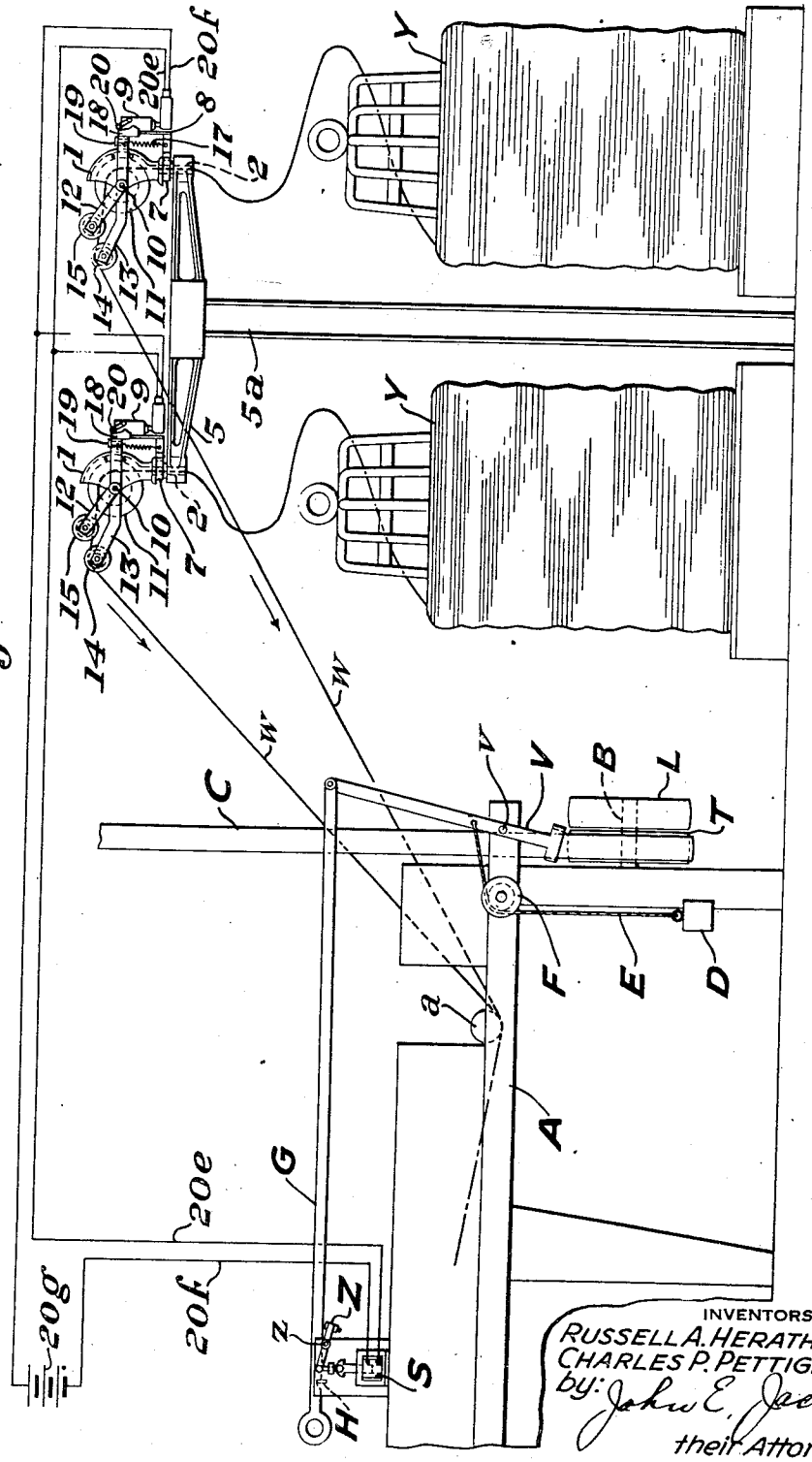
Jan. 13, 1948. R. A. HERATH ET AL 2,434,406

AUTOMATIC STOP MECHANISM

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Fig. 1



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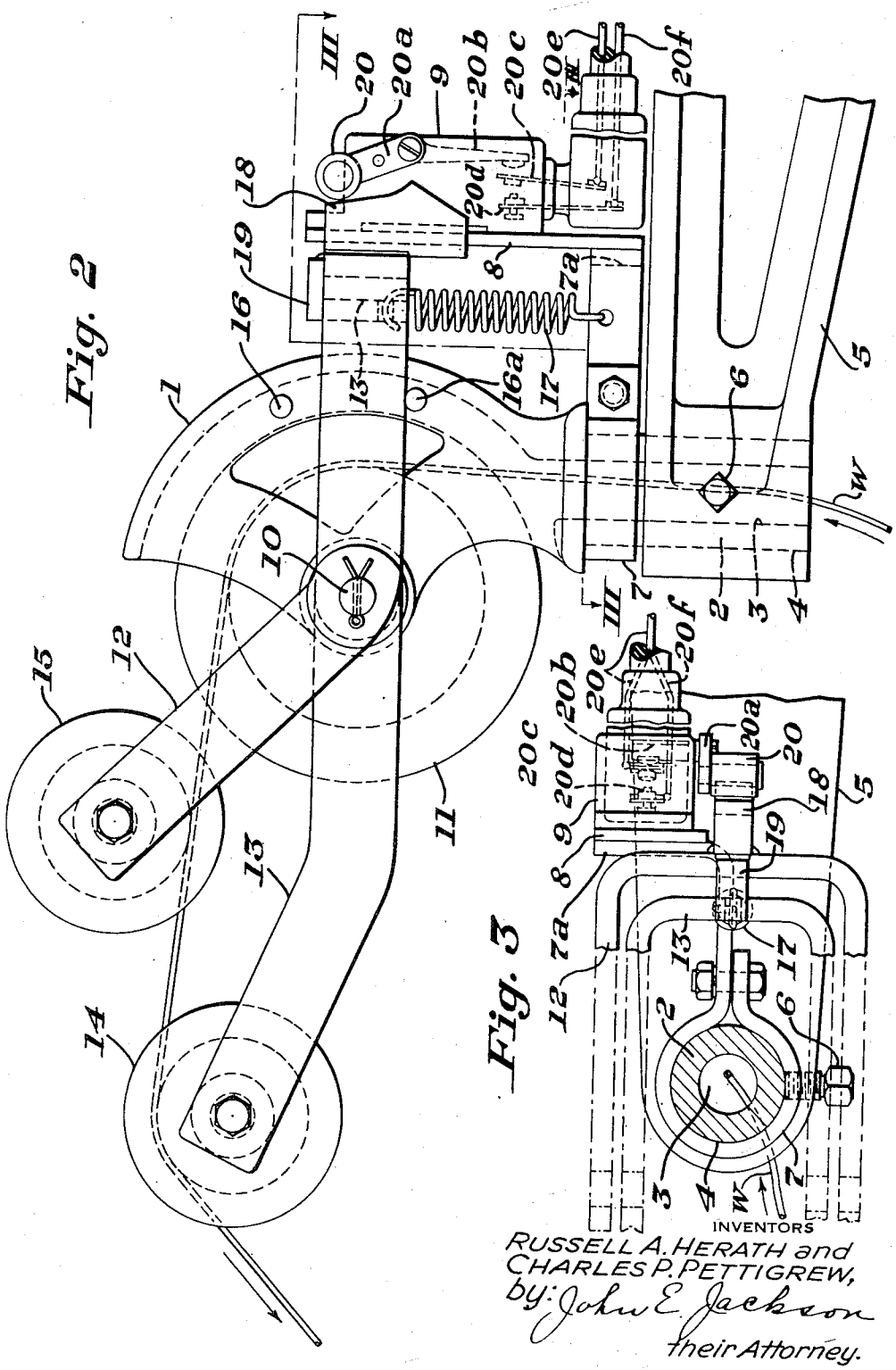


Fig. 2

Fig. 3

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Fig. 4

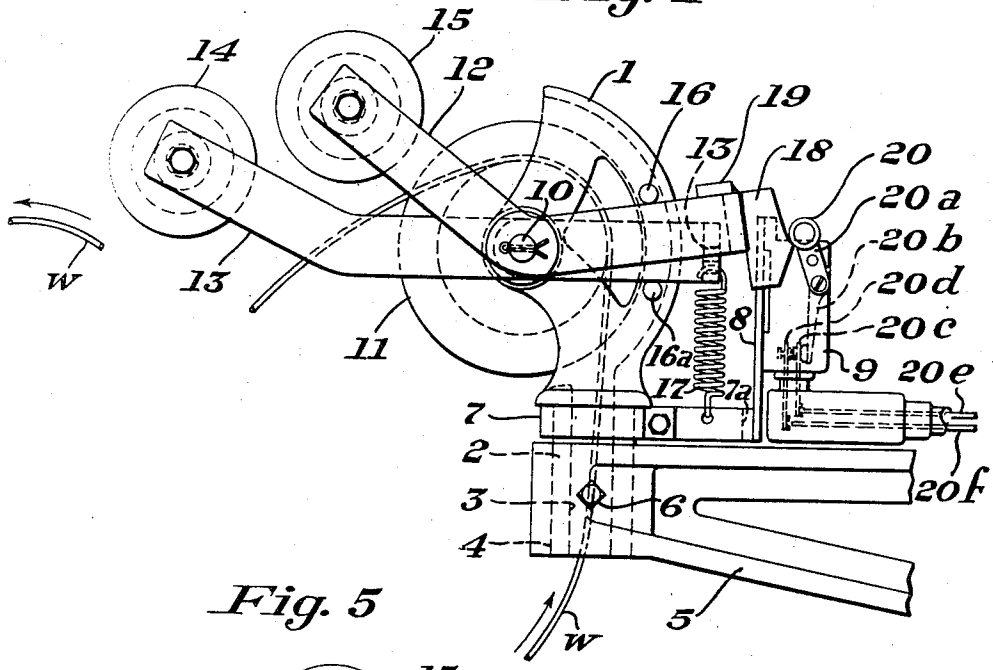
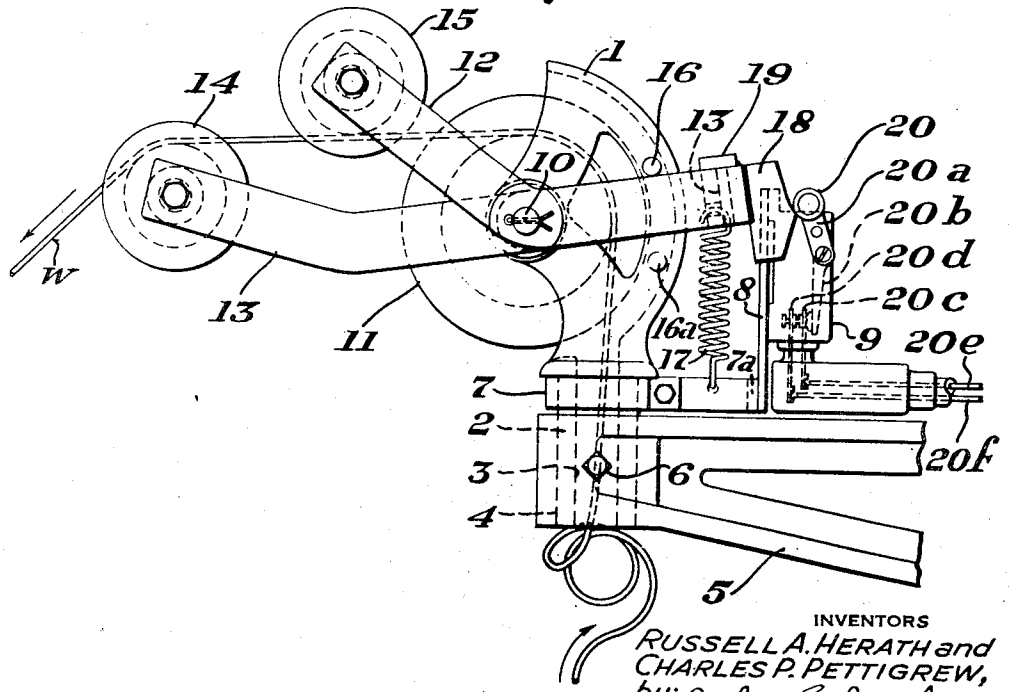


Fig. 5



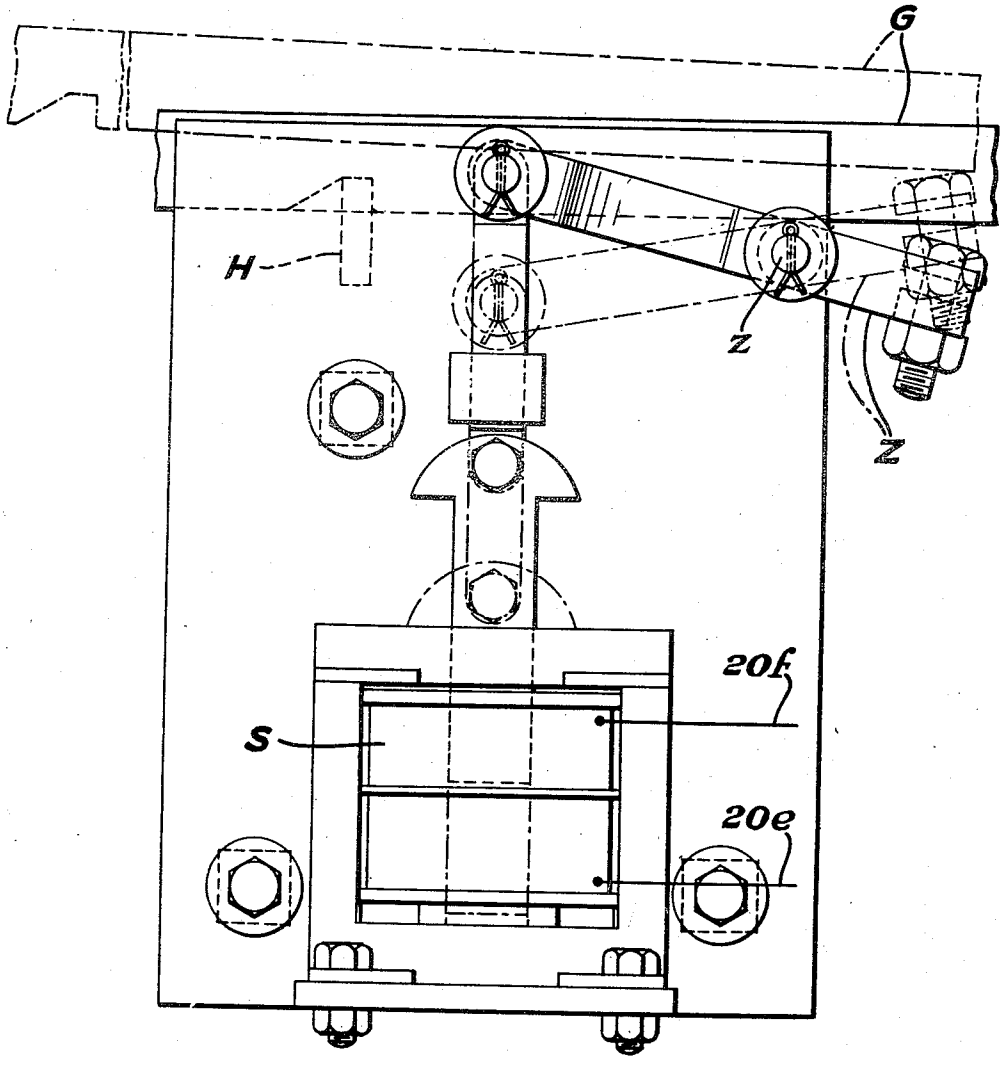
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AUTOMATIC STOP MECHANISM

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Fig. 6



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2,434,406

AUTOMATIC STOP MECHANISM

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Application May 28, 1945, Serial No. 596,330

4 Claims. (Cl. 140—126)

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This invention relates to an automatic stop mechanism for wire fabricating machines of various types such as those used in the manufacture of barbwire fencing and various wire fabrics.

The chief object of the invention is to provide automatic means for stopping a wire working machine upon the arrival of either a snarl or a broken wire or end of wire at a detector station.

As will more fully appear hereinafter, the herein claimed invention is directed to a unique and compact mechanism adapted to be combined with the power driving means of a wire working machine and the source of wire supply for the machine, the mechanism including a snarl detector sheave and a broken wire detector sheave both coacting with the same wire en route from the supply source to the machine, the mechanism also including a switch arranged to be actuated in response to movement of one or the other of said detector sheaves upon the arrival of a snarl or an end of a wire at a detector station, the mechanism including means controlled by the switch adapted to stop the operation of the power drive for the wire working machine in response to a predetermined movement of either the snarl detector sheave or the broken wire detector sheave.

The above and further related features of the invention will be more fully apparent from consideration of the following specification, the appended claims, and the accompanying drawings.

In the drawings:

Figure 1 is a side elevation showing a portion of a barbwire machine and a source of wire supply, with detector mechanism interposed between the fabricating machine and the source of wire supply.

Figure 2 is an enlarged side elevation of the principal parts of the snarl detector and broken wire detector elements and switch actuating mechanism coordinated therewith.

Figure 3 is a fragmentary horizontal section taken on section line III—III of Figure 2.

Figure 4 is a view similar to Figure 2, illustrating the operation of the broken wire detector when either the end of a wire reaches the detector station or when a wire breaks.

Figure 5 is a view similar to Figure 2, illustrating the action of the snarl detector mechanism upon the occurrence of a snarl.

Figure 6 is an enlarged detail view of a solenoid-operating mechanism controlled in response to the movement of either the snarl detector sheave or the broken wire detector sheave.

Referring in detail to the drawings, A represents any conventional form of wire fabricating machine, such as a barbwire making machine or wire fence machine, adapted to be supplied with line wires *w* advanced or pulled through the wire fabricating machine by any conventional form of wire feed, the wires *w* passing over suitable guide sheaves *a*. The wire fabricating machine may be regarded as including a main drive shaft B having a tight pulley T keyed or otherwise affixed thereto and a loose pulley L rotatably mounted thereon. A belt C driven from a pulley (not shown) on the overhead countershaft is adapted to be moved by a shifter V pivotally mounted at *v* to any convenient part of the wire fabricating machine. A counterweight D trained over a guide sheave F is connected by a cable E to the shifter V, as shown.

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An operating rod G pivotally connected to the shifter V is normally held in the position of Figure 1 by a latch element H. So long as the parts are in the position illustrated, the drive belt C will be trained around the tight pulley T and therefore transmit power to the wire fabricating machine.

As will appear more fully hereinafter, the present invention provides for automatically actuating the belt shifter V when a snarl occurs in one of the wires *w* or when said wire breaks. Upon the occurrence of a snarl or the end of a wire being reached, the belt shifter V is adapted to be rocked counter-clockwise upon the tripping of the latch H, whereupon the weight D will rock the shifter V so as to engage the belt C with the loose pulley L. The tripping of latch H is effected by a solenoid S which rocks a lever Z pivoted at *z*. The solenoid S is under control of a switch to be later described.

One or more wires *w*, to be fed to the wire fabricating machine, are adapted to be supplied from one or more pay-off reels, indicated at Y. Each wire *w* passes through identical snarl detector and broken wire detector mechanism to be described, and since these mechanisms are of identical construction a description of one will suffice for all. By way of illustration, in Figure 1 we have shown two wire supply reels and two detector mechanisms, but it will be understood that more than two or less than two may be employed if desired. As above mentioned, the primary purpose of the present invention is to prevent snarls of wire from entering a wire fabricating machine, and also to prevent broken wires or the last ends of a wire supply from entering a wire fabricating machine. The improved control mechanism of our invention serves

the double function of interrupting the transmission of power to the wire fabricating machine A, upon the arrival of either a snarl or the end of a wire at a detector station.

Our improved mechanism includes a housing 1 having a depending shank 2 formed with a central bore 3 extending therethrough through which the wire *w* travels as it is withdrawn from the payoff reels or bundles Y. The shank 2 is mounted in a bearing open 4 formed in the hub end of a supporting bracket 5 secured to a suitable fixed standard 5a, the housing being adapted to be suitably oriented and held in any desired position by means of a set screw 6 mounted in a suitable tapped opening in the hub end of the bracket 5. A collar member 7 is secured to the shank 2, as shown, and has a lateral extension 7a to which is secured a plate member 8 which in turn supports a limit switch 9.

The housing 1 has hub portions, as shown, to receive a pin 10 which rotatably supports a large grooved pulley 11 and also rotatably supports arms 12 and 13. The arm 13 near its left end, as shown in Figures 2, 4, and 5, rotatably supports a grooved snarl detector pulley 14. This arm member 13 is so mounted on the pin 10 that it is capable of pivotal movement relatively to the arm member 12. The arm member 12 carries a broken wire detector sheave 15, and said arm is pivotally mounted on the pin 10. The angular movements of arms 12 and 13 are limited by stop pins 16 and 16a, and the movement of arm 13 is somewhat restrained by a tension spring 17 whose upper end engages the right extremity of the arm 13 and whose lower end is anchored to the collar extension 7a. A tooth-like projection 19 is secured to the right end of arm 12 and overlaps the right end of arm 13, as shown. As thus arranged, counter-clockwise movement of the arm 13, as viewed in Figure 2, will cause the right extremity of said arm 13 to strike the projection 19 and thus impart counter-clockwise movement thereto. Secured to the right extremity of the arm 12 is a cam-like member 18 which is adapted to coact with a follower roller 20 secured to the free end of a switch lever 20a forming part of the limit switch 9. Within the casing of the limit switch is an operating finger 20b which is adapted to shift a movable contact 20c into engagement with a fixed contact 20d, the contacts 20c and 20d being connected by wires 20e and 20f in a circuit with a source of electric current indicated at 20g, which circuit includes the solenoid S hereinabove referred to. The arrangement is such that when the circuit is closed across the contacts 20c and 20d, the solenoid S is energized, whereupon the latch H is tripped and the operating rod G and shifter V are moved to the left by the counterweight D, thereby shifting the belt from the tight pulley T to the loose pulley L, thus interrupting the power drive and stopping the wire fabricating machine.

Normally the broken wire detector sheave 15 rides on the relatively taut stretch of the wire between the guide sheave 11 and the snarl detector sheave 14, and thus under normal conditions the limit switch is held open in the condition shown in Figure 2. However, upon breakage of the wire *w* or upon arrival of the end of a coil of wire at the broken wire detector sheave 15, the sheave 15, under such conditions, no longer being held up by the tension of the wire, will drop, thus rocking the lever 12 counter-clockwise through an angle determined by the position of stop 16, and in such rocking movement it will

shift the parts to the position of Figure 4, wherein it is noted that the cam 18 will strike the follower 20 and shift the lever 20a to an angle sufficient to close the circuit across the contacts 20c and 20d, thereby energizing the solenoid S and through the connections previously described shifting the belt C to position to stop the machine A.

In a somewhat similar manner, upon the occurrence of a snarl, the pull exerted on the wire *w*, occasioned by the snarled portion, as indicated pictorially in Figure 5, engaging the entrance throat of the bore in the shank of the housing 1, will cause an increased tension in the wire *w* which will be effective to pull the snarl detector sheave 14 downwardly, for example, to the position illustrated in Figure 5, thereby rocking the arm 13 counter-clockwise about its pivotal support 10, against the action of the spring 17, whereupon the right extremity of the arm 13 will strike the tooth 19, rock the lever 12 which will shift the cam 18 to the position of Figure 5, thus causing the cam to contact the follower 20 and rock the lever 20a a sufficient angular distance to shift the finger 20b to a position to close the circuit across the contacts 20c and 20d, thus energizing the solenoid S and thereby again actuating the belt shifter mechanism to interrupt the transmission of power to the wire fabricating machine A.

While we have shown and described a construction and arrangement of cooperating parts which an actual reduction to practice has demonstrated is highly desirable, it is not to be construed that we are limited precisely thereto, since various modifications and substitutions of equivalents may be resorted to by those skilled in the art, within the scope of the appended claims.

We claim:

1. A device of the character described, adapted to stop a wire working machine upon the arrival of either a snarled wire or the end of a wire at a detector station, said device comprising a housing rotatably supporting a guide sheave over which is reeved wire adapted for use in the wire working machine, a pair of juxtaposed levers mounted for rocking movement about the pivotal axis of said guide sheave, a snarl detector sheave journaled adjacent the free end of one of said levers and arranged to be normally held yieldingly at a determined elevation by the wire en route from said guide sheave to said wire working machine, a broken wire detector sheave journaled adjacent the free end of the other of said levers and normally riding at a determined elevation on a stretch of wire between said guide sheave and said snarl detector sheave, and switch mechanism adapted to be actuated when either of said levers is moved due to a change from normal position of either said snarl detector sheave or said broken wire detector sheave, said switch mechanism being adapted to control the operation of a wire working machine, a tooth on one of said levers for coaction with the other lever, the parts being so constructed and arranged that a rocking movement imparted to either of said levers will actuate said switch mechanism.

2. A device of the character described adapted to stop a wire working machine upon the arrival of either a snarled wire or the end of a wire at a detector station, said device comprising a housing having a shank adjustably held in a bearing portion of a fixed bracket, said shank having a passageway therein through which wire is adapted to travel en route to a wire working machine, a guide sheave over which the wire from said

passageway is reeved, a pair of juxtaposed levers mounted on a common pivotal supporting rod carried by said housing, said guide sheave also being mounted on said rod, a snarl detector sheave journaled on one of said levers and arranged to be held normally at a determined elevation by the wire en route from said guide sheave to said machine, a broken wire detector sheave journaled on the other of said levers and normally riding at a determined elevation on a stretch of wire between said guide sheave and said snarl detector sheave, a switch including an operating arm adapted to be rocked when either of said levers is moved due to a change from normal position of either said snarl detector sheave or said broken wire detector sheave, said switch being adapted to control the operation of a wire working machine, a member on one of said levers for coaction with said switch operating arm, and a tooth on one of said levers for coaction with the other lever so arranged that a rocking movement imparted to either of said levers will actuate said switch operating arm.

3. The apparatus defined in claim 2, further characterized in that said housing carries a pair of stops limiting the pivotal movement of both of said levers, the lever carrying said snarl detector sheave being normally held by a spring in a position determined by one of said stops.

4. A device of the character described adapted to stop a wire working machine upon the arrival of either a snarled wire or the end of a wire at a detector station, said device comprising a snarl detector sheave and a broken wire detector sheave, both adapted to coact with different portions of the same wire, respective levers on the free ends of which said sheaves are journaled, a common pivotal support for both said levers, means on one of said levers for transmitting movement to the other upon the shifting of one of the detector sheaves relatively to the other, a switch controlling the operation of the wire working machine and a member secured to one of said levers for actuating said switch.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
556,622	Dailey	Mar. 17, 1896
1,399,384	Heilman	Dec. 6, 1921
2,360,741	Symmes	Oct. 17, 1944