

E. WRIGLEY.

STOP MOTION DEVICE FOR KNITTING MACHINES.

APPLICATION FILED JUNE 16, 1903.

3 SHEETS—SHEET 1.

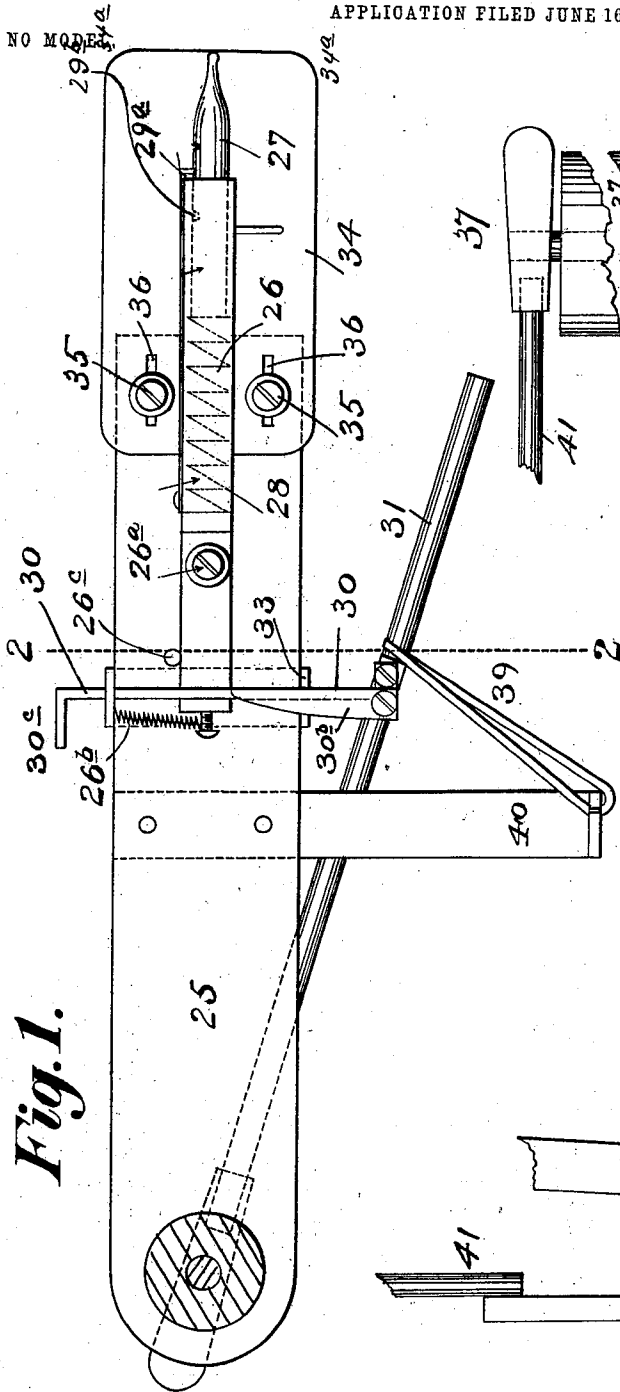


Fig. 1.

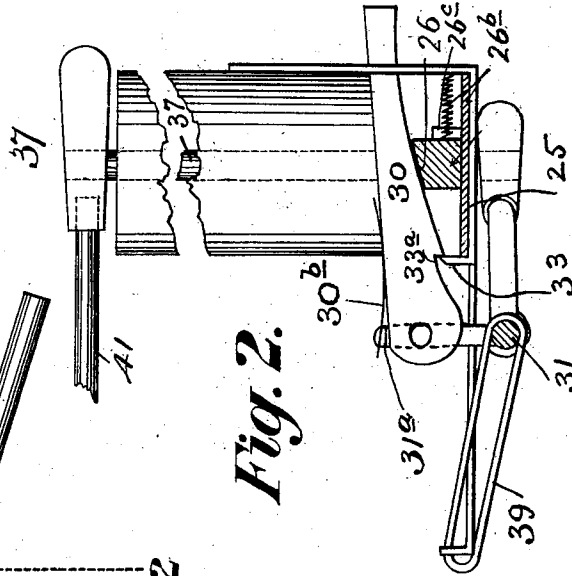


Fig. 2.

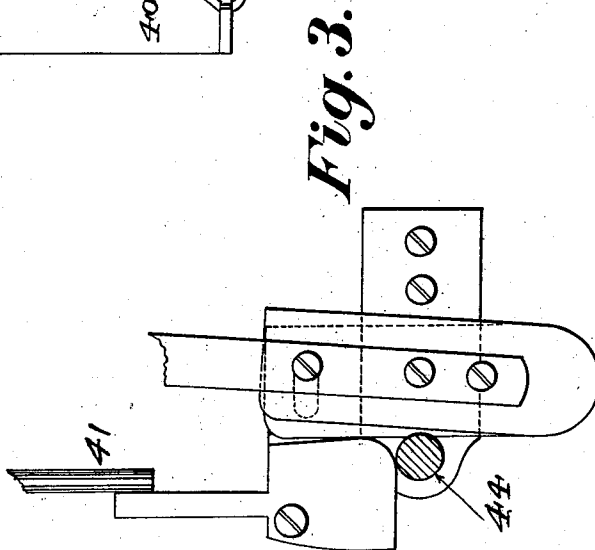


Fig. 3.

Witnesses.

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Inventor:

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No. 750,147.

PATENTED JAN. 19, 1904.

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NO MODEL.

3 SHEETS—SHEET 2.

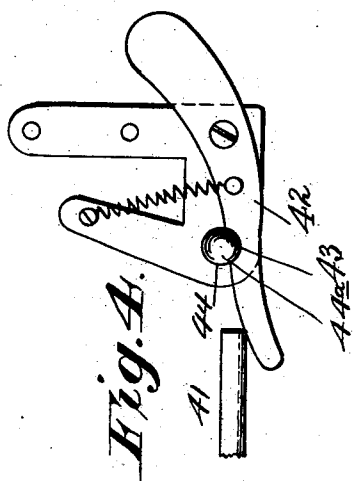
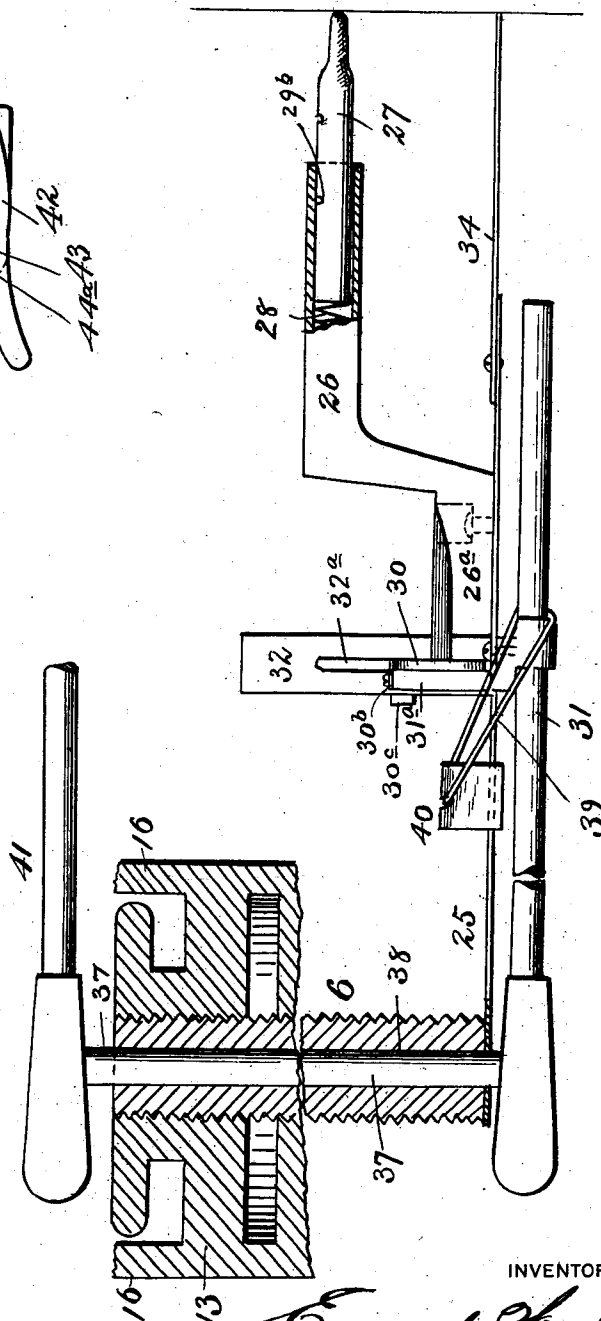


Fig. 4.

Fig. 5.



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INVENTOR:

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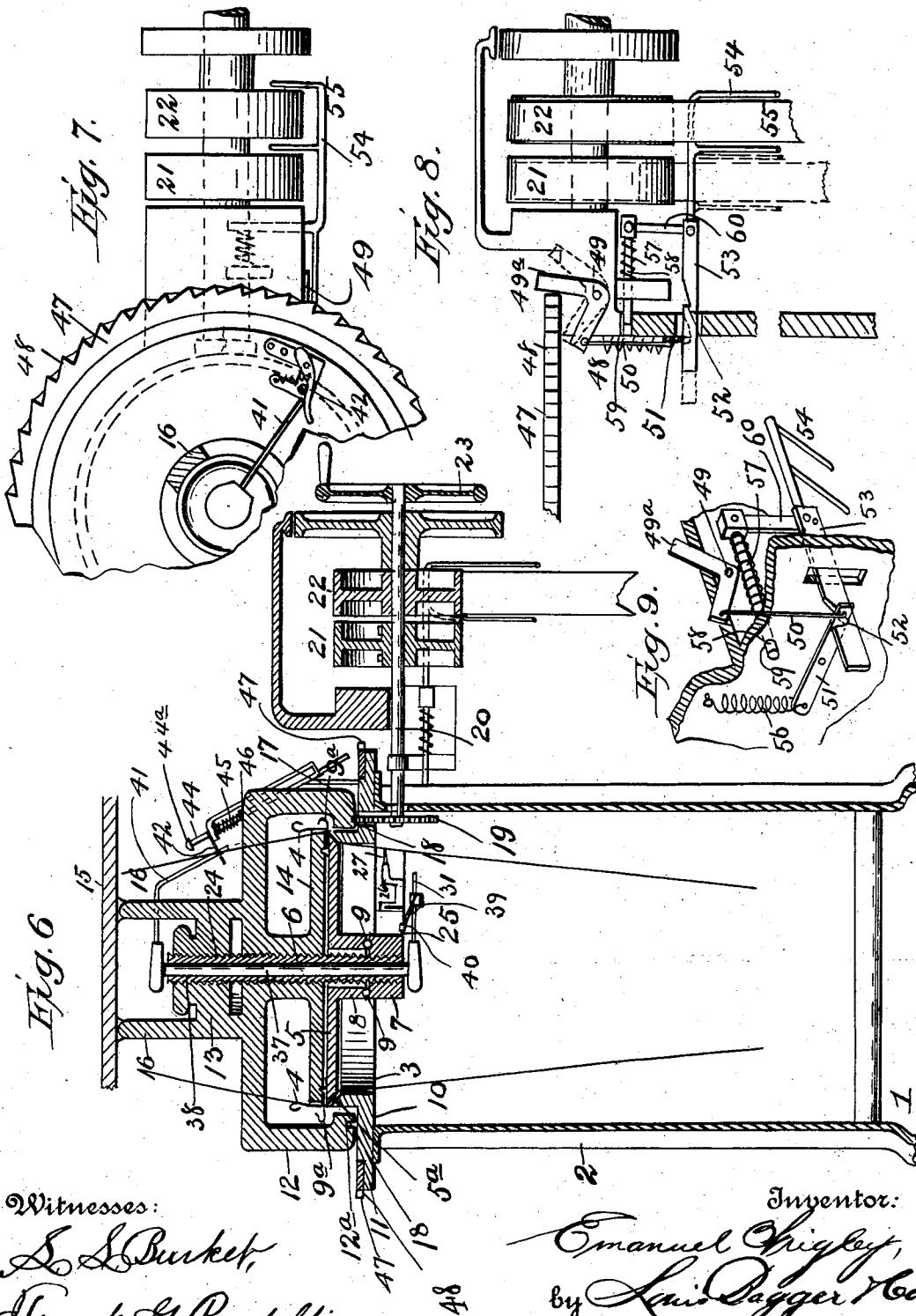
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

EMANUEL WRIGLEY, OF WOONSOCKET, RHODE ISLAND.

STOP-MOTION DEVICE FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 750,147, dated January 19, 1904.

Application filed June 16, 1903. Serial No. 161,707. (No model.)

To all whom it may concern:

Be it known that I, EMANUEL WRIGLEY, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Stop-Motion Devices for Knitting-Machines, of which the following is a specification.

My invention relates to a stop-motion device for knitting-machines, and has for its object to construct an improved device of this character which will be operated on encountering a hole in the fabric to stop the machine.

The simple and novel construction employed by me in carrying out my invention is fully described and claimed in this specification and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a plan view of my device. Fig. 2 is a section on the line 2-2, Fig. 1. Fig. 3 is a detail plan of a hand-operated stop-motion device in common use and which can be conveniently used in combination with my device. Fig. 4 is a detail plan of another form of hand-operated stop-motion which I may use. Fig. 5 is a side elevation of my device in combination with a knitting-machine shown in fragment. Fig. 6 is a vertical section of a knitting-machine. Fig. 7 is a plan view of the shifting mechanism. Fig. 8 is an elevation of the same, partly in section. Fig. 9 is a detail perspective of the shipper and latch mechanism engaging the same.

Like characters of reference designate like parts in the different views of the drawings.

The numeral 1 designates a frame supporting a stationary cylinder 2, having a beveled-edge rim 3 thereon of reduced diameter, on which a circular set of needles 4 are mounted vertically. A horizontal dial 5, having a beveled edge 5^a, is loosely mounted on a vertical dial-post 6, having a collar 7 thereon, which engages a circular flange 8, formed on the dial 5. Ball-bearings 9 are provided for the dial 5 to enable the dial-post 6 to be rotated without disturbing the dial, which is provided with a set of radially-extending needles 9^a, which coöperate with the needles 4. A flange

10 is formed on the upper end of the cylinder 2, adjacent to the rim 3, and forms a ledge 11, which serves as a bearing for a hollow vertical cylinder 12, having a flanged lower edge 12^a, which engages the ledge 11. The cylinder 12 is closed at its upper end by a head 13, which serves to support a cam-dial 14, located above and parallel with the needle-dial 5, and a bobbin-rack 15, engaged by dogs 16, carried by the head 13. To enable the cylinder 12 to be driven to rotate the cam-dial 14 and bobbin-rack 15, a series of gear-teeth 17 are formed in the bottom of a groove 18 in the flange 10 and are engaged by a gear 19, rigidly fixed on a shaft 20, journaled in bearings supported on the frame 1, and having a fixed pulley 21 and a loose pulley 22 thereon and a wheel bearing a handle 23 to enable the machine to be started by hand. The dial-post 6 extends upwardly and passes through an aperture 24 in the cylinder-head 13, in which it is rigidly fixed against turning.

The portion of the machine so far described forms no part of my invention, which will now be described in detail.

Rigidly mounted on the lower end of the dial-post 6 and extending radially is an arm 25, which carries a trigger-lever 26, fulcrumed intermediate its ends on a stud 26^a, seated in the arm 25. A spring 26^b, connected to the short arm of the lever 26, holds it normally in contact with a stop 26^c and in alinement with the arm 25. The longer arm of the lever 26 is bored longitudinally to accommodate a pointed finger 27, slidingly mounted therein and bearing on the outer end of a coiled spring 28, seated in said bore, a catch 29^a engaging a groove 29^b to limit the outward movement of the finger 27. The short arm of the trigger-lever 26 normally engages the free end of a catch-lever 30, fulcrumed on a pin 30^a, seated in a standard 31^a, footed on an arm 31. A spring 30^b, mounted on the standard 31^a, bears on the catch 30 and yieldingly holds it in contact with a tooth 33, carried by the arm 25 and engaging a notch 33^a in the under side of the catch-lever 30. The catch-lever 30 engages a guide-slot 32^a, formed in an arm 32, rigidly secured to the arm 25. The free end of the

catch-lever 30 is bent at right angles to form a stop-arm 30^e, which serves to limit the longitudinal movement of the lever 30.

To keep the fabric in even tension, so that the finger 27 will have a flat surface to work upon, a tension-plate 34 is adjustably mounted on the end of the arm 25 by means of screws 35, seated in said arms and fitting slots 36 in said plate 34. The outer end of the plate 34 is rounded off on the corners 34^a to adapt it to bear on the fabric without injuring it.

The arm 31, previously mentioned, is rigidly secured to the lower end of a vertical shaft 37, which passes through a longitudinal bore 38 in the dial-post 6. An elastic metallic band 39 passes over the arm 31 and through an aperture in an arm 40 on the arm 25, is stretched taut, and normally tends to draw the diverging arm 31 away from the fixed arm 25. This action is opposed by the catch-lever 28 until disengaged by the latch-lever 26, as will further appear.

To enable a movement of arm 31 to operate a stop mechanism, an arm 41 is rigidly secured to the upper end of the shaft 37 and is bent downwardly to bring it into position to normally rest against a spring-pressed catch-lever 42, one arm of which engages a notch 43 in the side of a slidingly-mounted plunger 44, surrounded by a spring 45, which engages a collar 46 thereon and tends to oppose the action of the catch 42 and force down the plunger, which is provided with a head 44^a to limit this movement.

To cooperate with the plunger 44, a wheel 47 is provided and seated on the rim 11, which is turned off to form a seat therefor, said wheel having ratchet-teeth 48 on its periphery which project beyond the outer edge of the flange 11. An elbow-lever 49 is mounted with one arm 49^a engaging the teeth 48 and with the other arm connected by a rod 50 to a catch-lever 51, which normally engages a notch 52, formed in a sliding shipper 53, the fork 54 of which straddles a belt 55, which runs on the pulleys 21 and 22. A spring 56 is connected to the catch-lever 51 and tends to hold it in engagement with a notch, and a spring 57 surrounds a guide-rod 58, passing through an aperture 59 and seated in an arm 60, carried by the shipper. By this arrangement the shipper 53 is operated by the spring 57 to shift the belt 55 from the tight pulley 21 to the loose pulley 22.

During the operation of knitting the arm 41 touches the catch 42, which engages the notch 43 in the plunger 44, and the catch-lever 51 engages the notch 52 in the shipper 53, and thereby holds the belt 55 on the tight pulley 21, which transmits power to the shaft 20 and drives the cylinder 12 to rotate the dial-post 6 and cam-dial 14 to operate the needles 9^a to knit the fabric A, which as fast as formed passes down into the cylinder 2. The tension-plate 34 is adjusted to bear lightly on the in-

ner surface of the fabric A. The spring 28 also holds the tip of the finger 27 in contact with the inner surface of the fabric A. As the dial-post 6 revolves it sweeps the arm 25 and finger 27 around, and should a hole or other irregularity in the fabric A be encountered by the finger 27 its movement would be retarded or wholly stopped and reversed, which would turn the lever 26 about its pivot 26^a and bring the short arm thereof in contact with the lever 30 and disengage it from the tooth 33, thereby releasing the arm 31, which will be swung around through the action of the elastic band 39, thereby rotating the shaft 37 and swinging the arm 41. The moving of the arm 41 will actuate the catch 42 and disengage it from the notch in the plunger 44 to release it and permit the spring 45 to force down the plunger 44 into engagement with one of the teeth 48 on the wheel 47, with the result that as the cylinder 12 continues to turn and carry the plunger with it the wheel 47 will be turned to cause the upper arm 49^a of the elbow-lever 49 to ride up on one of the teeth 48 to pull on the connecting-rod 50 to raise the catch 51 out of the notch 52, and thereby release the shipper to enable it to be operated by the spring 56 to shift the belt from the tight pulley 21 to the loose pulley 22 to stop the machine.

I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a stop-motion for knitting-machines, the combination of a dial-post bearing an arm, a trigger-lever fulcrumed on said arm and bearing a spring-pressed finger located to engage the surface of the knit fabric, a spring yieldingly holding said lever in alinement with said arm, a shaft rotatably mounted in a longitudinal aperture in said dial-post and bearing an arm extending at an angle to said first-mentioned arm, a catch whereby said shaft is held against turning relative to said dial-post, said catch being arranged to be disengaged by a pivotal movement of said lever, an elastic member acting in opposition to said catch, an arm carried by said shaft, and means operated by said last-mentioned arm whereby the driving means of a knitting-machine is disengaged, substantially as described.

2. In a stop-motion device for knitting-machines, the combination with the dial-post mounted to revolve relative to the surface of the knit fabric, the arm rigidly connected to said dial-post, the pivoted latch-lever mounted on said arm, the shaft mounted to rotate relative to said dial-post, the pivoted catch carried by said arm and located to be engaged by said latch-lever, the tooth mounted on said first-mentioned arm and engaged by said catch,

the elastic member acting in opposition to said catch to rotate said shaft, and means operated by a rotation of said shaft to stop the knitting-machine, substantially as described.

5 3. In a stop-motion for knitting-machines, the combination of the hollow dial-post mounted to rotate relative to the fabric, the rigid arm carried by said dial-post, the shaft rotatably mounted in the bore in said dial-post, the
10 arm carried by said shaft, the catch mechanism carried by said last-mentioned arm, the trigger mechanism carried by said rigid arm whereby said catch mechanism is operated to release said arm, and the finger carried by said
15 trigger mechanism and located to bear on the surface of the fabric, and means actuated by the shaft in the dial-post, to stop the action of the machine, substantially as described.

20 4. In a stop-motion for knitting-machines, the combination of the hollow dial-post rotatably mounted relative to the needle-cylinder, the rigid arm carried by said dial-post, the

shaft rotatably mounted in said dial-post, the arm carried by said dial-post, the slotted tension-plate mounted on said rigid arm, the catch
25 pivoted to said last-mentioned arm and passing through the slot in said arm, the stop mounted on said catch and located to engage said arm to limit the movement of said catch, the tooth mounted on said rigid arm and en-
30 gaged by said catch, the elastic member connected to said arms and opposing said catch and the trigger carried by said arm and engaging said catch, and means actuated by the
35 shaft in the dial-post, to stop the action of the machine, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EMANUEL WRIGLEY.

Witnesses:

MABEL WRIGLEY,

CLARENCE WRIGLEY.