

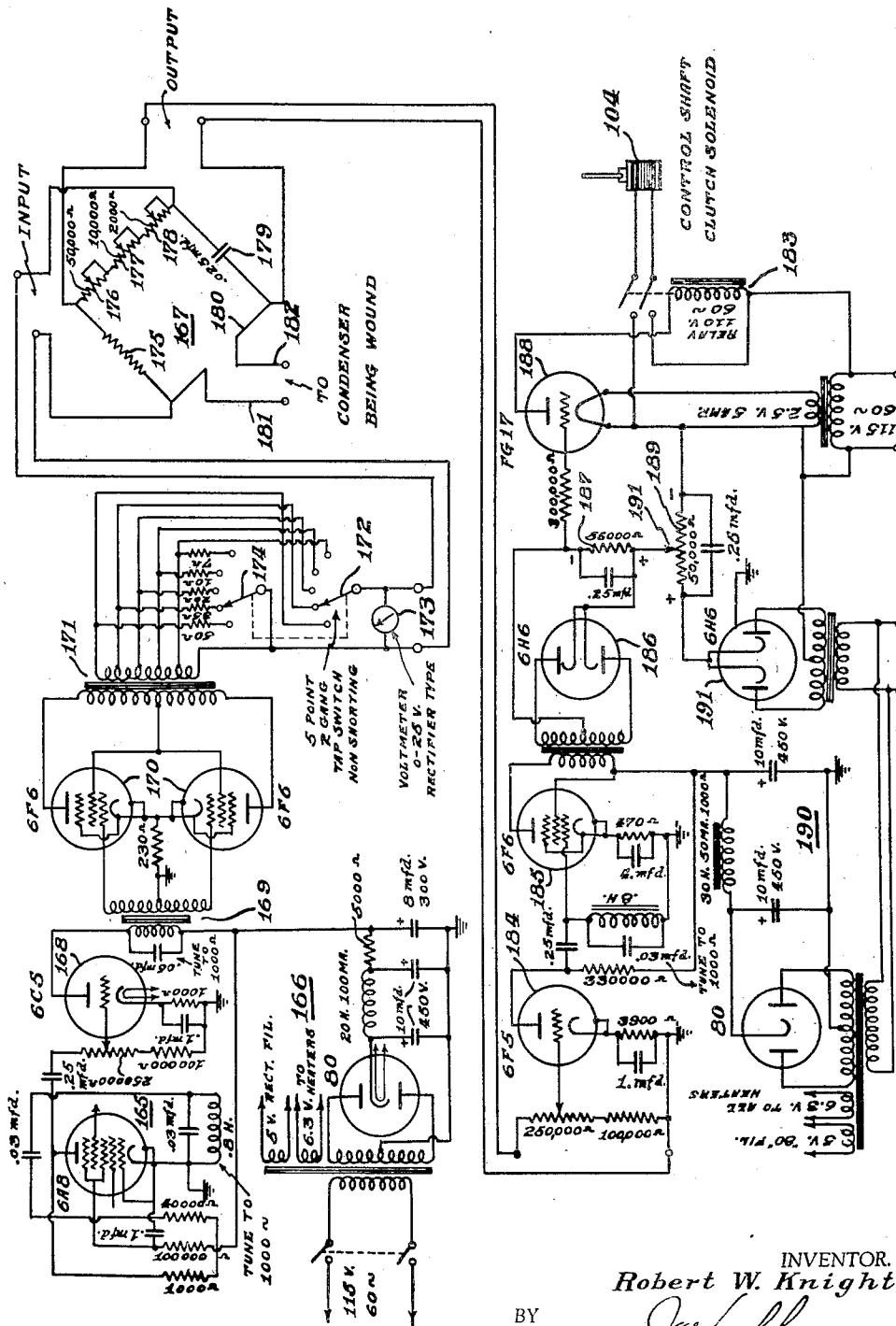
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CONTROL SYSTEM FOR CONDENSER WINDING MACHINES

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CONTROL SYSTEM FOR CONDENSER
WINDING MACHINESRobert W. Knight, Collingswood, N. J., assign-
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5 Claims. (Cl. 175—183)

This invention relates to electrical control systems for condenser winding machines such as that disclosed by a copending application of Thomas Ackley, Serial No. 91,882, filed July 22, 1936, and has for its principal object the provision of an improved control system which is so arranged as to cause the machine successively to (1) close an automatic mandrel for gripping the ends of the paper and metal foil strips, (2) rotate the shaft of the mandrel for winding the paper and foil on it, (3) disengage the paper and foil feed rollers to permit the paper and foil to be drawn forward by the mandrel, (4) engage the paper and foil strip feed rollers to prepare them to receive and feed the strips to the mandrel, (5) cut the foil strips which are fed slower than the paper strips for securing proper overlap of the paper and foil at the beginning and end of the condenser, (6) cut the paper strips, (7) apply a sticker to seal the outer turns of the paper together, (8) stop rotation of the automatic mandrel, (9) eject the completed condenser, and (10) open the automatic mandrel to receive the ends of the paper and foil strips for rewinding the next succeeding condenser.

The invention will be better understood from the following description when considered in connection with the accompanying drawing and its scope is indicated by the appended claims.

The single figure of the drawing is a wiring diagram of the system through which operation of the machine is controlled.

This electrical control circuit includes an oscillator generator 165 which may be tuned to generate a signal having a frequency of 1000 cycles, and is energized from a socket power unit 166 and is coupled to the input terminals of a bridge network 167 through an amplifier 168, a coupling transformer 169, a push-pull amplifier 170 and a transformer 171. Interposed between the transformer 171 and the bridge 167 are a voltage control switch 172, a voltmeter 173 and a switch 174 associated with a plurality of compensating resistors connected to the various secondary leads of the transformer.

The bridge 167 consists of an arm including a resistor 175, an arm including adjustable resistors 176 to 178 which may be adjusted to produce condensers of different capacity, an arm including a capacitor 179 and an arm 180 connected through terminals 181 and 182 to the terminals of the condenser or condensers being wound.

The output potential of the bridge 167 is applied to the operating coil 183 of the clutch solenoid 104 through a channel including ampli-

fiers 184 and 185, a rectifier 186, a resistor 187 and an amplifier 188. Connected in the input circuit in series with the resistor 187 is an adjustable resistor 189 which is supplied with current through a rectifier 191 from the same power source as the amplifier channel.

With these connections, the output current of the bridge 167 is controlled by the capacity of the condenser which is being wound and which is connected to the bridge terminals 181—182. This output current is amplified by the channels 184 to 186 and appears in the resistor 187 as a direct current which decreases as the capacity of the condenser increases. The control grid of the output amplifier is therefore subjected to a negative bias potential component which becomes less negative as the capacity of the condenser increases. It is also subjected to a positive bias potential component which may be adjusted by means of the adjustable terminal for adjusting the point at which current is released through the amplifier 188 for operating the solenoid 104. While the various constants utilized in the construction of the system have been indicated on the drawing, it will, of course, be understood that these constants are not critical but may be varied to suit the particular conditions under which the system is operated.

I claim as my invention:

1. In a system for continuously measuring the capacity of a condenser during its winding operation, the combination of a network which includes said condenser and is provided with input and output terminals, alternating current supply means connected to said input terminals, an amplifier provided with input and output circuits, means interposed between said network output terminals and said amplifier input circuit for impressing on said input circuit a potential which is of one polarity and is dependent on said capacity, means for impressing on said input circuit a potential of opposite polarity, and a solenoid connected in said amplifier output circuit and operable in response to a value of said capacity predetermined by the magnitude of said opposite polarity.

2. In a system for continuously measuring the capacity of a condenser during its winding operation, the combination of a network which includes said condenser and is provided with input and output terminals, an oscillation generator connected to said input terminals, an amplifier provided with input and output circuits, means interposed between said network output termi-

- nals and said amplifier circuit for impressing on said input circuit a potential which is of one polarity and is dependent on said capacity, means for impressing on said input circuit a potential of opposite polarity and a device connected in said amplifier output circuit and operable in response to a value of said capacity dependent on the magnitude of said opposite polarity potential.
3. In a system for continuously measuring the capacity of the condenser during its winding operation, the combination of a network which includes said condenser and is provided with input and output terminals, an oscillation generator connected to said input terminals, an amplifier provided with input and output circuits, means interposed between said network output terminals and said amplifier input circuit for impressing on said input circuit a potential which is of one polarity and is dependent on said capacity, means for impressing on said input circuit a potential of opposite polarity, a device connected in said amplifier output circuit and operable in response to a value of said capacity dependent on the magnitude of said opposite polarity potential, and means for adjusting said magnitude.
4. In a system for continuously measuring the capacity of a condenser during its winding operation, the combination of a bridge network which includes said condenser and is provided with input and output terminals, alternating current supply means connected to said input terminals, an am-

plifier provided with input and output circuits, amplifying and rectifying means interposed between said network output terminals and said amplifier input terminals for applying to said input circuit negatively polarized uni-directional potential which varies as the capacity of said condenser, means for applying a positively polarized uni-directional potential to said input circuit, and means for adjusting the magnitude of said positively polarized potential.

5. In a system for continuously measuring the capacity of the condenser during its winding operation, the combination of a bridge network which includes said condenser and is provided with input and output terminals, alternating current supply means connected to said input terminals, an amplifier provided with input and output circuits, amplifying and rectifying means interposed between said network output terminals and said amplifier input terminals for applying to said input circuit a negatively polarized uni-directional potential which varies as the capacity of said condenser, means for applying a positively polarized uni-directional potential to said input circuit, means for adjusting the magnitude of said positively polarized potential, and a device connected in said amplifier output circuit and operable at a value of said capacity dependent on the adjustment of said positively polarized control potential.

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