

# CONTENTS

1.	PREFACE.....	3
2.	INTRODUCTION.....	4
3.	DRIVE OF AUTOMATIC WEAPON MECHANISM.....	6
3.1	Blow - back Weapons.....	6
3.2	Recoil-operated Weapons.....	8
3.2.1	Long Recoil-operated Weapons.....	8
3.2.2	Short Recoil-operated Weapons.....	9
3.3	Gas-operated Weapons.....	11
3.3.1	Theoretical Solution of the Gas-operated Drive.....	12
3.3.2	Discharge Coefficients.....	17
3.3.3	Utilization of Gases from the Barrel Bore for the Blow Back Drive Braking ....	20
3.4	Combined Internal Drive.....	22
3.4.1	Combination of the Gas-operated Drive with the Recoiling Barrel.....	22
3.4.2	Combination of the Gas-operated Drive with the Blow-back.....	24
3.5	External Drive.....	26
4.	CARTRIDGE FEED.....	28
4.1	Magazine Feed.....	28
4.1.1	Principle of Magazine Feed.....	28
4.1.2	Feed Timing for Spring Magazines with Straight Channel.....	30
4.1.3	Feed Timing for Magazines with Spiral Channel.....	32
4.2	Belt Feed.....	34
4.2.1	Cartridge Belt.....	34
4.2.2	Resistance of the Cartridge Belt.....	36
4.2.3	Cartridge Belt Feed Mechanisms.....	38
4.2.4	Basic Features of the Belt Feed Mechanisms Theory.....	41
4.3	Conveyer Feed Mechanisms.....	46
5.	SPECIALTIES OF DESIGN OF THE OTHER COMPONENTS AND MECHANISMS OF AUTOMATIC WEAPONS.....	47
5.1	Weapon Mechanisms Return Systems.....	47
5.1.1	Spring Return Systems.....	47
5.1.2	Special Note for Buffers.....	51
5.2	Pneumatic Breech Recuperator.....	54

5.3	Barrel Recuperators of Automatic Weapons.....	56
5.3.1	Spring Barrel Recuperators.....	56
5.3.2	Gas-operated Barrel Recuperators.....	58
5.4	Cartridge Case Extraction Force.....	63
5.5	Effect of Case Ejection on Breech Block Movement.....	68
5.6	Cocking of the Weapon.....	70
5.6.1	Short Summary of Types of Cocking Arrangement.....	70
5.6.2	Theory of the Automatic Weapons Pyro-recocking System.....	73
6.	PROCEDURE OF THE AUTOMATIC WEAPON DESIGN AND THE FUNCTION DIAGRAM CALCULATION.....	83
6.1	Entrance Information for the Design of a New Automatic Weapon.....	83
6.2	Preliminary Drawing of Solved Automatic Weapon .....	86
6.3	Preliminary Calculation of the Functional Diagram of the Automatic Weapon.....	87
6.4	Following Design of Solved Automatic Weapon .....	89
6.5	Calculation of the Complete Functional Diagram.....	90
6.6	Calculation of the Drive and Completion of the Weapon Design.....	92
7.	SPECIALTIES OF HIGH RATE OF FIRE WEAPONS DESIGN.....	94
7.1	Summary of Main Features of High Rate of Fire Weapons.....	94
7.2	Special Tasks at the Revolver Automatic Weapons Designing.....	95
7.3	Optimization of the Gatling Functional Curve.....	99
7.4	Breech Crank Mechanisms of the Weapon with Together Bound Barrels and Breeches.....	103
	References.....	111