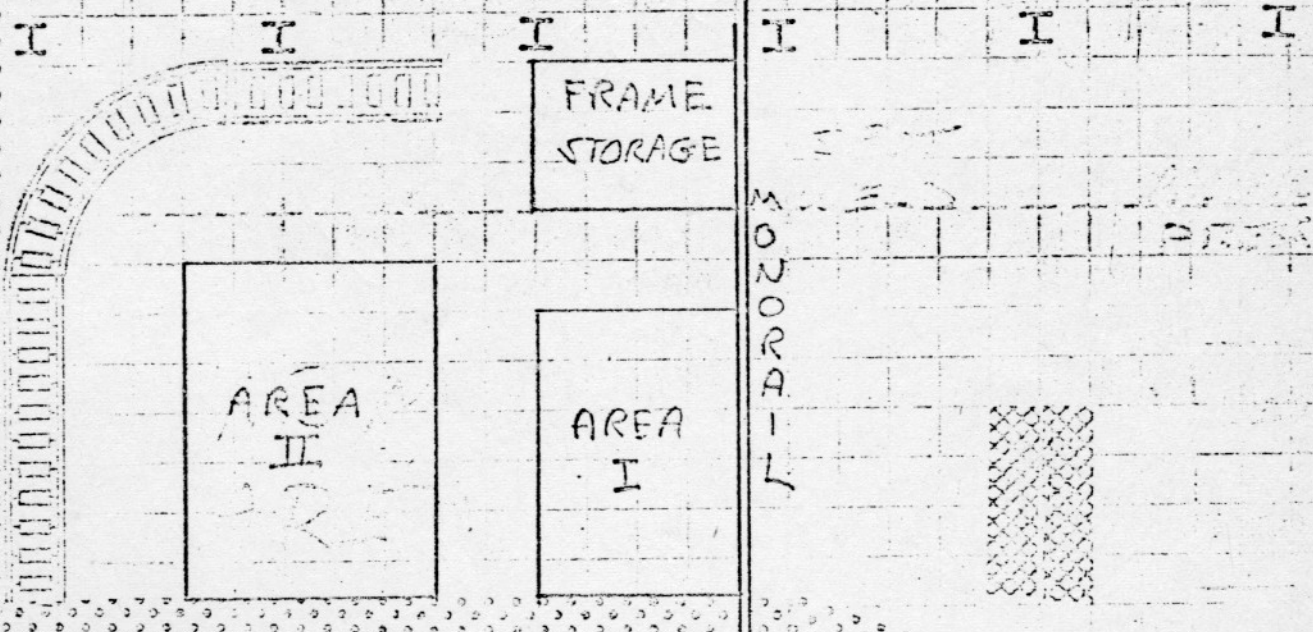
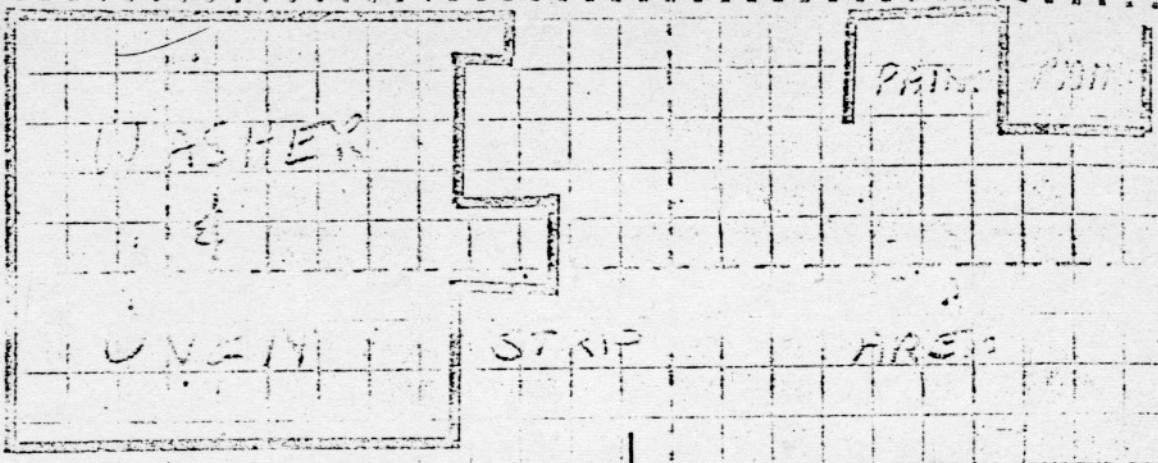


June 30, 1971

O.P.E.O.  
MATERIAL  
HANDLING  
WORK BOOK



SUB-ASSEMBLY

TEST

PACKAGING

POWER SUPPLY

OUTDOOR POWER EQUIPMENT OPERATION

Manufacturing Engineering

Prepared By: D. Pristash

Approved By: C. Wetherby

Instruction No. 12-7

Issued: \_\_\_\_\_

Supersedes: \_\_\_\_\_

SUBJECT: Material Handling

page 1 of 3

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This manual describes and shows the material handling racks developed for the assembly lines, paint area, and the machining area. To insure that losses and damage during handling are minimized, all parts will be placed in the specialized racks or containers provided. The purpose of this instruction is to inform all concerned parties as to responsibility, loading, maintenance and modification.

I. Responsibilities

A. Production Control:

1. Overall responsibility to insure compliance of movement and loading directions.
2. Will see that proper racks are at work station.
3. Will see that empty racks are in staging area, or paint unload area.
4. Will make all moves in such a manner that there are no interruptions in the assembly areas due to parts shortages.
5. Will not move partially full racks to assembly line unless no others are available.

B. Paint Foreman:

1. Responsible for the loading of racks and pans in the proper manner as per these instructions.
2. Will have finisher move correct racks to unload station if not already there.

C. Machining Foreman:

1. Responsible for the use of all racks in his area.
2. Will insure proper treatment of racks and trays in area.

D. Assembly Foreman:

1. Responsibility for the use of all racks in his area.

OUTDOOR POWER EQUIPMENT OPERATION

Manufacturing Engineering

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SUBJECT: Material Handling

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2. Will see that sub-assembly areas load racks in proper manner.

3. Will insure that racks are treated in proper manner.

E. Manufacturing Engineering:

1. Responsible for design and modification of all material handling devices.

2. Will see that racks are used in proper manner.

3. Will update instructions as required.

II. Use of Racks

A. Storage:

1. There will be two storage areas for painted parts.

2. Racks will not be moved to other storage areas without informing Production Control.

3. Area I is for empty racks and is for use of the monorail unloader.

4. Area II is for empty racks, and also for full racks both painted and sub-assembled.

5. Parts in machine area will be stored in the two in-process goods storage areas or by the machine.

B. Loading:

1. Only specified parts will be placed in racks.

2. Only specified numbers of parts will be placed in racks.

3. The paint foreman will insure compliance with the loading procedures.

4. The assembly foreman will insure compliance with the sub-assembly loading.

OUTDOOR POWER EQUIPMENT OPERATION

Manufacturing Engineering

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C. Movement:

1. There will be only three groups of people authorized to move racks.
2. Group I is the paint area to include the paint finisher and monorail unloader.
3. Group II is Production Control.
4. Group III is the sub-assembly workers who may switch racks around in the sub-assembly area.

III. Maintenance:

Will be handled in the normal manner with Special Shop Order form.

IV. Modification:

There will be no modification to any racks without the permission of Manufacturing Engineering.

REGULAR PRODUCTION SCHEDULING  
CONTAINER NEEDS INCLUDING A BUFFER OF .20% FOR A TRACTOR RATE OF 30

ITEM	PART NAME	SQ. FT. PER CONTAINER	CONTAINER SIZE	NUMBER CONT.	TOTAL AREA PER ITEM
1	BATT BOX	24	10	4	96
2	BATT BOX COVER	12	42	2	24
3	FRAME	18	6	7	126
4	CONT CAB	12	21	2	24
5	GRILL	12	42	2	24
6	TRANSAXLE	12	8	5	60
7	HOOD	12	30	2	24
8	STEERING SHAFT	3	60	2	6
9	L SIDE PANNEL	9	100	2	18
10	R SIDE PANNEL	9	100	2	18
11	CONT CAB COVER	6	100	2	12
12	BUMPER	6	40	2	12
13	MOTOR PLATE	6	150	2	12
14	STIFFNER	6	160	2	12
15	L LIFT SUPPORT	6	160	2	12
16	R LIFT SUPPORT	6	160	2	12
17	UNDER CAR HARN	6	40	2	12
18	GRILL ASSM	6	24	2	12
19	CONT CAB ASSM	6	8	5	30
20	LIFT ASSM	6	24	2	12
21	CONT PANN ASSM	15	27	2	30
22	MOTOR ASSM	6	9	5	30
23	CHARGER BASE	6	15	3	18
24	DISCONNECT	6	100	2	12
25	DASH ASSM	8	50	2	16
26	THROTTLE ASSM	8	50	2	16
27	REAR TIRE	16	16	3	48
28	BRAKE ROD	3	300	2	6
29	FRONT TIRE	16	20	2	32
30	STEERING WHEEL	6	80	2	12
31	TIMMER COVER	8	40	2	16

TOTAL REQUIRED FLOOR SPACE IN SQUARE FEET: 794

## REGULAR PRODUCTION SCHEDULING

CONTAINER NEEDS INCLUDING A BUFFER OF .20% FOR A TRACTOR RATE OF 35

ITEM	PART NAME	SQ. FT. PER CONTAINER	CONTAINER SIZE	NUMBER CONT.	TOTAL AREA PER ITEM
1	BATT BOX	24	10	5	120
2	BATT BOX COVER	12	42	2	24
3	FRAME	18	6	8	144
4	CONT CAB	12	21	3	36
5	GRILL	12	42	2	24
6	TRANSAXLE	12	8	6	72
7	HOOD	12	30	2	24
8	STEERING SHAFT	3	60	2	6
9	L SIDE PANNEL	9	100	2	18
10	R SIDE PANNEL	9	100	2	18
11	CONT CAB COVER	6	100	2	12
12	BUMPER	6	40	2	12
13	MOTOR PLATE	6	150	2	12
14	STIFFNER	6	160	2	12
15	L LIFT SUPPORT	6	160	2	12
16	R LIFT SUPPORT	6	160	2	12
17	UNDER CAR HARN	6	40	2	12
18	GRILL ASSM	6	24	2	12
19	CONT CAB ASSM	6	8	6	36
20	LIFT ASSM	6	24	2	12
21	CONT PANN ASSM	15	27	2	30
22	MOTOR ASSM	6	9	5	30
23	CHARGER BASE	6	15	3	18
24	DISCONNECT	6	100	2	12
25	DASH ASSM	8	50	2	16
26	THROTTLE ASSM	8	50	2	16
27	REAR TIRE	16	16	3	48
28	BRAKE ROD	3	300	2	6
29	FRONT TIRE	16	20	3	48
30	STEERING WHEEL	6	80	2	12
31	TIMMER COVER	8	40	2	16

TOTAL REQUIRED FLOOR SPACE IN SQUARE FEET: 882

REGULAR PRODUCTION SCHEDULING  
CONTAINER NEEDS INCLUDING A BUFFER OF .20% FOR A TRACTOR RATE OF 40

ITEM	PART NAME	SQ. FT. PER CONTAINER	CONTAINER SIZE	NUMBER CONT.	TOTAL AREA PER ITEM
1	BATT BOX	24	10	6	144
2	BATT BOX COVER	12	42	2	24
3	FRAME	18	6	9	162
4	CONT CAB	12	21	3	36
5	GRILL	12	42	2	24
6	TRANSAXLE	12	8	7	84
7	HOOD	12	30	2	24
8	STEERING SHAFT	3	60	2	6
9	L SIDE PANNEL	9	100	2	18
10	R SIDE PANNEL	9	100	2	18
11	CONT CAB COVER	6	100	2	12
12	BUMPER	6	40	2	12
13	MOTOR PLATE	6	150	2	12
14	STIFFNER	6	160	2	12
15	L LIFT SUPPORT	6	160	2	12
16	R LIFT SUPPORT	6	160	2	12
17	UNDER CAR HARN	6	40	2	12
18	GRILL ASSM	6	24	3	18
19	CONT CAB ASSM	6	8	7	42
20	LIFT ASSM	6	24	3	18
21	CONT PANN ASSM	15	27	2	30
22	MOTOR ASSM	6	9	6	36
23	CHARGER BASE	6	15	4	24
24	DISCONNECT	6	100	2	12
25	DASH ASSM	8	50	2	16
26	THROTTLE ASSM	8	50	2	16
27	REAR TIRE	16	16	4	64
28	BRAKE ROD	3	300	2	6
29	FRONT TIRE	16	20	3	48
30	STEERING WHEEL	6	80	2	12
31	TIMMER COVER	8	40	2	16

TOTAL REQUIRED FLOOR SPACE IN SQUARE FEET: 982



REGULAR PRODUCTION SCHEDULING  
CONTAINER NEEDS INCLUDING A BUFFER OF .20% FOR A TRACTOR RATE OF 45

ITEM	PART NAME	SQ. FT. PER CONTAINER	CONTAINER SIZE	NUMBER CONT.	TOTAL AREA PER ITEM
1	BATT BOX	24	10	6	144
2	BATT BOX COVER	12	42	2	24
3	FRAME	18	6	10	180
4	CONT CAB	12	21	3	36
5	GRILL	12	42	2	24
6	TRANSAXLE	12	8	8	96
7	HOOD	12	30	2	24
8	STEERING SHAFT	3	60	2	6
9	L SIDE PANNEL	9	100	2	18
10	R SIDE PANNEL	9	100	2	18
11	CONT CAB COVER	6	100	2	12
12	BUMPER	6	40	2	12
13	MOTOR PLATE	6	150	2	12
14	STIFFNER	6	160	2	12
15	L LIFT SUPPORT	6	160	2	12
16	R LIFT SUPPORT	6	160	2	12
17	UNDER CAR HARN	6	40	2	12
18	GRILL ASSM	6	24	3	18
19	CONT CAB ASSM	6	8	8	48
20	LIFT ASSM	6	24	3	18
21	CONT PANN ASSM	15	27	3	45
22	MOTOR ASSM	6	9	7	42
23	CHARGER BASE	6	15	4	24
24	DISCONNECT	6	100	2	12
25	DASH ASSM	8	50	2	16
26	THROTTLE ASSM	8	50	2	16
27	REAR TIRE	16	16	4	64
28	BRAKE ROD	3	300	2	6
29	FRONT TIRE	16	20	3	48
30	STEERING WHEEL	6	80	2	12
31	TIMMER COVER	8	40	2	16

TOTAL REQUIRED FLOOR SPACE IN SQUARE FEET: 1039

REGULAR PRODUCTION SCHEDULING  
CONTAINER NEEDS INCLUDING A BUFFER OF .20% FOR A TRACTOR RATE OF 50

ITEM	PART NAME	SQ. FT. PER CONTAINER	CONTAINER SIZE	NUMBER CONT.	TOTAL AREA PER ITEM
1	BATT BOX	24	10	7	168
2	BATT BOX COVER	12	42	2	24
3	FRAME	18	6	11	198
4	CONT CAB	12	21	3	36
5	GRILL	12	42	2	24
6	TRANSAXLE	12	8	9	108
7	HOOD	12	30	3	36
8	STEERING SHAFT	3	60	2	6
9	L SIDE PANNEL	9	100	2	18
10	R SIDE PANNEL	9	100	2	18
11	CONT CAB COVER	6	100	2	12
12	BUMPER	6	40	2	12
13	MOTOR PLATE	6	150	2	12
14	STIFFNER	6	160	2	12
15	L LIFT SUPPORT	6	160	2	12
16	R LIFT SUPPORT	6	160	2	12
17	UNDER CAR HARN	6	40	2	12
18	GRILL ASSM	6	24	3	18
19	CONT CAB ASSM	6	8	9	54
20	LIFT ASSM	6	24	3	18
21	CONT PANN ASSM	15	27	3	45
22	MOTOR ASSM	6	9	8	48
23	CHARGER BASE	6	15	5	30
24	DISCONNECT	6	100	2	12
25	DASH ASSM	8	50	2	16
26	THROTTLE ASSM	8	50	2	16
27	REAR TIRE	16	16	4	64
28	BRAKE ROD	3	300	2	6
29	FRONT TIRE	16	20	4	64
30	STEERING WHEEL	6	80	2	12
31	TIMMER COVER	8	40	2	16

TOTAL REQUIRED FLOOR SPACE IN SQUARE FEET: 1139

REGULAR PRODUCTION SCHEDULING  
CONTAINER NEEDS INCLUDING A BUFFER OF .20% FOR A TRACTOR RATE OF 54

ITEM	PART NAME	SQ. FT. PER CONTAINER	CONTAINER SIZE	NUMBER CONT.	TOTAL AREA PER ITEM
1	BATT BOX	24	10	7	168
2	BATT BOX COVER	12	42	2	24
3	FRAME	18	6	12	216
4	CONT CAB	12	21	4	48
5	GRILL	12	42	2	24
6	TRANSAXLE	12	8	9	108
7	HOOD	12	30	3	36
8	STEERING SHAFT	3	60	2	6
9	L SIDE PANNEL	9	100	2	18
10	R SIDE PANNEL	9	100	2	18
11	CONT CAB COVER	6	100	2	12
12	BUMPER	6	40	2	12
13	MOTOR PLATE	6	150	2	12
14	STIFFNER	6	160	2	12
15	L LIFT SUPPORT	6	160	2	12
16	R LIFT SUPPORT	6	160	2	12
17	UNDER CAR HARN	6	40	2	12
18	GRILL ASSM	6	24	3	18
19	CONT CAB ASSM	6	8	9	54
20	LIFT ASSM	6	24	3	18
21	CONT PANN ASSM	15	27	3	45
22	MOTOR ASSM	6	9	8	48
23	CHARGER BASE	6	15	5	30
24	DISCONNECT	6	100	2	12
25	DASH ASSM	8	50	2	16
26	THROTTLE ASSM	8	50	2	16
27	REAR TIRE	16	16	5	80
28	BRAKE ROD	3	300	2	6
29	FRONT TIRE	16	20	4	64
30	STEERING WHEEL	6	80	2	12
31	TIMMER COVER	8	40	2	16

TOTAL REQUIRED FLOOR SPACE IN SQUARE FEET: 1185

N O T E S

PARTS IDENTIFICATION

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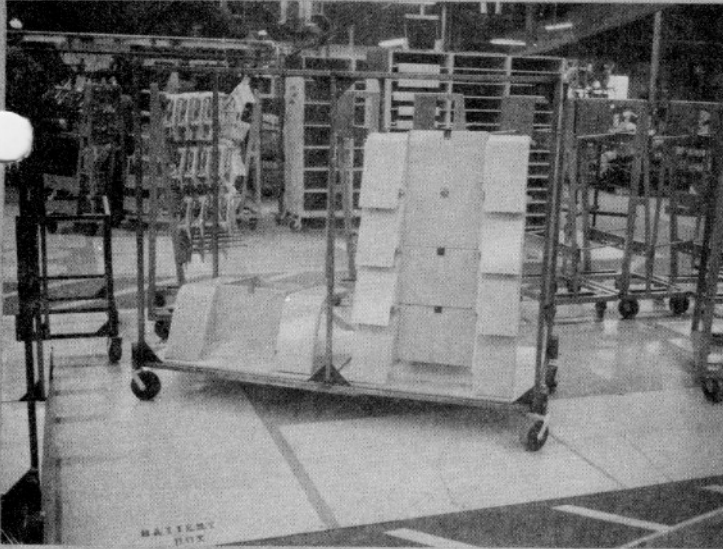
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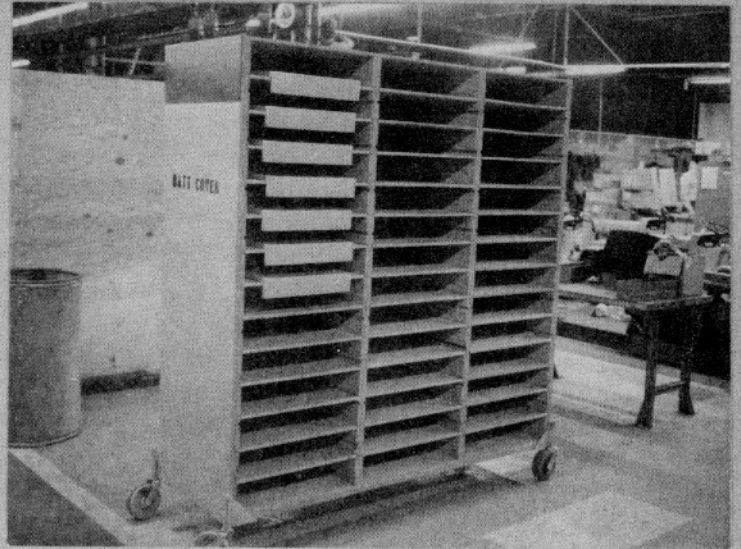
QTY/RAC

ITEM	NAME	DRWG. NO.	PG. PIC. NO.	QTY/RAC
1	Frame	587E926 G1	3	6
2	Motor Plate	541C915 P1	29	150
3	Battery Box	423D221 G1	1	10
4	Control Cabinet	587E919 P1	4	14
5	Lift Support (RH)	541C668 P1	35	160
6	Lift Support (LH)	541C668 P2	35	160
7	Bumper and Yoke	163B987 2G	28	40
8	Steering Shaft	211A3416 G1	8	50
9	Grill	423D214 P1	4	14
10	Stiffener	211A3178 P1	31	70
11	Battery Box Cover	422D834 G1	2	42
12	Side Panel (LH)	422D838 P1	11	100
13	Side Panel (RH)	422D837 P1	11	100
14	Hood Fabrication	587E922 G1	6	30
15	Control Cabinet Cover	542C868 P2	27	100
16	Seat Pan	211A3209 P2	33	30
17	Battery Clamp, Rear	163B9875 G1	37	60
18	Battery Clamp, Front	211A3439 G1, G2	39	60
19	Battery Holddown	211A3440 G1	38	40
20	Upper Battery Clamp	211A3443 P1	54	120
21	Hitch Extension Bar	163B9919 P1	44	40
22	Mower Housing Assembly	587E936 G2	19	6
23	Caster Support	541C926 G1	10	80
24	Mower Attachment Arm	542C872 G1	32	40
25	Shaft, Front Roller	243A4643 P1	40	100
26	Rear Adjuster (RH)	163B9801 G1	12	75
27	Rear Adjuster (LH)	163B9801 G2	12	75
28	Baffle, Rear Discharge	423D204 G1	13	40
29	Baffle, Side Discharge	587E934 G1	18	70
30	Side Cover	542C899 P1	30	500
31	Discharge Chute Assembly	541C906 G1	20	40
32	Wire Box	541C910 P1	47	40
33	wire Cover	541C909 P1	41	30
34	Grass Deflector Strip	243A4520 P1	9	100

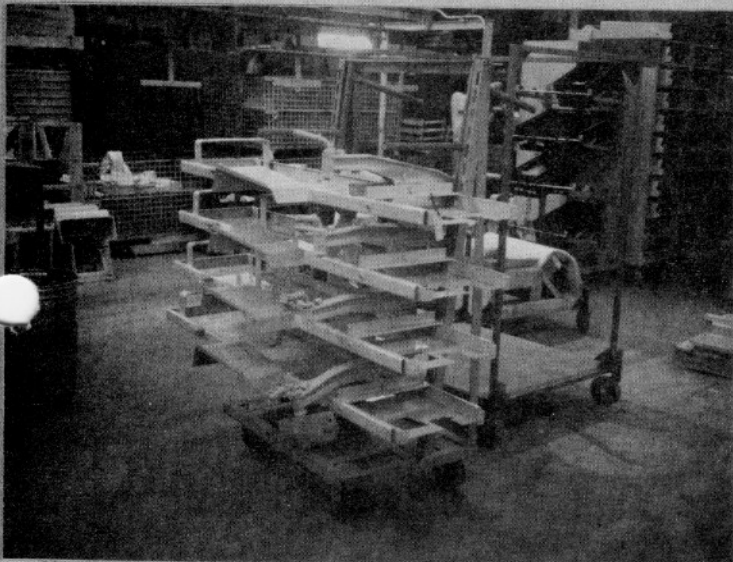




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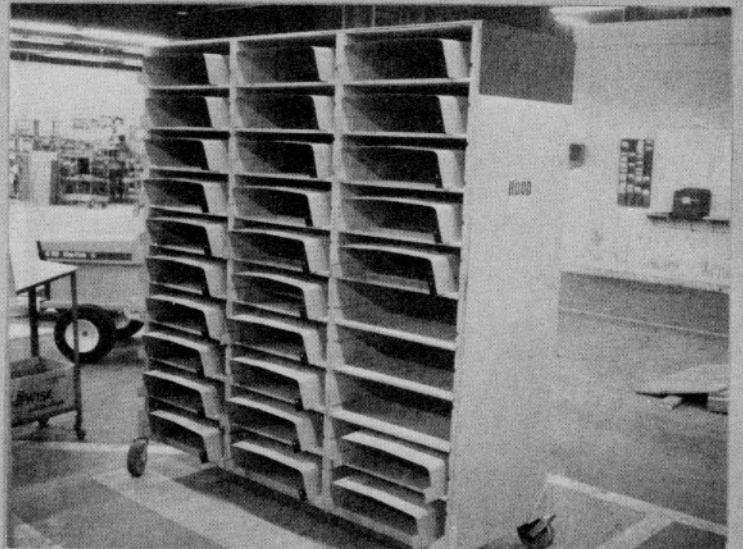
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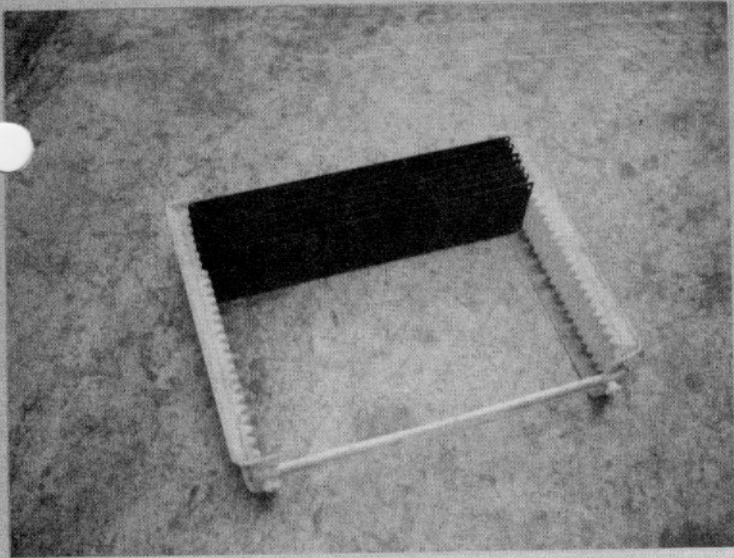
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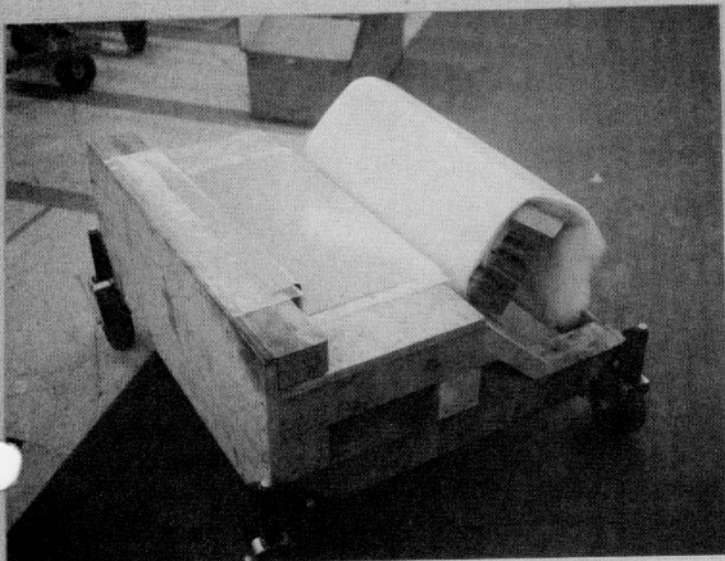
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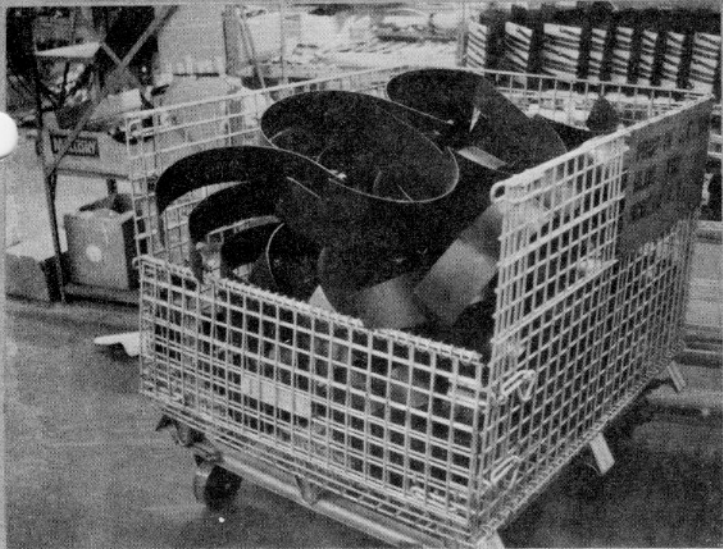


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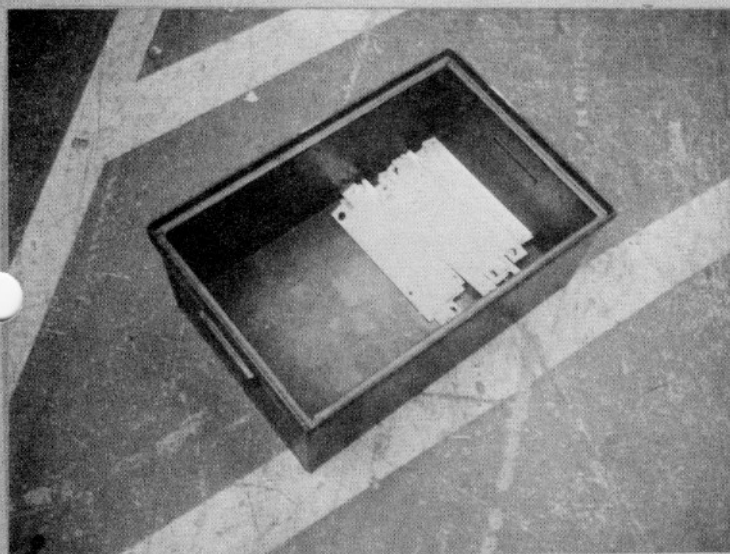




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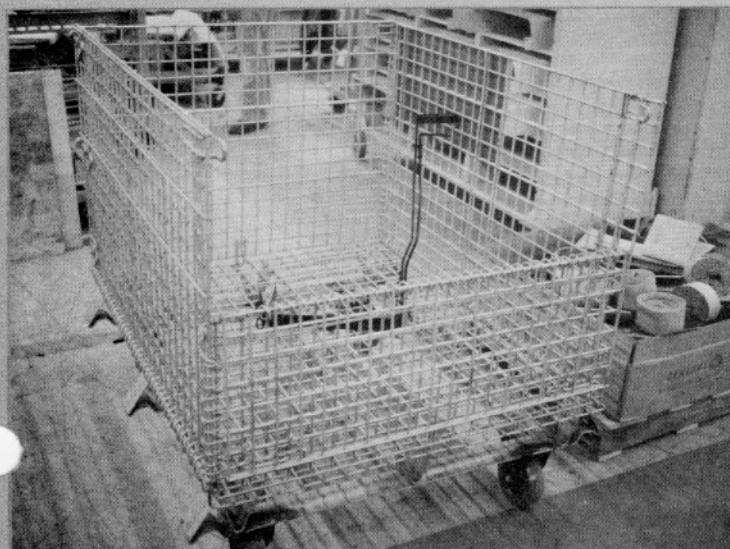
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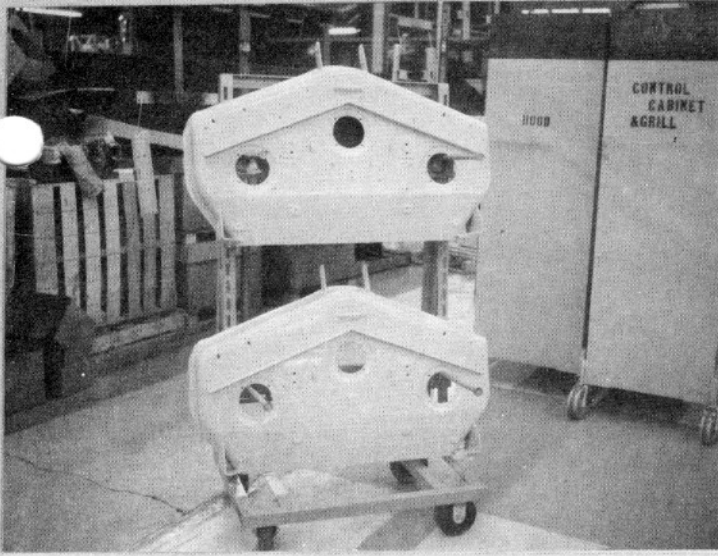
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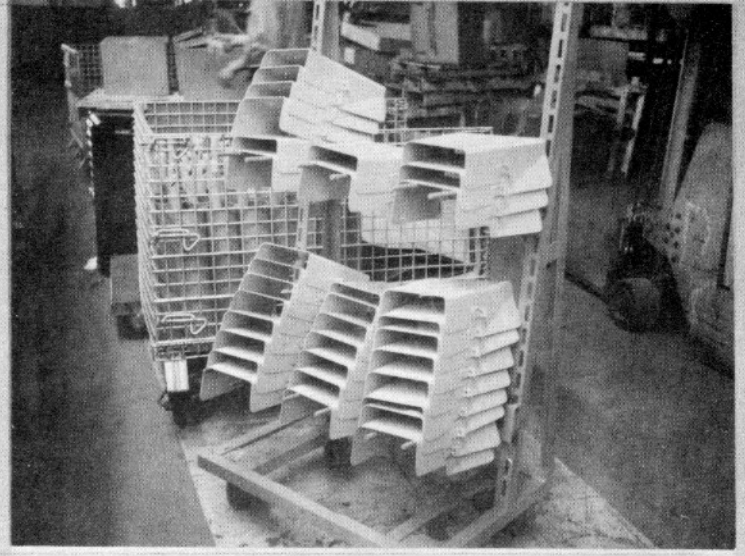
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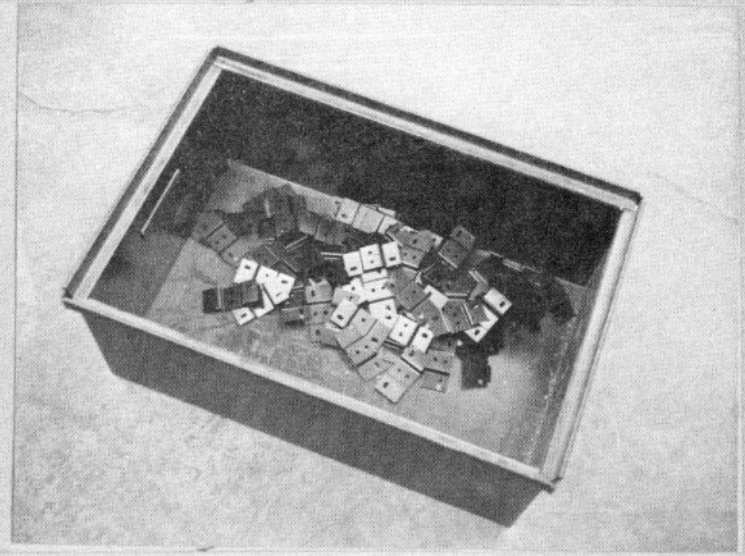
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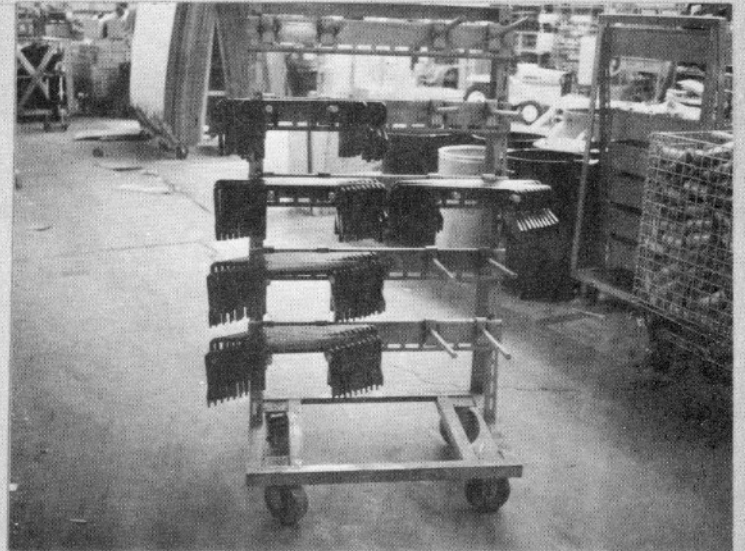
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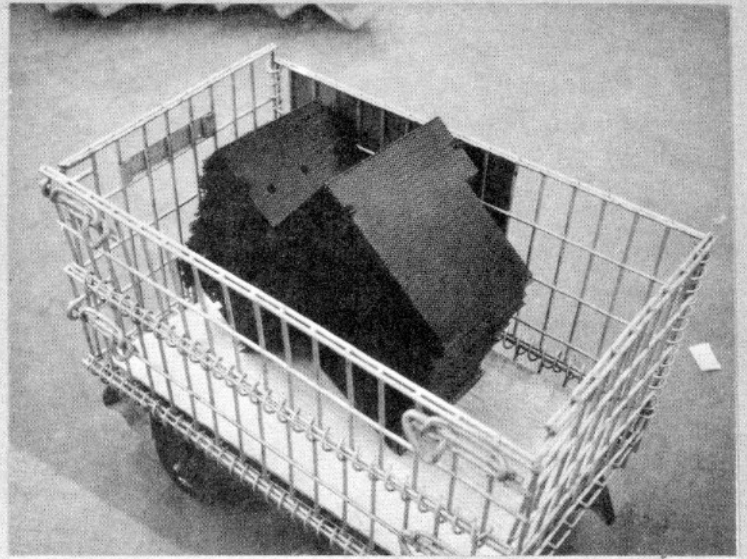
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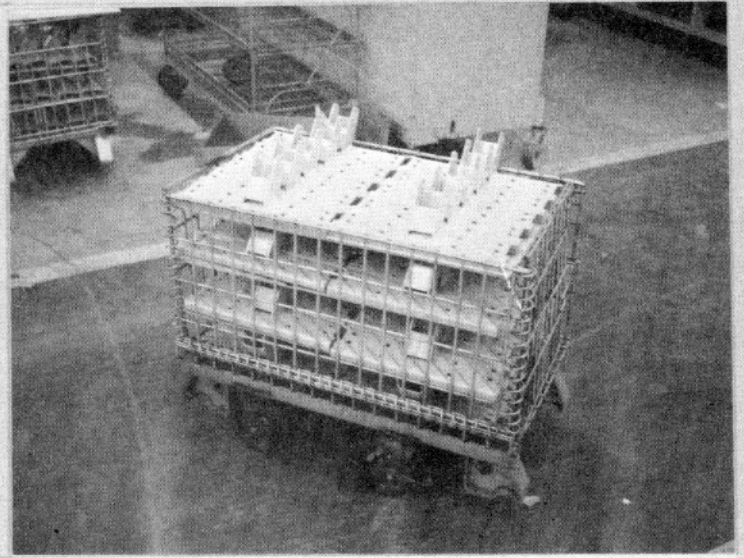
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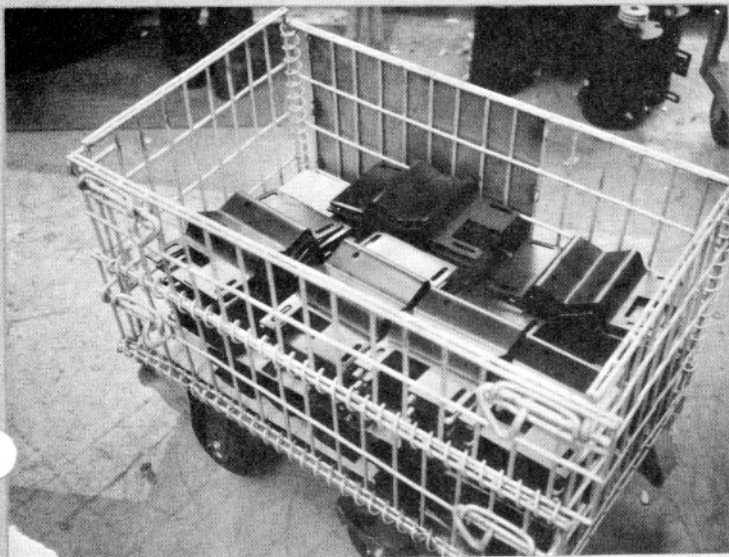
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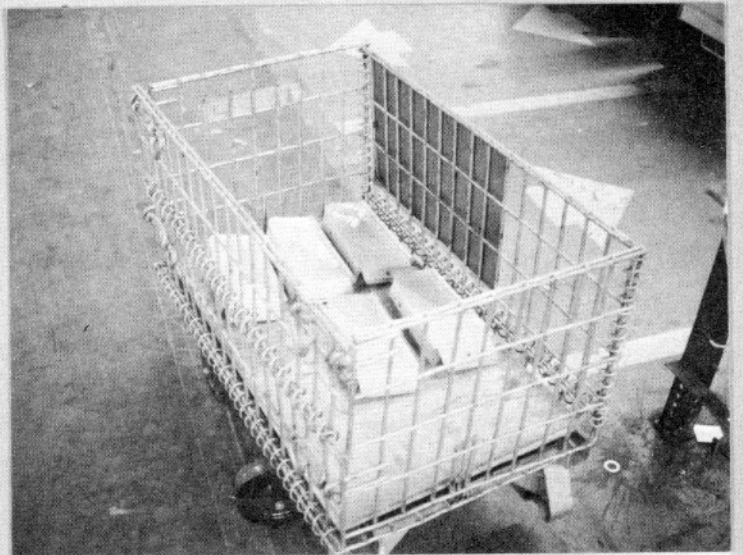
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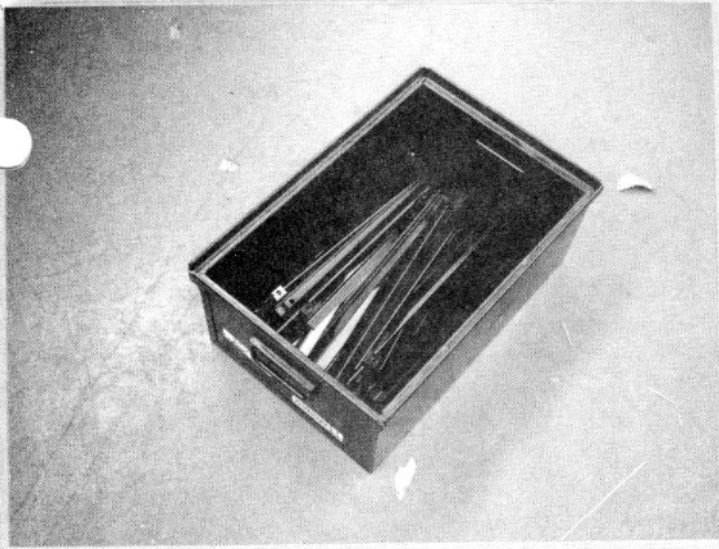
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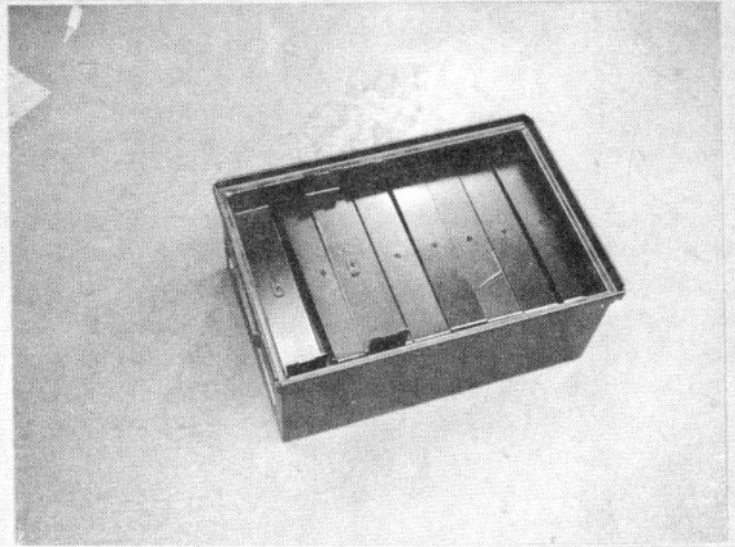
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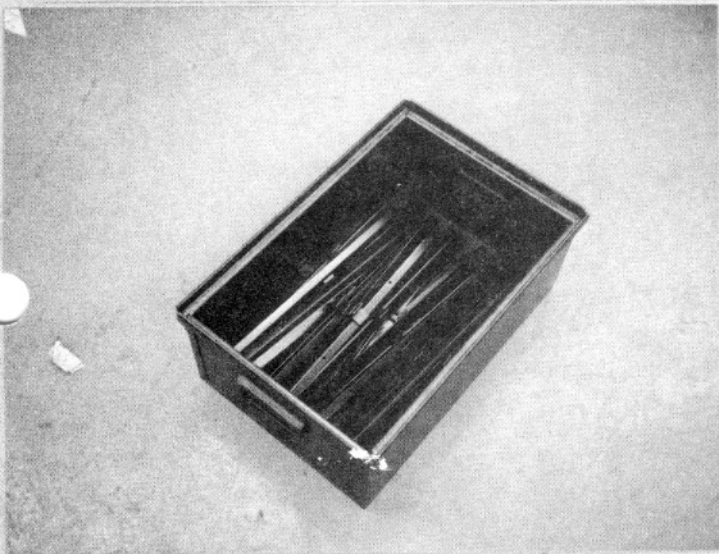
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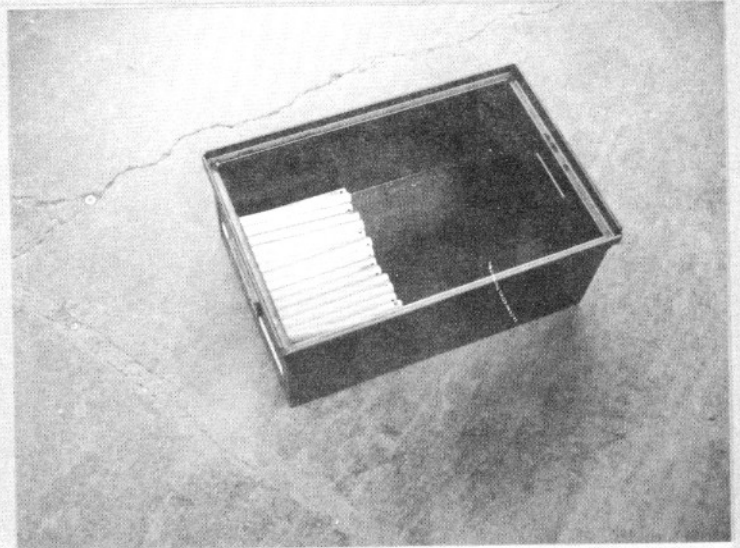
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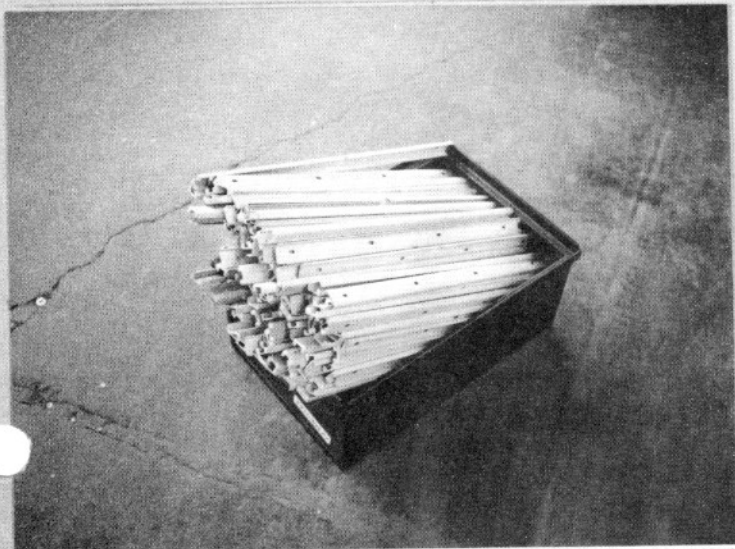
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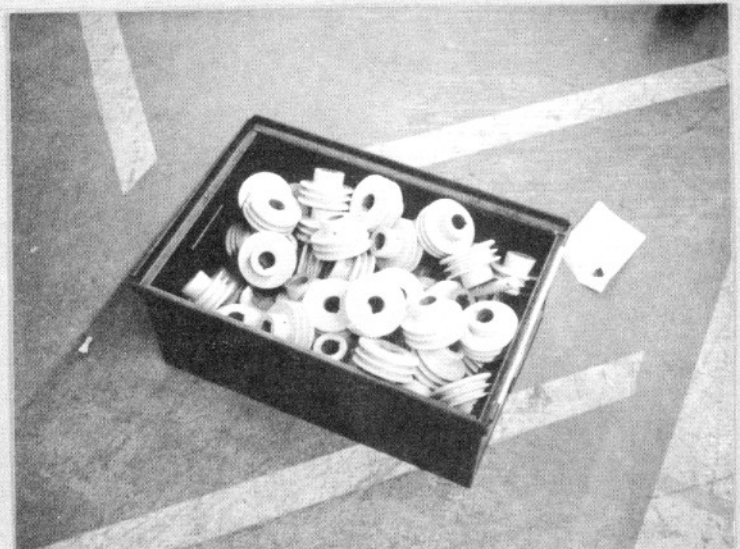
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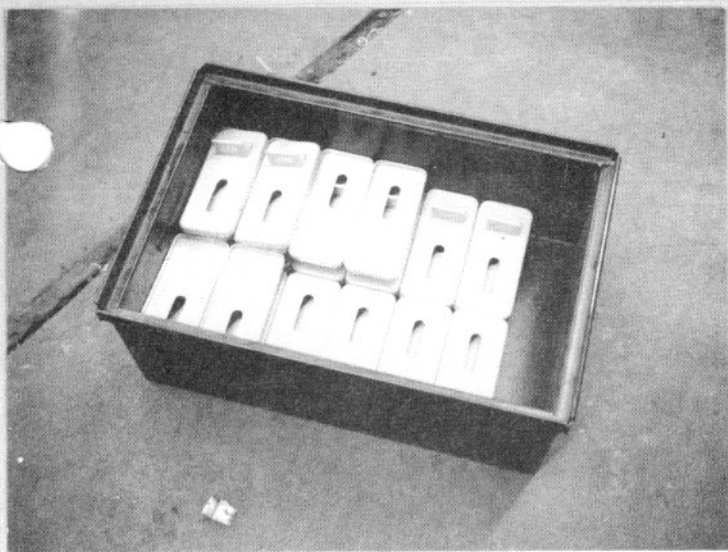
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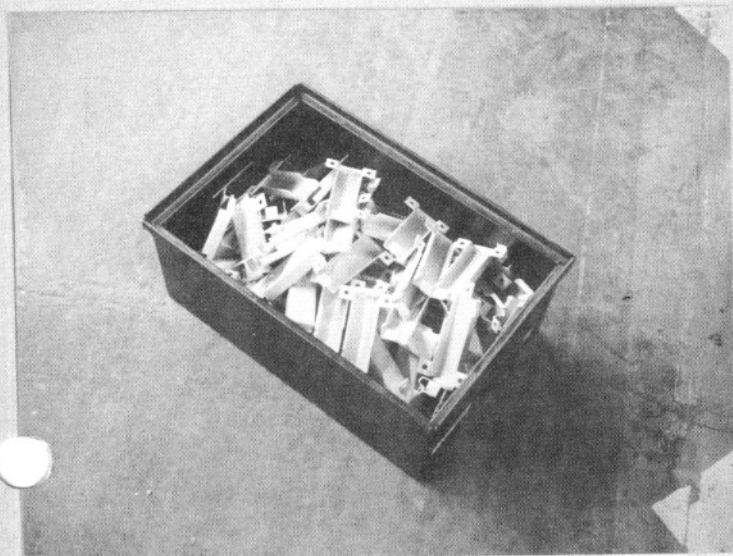
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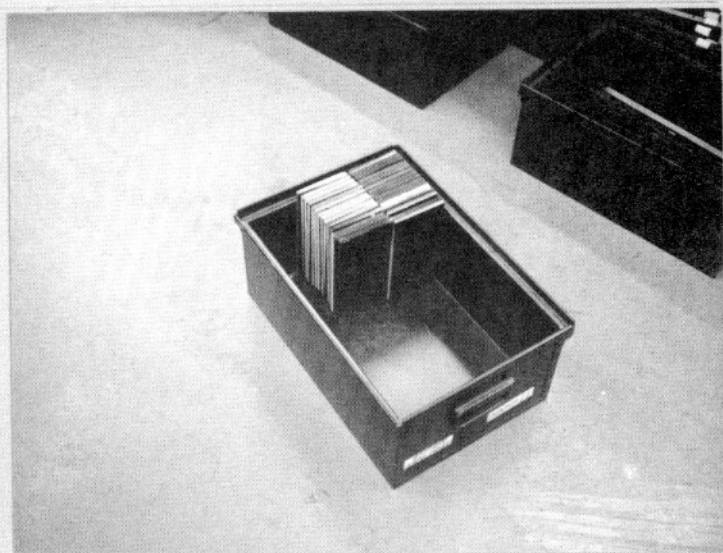
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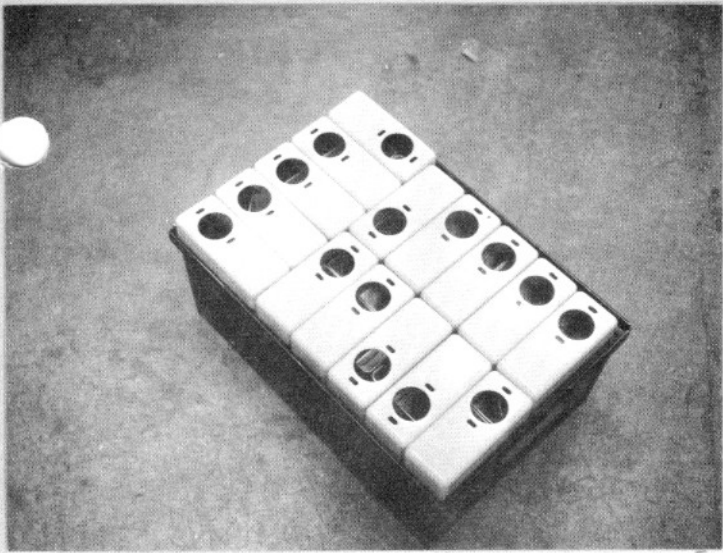
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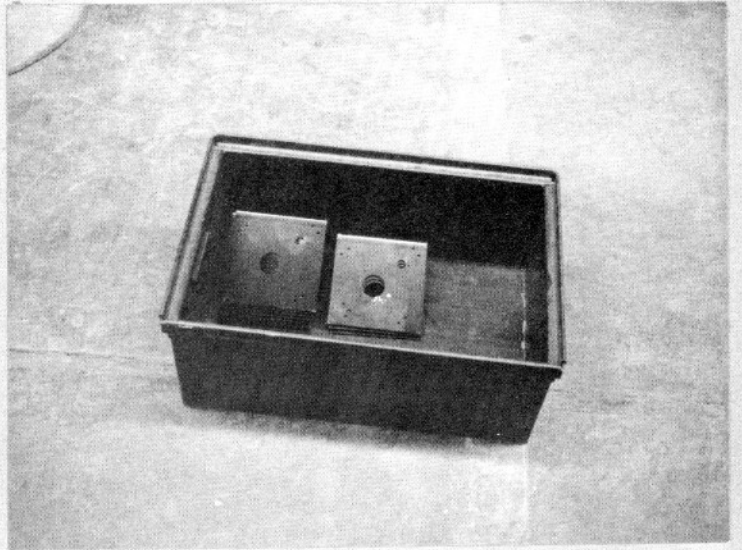
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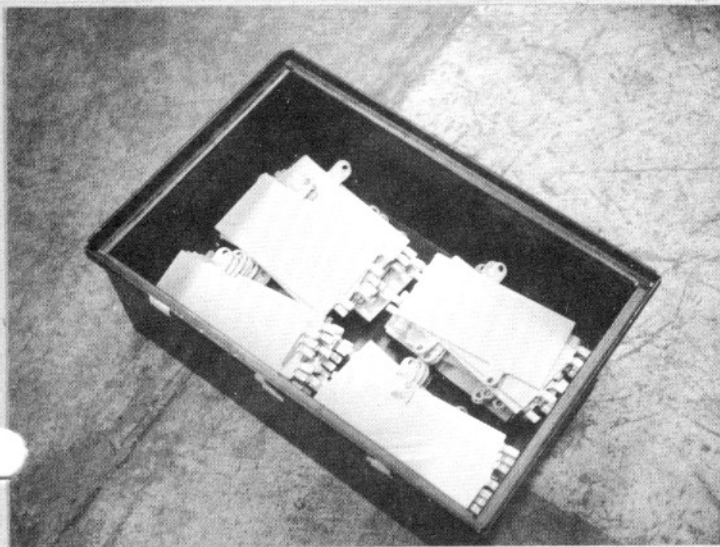
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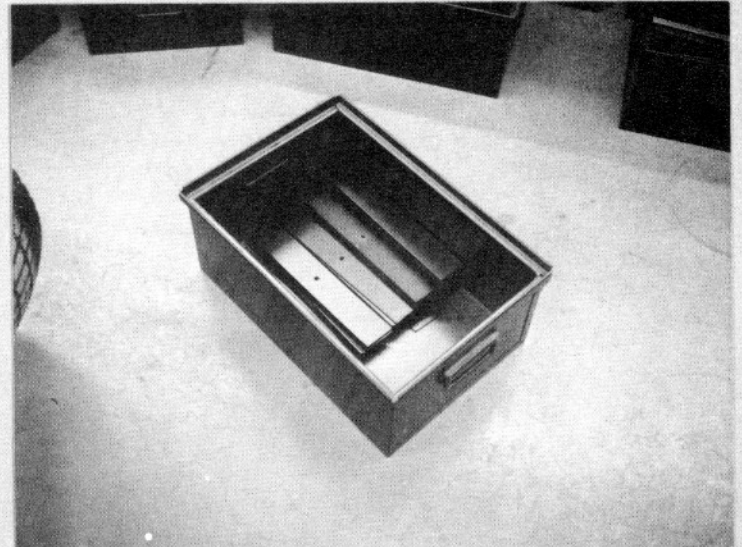
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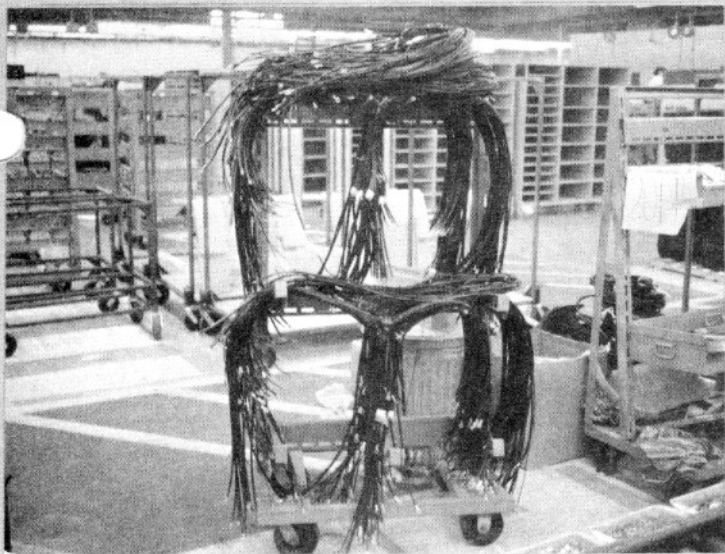
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PARTS IDENTIFICATION

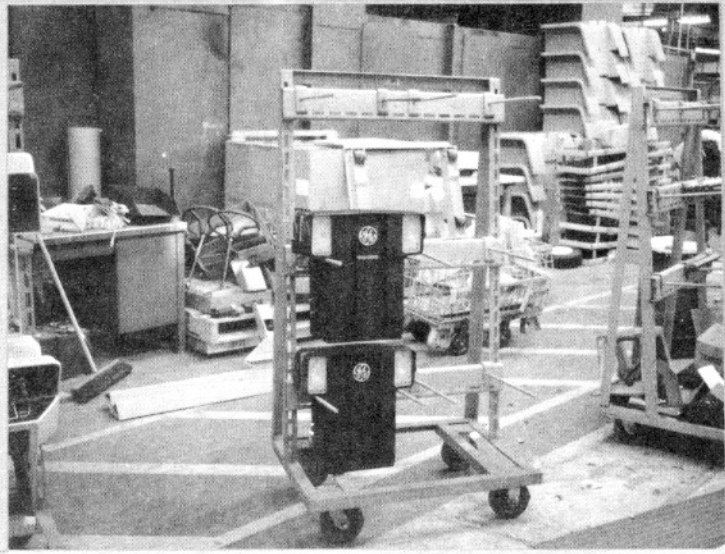
ITEM	NAME	DRWG. NO.	PG. PIC. NO.	QTY/RA
1	Under Carriage Harness	423D215	1	40
2	Grill Assembly	541C941	2	24
3	Transaxle Assembly	542C879	3	8
4	Bulkhead Assembly	423D250	4	8
5	Lift Assembly	423D217	5	24
6	Control Panel Assembly	422D831	6	27
7	Drive Motor	163B9908	7, 11	16, 9
8	Tractor Kit Box	--	8	50
9	Battery Terminals	243A4521	9	1 000
10	Batteries	243A4527	10	40
11				
12	Charger Base	423D211	12	15
13	Shipping Box	--	13	--
14	Center Support	--	14	--
	Box Stiffener	--	15	--
16	Pallet	--	16	--
17	Battery Accessories	--	17, 18	--
18				
19	Cruise Control Assembly	178B8010	19	300
20	Power Resistor E-20	178B8012	20	100
21	Cam Assembly	243A4796	21	40
22	Disconnect	163B9923	22	100
23	Switch Assembly	211A3198	23	300
24	Dash Assembly	163B9822	24	50
25	Throttle Assembly	423D213	25	100
26	Rear Tire	541C658	26	16
27	Brake Rod	211A3468	27	200
28	Front Tire	163B9707	28	20
29	Steering Wheel	163B9843	29	90
30	Charger Cover	423D212	30	40
	Spindle	541C900	31	100
32	Gear Sector	211A3418	32	50
33	Shift Lever	--	33	70
34	Tie Rod	211A3283	34	150



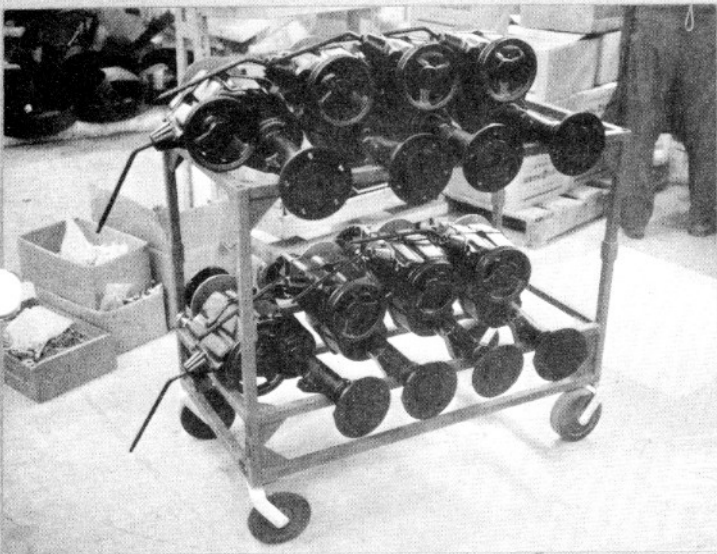




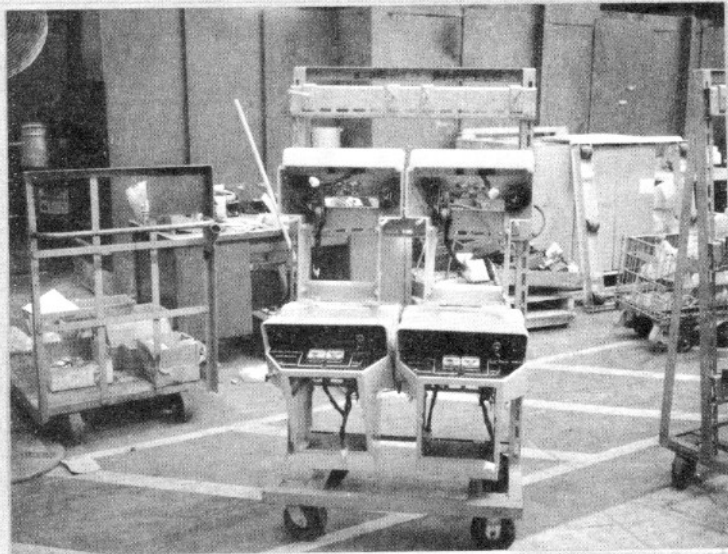
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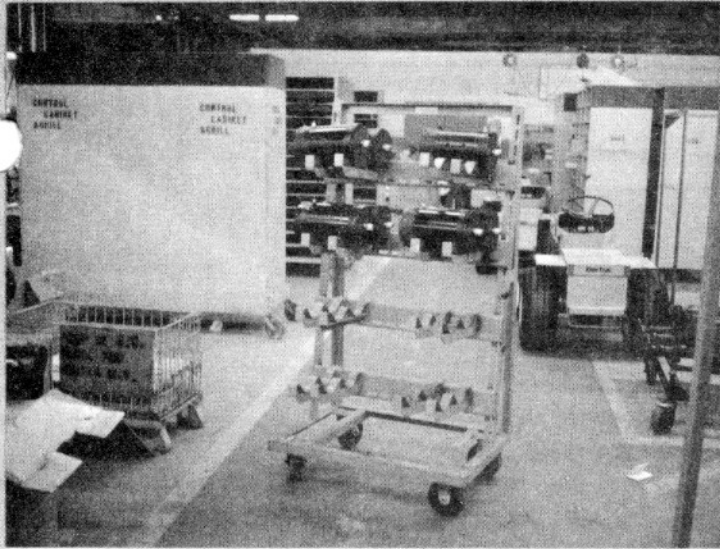
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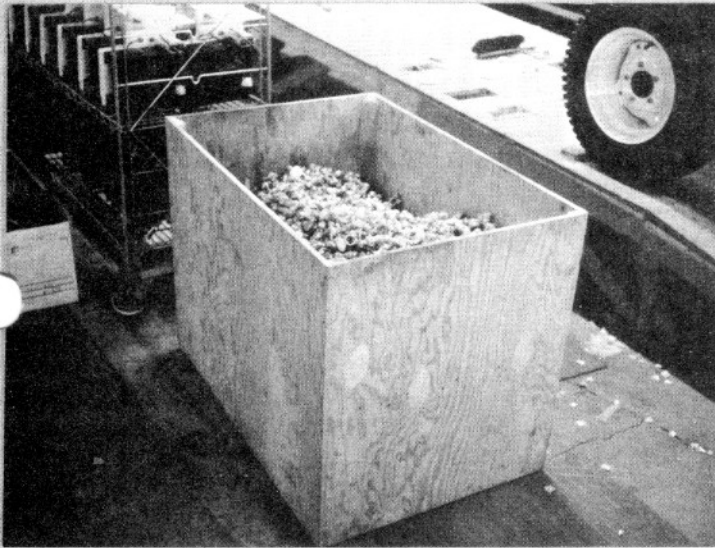
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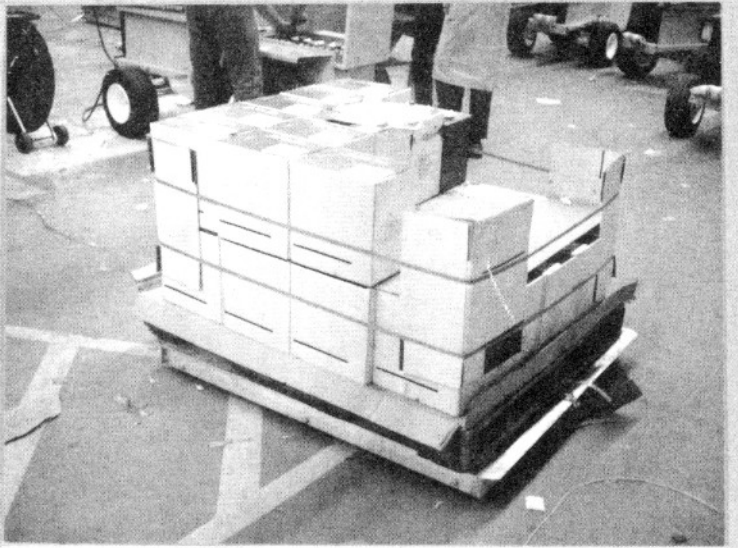
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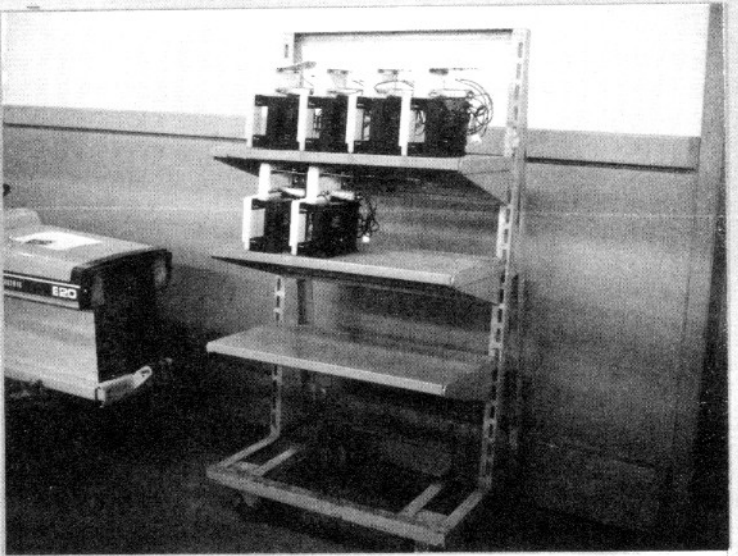
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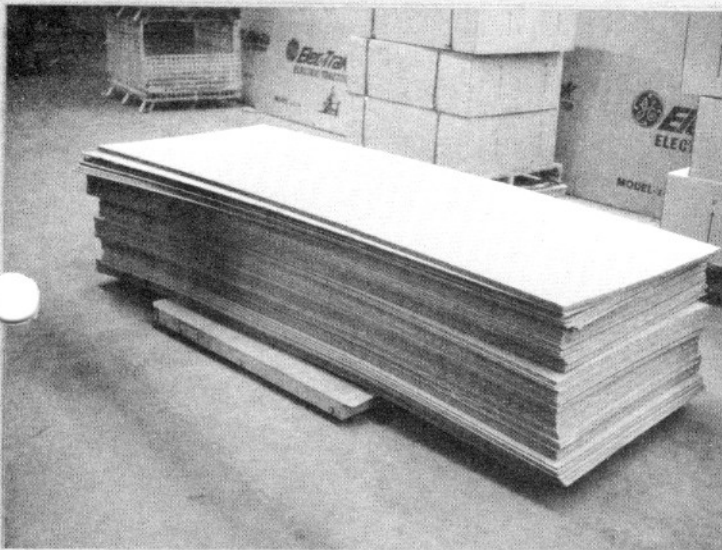
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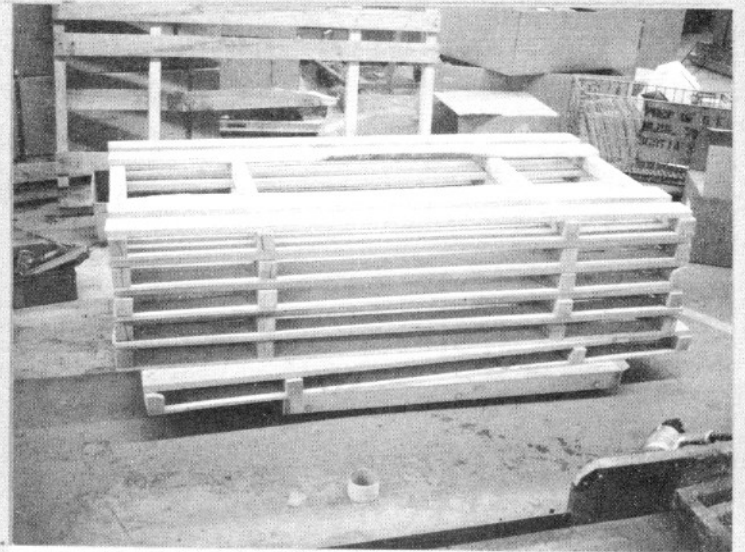
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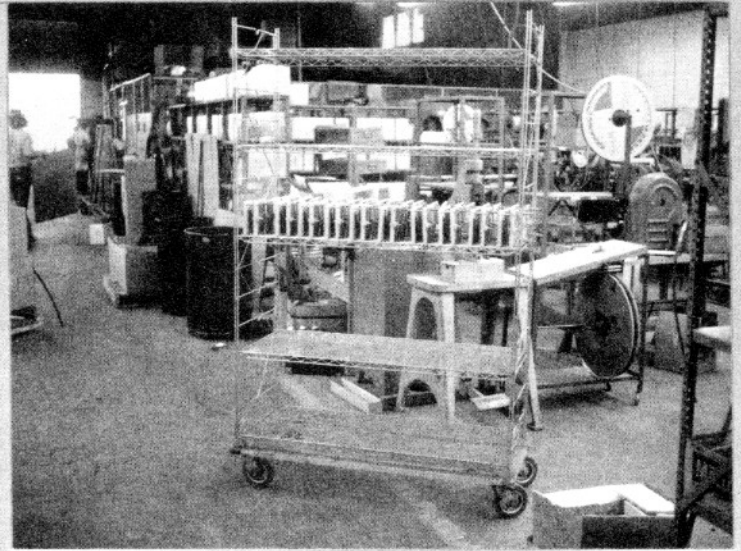
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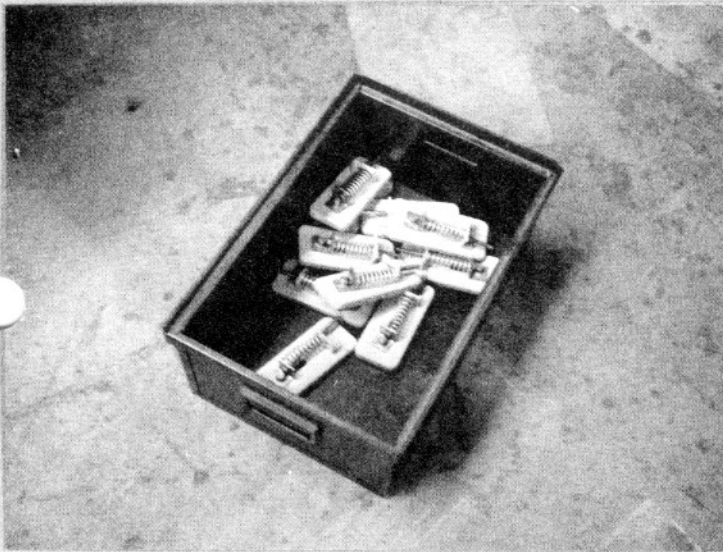
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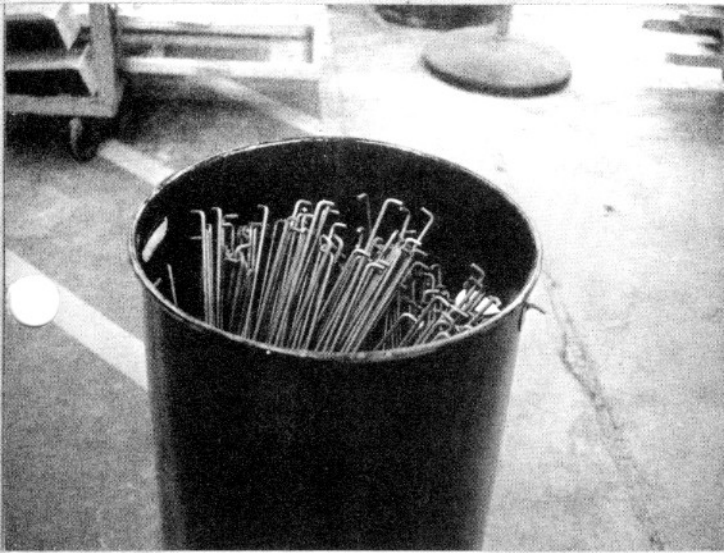
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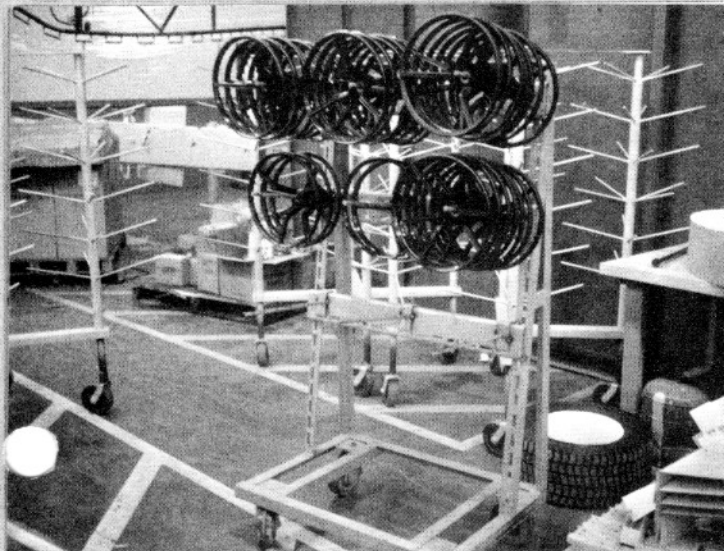
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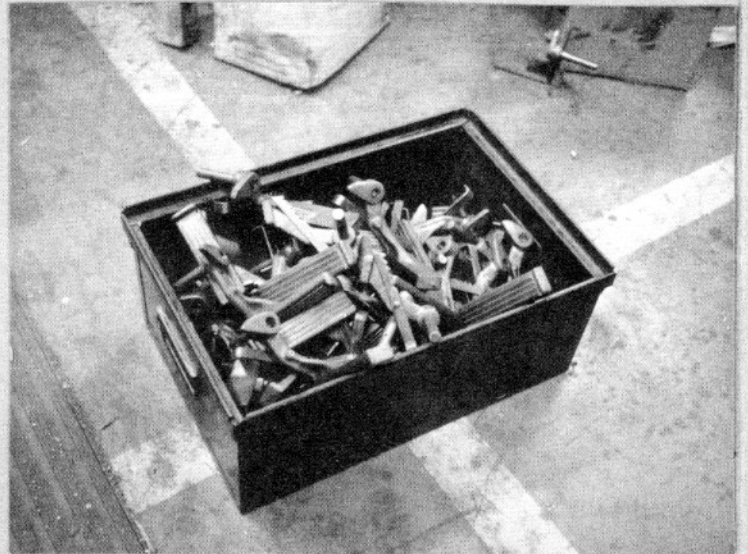
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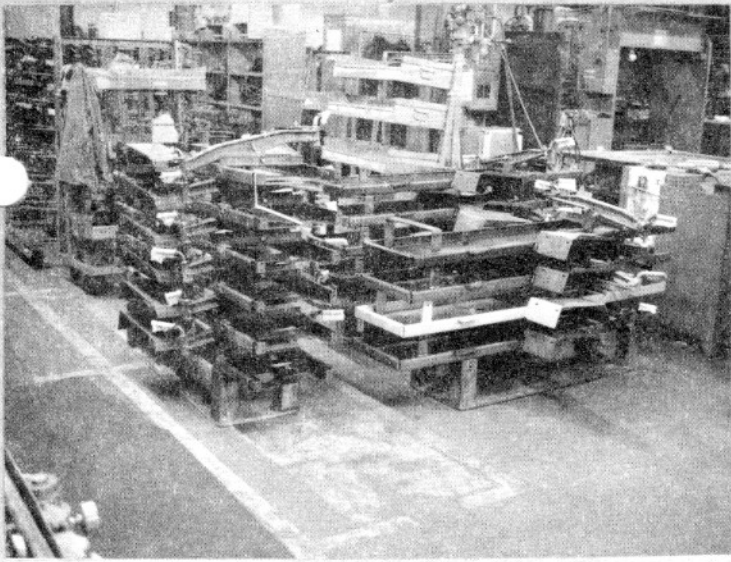
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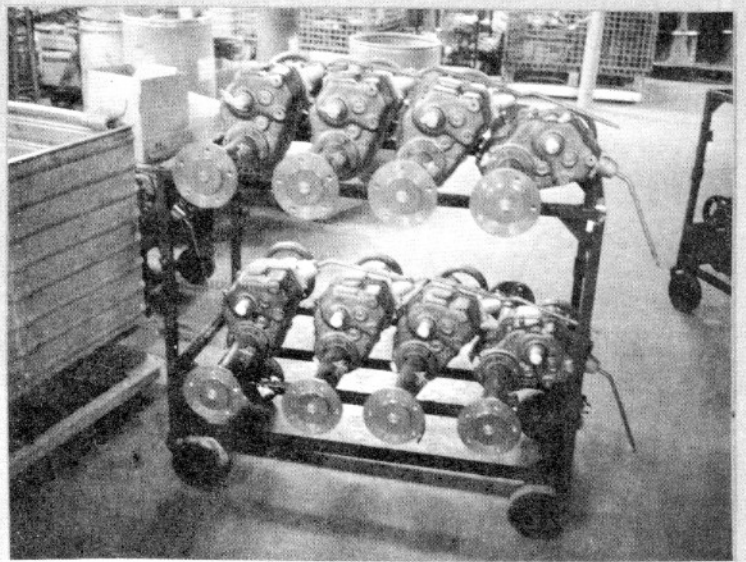
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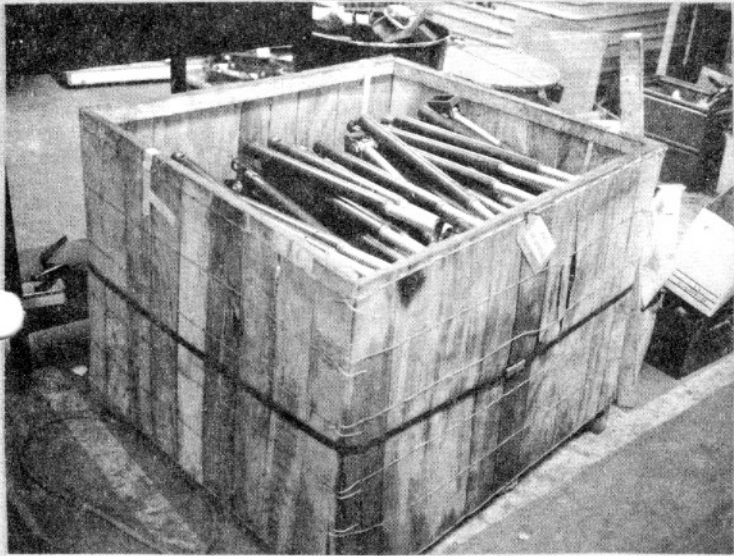
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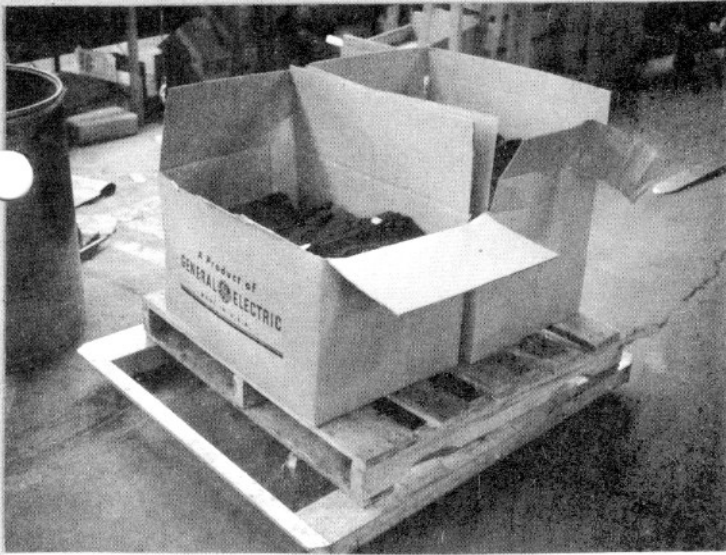


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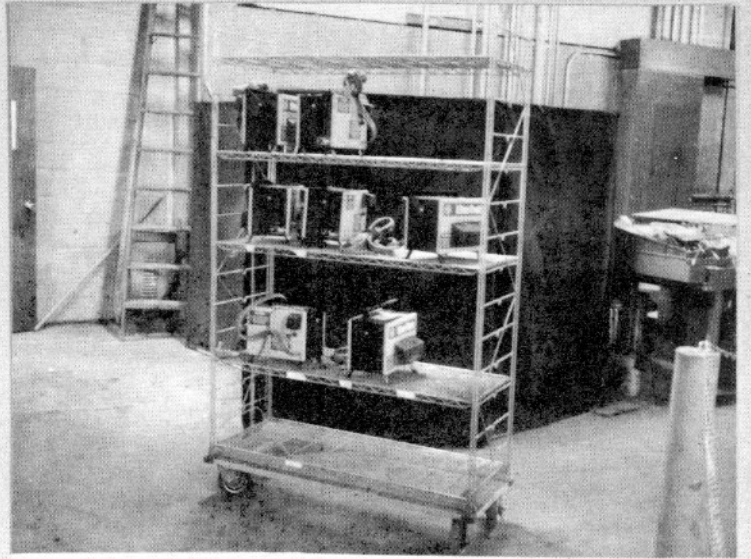


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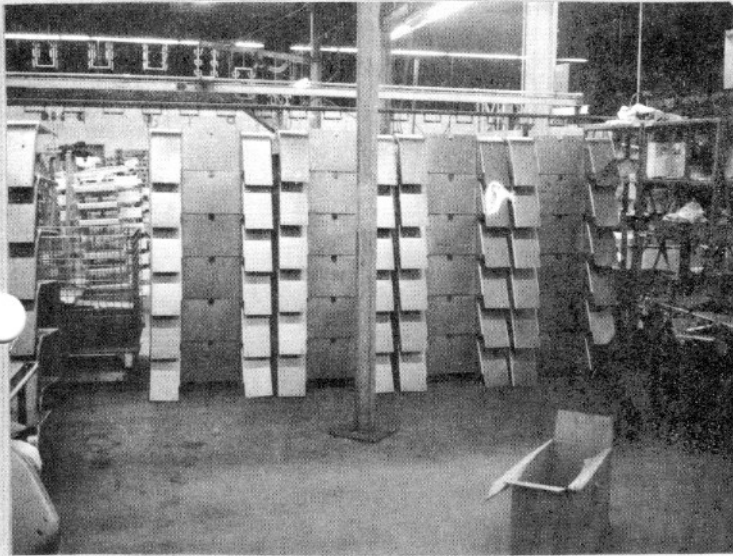




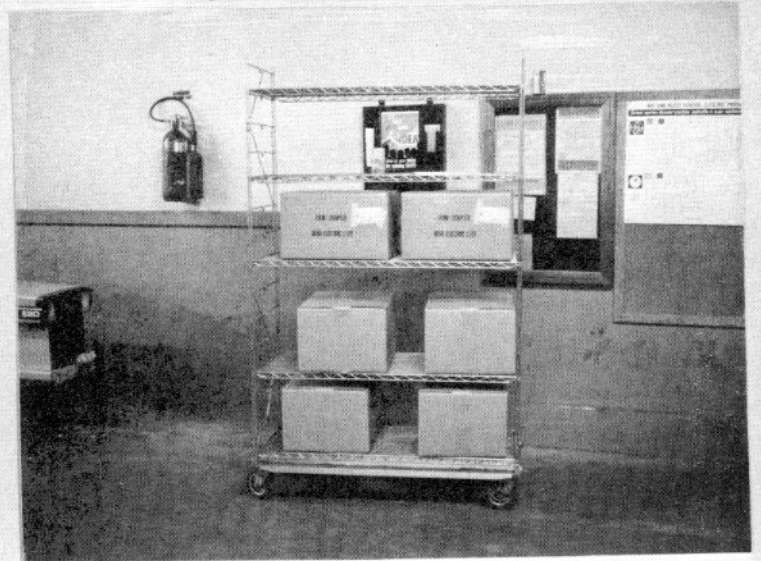
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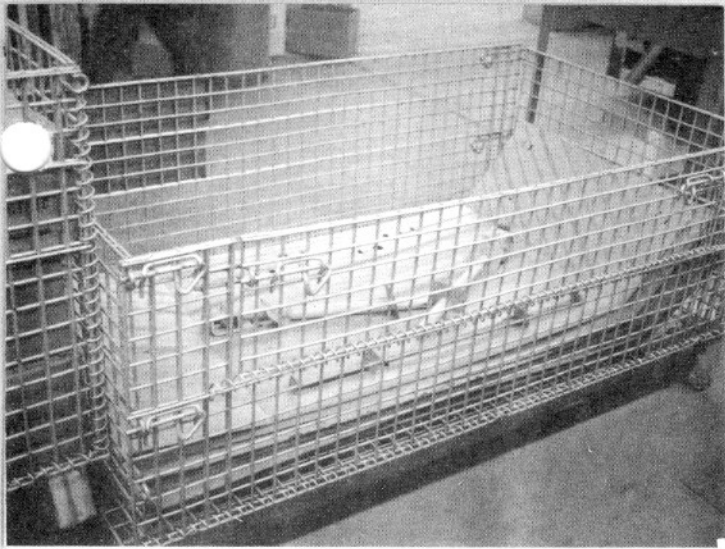
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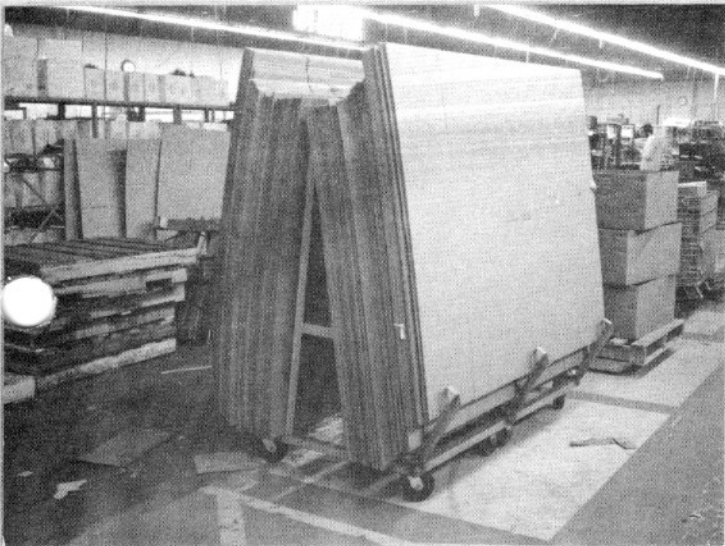
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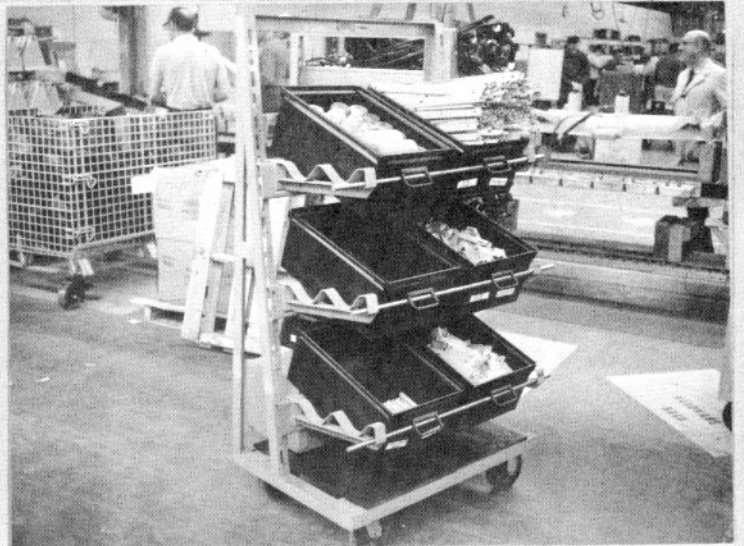
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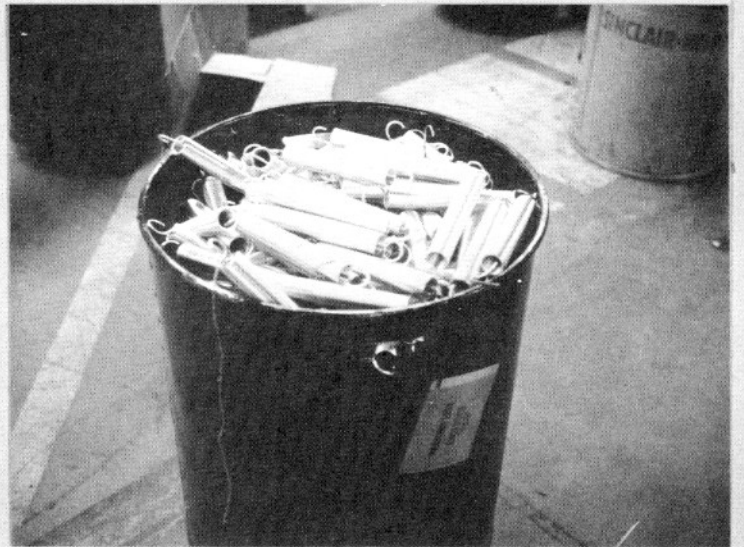
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The following pages contain pictures of parts worked on in the machine shop. Since a great deal of the work is on similar parts, no attempt has been made to show every single part. Instead, these pictures show typical parts and their storage in our rack system.

Picture	Application
1, 2	lathe parts
3, 5, 6	drill parts
4, 19, 20	parts for welding
7, 8, 9	saw parts
10, 11, 12	shear parts
13, 15, 16	bin storage*
14	paint area loading**
17, 18	press area parts
21, 24	raw castings
22, 23	finished castings

\* No more than 4 high, no more than 3,000# ea.

\*\* Bins are placed on pallet dollies and moved through paint area.

PART/CONTAINER TABLE

6 x 15 x 32 3/4 Vince Rasnik Trays

1.	Throttle Bracket	After Punch
2.	Seat Switch Bracket	After Punch
3.	Seat Switch Activator	After Punch
4.	Throttle Yoke	All the way
5.	Stop	All the way
6.	Yoke Shaft	All the way
7.	Batt. Clamp Angle	All the way
8.	Throttle Shaft	All the way
9.	Brake Shaft	All the way
10.	Batt. Box Angle	All the way
11.	Mower Plug	All the way
12.	Mower Bushing	All the way
13.	Roller Shaft	All the way
14.	Shaft Front Roller	All the way
15.	Guide Bars	All the way
16.	Adjuster Tubing	All the way
17.	Lift Tube	All the way
18.	Lift Guide	All the way

40 x 48 x 24 Steel Tote Boxes

1.	Upper Clamp	All the way
2.	Clamp Holddown	After Punch
3.	Clamp, Rear	All the way
4.	Th. Sw. Mount	All the way
5.	Roller Adjuster	All the way
6.	Clamp, Front	All the way
7.	Link Lever	All the way
8.	Yoke Arm	All the way
9.	Hood Spacer	All the way
10.	Heat Sink	After Punch
11.	Brake Bracket	After Punch
12.	Spindle Arms	All the way
13.	Plate Disc	After Punch
14.	Batt. Box Lug	After Punch
15.	Hitch Ext. Bar	All the way
16.	Strip	All the way
17.	Wire Cover	All the way
18.	Wire Box	All the way
19.	Guide Bar	All the way
20.	Yoke Brace	All the way

(Continued page 2)

30 x 48 x 24 Steel Tote Boxes (Continued)

21.	Gear Sect. Shaft	All the way
22.	Steering Shaft	All the way
23.	Mower Arm	All the way
24.	Mower Brace	All the way
25.	Adjuster Rod	All the way
26.	Spring Bracket	After Punch
27.	Lift Clevis	After Punch

40 x 48 x 30 Cargotainers

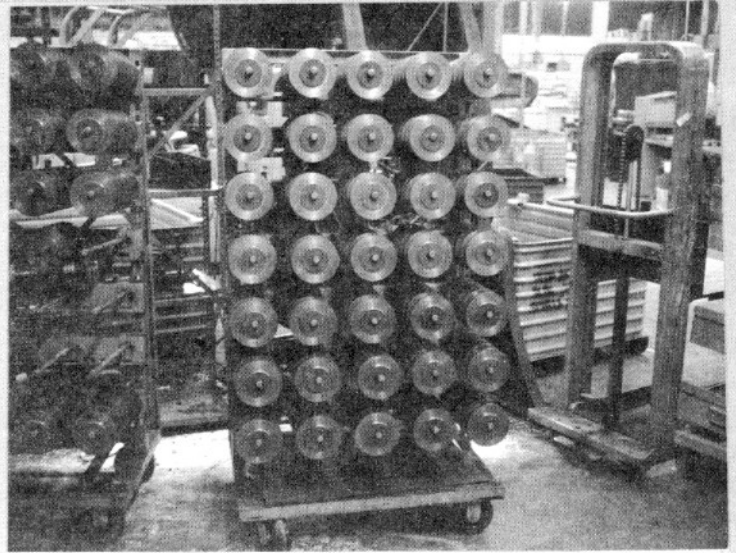
1.	Upper Panel	All the way
2.	Lower Panel	All the way
3.	Dash Panel	All the way
4.	Th. Sw. Plate	All the way
5.	End Cover	All the way
6.	Lift Support - R	All the way
7.	Lift Support - L	All the way
8.	Batt. Chg. Cover	All the way
9.	Bumper	All the way
10.	Cont. Cab. Cover	All the way
11.	Roller Support - R	All the way
12.	Roller Support - L	All the way
13.	Motor Plate	All the way
14.	Grills	All the way

40 x 72 x 24 Cargotainers

1.	Throttle Bracket	Through Shear
2.	Seat Switch Bracket	Through Shear
3.	Seat Switch Actuator	Through Shear
4.	Brake Bracket	Through Shear
5.	Lift Clevis	Through Shear
6.	Batt. Box Shell	All the way
7.	Heat Sink	Through Shear
8.	Disconnect Plate	Through Shear
9.	Batt. Box Lug	Through Shear
10.	Spring Bracket	Through Shear
11.	Control Cabinet	Through Shear
12.	Clamp Holddown	Through Shear



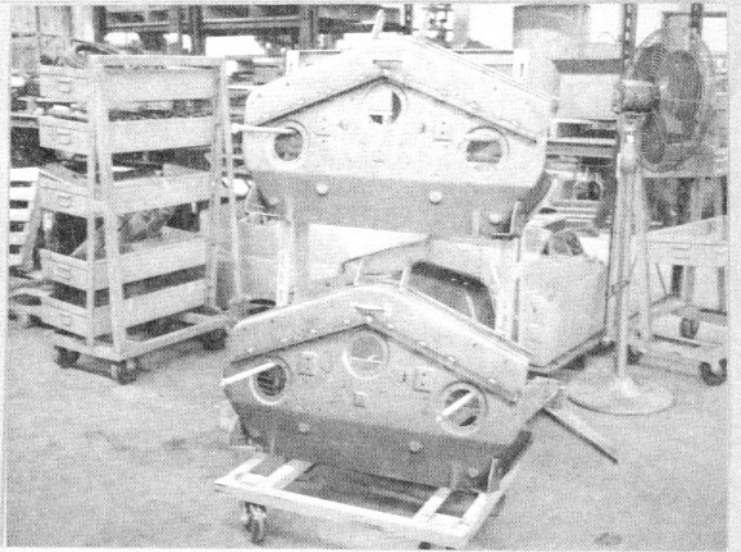
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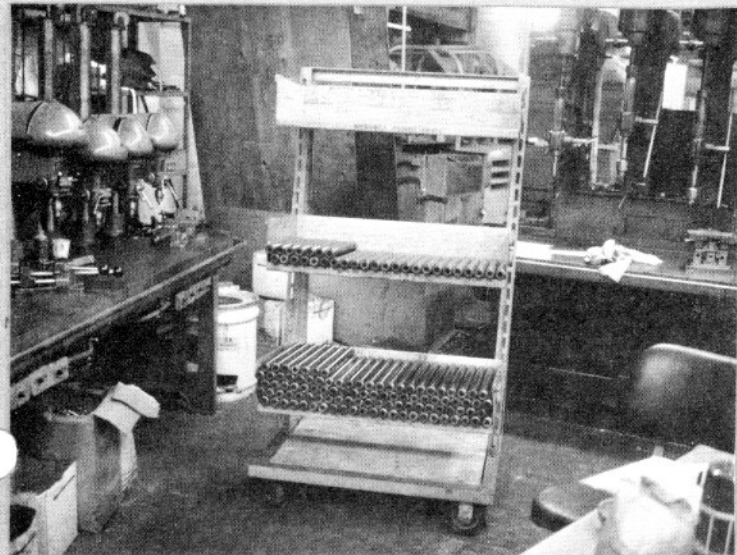
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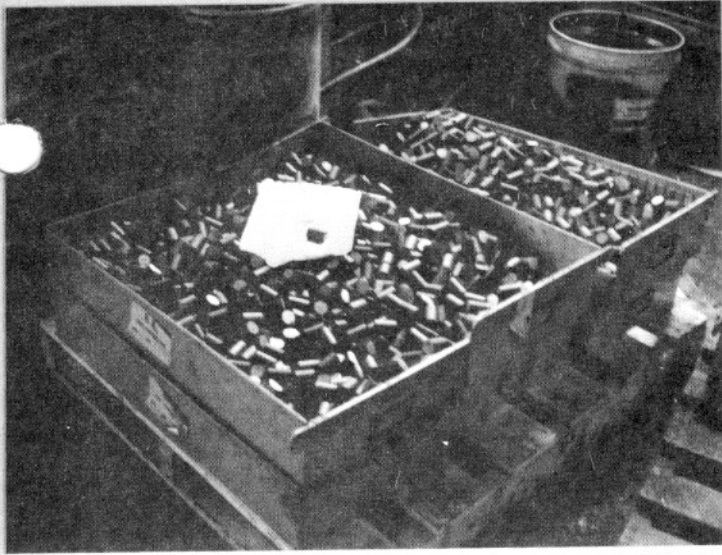
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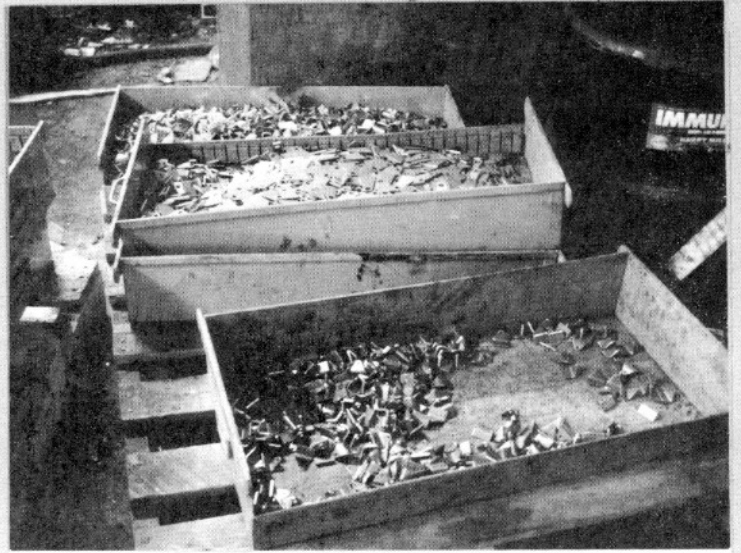
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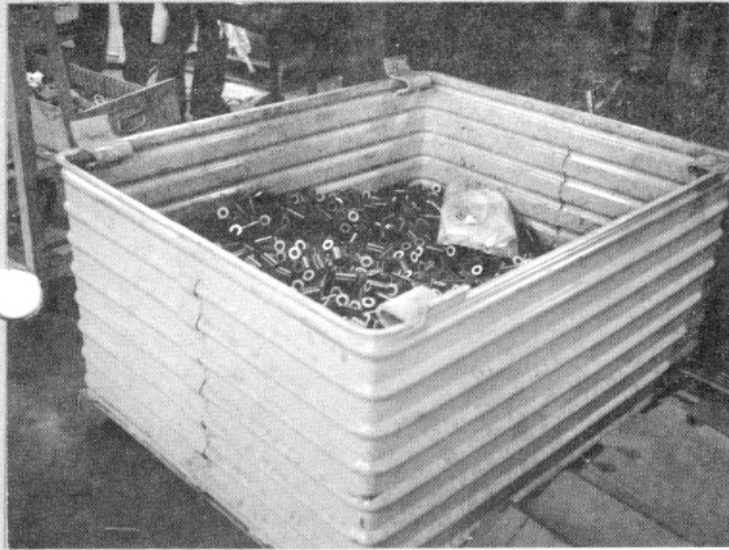
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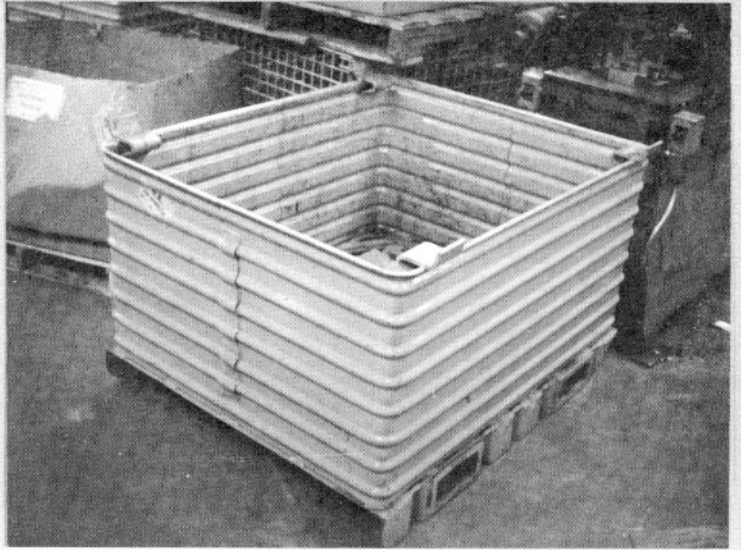
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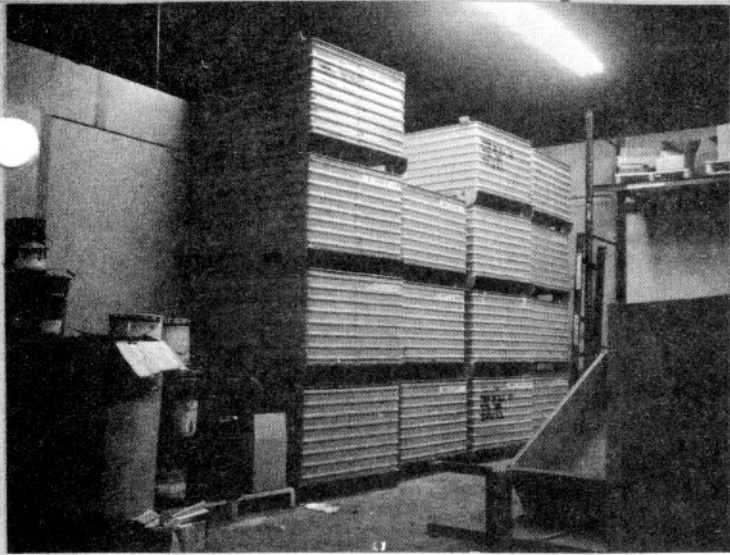
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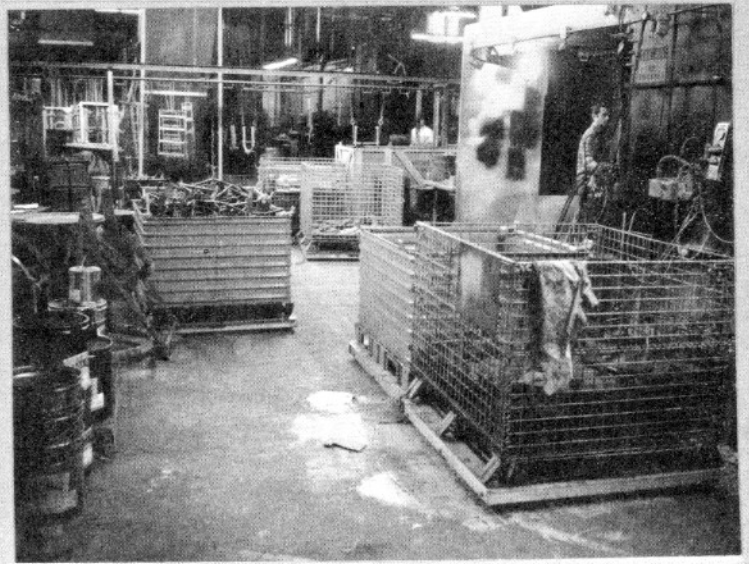
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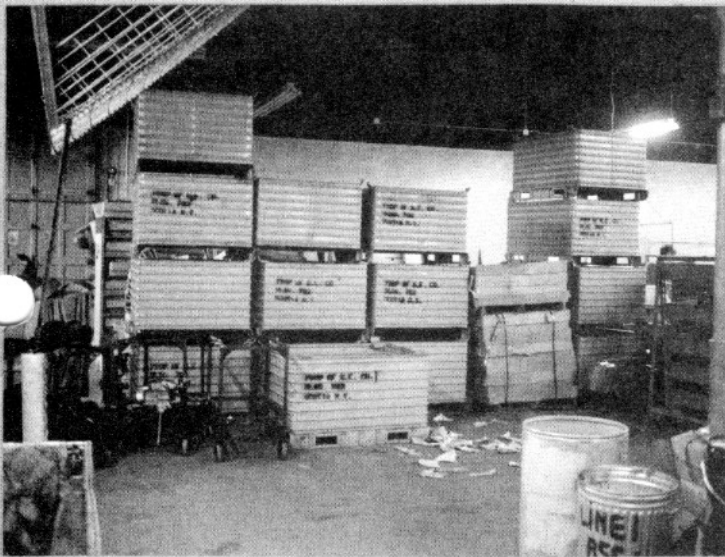
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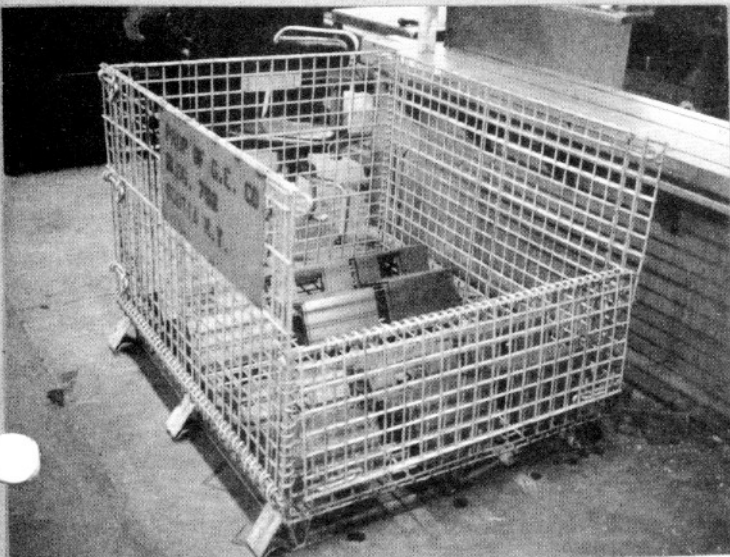
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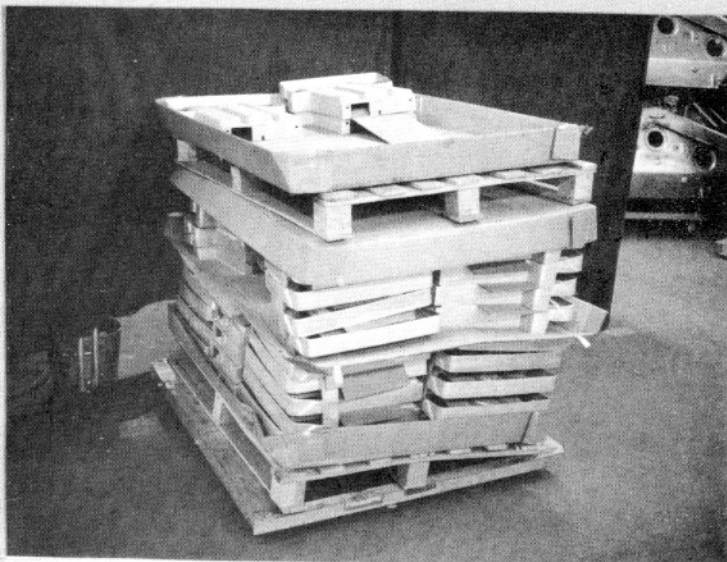
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