

## CONTENTS

INTRODUCTION .....	5
SECTION 1. CHOICE OF INITIAL INGOTS FOR FORGING BY HYDRAULIC PRESS .....	6
SECTION 2. USING OF FORGING WASTE IN STEEL PRODUCTION AND REDUCING OF ELECTRICITY CONSUMPTION DURING STEEL MELTING IN ELECTRIC ARC FURNACES .....	8
SECTION 3. FEATURES FORGING INGOTS.....	10
3.1 Drawing operation .....	13
3.2 Rolling-off .....	20
3.3 Mandrel drawing .....	21
SECTION 4. TECHNOLOGICAL POSSIBILITIES FOR INCREASING THE PROCESSED MASS OF INGOTS ON HYDRAULIC PRESSES .....	23
SECTION 5. FORGING WAYS OF LARGE PLATES .....	26
SECTION 6. METHODS FORGING OF LARGE-SIZED SLABS .....	32
SECTION 7. WAYS TO REDUCE METAL CONSUMPTION AND TO INCREASE THE MECHANICAL PROPERTIES DURING FORGING SOLID CYLINDRICAL PRODUCTS .....	43
7.1 Improving the quality of large forged pieces .....	43
7.2 Piercing punch of forging ingots with simultaneous removal of hot-top .....	46
7.3 Forging of gearwheel with their subsequent step rolling-off.....	47
7.4 Production of thin-walled forged pieces such as rings and cylinders from rolling-off pipes .....	50
7.5 Ingots for hollow forged pieces .....	51
SECTION 8. MANUFACTURE OF LARGE-SIZED FORGED PIECES SUCH AS RINGS AND RIMS WITH ELIMINATION OF SPHERICITY ON THE ENDS .....	54

SECTION 9. ROLLING-OFF LARGE-SIZED FORGED PIECES SUCH AS RINGS AND SHELLS OF PARTICULAR PRECISION ON POWERFUL HYDRAULIC PRESSES .....	57
SECTION 10. METHOD FOR PRODUCING OF HOLLOW SPHERICAL FORGED PIECES.....	59
SECTION 11. PRODUCTION OF LARGE FORGED PIECES SUCH AS CYLINDERS STEPPED ALONG THE OUTER AND INNER DIAMETERS BY FORGING ON PRESS .....	65
SECTION 12. IMPROVEMENT FORGING PROCESSES OF ROTOR SHAFTS.....	70
SECTION 13. IMPROVEMENT OF TECHNOLOGICAL PROCESSES FORGING OF CRANK-SHAFTS.....	73
SECTION 14. FORGING OF SMOOTH LONG SHAFTS .....	87
SECTION 15. SELF-GUIDING DIE FOR PIERCING PUNCH OF HOLES IN SHAFTS .....	89
REFERENCES .....	91