AUTOMATIC CONTROL SYSTEM FOR THE ELECTRIC REGIMES OF THREE-ELECTRODES (ACSEM-3) AND SIX-ELECTRODES (ACEMS-6) FERROALLOY FURNACES

ACSER-3 and **ACSER-6** allows providing operative presentation of information as a conventionalized sectional elevation of furnace – ACSER-3 (fig. 1) ACSER-6 (fig. 2), and that is easy to understand for technological personnel.

The basic task of control is to regulate the electrical regime of furnace for the purpose to keep optimal process of melting which is achieved by next ways:

1. Control of electrodes transfer.

2. Control of the mechanism of switching the voltage stages.

3. Making the recommendations and control of electrodes slipping.

4. Making the recommendations on correction of charge, taking into account the parameters of slipping and electric mode, controlled in the real time.

5. Combining the furnace **ACSER** systems in the local computer network with passing this information to the technological services of factory.

For the decision of these tasks algorithms of control are developed, they allow in the automatic mode to reduce to minimum subjective influences on operative control of process motion by recommendations on correction of charge and controlling system.

During the work of furnace in the automatic mode of control optimization of technological process motion allows to get the economy of power and financial resources: electric power – 2–4 %; raw material – 2–6 %; electrode mass – 2–4 %.

Virtual teaching system is created on the base of **ACSER**-3; it is an emulator of three-electrode furnace work, which is a trainer to teach personnel the features of control by slipping electrodes and by the electric mode of three-electrode ferroalloy furnace.

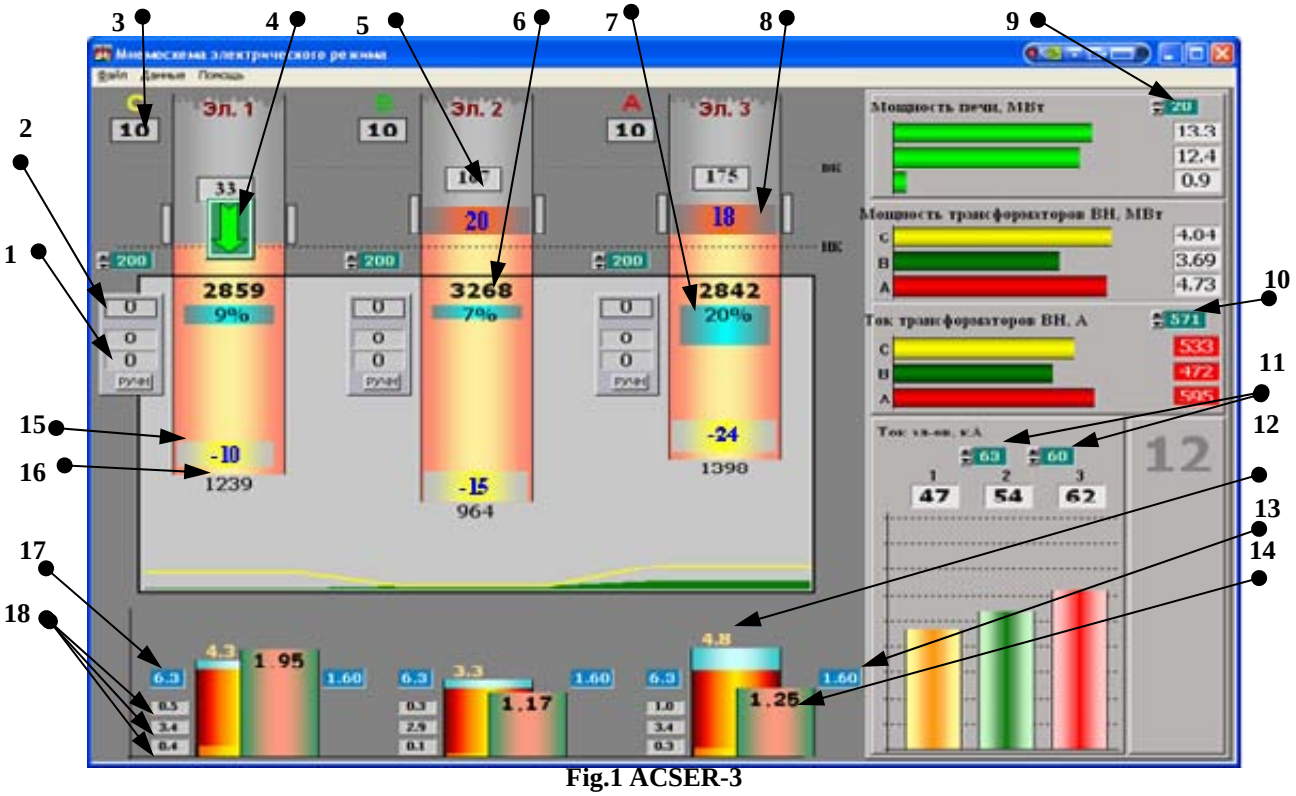

Fig.1 ACSER-3

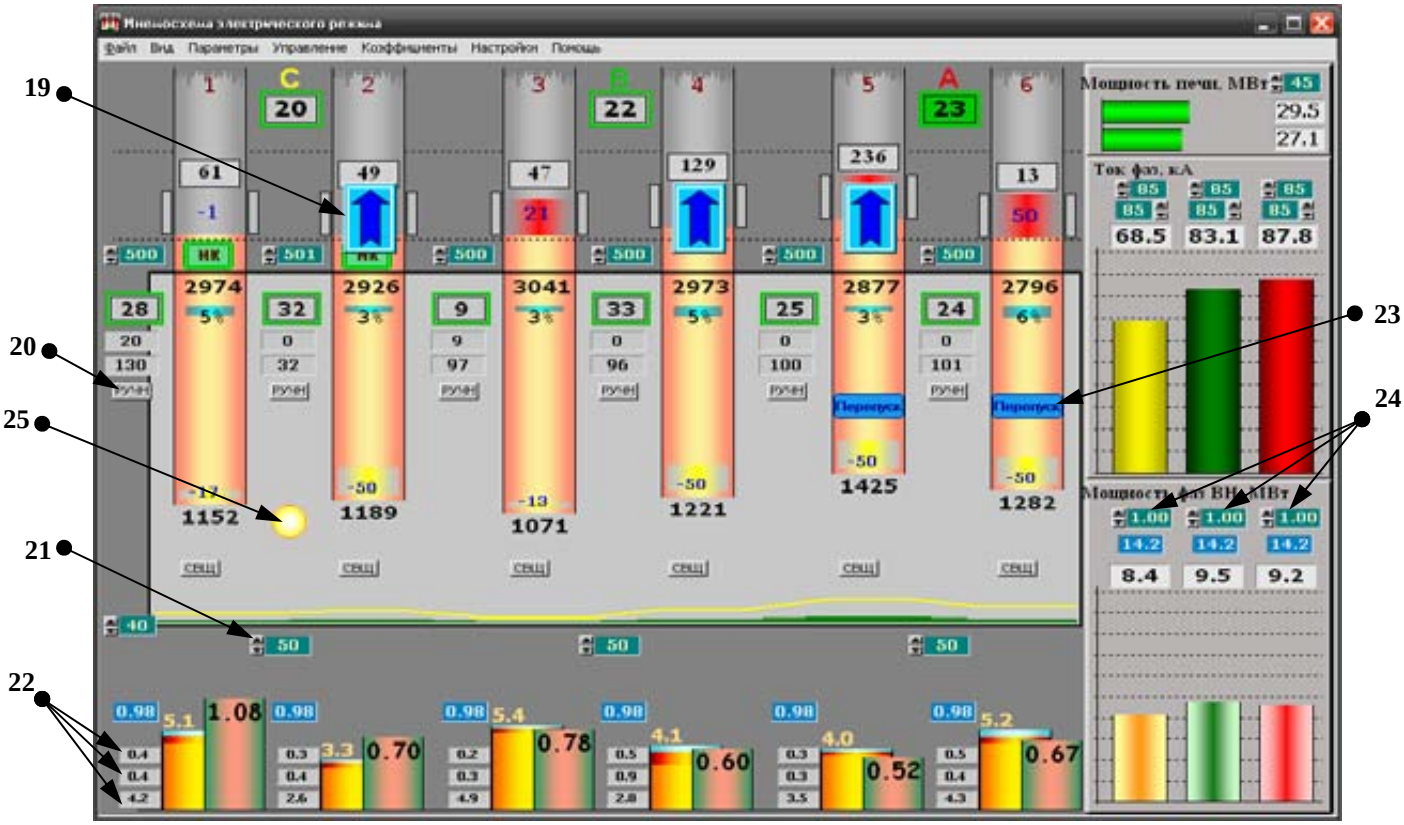

Fig.2 ACSER-6

Symbolic circuit of ACSER output information

1–total value of electrodes slipping per shift, day, mm; **2**–value of one-time electrodes slipping, mm; **3**–№ SSV; **4**–pull down the electrode; **5**–electrode holder position, mm; **6**–electrode length, mm; **7**–P_{arc}/P_{el}*100% ; **8**– readiness of electrode to slipping, mm; **9**–set point of furnace capacity, MWatt; **10**–set point of transformer current, A; **11**– set point of electrode work current and slipping current, kA; **12**- P_{el}, MWatt; **13**– set point of electrode resistance mOm; **14**–R_{el} mOm; **15**-electrode consumption between slippings; **16**-distance to top hole axis, mm; **17**–set point of P_{el}, MWatt; **18**-P_{arc} , P_{shunt}, P_{flux}, MWatt (FeSi calculation); **19**– lift up the electrode; **20**–slipping regime (P/A); **21**–percentage distribution of capacity between the electrodes; **22**–P_{arc}, P_{shunt}, P_{flux}, MWatt (SiMn calculation); **23**–advice for electrodes slipping; **24**–percentage distribution of capacity between phases; ; **25**–top hole condition.