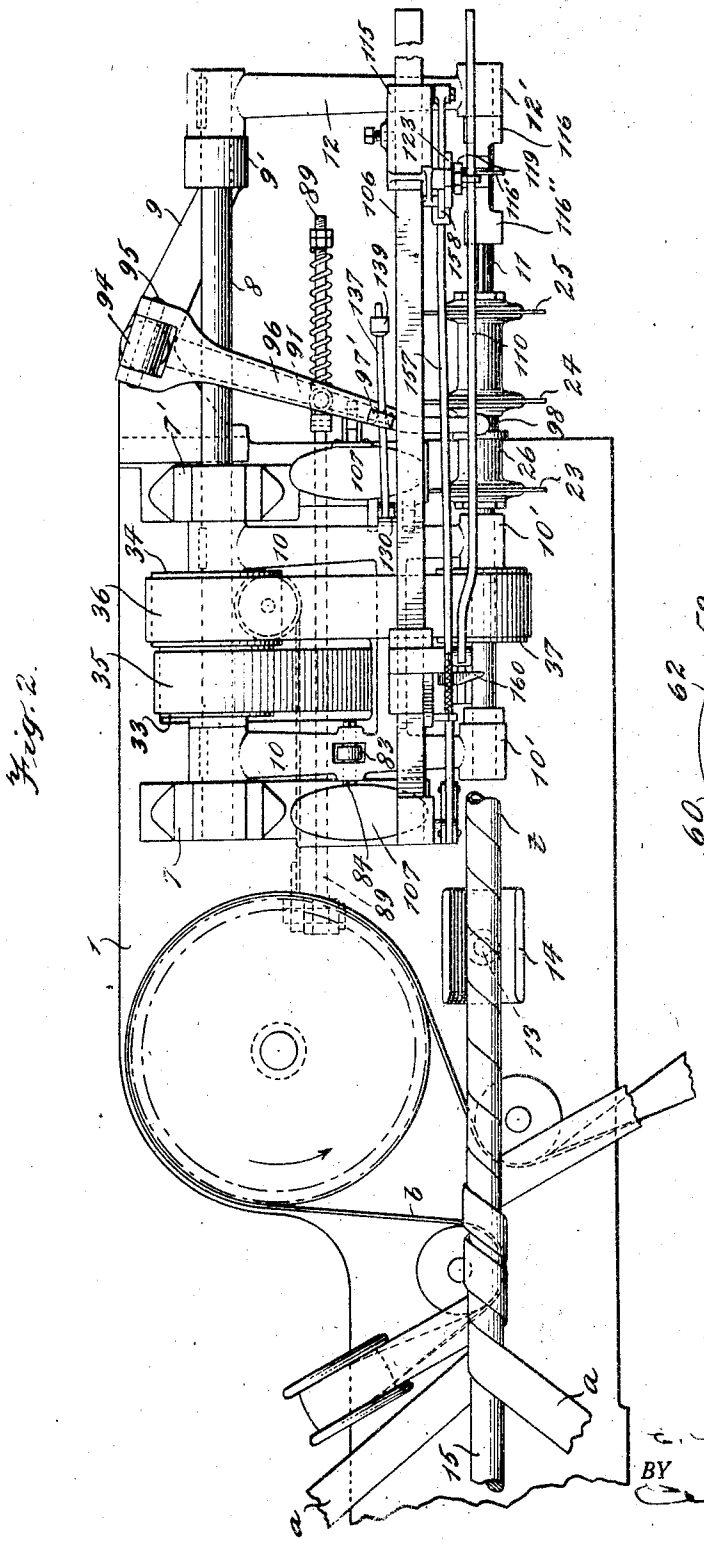


Fig. 2.

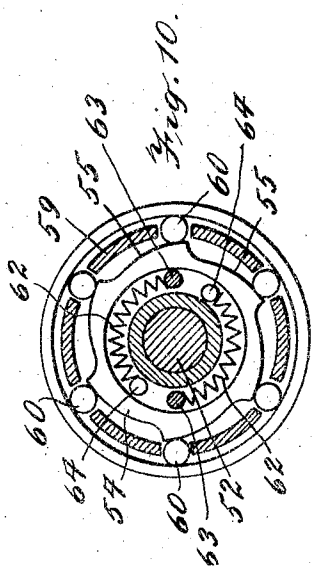


Fig. 10.

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Fig. 3.

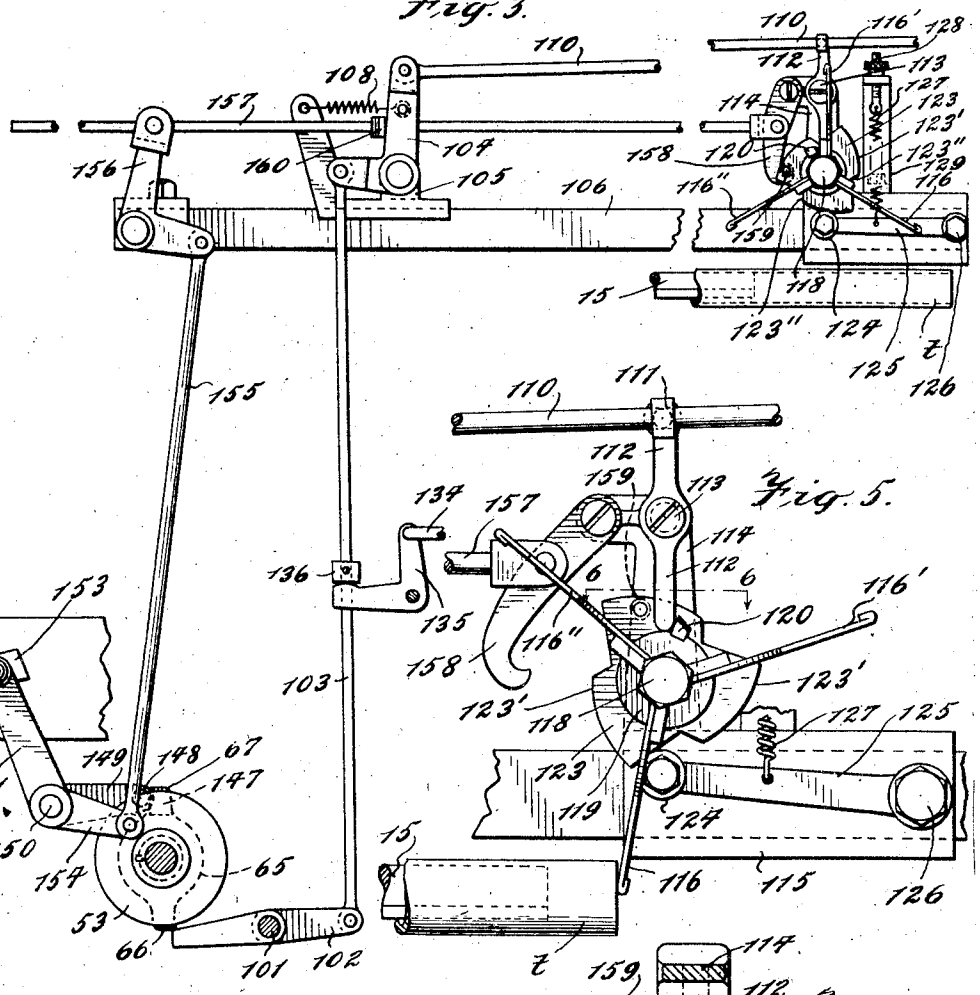


Fig. 5.

Fig. 4.

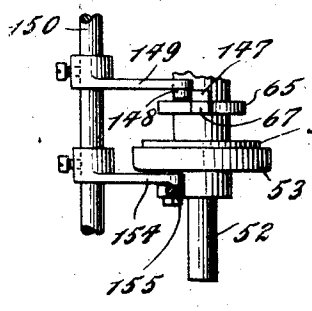
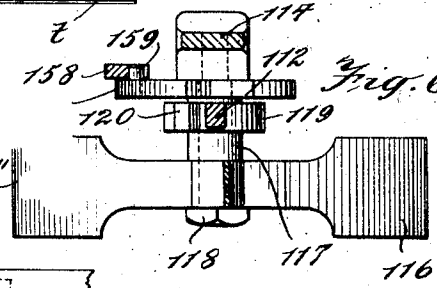


Fig. 6.



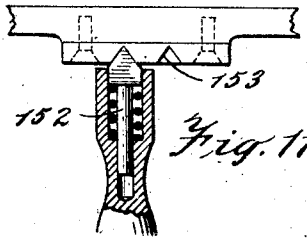


Fig. 11.

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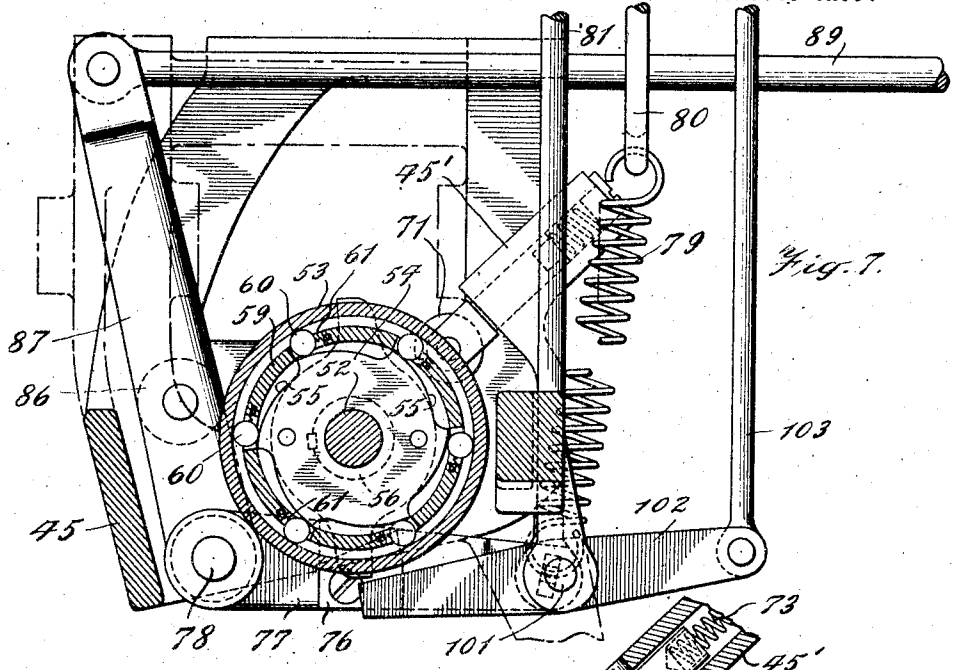


Fig. 7.

Fig. 9.

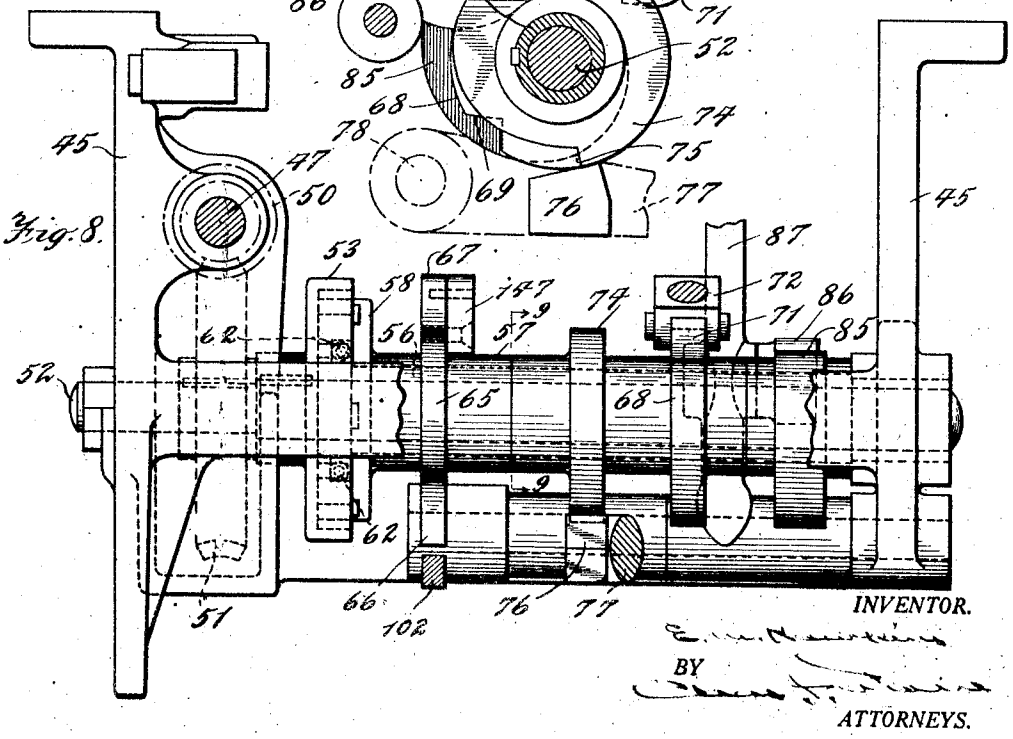


Fig. 8.

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Patented Jan. 8, 1929. 1,698,230

UNITED STATES PATENT OFFICE.

EDGAR M. HAWKINS, OF ROCHESTER, NEW YORK, ASSIGNOR TO M. D. KNOWLTON COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

TUBE-CUTTING MACHINE.

Application filed June 13, 1927. Serial No. 198,485.

The invention relates to certain improvements in tube cutting machines, especially of the type shown in application Serial No. 196 351, filed June 3, 1927, and has for its object to provide such machines with a simple and efficient stop or lockout mechanism, which, when manually set, will prevent the engagement of the cutter mechanism with the travelling tubing, and, preferably, will also lock the trip mechanism in inoperative relation out of the path of movement of the tubing; whereby the portions of tubing that are defective or otherwise unsatisfactory may be fed through the machine without being cut.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation, partly in section, of the complete machine.

Fig. 2 is a plan view of the machine associated with a tube forming machine.

Fig. 3 is an enlarged side elevation of certain of the controlling and operating mechanism shown in Fig. 1.

Fig. 4 is a plan view of part of the mechanism shown in Fig. 3.

Fig. 5 is a fragmentary side elevation on an enlarged scale showing the trip mechanism and the coordinated discharging means.

Fig. 6 is a sectional plan view taken on the line 6—6 of Fig. 5, but with the parts in the positions shown in Fig. 3.

Fig. 7 is an enlarged elevation, partly in section, of certain of the operating and controlling mechanisms.

Fig. 8 is a front elevation, partly in section, of the mechanism shown in Fig. 7.

Fig. 9 is a section on line 9—9 of Fig. 8.

Fig. 10 is a sectional end elevation of one element of the clutch mechanism.

Fig. 11 is a detail view, partly in section, of the handle for operating the lockout mechanism.

Referring to Figs. 1 and 2 of the drawings, 1 indicates the bed or table of the machine, which is supported by suitable legs 2 connected at their bottoms by a cross beam 3 which constitutes the support for a suitable electric motor 4 for operating the mechanism, upon the shaft of which motor are mounted belt pulleys 5 and 6. As shown more particularly in Fig. 2, the frame of the machine constitutes a continuation of the frame of a tube forming machine in which a continuous length of tubing is produced by overlapping spirally wound strips of paper or the like *a*, *a* cemented together by any suitable adhesive, and which tubing is fed forward upon its supporting mandrel with a continuous movement by the winding and feeding belt *b*. While the machine of the present invention may be conveniently associated with a tube forming machine and, if desired, may constitute a component part of the latter, it is to be understood that the invention is not limited to such association, but the tube cutting machine may be built and operated as a separate unit entirely disassociated from the tube forming mechanism, in which case suitable means are provided for feeding tubing in continuous lengths into the machine.

Adjustably secured on the top of table 1 are pedestals 7, 7′ in which is journaled a horizontal shaft 8, the outer end of which is also journaled in a bearing 9′ on a bracket 9 secured to the front end of the table. Keyed to the shaft 8 in proper spaced relation are two arms 10, 10 provided at their ends with journal bearings 10′, 10′, which support a cutter carrying arbor 11, the outer end of which is journaled in a bearing 12′ on arm 12 keyed to the outboard end of shaft 8, the several parts being so arranged that the arbor 11 is adapted to be swung about the shaft 12 as an axis.

The cutters, preferably in the form of disk saws, are, in the machine exemplified in the drawings, three in number, to wit, 23, 24 and 25, spaced at intervals on a sleeve 26, which latter is slidably mounted for longitudinal movement on the arbor 11 and has a splined connection with the latter to be rotated therewith.

Mounted on the top of the table is a vertically adjustable pedestal 13 carrying at its upper end a trough-like member 14, adapted to receive the tubing to be cut, which tubing, indicated at *t*, is shown as supported on a mandrel 15, said mandrel also constituting a part of the tube forming machine upon which the strips of paper are wound in making up the tube and the mandrel being continued through the cutting machine above and in parallelism with the arbor 11, to constitute a support for the tubing and the sections being cut, the extreme end of the mandrel being beyond the outer limit of the traverse of the

cutting mechanism to be hereinafter described.

Loosely journaled on shaft 8 is a double pulley comprising members 33 and 34, the former being connected by a belt 35 to pulley 5 on the shaft of motor 4 and the member 34 being connected by a belt 36 to a pulley 37 fast to the cutter arbor 11, which insures the continuous drive of the cutters so long as the motor 4 is operated, with the cutter arbor in its lowermost position and the saws or cutters out of contact with the tubing carried by the mandrel, but adapted to be projected into the path of travel of the tubing and to travel with the tubing in the cutting operation, as will be hereinafter explained.

Journaled in a supporting frame 45 and in bearing bracket 46 on the under side of the table 1 is a shaft 47, upon which is fastened a pulley 48, which is connected by a belt 49 to drive pulley 6 on the shaft of motor 4, so that said shaft 47 is continuously rotated by the motor 4. Keyed to the shaft 47 within the frame 45 is a worm 50, which meshes with a worm gear 51 fast to a cross-shaft 52 journaled in said frame 45, said shaft, therefore, being continuously driven by shaft 47. Also keyed to the shaft 52 is one member 53 of a clutch mechanism, comprising a cup-like element adapted to be intermittently coupled with its mating clutch 54, which latter comprises a generally disk-shaped head provided with peripheral cam surfaces 55, said head being formed as an extension of a sleeve 56 loosely journaled on shaft 52. Loosely mounted on the sleeve 56 is a collar-like element 57 having an enlarged head 58 provided with a flange 59, which is interposed between the rim of clutch member 53 and the edge of clutch member 54, said flange 59 being provided with pockets or recesses in which are mounted balls or rollers 60, which are adapted to roll on the cam surfaces 55 of the clutch member 54, each of said balls or rollers being acted upon by a spring 61, tending to force the balls or rollers toward the high ends of the cam surfaces 55. The inner face of the head 54 on sleeve 56 is provided with an annular groove in which are mounted springs 62, 62, each spring being confined between a pin 63 secured in the bottom of the groove, and a pin 64 secured to the inner face of member 58, the springs 62 tending to rotate said members 54 and 58 relatively to each other. Formed integrally with the collar section 57 is a flange 65 having diametrically oppositely disposed lugs 66, 67, which constitute stop devices, which, when engaged by an abutment, cause the cooperating clutch members 53 and 54 to disengage, by first arresting the movement of collar 57 and the head member 58 thereof which moves the balls or rollers down the cam surfaces 55, thereby disengaging the clutch members 53 and 54. The inertia of the clutch member 54 and the sleeve 56 of which it forms a part, causes these members to rotate a short distance after the movement of collar 57 has been arrested, which movement has the effect of compressing the springs 62, which are held under such compression by means of a flange 68 formed integrally with the sleeve 56 and provided with opposite notches 69 and 70, one or the other of which is adapted to be engaged by a roller 71, journaled in a clevis-slide 72 mounted in an arm 45′ of housing 45, said slide being held in yielding engagement with the flange 68 by means of the compression spring 73. The function of the springs 62 is to initiate the clutch engaging operation, after lug 66 or 67 on collar 57 has been disengaged from its retaining detent, the stored energy of the said springs serving to impart a partial rotation to collar 57 and head 58, the rim 59 of the latter operating to move the balls or rollers 53 into engagement with the high portions of the cam surfaces 55, thereby connecting clutch members 53 and 54.

The object of providing the collar 57 with two stop lugs 66 and 67, and the flange 68 with two notches 69 and 70 is to secure the disengagement of the clutch members at the end of each half revolution, for reasons to be hereinafter explained.

Keyed on the sleeve 56 is a cam 74 having a shoulder 75. Engaging the peripheral edge of said cam 74 is a lug 76 secured to a lever 77 pivoted on shaft 78. Connected to the outer end of the lever 77 is a spring 79 anchored at its upper end to an adjustable eye 80 secured to the table 1. Also secured to the outer end of lever 77 is a lift rod 81, which latter at its upper end is secured to one of the swinging arms 10 of the arbor frame by an adjustable connection comprising a screw collar 82 and a slotted rod section 83, the elongated slot of which is engaged by a cross pin 84 secured to member 10, as shown in Figs. 1 and 2, these parts being so arranged that, when the lug 76 engages the high part of cam 74, as shown in Fig. 9, the saws are held in their lower position out of the path of movement of tubing, but, as soon as the lug 76 drops off of the high part of the cam onto the low portion thereof, spring 79 rocks lever 77, elevates rod 81 and swings the frame carrying the saw arbor upward until the saws are projected into the path of travel of the tubing. The purpose of the pin and slot connection between the rod 81 and the arm 10 of the swinging arbor frame is to permit the two half revolutions of the clutch to be effected during each cutting operation, as will be hereinafter explained.

Fast on sleeve 56 is a cam 85, the rise of which is gradual through substantinally one hundred and eighty degrees and terminates in a high point which drops off quickly to the hub section, which is substantially concentric

with the sleeve 56. This cam 85 engages a roller 86 journaled on a stud mounted on lever 87, which is pivoted on shaft 78. The upper end of the lever 87 is connected by a rod 89, which passes through a block 90, swivelled in the clevis end of a rock lever 91, the other end of which is pinned to the end of a vertical shaft 92 journaled in a vertical bearing 93 formed in bracket 9. Pinned to the upper end of the shaft 92 is a cap piece 94 having an eye at its top to receive a cross pin 95 on the ends of which pin are mounted the forked ends of lever 96, the forward end of which latter is provided with a fork carrying block 97, which engages an annular groove 98 in sleeve 26 carrying the saws. This particular coordination is designed to return the gang of saws to its initial position after each cutting operation, when the high part of cam 85 swings the lever 87 and causes rod 89 to actuate lever 91, which, in turn, rocks shaft 92 and lever 96 connected thereto to slide the sleeve carrying the saws on saw arbor 11. The swivel connection between the lever 96 and the cap 94 connected to shaft 92 permits the lever 96 to follow the movement of the saw arbor toward and away from the path of travel of the tubing.

Pivoted to a bracket extension of the housing 45 at 101 is a rock lever 102, the free end of which is adapted to engage lug 66 or 67, to disengage the members of the clutch and to permit the clutch members to be automatically engaged, when the end of said lever is moved out of engagement with lug 66 or 67. The opposite end of lever 102 is connected to a lift rod 103, which is attached at its upper end to a bell crank 104 mounted upon bracket 105 secured to a bar 106 running longitudinally of the machine in general parallelism with the mandrel, said bar being secured to pedestals 107, 107 fast to the table 1. Said bell crank lever is acted upon by a spring 108 attached to an extension of bracket 109, which spring normally tends to rock the bell crank in a direction to swing the free end of lever 102 into the path of movement of lug 66 or 67. Connected to the upper end of bell crank 104 is a rod 110, which passes through and is secured in an eye 111 of a lever 112 pivoted at 113 to a bracket 114, which bracket forms an upward extension of an adjustable slide 115 mounted on bar 106.

The slide 115 carries the trip mechanism which operates the clutch releasing lever 102 and which also, in the machine exemplified, constitutes a part of the mechanism for automatically discharging or stripping the cut sections of the tubing from the mandrel after each cutting operation. The trip plate per se constitutes one of three radial arms or blades 116, 116′, and 116″, connected to a hub section 117 journaled on a pin 118 secured to the bracket 114, said hub section having a flange 119 thereon provided with a lug 120, diametrically opposite the arm 116, which lug is adapted to engage the lower end of lever 112, when the trip plate 116 is swung outwardly by the end of the tubing passing through the machine, thereby causing lever 112 to swing on its pivot 113 causing rod 110 to swing to the right, as viewed in Figs. 1, 2, 3 and 5, rocking bell crank 104 to cause rod 103 to swing rock lever 102, so that the free end of the latter disengages lug 66 or 67, thereby permitting the effective engagement of the clutch member 53 fast to shaft 52 and clutch member 54, which serves to rotate the sleeve 56 and its associated elements, the rotation of said member 56 being arrested after each half revolution by the engagement of the free end of lever 102 with the opposite lug 66 or 67 as the case may be, which has the effect of disengaging the loose member of the clutch and arresting the rotary movement of sleeve 56.

As indicated, the trip mechanism also constitutes a component part of the stripping mechanism for discharging the sections of the tubing, which is accomplished by causing the blades 116′, 116″ and 116 to engage the severed sections in sequence and flip them off of the end of the mandrel. This operation is effected by the mechanism more particularly shown in Figs. 3, 5 and 6, in which 123 indicates a plate secured to the hub section of the trip device, which plate is provided with three peripheral cam surfaces 123′ separated by notches 123″, the peripheral edge of the plate being engaged by a roller 124 mounted on the end of a lever 125 pivoted at 126 to slide 115, the lever being held in adjustable pressure contact with the periphery of the cam plate by a spring 127 connected to the mid section of the lever 125 and anchored to an adjusting screw 128 mounted in a bracket 129 extending upwardly from the slide 115, the engagement of the roller 124 with the cam surfaces of the plate 123 serving, through the action of spring 127, to complete successive rotatory movements of one hundred and twenty degrees to the hub 117 and, therefore, to the blades 116, 116′, 116″ secured thereto, the initial rotary movements being effected by the engagement of the advancing tubing with blades 116, 116′ and 116″.

Pivoted on the bracket extension of the pedestal 107, which is adjacent the saw arbor, is an angular lever 130 acted upon by tension spring 131 anchored to the table top, said lever carrying a latch plate 132 adapted to engage the adjacent arm 10 of the swinging arbor frame, the engagement of the latch plate serving to hold the saw arbor frame in its upper position with the saws in the path of travel of the tubing, after the arbor frame has been swung to this position.

Connected to the lever 130 is a rod 134, the opposite end of which is connected to a bell crank 135 pivoted on a bracket on the table

top 1, the other end of the bell crank engaging a collar 136 adjustably mounted on pull rod 103, which latter actuates the trip lever 102 controlling the clutch mechanism. To the upper end of the lever 130 is pivoted one end of a rod 137, which passes through a perforated lug 97' secured to the upper side of arm 96, which latter serves directly to return the saws to their initial inoperative position, as hereinbefore explained. Adjustably mounted on the rod 137 is a collar or abutment 139, which, as the arm 96 is swung by the movement of the cutters with the tubing during the cutting operation, is engaged by lug 97', thereby swinging lever 130 to disengage latch plates 132 and 133, so as to permit the cutter arbor frame to drop and also to move rod 134 to the right as shown in Fig. 1, thereby rocking bell crank 135, raising rod 103 and swinging trip lever 102 out of engagement with the lug 67 to cause a reengagement of the clutch mechanism and thereby effect a second half revolution of the loose clutch member 56, whereby all of the parts are restored to normal operative position.

Under certain conditions, it is found desirable and necessary to suspend the cutting operation, as, for example, when the tubing is defective or the machine becomes clogged and to permit the defective tubing to be run through the machine without being cut. To effect this result, a special lockout mechanism to prevent the engagement of the clutch members and also to latch the trip mechanism and stripping means in inoperative position and permit the free passage of the tubing past the trip mechanism, is provided, this lockout mechanism being effective after the completion of a cutting operation. Secured to the flange 65 on collar 57 (see Fig. 4) and in the rear of lug 67 on said flange is a stop lug 147, which is adapted to be engaged by a pin 148 on the end of a lever 149 mounted on shaft 150, which shaft is journaled in bearings in the housing 45. Connected to the shaft is a hand crank 151 provided with a spring latch pin 152 cooperating with a notched retaining plate 153 secured to the side of the machine frame. When the crank handle is swung in a direction to move pin 148 in the path of movement of lug 67, the engagement of these parts effects the disengagement of the clutch members in the same manner as the engagement of the end of trip lever 102, and prevents the further operation of the clutch mechanism until the handle 151 is moved to the opposite position, which swings the pin 148 out of the path of movement of the lug 147. Also fixed on the shaft 150 is a crank arm 154 connected by a rod 155 with a bell crank 156 mounted on bar 106, the upper arm of the bell crank being pinned to a pull rod 157, the opposite end of which is pin-connected with a swinging latch 158 pivoted to the bracket 114, the lower hook end of the latch 158 being adapted to engage a pin 159 on the rear face of the cam plate 123 and serving to arrest the rotatory movement of said cam plate and the radial arms of the trip and stripping devices in the position shown in Figs. 1 and 3, when all of the radial arms are out of the path of movement of the tubing. Secured to the rod 157 is a finger 160 adapted to engage bell crank 104 and thereby operate the trip lever 102 and tripping the clutch at the same time the safety device is thrown in.

The operation of the machine as described is as follows: The tubing is fed into the machine, either from the tube forming mechanism or from any other source, over the mandrel, the latter being maintained in proper feeding position by the guide member 14, and extending through the cutting machine to a point just short of the vertical position of the trip arm 116, so that the latter will clear the end of the mandrel, but the mandrel will nevertheless constitute an effective support for the tubing during the entire cutting operation and for the cut sections of the tubing until the latter are stripped from the forward end of the mandrel. When the advance end of the tubing engages the trip plate 116, as shown in Fig. 5, the latter is swung forward, thereby imparting a partial rotation to the hub 117 and the flange 119 carrying lug 120 and the cam plate 123. The lug 120 engages the lower end of lever 112, rocking the latter and exercising a forward pull on rod 110 connected to said lever, which rocks bell crank 104, which moves rod 103 upward and rocks lever 102, so that its end is moved out of engagement with lug 66, thereby permitting clutch member 54 to be automatically engaged with clutch member 53 fast to shaft 52, as hereinbefore explained. This causes a rotation of sleeve 56 and the elements carried thereby. At this time, the high part of cam 85 on sleeve 56 passes out of engagement with roller 86 on lever 87, which will permit the lever 87 to move forward in the direction of movement of the tubing, so that the saws will be free to travel with the tubing, when they are engaged therewith. Immediately after the freeing of the lever 87, the lug 76 on rock lever 77 will drop behind shoulder 75 on cam 74 and permit spring 79 to move the outer end of lever 77 upward and with it rod 81, thereby swinging the frame carrying the saw arbor upward until the saws are engaged with the tubing. Upon completion of the upward movement of the saws, the latch member 132 on lever 130 engages arm 10 of the saw arbor frame and thereby locks the saws in their upper position until the cutting operation has been completed. The saws, which are constantly driven through the belt connection of the arbor 11 with the drive pulley 5, move with the tubing during the cutting operation. The

action of the spring 79 is to move the saws quickly into engagement with the tubing immediately after they have been freed by the release of lever 87 by the high portion of the cam 85.

The machine, as described, is constructed so that the clutch member 54 will be stopped at the end of each half revolution. The reason for this particular operation is that, in cutting very large tubes, the saws require more time to effect the cut, due to the fact that the larger tube rotates more slowly on the mandrel and the helical turns are longer than those of the smaller tube and, therefore, a relatively longer time is required to effect a complete severance of the sections of the larger tubing. For this reason, the lug 67, carried by the collar-like members 57, is arranged approximately one hundred and eighty degrees from the point 66, so that the engagement of the lug 67 by the end of trip lever 102, after the latter has been returned to its position by spring 108, operates to stop the clutch at a half revolution with all of the adjustments in proper relation to permit the saws to continue their free forward movement with the tubing and sufficient time will be allowed to permit the saws to finish the cuts in the larger tubing.

The completion of the cutting operation is determined by the adjustment of the collar 139 on rod 137 and the engagement of said collar by the lug 97 on the lever 96, which moves with the saws and which is also instrumental in returning the saws to initial position. This collar 139 is so adjusted on the rod 137 as to be engaged by the lug 97 as aforesaid, immediately after the saws have completed the severance of the three sections from the end of the tubing. The movement of the rod 137 by the engagement of collar 139 by lug 97 swings lever 130 to disengage latch member 132 from frame arm 10, thereby permitting the frame carrying the saw arbor to drop to its lower position, which action is rendered possible by reason of the fact that the cam 74 has made a half revolution with the first operation of the clutch, so that the rod 81 has been dropped to its lower position, the dropping of the rod being permitted by reason of the elongated slot in the adjustable member 83 on the end of the rod engaging the pin 84 secured to the arm 10 of the saw arbor frame. The rocking movement of the lever 130 actuates rod 134 to rock bell crank 138 and through collar 136 to lift rod 103, thereby disengaging the forward end of lever 102 from lug 67, permitting the automatic engagement of the clutch, so that the second half revolution of the sleeve 56 is effected and the parts carried thereby return to normal position, as indicated in Fig. 7. The second half revolution of the cam 85 is effective in moving lever 87 to the left, as indicated in Fig. 7, thereby causing rod 89 to move the gang of saws along the arbor 11 to initial inoperative position ready to take up the next cycle.

As hereinbefore stated, the saws during the cutting operation move forward on their supporting arbor with the tubing and, in the particular machine shown, sever three sections from the end of the tubing simultaneously of exactly the same predetermined length, the length of the first section being determined by the adjustment of the trip mechanism on bar 106 and the length of the other sections being fixed by the spacing of the saws. As the advancing end of the tubing, during the cutting operation, forces trip arm 116 forward in a rotary path, the roller 124 on arm 125 rides out of the notch in the cam plate onto the adjacent cam section, which is given a curvature so that the upward pressure of the roller due to the spring 127, will impart a rotatory movement of one hundred and twenty degrees to the three radial arms carried by the hub 117, thereby causing arm 116″ to engage the first cut section of the tubing and knock the same off of the mandrel. The roller 124 on lever 125 then engages the notch adjacent arm 116″ and the rotatory trip and stripping arms are arrested for a moment with arm 116″ in position to be engaged by the front edge of the second cut tube section, the advance of which initiates another rotatory movement of the arms until the roller 124 rides on the second cam section, to wit, that immediately following arm 116″ and the three arms are again rotated in unison until they complete a movement of approximately one hundred and twenty degrees, when arm 116′ engages the second tube section and knocks the same from the mandrel. This operation is repeated by the third cut section of tubing engaging arm 116′, thereby bringing the trip arm 116 into engagement with the third section of tubing and stripping the same from the mandrel, the arm 116 being brought to rest in the position shown in Fig. 5 somewhat in advance of the end of the uncut tubing ready to be engaged thereby to initiate the next cutting operation.

As hereinbefore stated, it is desirable at times to suspend the cutting operation in order to discharge a section of defective tubing through the machine without cutting the same and, in order to bring this about, the handle 151 is moved to the position shown in Fig. 3, so that the pin 148 on arm 149 lies in the path of lug 147 on flange 65 of the collar-like member 57 and to the rear of stop lug 67. The operation of handle 151 also rocks lever 154, which, through pull rod 155, bell crank 156, pull rod 157 and collar 160, rocks bell crank 104, lifting rod 103 and rocking lever 102 to disengage lug 66, which permits the engagement of the clutch members to initiate a rotation of the member 54, sleeve 56 and collar 57, which movement is immediately ar-

rested, however, by the engagement of pin 148 with lug 67 and the machine is thus locked out or in inoperative position so long as handle 151 is retained in the adjustment indicated. The movement of handle 151 also effects the locking of the trip and stripping mechanism in inoperative position, as hereinbefore explained; that is to say, arm 154 lifts rod 155 which rocks bell crank 156, moving pull rod 157 to the right, as shown in Fig. 3, and forcing the latch lever or gag 158 into engagement with the pin 140 on the cam plate 123 as soon as said pin is moved by the rotation of the trip plate by the advancing tubing, the position of the radial arms of the trip and stripping mechanism being that indicated in Figs. 1 and 3 and is shown in locked position completely above and out of the path of travel of the defective tubing passing through the machine. In order to restore the machine to operative condition, it is only necessary to swing the handle 151 to move the pin 148 out of engagement with stop lug 147 and, as rock lever 102 is out of stopping engagement with the opposite lug 66, the clutch members are automatically engaged and a new cycle of cutting operations is begun, it being understood that the return of handle 151 to initial position also releases the latch or gag 158 from engagement with the plate 159, thereby restoring the trip mechanism to normal position.

What I claim is:

1. In a tube cutting machine, a cutter mechanism mounted for transverse and parallel movements relative to the travel of the tubing, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing including fast and loose clutch members on said shaft, a trip mechanism operative to engage the clutch members to effect the operation of the cutter projecting mechanism, and an independent stop device adapted to be engaged with the loose clutch members to render the same inoperative.

2. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the movable clutch member having a displaceable element operable to initiate the operation of said controlling mechanism, and an indepndent stop device adapted to be engaged with the loose clutch member to render the same inoperative.

3. In a tube cutting machine, a cutter mechanism mounted for transverse and parallel movements relative to the travel of the tubing, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing including fast and loose clutch members on said shaft, a trip mechanism operative to engage the clutch members to effect the operation of the cutter projecting mechanism, and an independent stop device comprising a lug on the loose clutch member, and a control member movable into the path of movement of said lug to hold the loose clutch member in inoperative position.

4. In a tube cutting machine, a cutter mechanism mounted for transverse and parallel movements relative to the travel of the tubing, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing including fast and loose clutch members on said shaft, a trip mechanism operative to engage the clutch members to effect the operation of the cutter projecting mechanism, and an independent stop device comprising a pivoted lever on the machine frame and a lug on the loose clutch member, and means for moving said lever into the path of movement of said lug to hold the loose clutch member in inoperative position.

5. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the movable clutch member having a displaceable element operable to initiate the operation of said controlling mechanism, and an independent stop device comprising a lug on the loose clutch member, and a control member movable into the path of movement of said lug to hold the loose clutch member in inoperative position.

6. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the movable clutch member having a displaceable element operable to initiate the operation of said controlling mechanism, and an independent stop device comprising a pivoted lever on the machine frame and a lug on the loose clutch member, and means for moving said lever into the path of movement of said lug to hold the loose clutch member in inoperative position.

7. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the loose clutch member having a pivoted trip plate normally positioned in the path of travel of the tubing to be displaced by the advanc-

ing end of the latter to initiate the operation of said controlling mechanism, and an independent stop device adapted to be engaged with the loose clutch member and with the pivoted trip plate to lock both of said members in their inoperative positions.

8. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the loose clutch member having a pivoted trip plate normally positioned in the path of travel of the tubing to be displaced by the advancing end of the latter to initiate the operation of said controlling mechanism, and an independent stop device comprising a rock shaft journaled on the machine frame, a lever fast to said shaft, a handle for rocking said shaft, and a lug on the loose clutch member engageable with said lever to hold the loose clutch member in its inoperative position.

9. In a tube cutting machine, a cutter mechanism mounted for transverse and parallel movements relative to the travel of the tubing, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing including fast and loose clutch members on said shaft, a trip mechanism operative to engage the clutch members to effect the operation of the cutter projecting mechanism, and an independent stop device adapted to be engaged by the loose clutch member and the trip mechanism to lock the same in their inoperative positions.

10. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the movable clutch member having a displaceable element operable to initiate the operation of said controlling mechanism, and an independent stop device adapted to be engaged by the loose clutch member and the displaceable element to lock the same in their inoperative positions.

11. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the loose clutch member having a pivoted trip plate normally positioned in the path of travel of the tubing to be displaced by the advancing end of the latter to initiate the operation of said controlling mechanism, and an independent stop mechanism adapted to lock the loose clutch member and the trip plate in their inoperative positions.

12. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the loose clutch member having a pivoted trip plate normally positioned in the path of travel of the tubing to be displaced by the advancing end of the latter to initiate the operation of said controlling mechanism, an independent stop mechanism adapted to lock the loose clutch member and the trip plate in their inoperative position, said stop mechanism including a lug on the trip plate, and a latch adapted to engage said lug and hold the trip plate in raised position.

13. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the loose clutch member having a pivoted trip plate normally positioned in the path of travel of the tubing to be displaced by the advancing end of the latter to initiate the operation of said controlling mechanism, an independent stop mechanism adapted to lock the loose clutch member and the trip plate in their inoperative positions, said stop mechanism comprising a rock shaft journaled in the machine frame, a lever fast to said shaft, a handle for rocking said shaft, a lug on the loose clutch member engageable with said lever to hold the loose clutch member in inoperative position, a lug on the trip plate, a pivoted latch adapted to engage the lug and hold the trip plate in raised position, and connections between said latch and rock shaft to swing the latch into engagement with the lug on the trip plate.

14. In a tube cutting machine, a cutter mechanism having a movable support, a constantly driven shaft, mechanism operative to project the cutter mechanism into the path of travel of the tubing, said mechanism including fast and loose clutch members on said shaft, mechanism controlling the loose clutch member having a pivoted trip plate normally positioned in the path of travel of the tubing to be displaced by the advancing end of the latter to initiate the operation of said controlling mechanism, an independent stop mechanism adapted to lock the loose clutch member and the trip plate in their inoperative positions, said stop mechanism comprising a rock shaft journaled on the machine frame, a lever fast to said shaft, a handle for

rocking said shaft, a lug on the loose clutch member engageable with said lever to hold the loose clutch member in inoperative position, a lug on the trip plate, a pivoted latch adapted to engage the lug and hold the trip plate in raised position, a second lever fast to the rock shaft, a lift rod connected to said second lever, a bell crank connected to said lift rod, and a rod connecting the bell crank and the latch to swing the latter into the path of movement of the lug on the trip plate.

In testimony whereof I affix my signature.

EDGAR M. HAWKINS.