

THE INTERTYPE

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THE INTERTYPE

A BOOK OF INSTRUCTION
FOR ITS OPERATION AND
GENERAL MAINTENANCE



INTERTYPE *Limited*

HEAD OFFICES AND WORKS, SLOUGH, BUCKINGHAMSHIRE, ENGLAND

COMPOSED ON THE INTERTYPE IN BASKERVILLE AND GARAMOND

Introduction

THIS BOOK on the function, care, operation and adjustment of the Intertype machine has been prepared to meet the need for a dependable reference on the subject. Like equipment used in other progressive industries, line composing machinery undergoes radical changes from time to time as new developments in the graphic arts extend the application of line-cast type and impose correspondingly greater demands upon the machinery that produces it.

At various intervals during the past, Intertype Limited has published instructional literature to provide operators, machinists and executives with the necessary technical information on new devices perfected and applied to the machine. The number and scope of these improvements, however, have increased to such an extent in recent years that it was deemed advisable to present in one volume the basic technical principles of the entire machine along with a description of the latest improvements devised for the machine in the modern printing establishment.

In the preparation of this book, several procedures of organization, classification and description were established to facilitate an understanding of the machine and to simplify the problems of reference. It should be noted first that the major divisions of subject matter are based upon the four main units of the machine and are presented in the same sequence in which the units operate. The four machine units are known as the ASSEMBLING, the CASTING, the TRANSFER-DISTRIBUTING and the MAGAZINE FRAME mechanisms.

The first section on the ASSEMBLING mechanism follows the course of the matrices and spacebands as they are released from the magazines and spaceband box respectively up to the point where the line is assembled in the assembling elevator. The mechanisms presented in this chapter comprise principally the keyboard, escapement mechanism, assembler entrance, assembler, assembler slide, assembling elevator and spaceband box.

The second section on the CASTING mechanism begins with the delivery of the line of matrices and spacebands to the first-elevator jaw and follows the actions of the various mechanisms up to the point where the slug is cast in the mold, ejected and delivered to the galley at the front of the machine. The chief parts described in this chapter include the delivery slide, first elevator, mold and actuating mechanism, vise closing and justification unit, metal pot, pot pump, ejecting mechanism, knife block, galley and slug lever.

INTRODUCTION

The third section on the **TRANSFER-DISTRIBUTING** mechanism outlines the transfer of the matrices to the second elevator, the return of the spacebands to the spaceband box, the elevation of the matrices to the distributor and the subsequent return of each matrix to the channel of the magazine from which it was originally drawn. The main assemblies outlined in this section are the first-elevator guide, transfer channel, transfer levers, second elevator, distributor shifter, font distinguisher and selector, distributor (single and double), channel entrance, magazine, driving mechanism and main cams.

The fourth section on the **MAGAZINE FRAME** mechanism contains an introductory outline of the various models of the Intertype according to the magazines carried on the machine and then presents a description of the magazine frames and the mechanism provided to operate them. From the standpoint of mechanism, the outstanding units described in this chapter comprise the assembled magazine frame, supporting brackets, operating mechanism, counterbalance devices, front removal magazine carriages, rear removal magazine frames and side magazine frames. A general description of machine positions and an outline of machine maintenance applicable to all models of the Intertype are also presented at the end of this section.

In addition to this system of organization and classification for the broad phases of the subject, a definite procedure of description was established to convey the details of each mechanism as logically and as concisely as possible. The description of each mechanism begins with an outline of the main parts in the assembly, an identification of the parts by function and an indication of how the parts are connected when assembled.

Having thus established the component parts of the mechanism and their relationship to each other, there follows next a complete description of normal operation in the same sequence in which the actions occur on the machine. The third phase of the description includes all of the adjustments relative to the assembly. It is logical to assume that this aspect of machine work can be undertaken intelligibly only when one understands precisely the construction of the assembly and the manner in which it is designed to function. The final phase of each description deals with maintenance and indicates not only how to lubricate the parts but also how to dismantle, clean, assemble and replace parts in the mechanism.

This same system of detailed presentation is also followed consistently in the case of special attachments or optional equipment for the machine. With respect to equipment of this nature, it should be noted that all of the devices have been classified according to the mechanism to which they are related and have been presented at the end of each of the four main sections.

INTRODUCTION

From the standpoint of illustrations, it will be noted that a view of the assembled mechanism is presented first and then several detail views of sub-assemblies or of individual parts. This method complements the system of description previously mentioned in that the assembly drawing is designed to clarify the textual outline of the mechanism, the function of the parts and their relationship to each other. The detail drawings serve to illustrate both the operation of the parts and the methods by which they are adjusted. An important innovation in illustration will be found in the cam contour drawings, which follow the main assembly drawings of mechanisms actuated by the cams. The periphery of each cam is divided into operative sections and the actions promoted by each change in cam contour is clearly indicated between the dividing lines of the illustration. The drawings of machine positions at the end of the book should prove helpful likewise in identifying the cycles of the machine by reference to the cams.

It should be noted that the Board of Engineers of Intertype Limited directed the preparation of this book and exercised continual guidance over the details of the work as well as its more comprehensive aspects. The text and illustrations have been checked carefully by technicians with many years of experience in the construction and design of line casting machinery and with a broad insight into the problems of operators, machinists and executives.

While it is hoped that the procedures outlined in this book will be adopted in large part by users of the Intertype machine, it is also realized that craftsmen who have devoted years to their vocations often develop methods, leading to the same result. The constructive imagination underlying such developments, rather than being discouraged, should be commended highly because this search for a more perfect process, a better method, a more economical system, is what makes printing a truly progressive art. It opens new horizons to the engineer, endows his work with greater meaning and helps him to serve his many interests with greater intelligence and purpose. The technical data contained in this book, therefore, is presented with the sincere desire that it will prove of maximum utility to line composing craftsmen in all parts of the world, but it is also hoped that this book will inspire and lead them into creative channels which will make the Intertype machine a more useful tool for the enlightenment and advancement of men.

INTERTYPE LIMITED

Table of Contents

CHAPTER I—*Assembling Mechanism*

	PAGE
Single Distributor Keyboard and Escapement Mechanism	1
Mixer Keyboard and Escapement Mechanism	1
Twin Channel Attachment	5
Rubber Rolls and Ferrule	5
Transposition and Non-Response of Matrices	6
Double or Continuous Response of Matrices	9
Keyboard Maintenance	11
Keyrods and Frames	12
Assembling of Spacebands	14
Spaceband Box Maintenance	14
The Magazine	15
Care of Magazines and Matrices	17
Single Distributor Assembler Entrance	18
Mixer Assembler Entrance	18
The Assembler	20
Assembler Slide	22
Assembling Elevator	25
Assembling Elevator Maintenance	26
Matrix Construction	27
Intertype Standardized Matrix Alignment System	30
Use of First-Elevator Alignment Stop Bar	32
Intertype Standardized Mold System	33
Caps for Use with the Standard Alignment Mold Body	33
Advertising Figure Mold Caps	34
Caps for Use with the .140" High Alignment Mold Body	34
Mold Bodies for High Cap Accented Matrices	35
Use of Liners with Recessed Mold Caps	35
Equipment for Special Composition	35

CHAPTER II—*Casting Mechanism*

Delivery Slide	39
Delivery Channel	43
First Elevator	44

CONTENTS

<i>Casting Mechanism—Continued</i>	PAGE
Vise Automatic	49
Vise Frame	52
The Mold	52
Mold Disk and Mold Disk Slide	57
Mold Disk and Mold Driving Mechanism	59
Mold Disk Slide and Related Mechanisms	63
Mold Disk Slide Safety Attachment	66
Vise Closing and Justification Mechanism	70
Pump Stop	77
Blank Line Justification Wedge	79
Vise Jaw Manual Closing Attachment	79
The Metal Pot	80
Metal Pot and Related Mechanisms	83
Movements of Metal Pot and Pot Pump Plunger	85
The Lock-Up	86
Removal of Pot Parts and Maintenance	90
Baffle Mouthpiece	94
Removing and Packing the Gas Metal Pot	95
Pot Gas Burner and Governor	95
Intertype Electric Metal Pot	99
The Heaters	101
Lever-Type Thermostat	101
Control Box	105
Relay Mechanism	105
The Rheostat	108
General Maintenance of the Electric Pot	111
Removing and Packing the Electric Pot	115
New Style Bulb-Type Thermostat	117
Control Box, Bulb-Type Thermostat	120
Pot Gasoline Burner	121
Type Metal	121
Intertype Universal Ejector	124
Intertype Universal Knife Block	128
Knife Wiper	134
Galley and Slug Lever	135
SPECIAL ATTACHMENTS FOR CASTING MECHANISM	
Adjustable Knife Block Detent	136
Galley Chute for Short Slugs	138

CONTENTS

Casting Mechanism—Continued

	PAGE
Assembling Elevator Duplex Rail Mechanism	139
Mold Cooling Attachment	141
Stick Attachment	142
Composing Stick	142
Display Italic Matrices and Spaces	143
Stick Attachment Operating Mechanism	145
Vise Jaw Odd Measure Device	147
Double-Acting Mold Attachment	149
Automatic Repeat Casting Attachment	149
Pot Crucible Mouthpiece Wiper	149
Intertype Automatic Quadding and Centering Device	150
Two Basic Characteristics of Quadding Machines	150
Movement of the Vise Jaws	155
Vise Jaw Mechanism	155
Engagement of Vise Jaws with Rack	155
Vise Jaw Operating Mechanism	158
Vise Jaw Operating Mechanism Adjustments	159
Operating Changes, Quadding and Centering Device	164
Justification and Quadding Mechanism	169
Justification and Quadding Adjustments	175
Improved Wedge Locking Device	177
Removal of Quadder Parts and Maintenance	177
Justified Quadding Attachment	178
Mechanism of Justified Quadding Attachment	180
Six-Mold Disk and Automatic Ejector Blade Selecting Mechanism	188
Construction of Mold Disk	188
Mold and Liner Insert	189
Mold Changes	191
Mechanism of Six-Mold Disk	192
Removal of Mold Disk	194
Ejector Blade Selecting Stops	195

CHAPTER III—Distributing Mechanism

The Transfer	200
First-Elevator Slide Guide	202
Transfer Channel	207
Setting the Transfer	209
General Maintenance of Transfer Mechanism	213

CONTENTS

<i>Distributing Mechanism—Continued</i>	PAGE
Transfer Levers and Related Parts	215
Transfer Lever Adjustments	217
Transfer Slide Safety Devices	221
Second Elevator and Related Parts	223
Distributor Shifter	229
Font Distinguisher	230
Distributing Mechanism, Outline of Actions	232
Distributor Box, Single Distributor Machines	235
Replacing Distributor Box Parts	242
Distributor Box for Mixer Machines	245
Matrix Lift Mechanism for Mixer Machines	247
Mixer Font Selector Mechanism	252
Mixer Distributor Box Clutch Mechanism	264
Single Distributor	269
Channel Entrance, Single Distributor Machines	279
Channel Entrance, Double Distributor Machines	287
Channel Entrance Operating Mechanism, Manual	289
Adjustments	295
Channel Entrance Operating Mechanism, Power	302
Adjustments	307
Maintenance	312
Distributor Clutch	313
Pi Stacker	319
Driving Mechanism	320
Adjustments	325
Intertype Motors	331
The Cams and Their Functions	335
Sequence of Machine Actions	338
Removal of Main Cams	341

CHAPTER IV—Magazine Frame Mechanism

Advantages of Intertype Standardization	345
Intertype Models	348
Universal Intertypes	349
Star Base Intertypes	353
Side Magazine Equipment	354
Tabular Summary of Intertype Models	357
Magazine Frame Shifting Mechanism, Manual	358

CONTENTS

Magazine Frame Mechanism—Continued

	PAGE
Magazine Frame and Supporting Brackets	359
Magazine Frame Operating Mechanism	361
Magazine Frame Counterbalance Mechanism	365
Magazine Carriages, Front Removal	370
Magazine Frames, Rear Removal	373
Side Magazine Frames	376

SPECIAL ATTACHMENTS FOR MAGAZINE FRAME MECHANISM

Magazine Frame Operating Mechanism (Power) for Universal	
Intertypes	377
Magazine Frame Driving Mechanism	378
Magazine Frame Control and Switch Mechanism	378
Safety Devices	381
Adjustments	389
Removal of Parts and Maintenance	394
Procedure for Erecting Universal Intertype Machine with Power	
Shift	394
Automatic Font Distinguisher for Single Distributor Machines	397
Universal Non-Mixer Intertypes	398
Font Distinguisher Mechanism	399
Distributor Box Clutch Operating Mechanism	402
Universal Non-Mixer Distributor Box	406
Font Selectors for Universal Mixer Intertypes	408
Selecting Schemes for Universal Mixer Machines	409
Setting Disk Selector	412
Operating Stud Selector	413
Operating Cam Selector	415
Distributor Signal Light	416
Forty-two Em Intertypes	419
Intertype Hard Metal Machine	421
Mohr Intertype Saw	425
Positions of the Machine	427
Maintenance Routine	433
Lubricating Points on the Intertype	436
Machine Changes and Operation	438
Operating Hints	440
Ordering Supplies	442
How to Order Intertype Matrices	443

List of Illustrations

FIGURE	PAGE
1 Single distributor keyboard and escapement mechanism	2
2 Keyboard cam and other parts in normal position	3
2a Keyboard cam in contact with the rubber roll	3
2b Keyboard cam at its highest stroke	3
3 Perspective view of the mixer keyboard and escapement mechanism	4
4 Twin channel attachment	5
5 Perspective view of the keyboard, showing how to remove the key- board rubber roll shafts	6
6 Keyboard cam rubber roll ferrule	7
6a New tube method of applying a rubber roll to the shaft	7
7 Rear view of the keyboard, showing the new style removable keybar banking bar and cam yoke locking bar	9
8 Intertype unit keyrod frame	10
9 Showing how to remove the mixer keyrod frame	10
10 Overmotion spring applied to Intertype keyrods	12
11 Perspective view of the spaceband releasing mechanism, with a de- tail view of the spaceband box	13
12 View of the magazine	15
13 Intertype escapement mechanism	16
14 Single distributor assembler entrance	17
15 Mixer assembler entrance	19
16 Intertype positive assembler	21
17 Assembler star shaft assembly	22
18 Assembler slide	23
19 Showing how to set assembler slide	24
20 View of the assembling elevator, showing its relation to the keyboard	24
21 End view of the assembling elevator, showing how matrices are as- sembled in the upper and lower positions	25
22 Detail view of the assembling elevator	26
23 Showing details of matrix construction	27
24 Matrix silhouettes, showing the location of Intertype font slots . . .	28
25 Matrix silhouettes, showing the location of Intertype mixer notches .	29
26 View of six matrices, illustrating the Intertype standardized matrix alignment system	30
27 New style first-elevator alignment stop bar	32
28 View of a matrix slide block and matrix slide	36
29 Showing the expansive range of a spaceband	37
30 Delivery slide in normal position above the assembling elevator . . .	40

LIST OF ILLUSTRATIONS

FIGURE	PAGE
31 Delivery slide and related parts in assembly	41
31a Delivery and elevator transfer cam, showing the surfaces of the delivery cam which promote the main movements of the delivery slide .	42
32 Delivery channel, showing the rails which support matrices in normal and auxiliary position, and the grooves which support the spacebands by their sleeve lugs	43
33 First-elevator jaw	44
34 First-elevator jaw (rear view), in which back jaw has been broken away to show matrices in normal and auxiliary position	45
35 First elevator and related parts in assembly	45
35a First-elevator cam, showing the surfaces of the cam which promote the main movements of the first elevator	46
36 First-elevator alignment stop bar	47
37 First-elevator lever link	48
38 Vise automatic and related parts in assembly	50
39 Intertype 30-cm universal adjustable mold	53
40 Universal adjustable triangular shelf mold	54
41 Old-style recessed mold	55
42 Advertising figure mold	55
43 Mold disk driving pinion and mold driving pinion shaft	56
44 Showing how an Intertype mold cap is removed when the liners are being changed	57
45 Mold disk, mold disk slide and related parts in assembly	58
46 Vise closing and mold turning cam and mold driving mechanism in assembly	59
46a Vise closing and mold turning cam, showing the parts of the mold turning cam which promote the rotary movements of the mold disk .	60
47 Mold disk locking stud bushings	61
48 Mold driving pinion shaft friction disk	61
49 The back knife	62
50 Section of the mold turning cam, showing one of the mold turning segments and one of the mold turning cam shoes	63
51 Mold disk slide and related parts in assembly	64
51a Mold cam and driving gear, showing the surfaces of the mold cam which promote the forward and backward movements of the mold disk and mold disk slide	65
52 Mold disk slide safety attachment (first style)	67
53 Mold disk slide safety device (new style)	69
54 Justification and vise closing mechanism in assembly	70
54a Justification cam, showing the surfaces of the cam which promote the main movements of the justification lever	71
54b Vise closing cam, showing the surfaces of the cam which promote the main movements of the vise closing lever	72
55 Vise justification mechanism just before first justification	73

LIST OF ILLUSTRATIONS

FIGURE

PAGE

56	Matrix line at first justification	73
57	Vise justification mechanism after first justification	74
58	Matrix line at second justification	74
59	Vise adjusting mechanism	75
60	Justification and vise closing lever springs	76
61	Intertype pump stop	78
62	Blank line justification wedge	79
63	Right-hand vise jaw manual closing attachment	80
64	Casting mechanism, showing the main parts in position preparatory to the casting of the slug	81
65	Pot crucible, mouthpiece and plunger	82
66	Metal pot, pot pump mechanism and related parts in assembly	83
66a	Pot cam, showing the surfaces of the cam which promote the main movements of the metal pot	84
66b	Pot pump cam, showing the surfaces of the cam which promote the main movements of the pot pump mechanism	85
67	Pot leg adjusting screws, by means of which the mouthpiece is aligned with the mold	87
68	Pot lever, showing its relation to the pot jacket	88
69	Baffle mouthpiece	92
70	Pot gas burner and governor system	96
71	Intertype gas governor	98
72	Electric pot and heating equipment	100
73	Lever-type electric pot thermostat	102
74	Direct current relay	104
75	Alternating current relay	106
75a	Pot relay coil (A.C.)	107
76	Pot rheostat	109
77	Lamp in series, which is used for testing open and short circuits	110
78	Direct current pot wiring diagram	111
79	Alternating current pot wiring diagram	112
79a	Alternating current pot maintaining circuit	114
79b	Alternating current pot opening circuit	116
80	New style bulb-type thermostat	117
81	Showing how the bulb-type thermostat is mounted on the pot cover	118
82	Pot wiring diagram for bulb-type thermostat	120
83	Universal ejector and related parts in assembly	123
84	Detail views of the ejecting mechanism	124
85	Intertype universal knife block	128
86	Intertype knife wiper	131
87	Inside galley	132
88	Outside galley	133
89	Slug lever and operating mechanism	134

LIST OF ILLUSTRATIONS

FIGURE		PAGE
90	Adjustable knife block detent	137
91	Galley chute for short slugs	138
92	Assembling elevator duplex rail mechanism	139
93	Mold cooling attachment	140
94	Intertype composing stick	143
95	Intertype display italic matrices	144
96	Perspective view of the stick attachment	145
97	Intertype vise jaw odd measure device	148
98	Quadder assembler slide	151
99	Assembling elevator (quadding)	152
100	Delivery slide (quadding)	153
101	First-elevator jaw (quadding)	154
102	Perspective view of complete vise jaw operating mechanism (quadding and centering device)	156
103	Vise closing attachment (quadding)	160
104	Vise jaw automatic adjustable release (quadding)	162
105	Vise jaw cushion device (quadding)	163
106	Detail view of vise jaw operating lever and roll (quadding)	165
107	Line spread device (quadding)	166
108	Detail view of parts which control the justification and quadding functions of machine	169
109	Quadded line between the vise jaws	170
110	Detail view of quadder parts with respect to quadded line	172
111	Justified line between the vise jaws	174
112	Improved wedge locking device (quadder)	176
113	Front view of justified quadding attachment	179
114	Rear view of justified quadding attachment	181
115	Justified quadding parts just after first justification	182
116	Detail view, showing position of justified quadding parts when line spread and indention rack gear lock is doweled in position	184
117	Improved wedge locking device (justified quadding)	185
118	Perspective view of six-mold disk	187
119	Automatic ejector shifting and selecting mechanism	189
120	Mold disk pinion operating mechanism and mold turning mechanism	190
121	Liner insert mold for six-mold disk	191
122	Mold for solid slugs	192
123	Headletter recessed mold	193
124	Headletter advertising figure mold	194
125	Six-mold disk ejector blade and selecting stop layout	196
126	First-elevator slide guide	203
127	First-elevator jaw duplex rail and operating bar	204
128	First-elevator slide recasting block	205
129	First-elevator slide at transfer position	206

LIST OF ILLUSTRATIONS

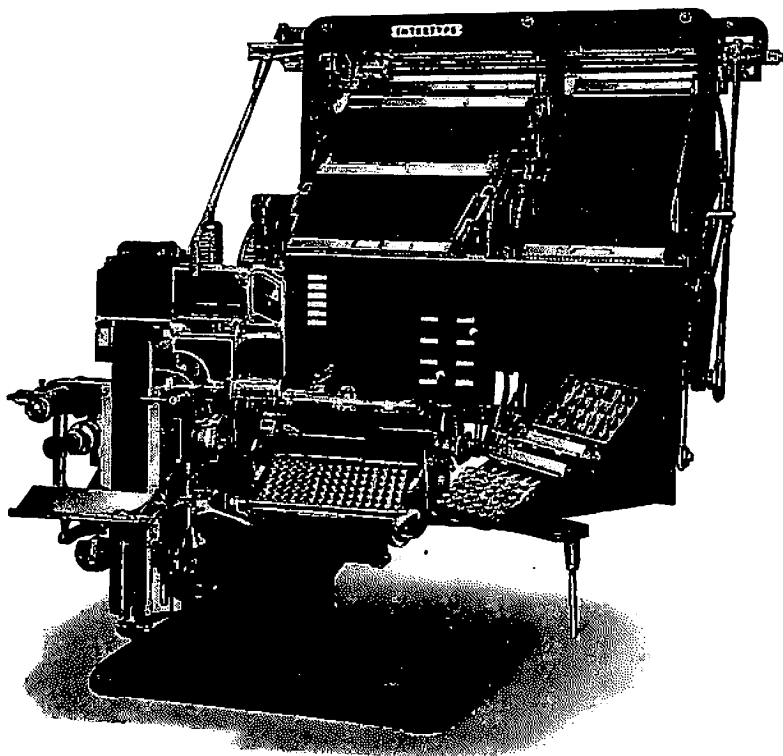
FIGURE	PAGE
130 Transfer channel	208
131 Line of matrices and spacebands in the process of transfer from first-elevator jaw to second-elevator bar	209
132 Matrices lifted out of transfer channel by second elevator	211
133 Elevator transfer lever, spaceband lever and related parts in assembly	214
133a Delivery and elevator transfer cam, showing the surfaces of the elevator transfer cam which promote the main movements of the elevator transfer lever and the spaceband lever	216
134 Elevator transfer slide finger	217
135 First movement of transfer levers	218
136 Second movement of transfer levers	220
137 Transfer slide safety devices	221
138 Second elevator and related parts in assembly	224
138a Second-elevator cam, showing the surfaces of the cam which promote the main movements of the second-elevator lever	225
139 Second elevator at normal or distributing position	226
140 Distributor shifter and related parts	228
141 Font distinguisher	231
142 Single distributor box	236
143 Single distributor box in relation to distributor screws	237
144 Views of the matrix in process of distribution	238
145 Distributor box bar point and matrix lift	239
146 Matrix raised into distributor screw threads	240
147 Detail view showing clearance between distributor screw threads and matrix lugs as the matrix is about to enter the threads	244
148 Mixer distributor box	246
149 Mixer distributor box and matrix lift mechanism	248
150 Side view of mixer machine	253
151 Views of mixer font selector mechanism	255
152 Detail view of mixer font selector parts	257
153 Front font selector arm and bushing	258
154 Detail view of back font selector arm shoe	261
155 Mixer distributor box clutch mechanism	263
156 Front view of mixer distributor box clutch	265
157 Views of the single distributor	270
158 Detail views of distributor back screws, showing clearances between screws and distributor bar or distributor bar strip	271
159 Matrix and distributor bar tooth combinations	272
160 Top view of single distributor	275
161 Single distributor channel entrance and the operating mechanism in assembly	280
162 Channel entrance in relation to distributor and magazine	282

LIST OF ILLUSTRATIONS

FIGURE		PAGE
163	Channel entrance partition plate and lower magazine plate, showing sidewise alignment of channel entrance partitions with magazine channels	284
164	Double distributor channel entrance	288
165	Channel entrance operating mechanism (manual)	290
166	Sectional view of right-hand magazine lifting lever	291
167	Magazine releasing and lifting mechanism	293
168	Magazine lifting lever stop bracket	294
169	Double distributor channel entrance (right-hand side view in rela- tion to magazines)	296
170	Channel entrance partition plates set to magazines	298
171	Channel entrance operating mechanism (power)	304
172	Channel entrance operating clutch	306
173	Magazine carriage catch releasing mechanism	308
174	Escapement rod depressing mechanism	310
175	Channel entrance safety stop lever	311
176	Intertype distributor clutch	313
177	Distributor clutch and channel entrance automatic stopping bar	314
178	Single distributor screw gears	316
179	Double distributor screw gears	317
180	Double distributor pi stacker	318
181	Driving shaft friction clutch	321
182	Driving shaft friction clutch and vertical starting lever in assembly	322
183	Starting and stopping lever and vertical starting lever in assembly	324
184	Starting and stopping mechanism and mold disk slide safety lock	326
185	Clutch flange clearances	327
186	Automatic stopping pawl and safety pawl adjustments	329
187	Intertype overhead motor	334
188	Cams and cam shaft, assembled	336
189	Universal Intertype machine	350
190	Star Base Intertype machine	352
191	Stack construction side magazine equipment	355
192	Tripod construction side magazine equipment	356
193	Magazine frame, supporting brackets and shafts	358
194	Magazine frame lifting cam	360
195	Magazine frame operating mechanism (manual)	363
196	Magazine frame operating handle lock	364
197	Magazine frame counterbalance mechanism (Universal)	366
198	Counterbalance mechanism for Star Base machines	368
199	Side magazine frame safety latch and link	369
200	Front removal magazine carriage for double distributor machines	370
201	Magazine frame lifting mechanism for double distributor machines	372
202	Rear removal magazine frame for Star Base double distributor machines	374

LIST OF ILLUSTRATIONS

FIGURE		PAGE
203	Intertype magazine frame power operating mechanism and related parts in assembly	379
204	Magazine frame operating control lever	382
205	Single and three-phase A.C. magazine frame operating motor switch	385
206	Two-phase A.C. magazine frame operating motor switch	386
207	D.C. magazine frame operating motor switch	387
208	Magazine frame operating control switch cam plate	391
209	Magazine frame supporting blocks	392
210	Automatic font distinguisher for single distributor machines	397
211	Font distinguisher for Universal non-mixer Intertypes	400
212	Manual font distinguisher setting disks	401
213	Distributor box clutch tripping mechanism and related parts in assembly	403
214	Detail view of non-mixer distributor box, showing its relation to matrix lift mechanism	407
215	Diagram of selecting system for Intertype F4-4s.m. machines	410
216	Setting disk selector	413
217	Operating stud and operating cam selectors	414
218	Distributor signal light for Universal double distributor machines	417
219	Normal position of the machine	426
220	Casting position of the machine	428
221	Transfer position of the machine	430
222	Ejecting to normal position of the machine	432



Model G4-4s.m. Intertype

WITH POWER SHIFT

Mixer machine equipped with two 90-channel and two 72-channel main magazines and four side magazines. See table on page 357 for complete list of Intertype models and various equipment combinations.

How the Intertype Operates

The Intertype casts lines of type or slugs instead of individual types such as are used for hand composition. The slugs are cast from matrices punched with the various characters needed for type composition. After the line of matrices has been assembled and the slug has been cast, the matrices are returned automatically to a magazine until they are needed again.

ASSEMBLING

As the operator depresses the keybuttons on the keyboard, matrices are released from the magazine. The matrices drop on a moving belt called the matrix delivery belt, which carries them to the assembling elevator in front of the operator. The assembling elevator, in cooperation with the assembler slide, assembles the matrices in a line preparatory to casting the line of type.

When the operator has filled out the line of matrices in the assembling elevator, he raises the elevator to the delivery slide. The slide carries the line of matrices to the casting mechanism and then returns to normal position, ready to receive the next line of matrices. Meanwhile the operator has started to set his next line, the line just sent in being handled automatically by the machine from this point on as described below.

CASTING

The delivery slide carries the line of matrices into the first-elevator jaw, which lowers immediately, carrying the line of matrices to a position in front of the mold in which the slug is to be cast.

The mold contains a cavity of the size and length of the desired slug. The back of this cavity aligns with a passage leading from the metal pot, which is filled with molten metal. The first elevator presents to the front of the mold cavity that part of the matrices in which the characters are punched. The mold advances against the matrix line, and the metal pot, which also moves forward, locks against the back of the mold. Then the pot pump forces molten metal into the mold cavity, casting a slug, which bears characters as they are arranged in the line of matrices.

In order to understand the entire casting operation, it is necessary to go back to the assembling of the line in the assembling elevator. Besides depressing the keys on the keyboard for the matrices desired, the operator also depresses a spaceband key after each word. Each time the spaceband key is depressed, a spaceband drops into the line in the assembling elevator. Spacebands serve two main purposes: they separate the groups of matrices which form the words, and they justify (spread out) the lines so they will all be of even length. A spaceband consists of a short sleeve and a long wedge, the inner surfaces of which are tapered. When the line of matrices is carried from the assembling elevator to the

HOW THE INTERTYPE OPERATES

casting mechanism, the spacebands are carried with it. The short sleeves of the spacebands rest between the word groups, while the long wedges hang about two inches below the matrix line.

Just before the slug is cast, the justification bar pushes upward against these wedges, spreading out the space between each word an equal amount. This is called justification of the matrix line.

After the slug is cast, the disk which carries the molds is turned three-quarters of a revolution, carrying the slug in the mold with it. As the mold disk turns, a knife behind it trims the bottom of the slug. When the mold disk stops, an ejector blade comes forward and pushes the slug out of the mold into the galley. As the slug is ejected from the mold, it passes between two parallel trimming knives, which trim it on both sides.

DISTRIBUTING

While the slug is being trimmed and ejected, the line of matrices from which it was cast is being returned to the magazine. The first elevator, which held the line of matrices in front of the mold, rises to the transfer channel, while a long arm known as the second elevator swings down from the top of the machine and comes to rest on the transfer channel. The matrix line is now transferred from the first elevator to the second elevator.

The second elevator, supporting the matrices by their teeth on a V-shaped bar, lifts them to the distributor box at the top of the machine. The matrices are then lifted one by one out of the distributor box to the distributor bar, which extends across the top of the magazine. Three revolving distributor screws parallel to the distributor bar engage three of the lugs of each matrix (two upper and one lower) and move the matrices along the bar. The bottom of the distributor bar is V-shaped and the matrices are moved across it supported by their teeth. When a matrix reaches a point directly above its channel in the magazine, there is a gap in the teeth in the distributor bar corresponding to the combination of teeth cut in the matrix. The matrix is thus released and drops into its proper channel in the magazine. Each character, of course, has a different combination of teeth, and the gaps in the distributor bar are cut to correspond. In the meantime, the spacebands, not having teeth, remain in the transfer channel, and while the matrices are lifted up to the distributor box, the spacebands are returned to the spaceband box at the right of the transfer channels.

The operations just described (the casting of the slug and the distribution of the matrices) are entirely automatic. The operator only has to finger the keys and raise the assembling elevator as each line of matrices is assembled.