

AT MICROFICHE REFERENCE LIBRARY

A project of Volunteers in Asia

Set of Construction Drawings for 12PU350 and
12PU500 Windmills

Published by:

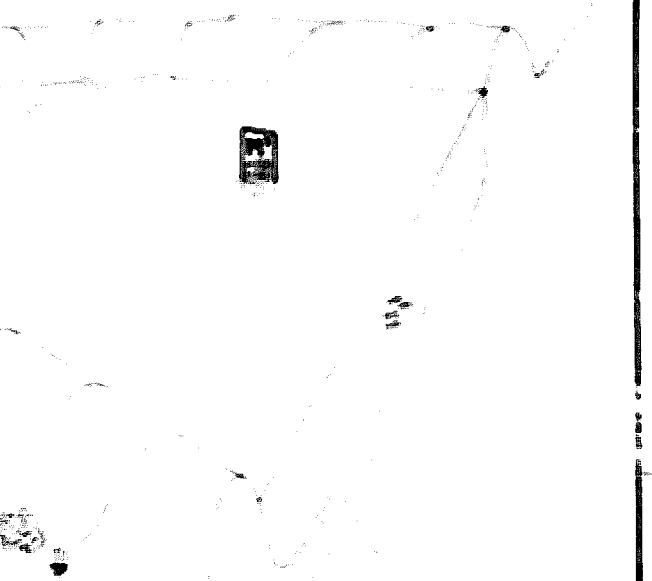
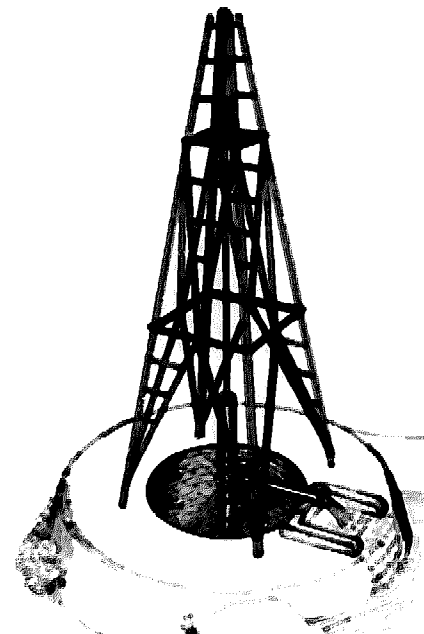
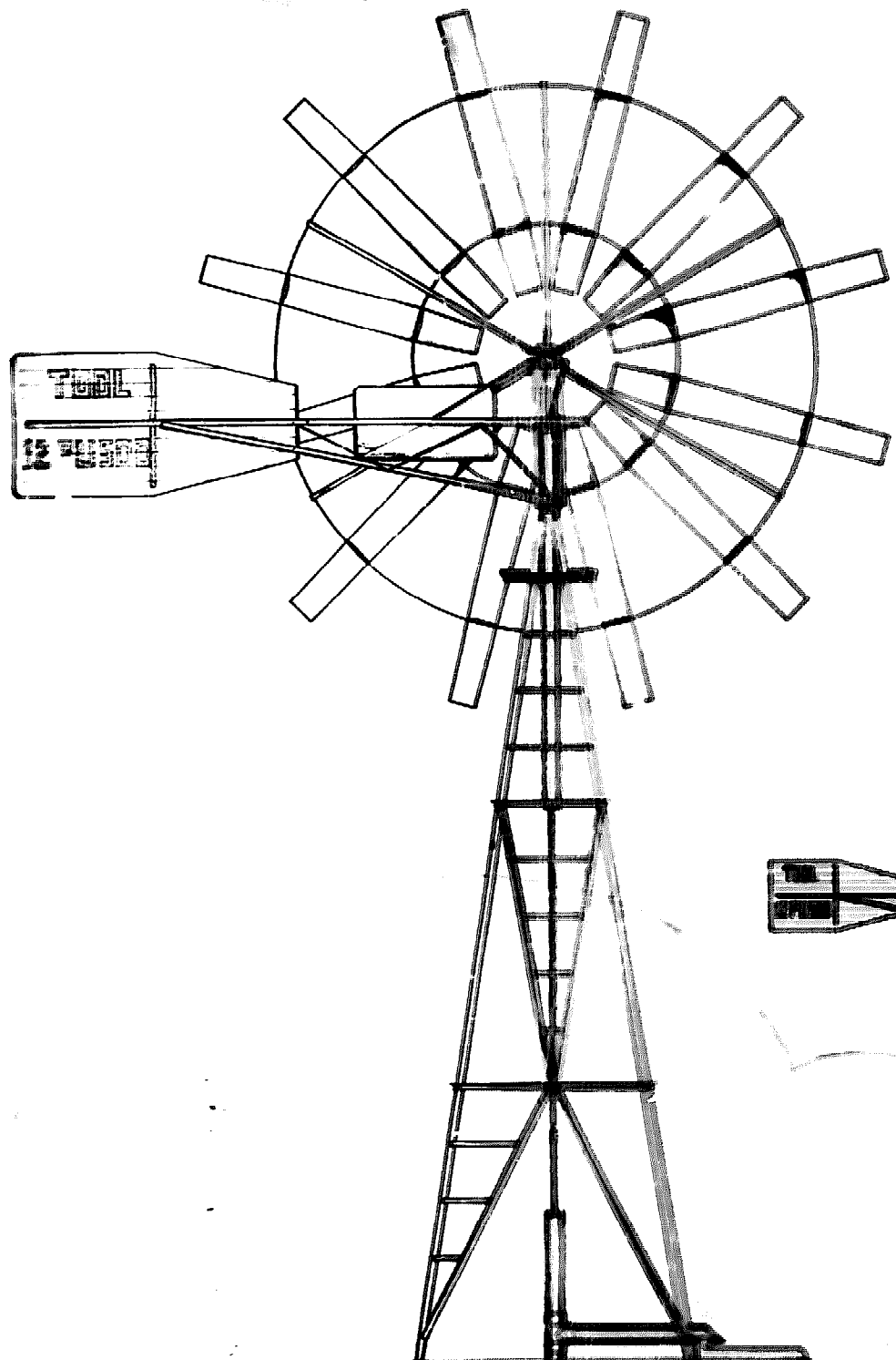
Stichting TOOL
Entrepotdok 68A/69A
1018 AD Amsterdam
The NETHERLANDS

Available from:

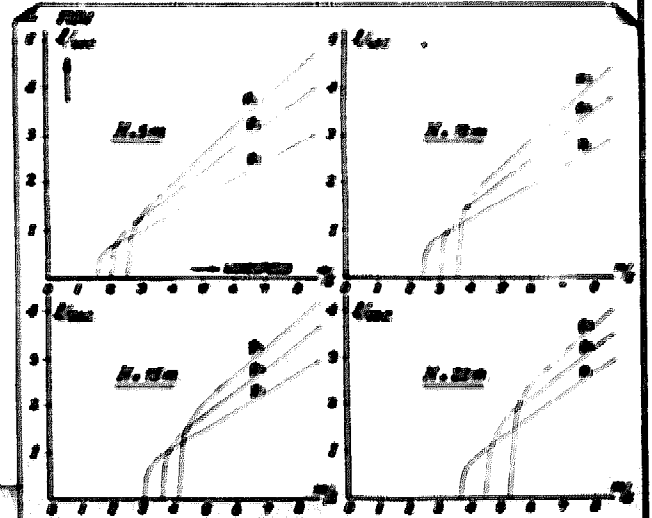
same as above

Reproduced by permission.

Reproduction of this microfiche document in any
form is subject to the same restrictions as those
of the original document.

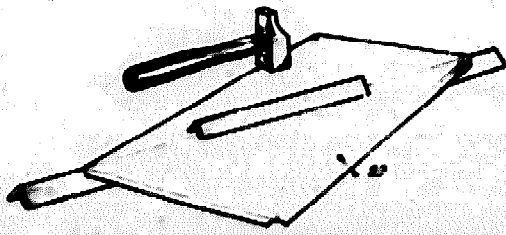
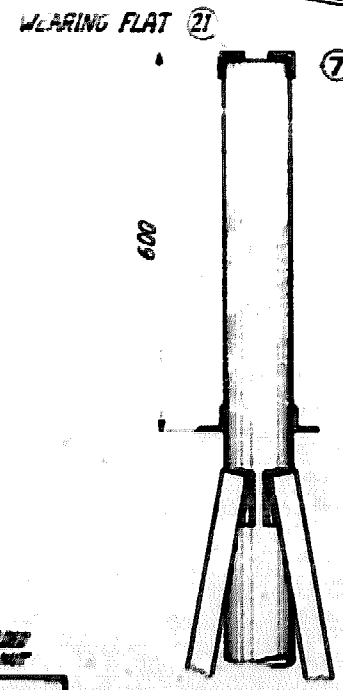
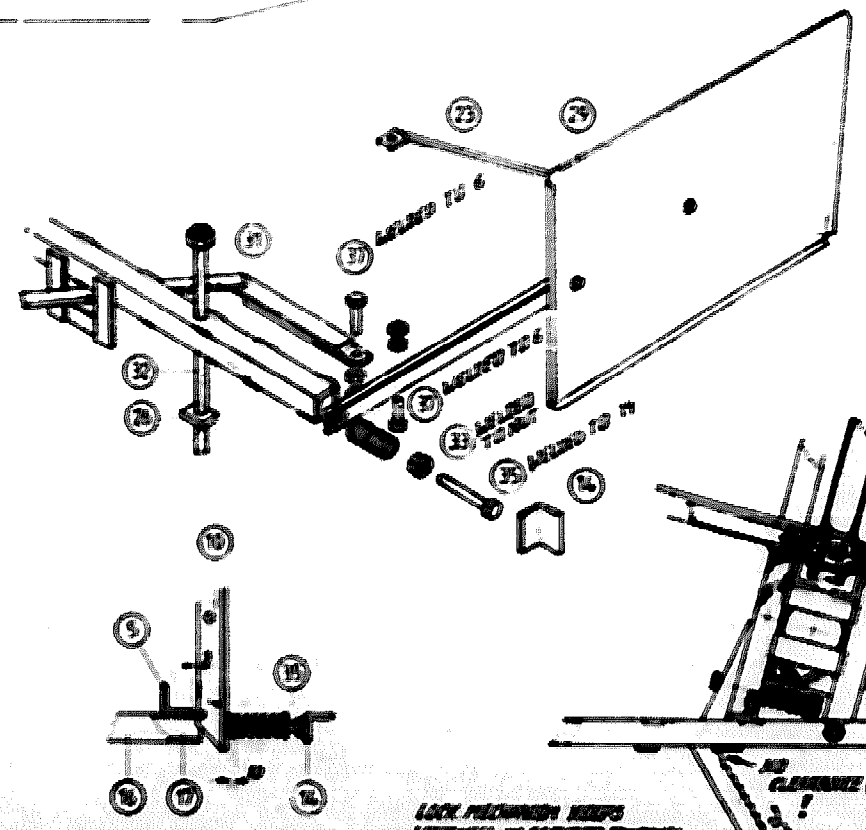
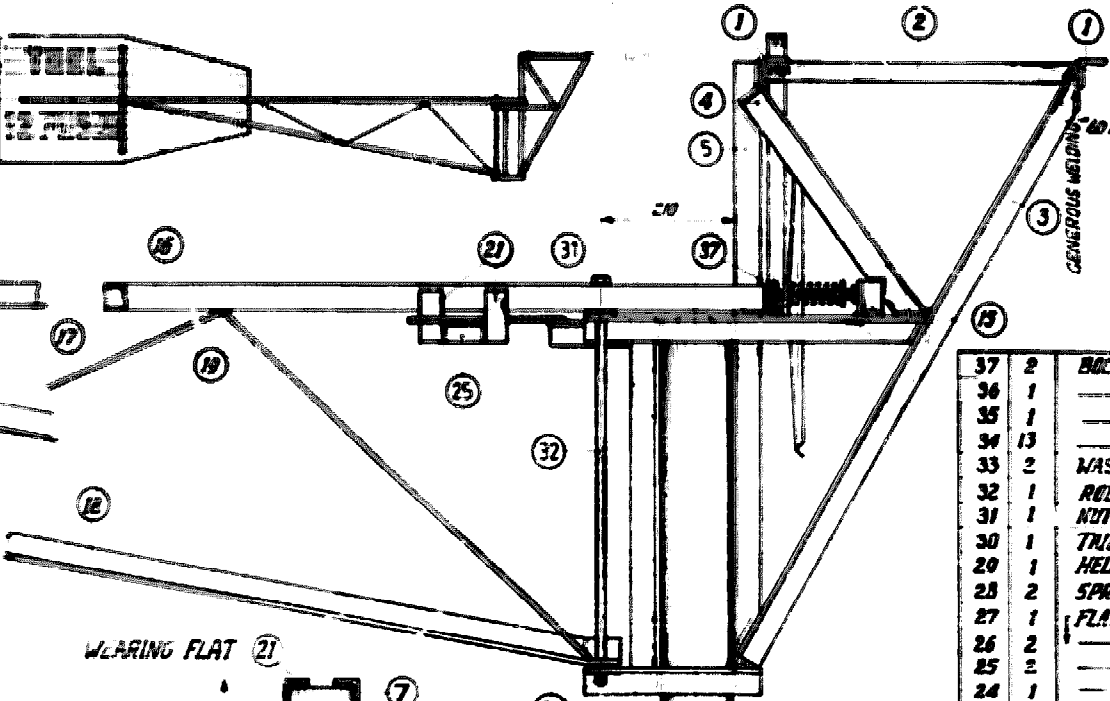
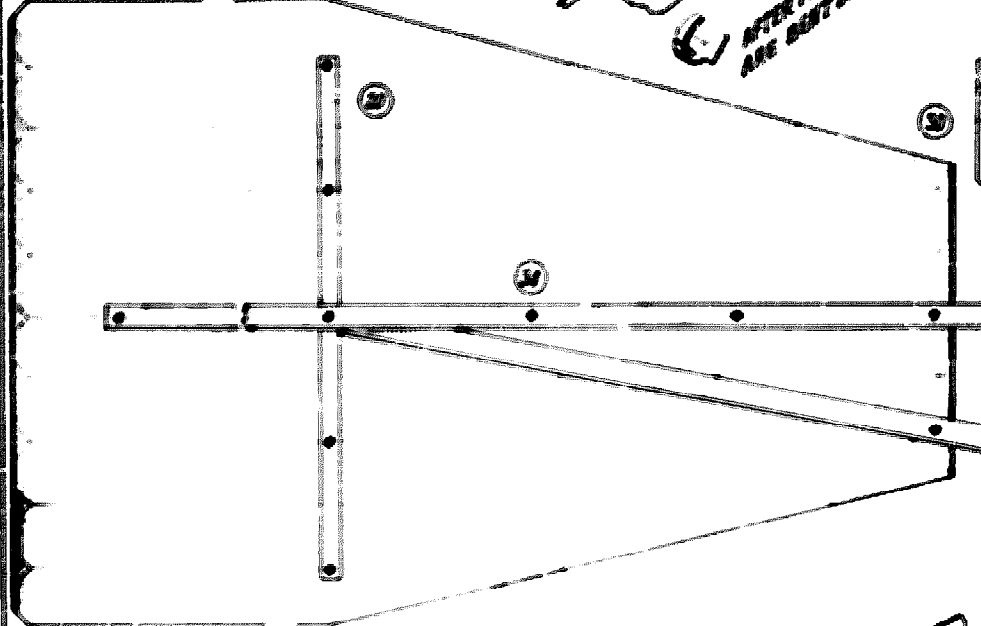
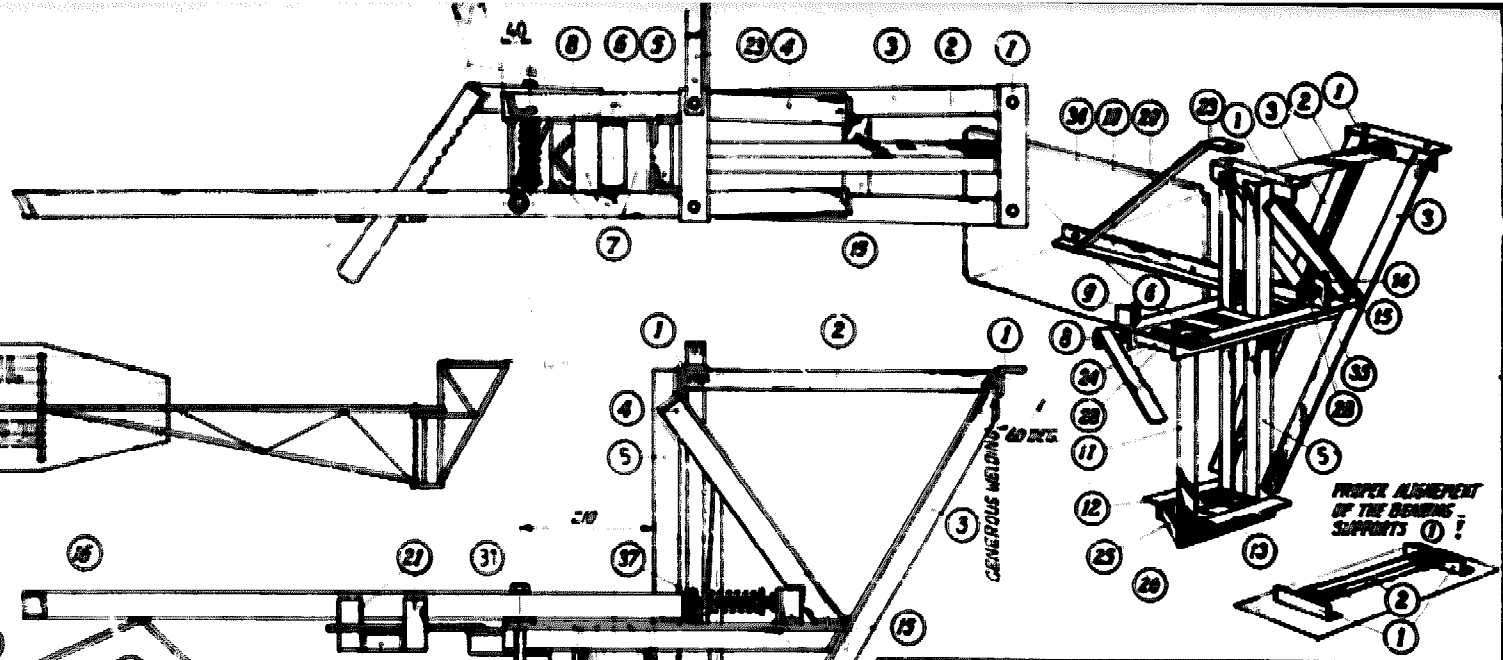
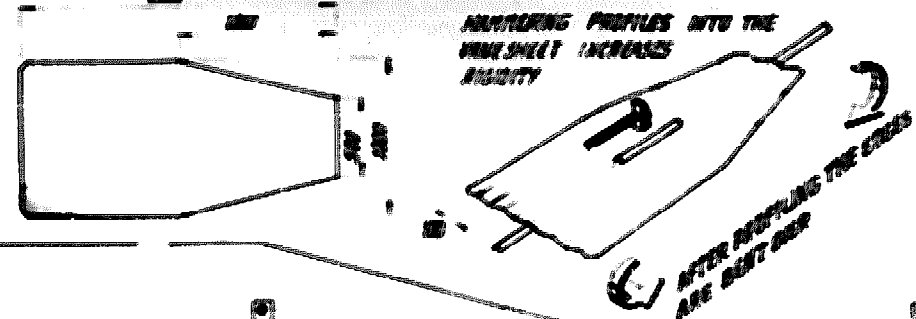


H. 1000000
 K. 10000
 L. 1000000000
 M. 1000000
 FOR 1000000000



12 FUSID WINDMILL FOR IRRIGATION

FOR INFORMATION:



LOCK MECHANISM KEEPS WINDMILL IN SECURED POSITION (75 DEG. OUT OF THE WIND)

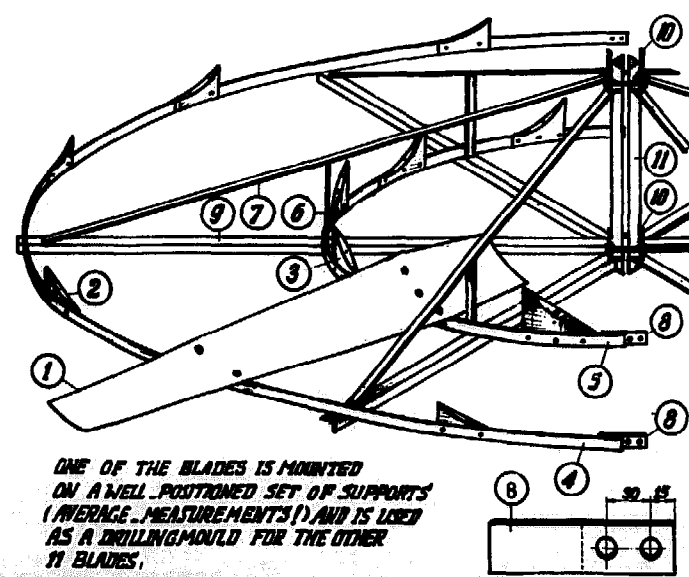
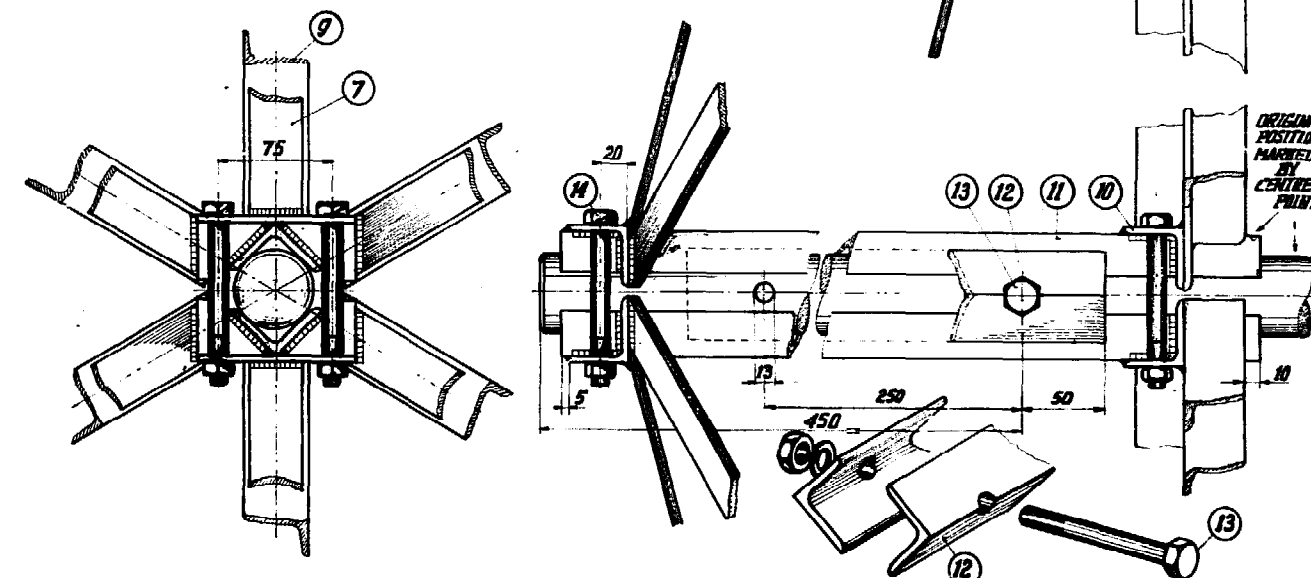
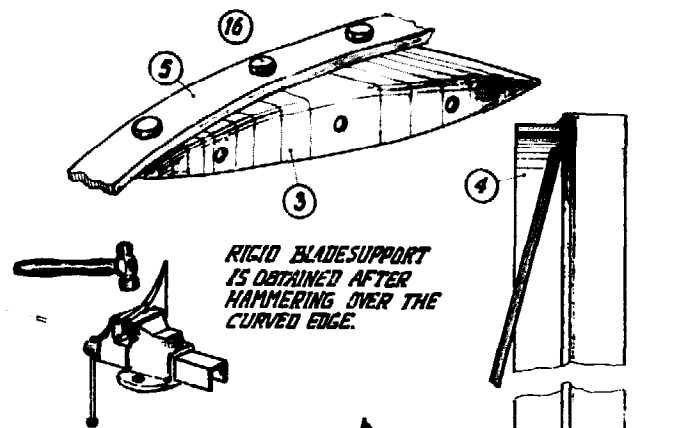
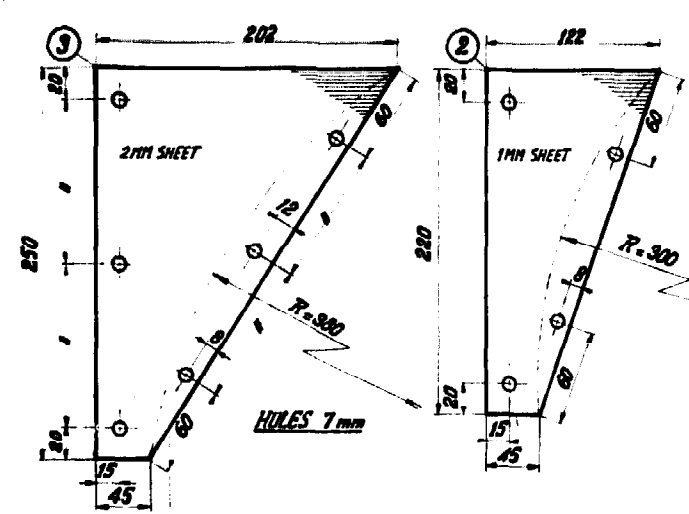
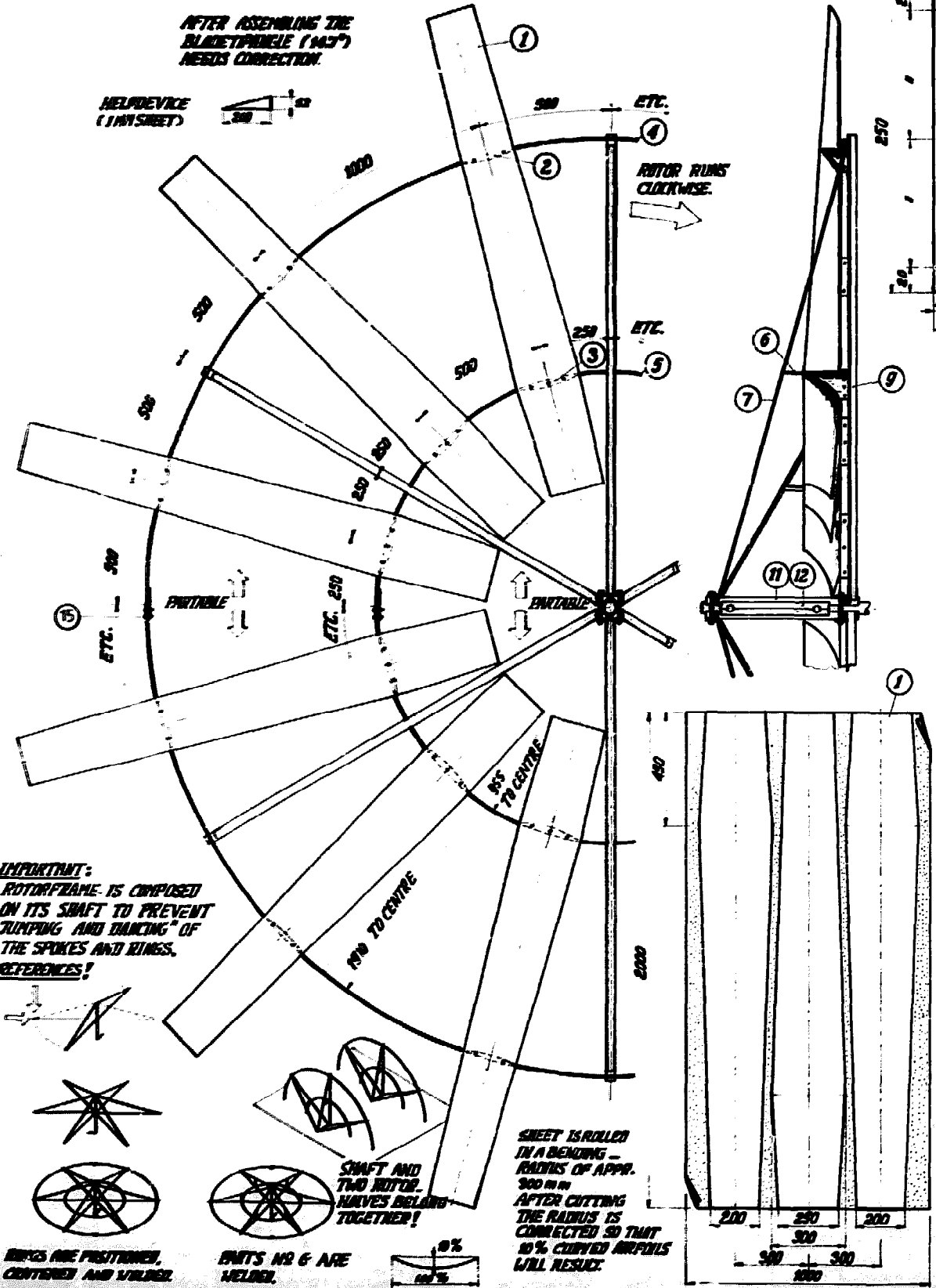
HELP FRAME SHEET IS PROFILED DIAGONALLY AND EDGES ARE BENT OVER 45 DEG.

37	2	BOLT, NUT, WASHER	M12 x 40	(1 1/4" x 1 1/2")
36	1	---	M10 x 150	(1 1/8" x 6")
35	1	---	M12 x 100	(1 1/4" x 4")
34	13	---	M 6 x 25	(1/4" x 1")
33	2	WASHER	ø 12	(ø 1/2")
32	1	ROD	ø 18 x 650	(ø 3/4" x 2')
31	1	NUT	M20	(1 1/2")
30	1	TRICRYANE	1 mm SHEET	2000 x 1000
29	1	HELPPANE	---	1000 x 500
28	2	SPRING	APPR. ø 30 x 100 x 64	---
27	1	FLAT IRON	30 x 6 (1 1/4" x 1/4")	LENGTH 100
26	2	---	---	50
25	2	---	---	130
24	1	---	---	115
23	1	---	---	90
22	1	---	---	360
21	4	---	---	90
20	1	---	---	830
19	3	---	---	750
18	1	ANGLE IRON	40 x 40 x 4 (1 1/2" x 1 1/2")	LENGTH 3000
17	1	---	---	400
16	1	---	---	1500
15	1	---	---	180
14	1	---	---	60
13	1	---	---	200
12	1	---	---	200
11	1	---	---	500
10	1	---	---	1000
9	1	---	---	45
8	1	---	---	100
7	4	---	---	TOWER PIPE DIA.
6	2	---	---	540
5	2	---	---	1000
4	2	---	---	400
3	2	---	---	1000
2	1	---	---	500
1	2	---	---	340

NO. 1001/1002 MATERIAL/NAME/REMARKS/MEASUREMENTS

HEROCONSTRUCTION - 12 PVS00 - WINDMILL

FOR INFORMATION:

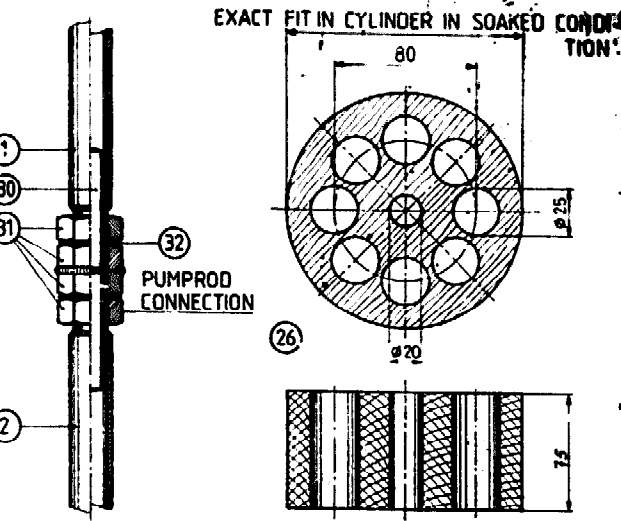
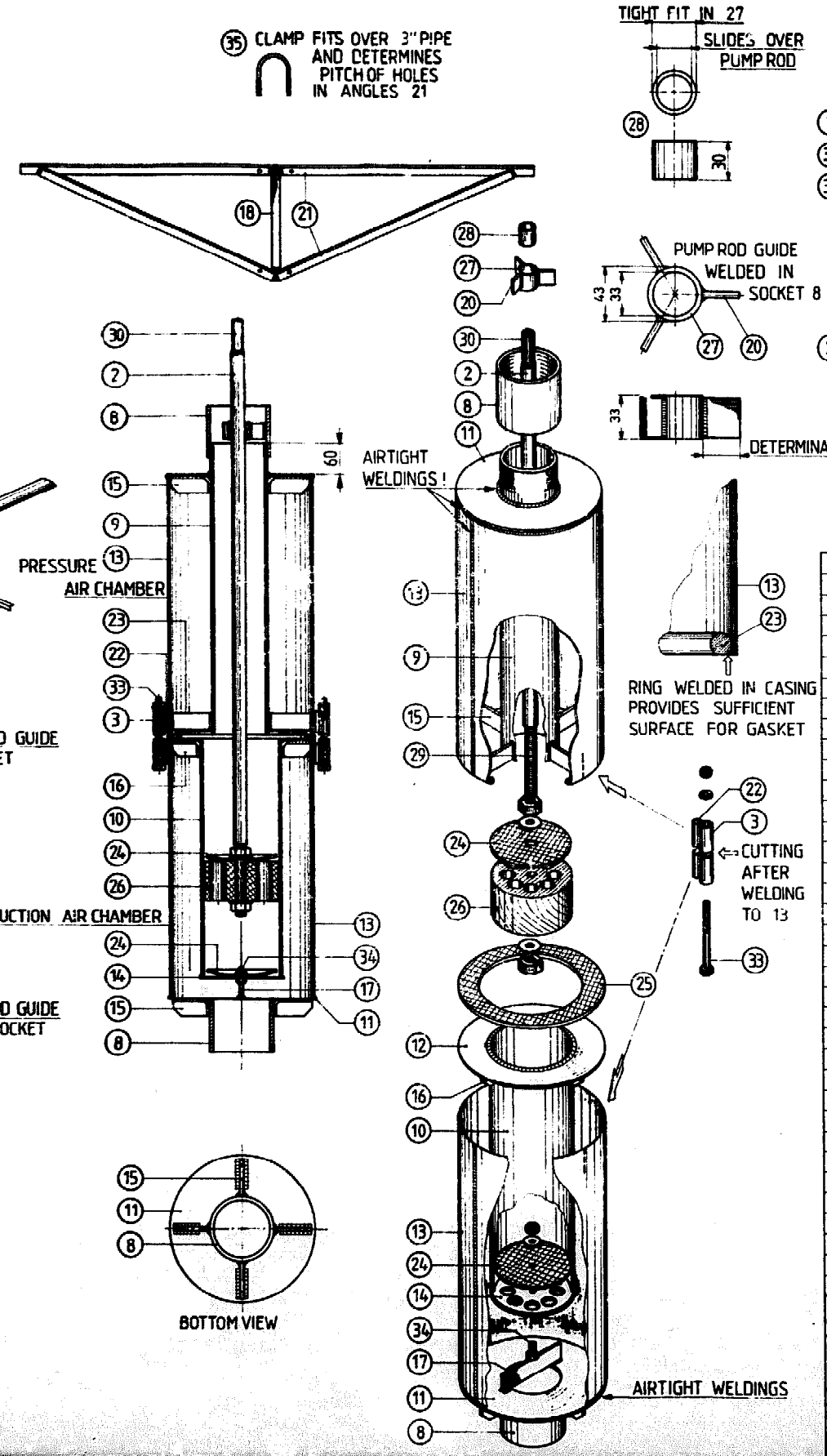
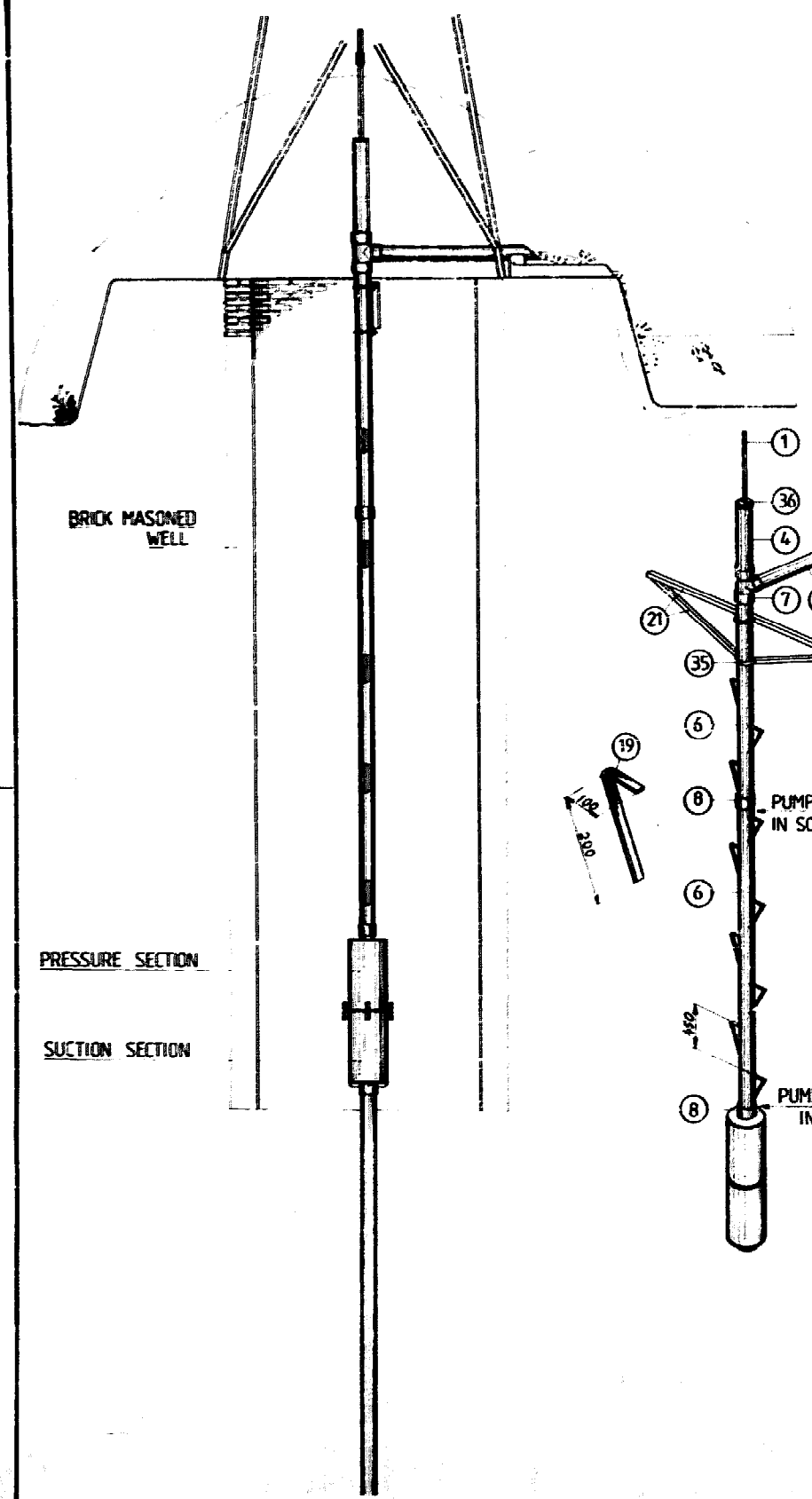


16	120	BOLT, NUT, WASHER	M6x20 (W 1/4" x 3/4")
15	8		M10x25 (W 3/8" x 1")
14	4		M12x100 (W 1/2" x 4")
13	2		M12x125 (W 1/2" x 5")
12	2	ANGLE IRON	50x50x5 (2" x 2") x 350
11	2		40x40x4 (1 1/2" x 1 1/2") x 625
10	4		x 100
9	6		x 1500
8	4	FLAT IRON	30x6 (1 1/4" x 1/4") x 120
7	6		x 1500
6	6		x 250
5	2		x 3000
4	2		x 6000
3	12	BLADE SUPPORT	2mm SHEET
2	12		1mm
1	12	BLADE	4 STANDARD SHEETS 1000x2000
NO. OF	MATERIAL/NAME/REMARKS/MEASUREMENTS		

FOR INFORMATION:

ROTOR FOR - 12 FU500 - WINDMILL (A-2)

0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z



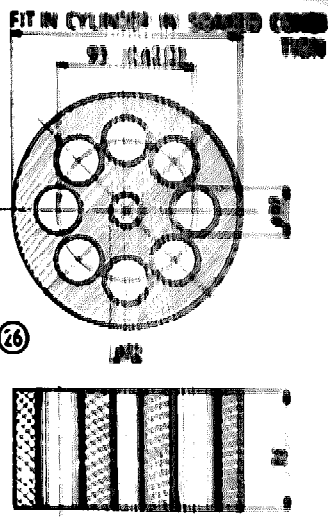
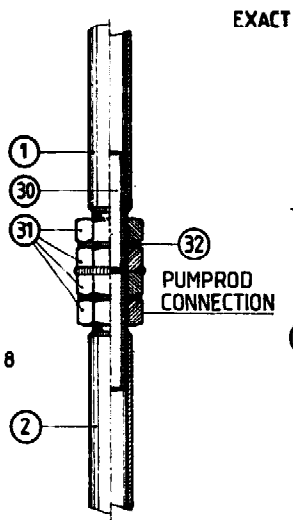
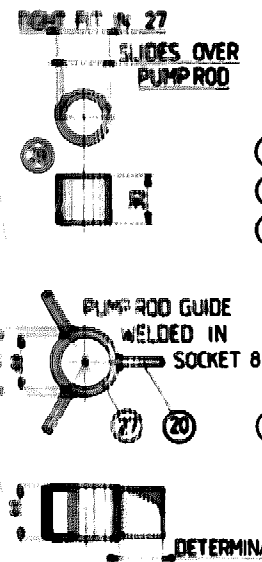
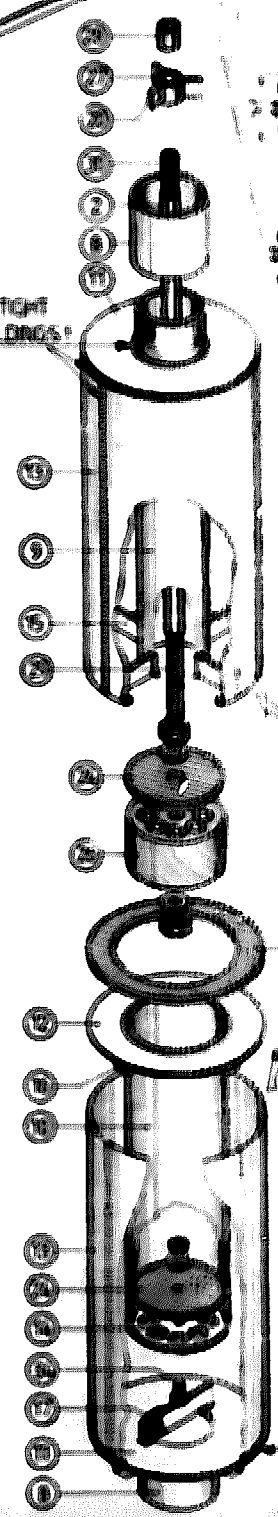
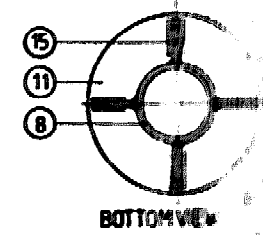
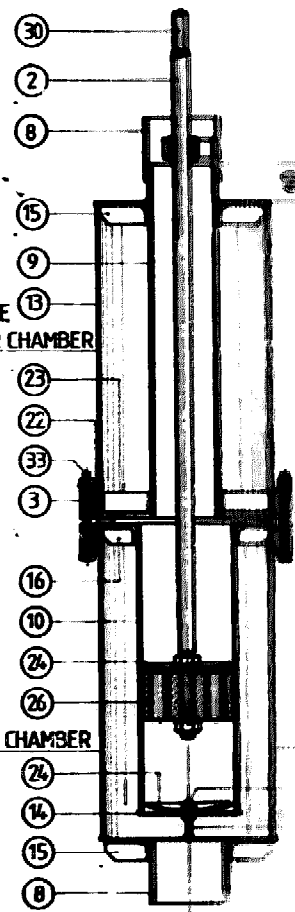
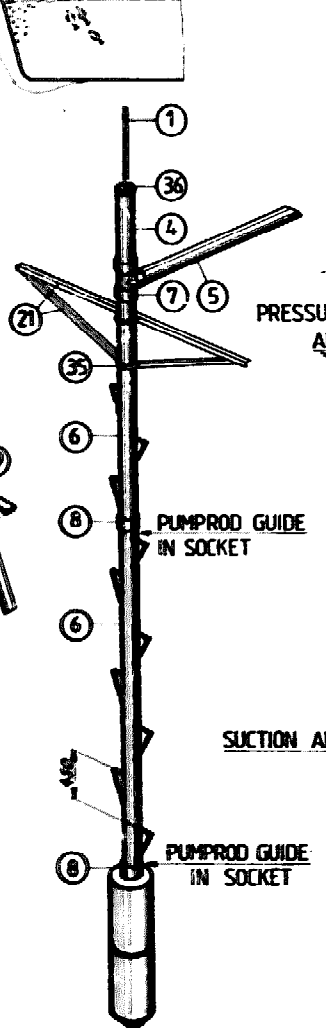
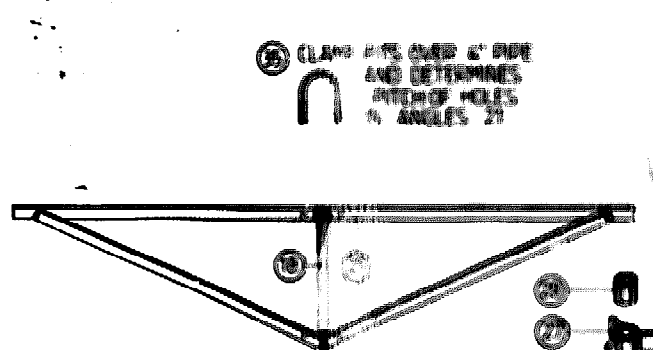
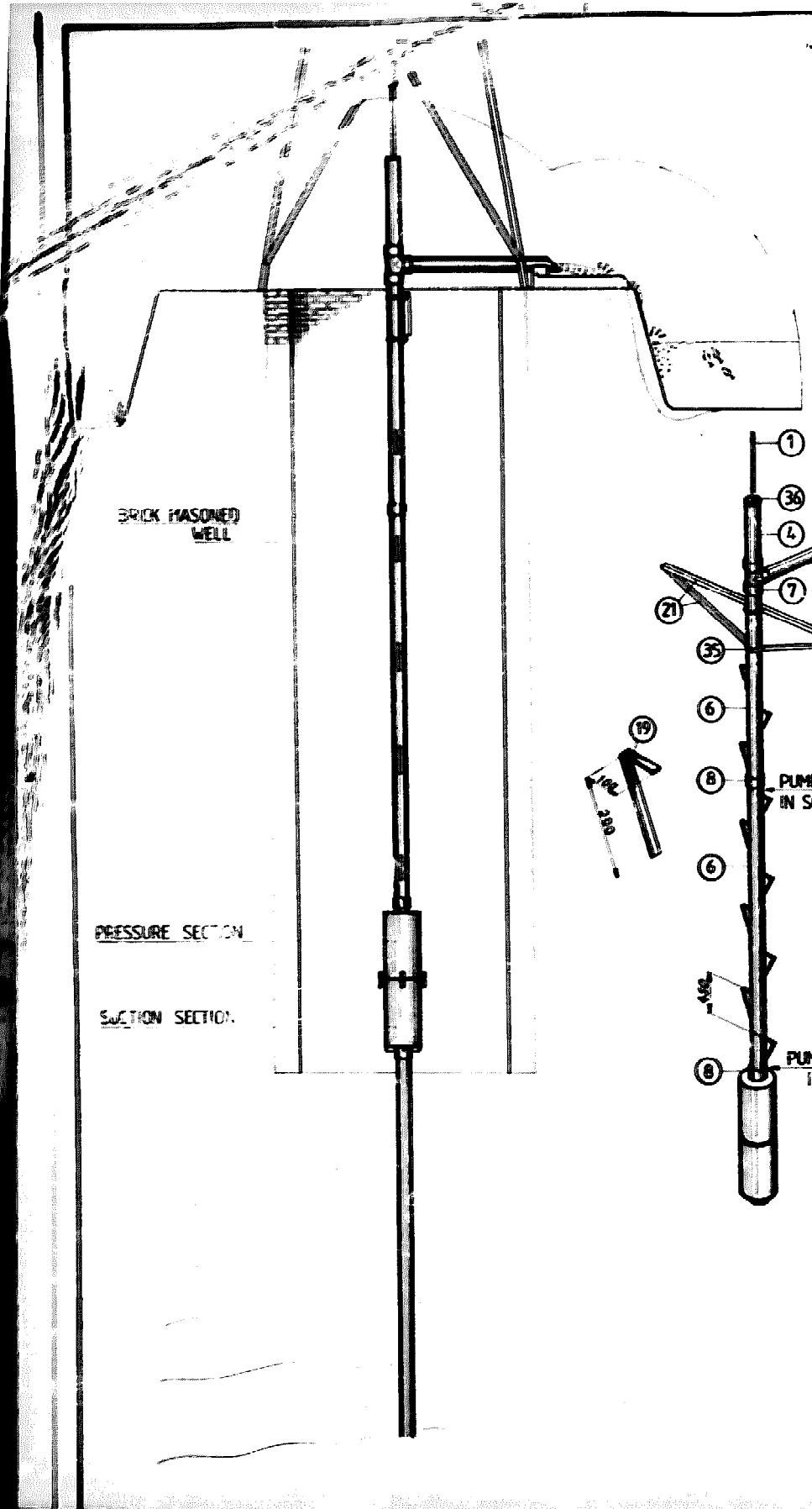
* AMOUNT OR SIZE DEPEND ON CIRCUMSTANCES

36	1	WOODEN PUMPROD GUIDE : 27 IN DRAWING NO 4
35	2	CLAMP ROD ϕ 12 (1/2") x 300
34	1	BOLT - NUT - WASHER M12 x 20 (W 1/2 x 3/4)
33	4	BOLT NUT WASHER M12 x 125 (W 1/2 x 5")
32	*	SPRING WASHERS M24 (W 7/8")
31	*	NUTS M24 (W 7/8")
30	*	THREAD STUD M24 x 100 (W 3/4 x 4")
29	1	THREAD STUD M24 x 150 (W 7/8 x 6")
28	*	GUN METAL BUSH ϕ 33 x 30
27	*	STEEL BUSH ϕ 43 x 33
26	1	PISTON TEAKWOOD
25	1	GASKET SOLE LEATHER ϕ 250 x 6
24	2	VALVE ϕ 125 x 6
23	1	RING ROD ϕ 8 (7/8") x 74.5
22	8	FILLING PIECE x 40
21	2	ANGLE IRON 40 x 40 x 4 (1 1/2 x 1 1/2) x *
20	3	FLAT IRON 30 x 6 (1 1/8 x 1/4) x *
19	*	x 300
18	1	x 450
17	1	x 155
16	4	x 50
15	12	x 75
14	1	FOOTVALVE 2 mm SHEET ϕ 145
13	2	CASING 500 x 775
12	1	CASING FLANGE ϕ 250
11	2	CASING FLANGE ϕ 250
10	1	CYLINDER SEAMLESS 5" GASPIPE x 460
9	1	DELIVERY PIPE 3" x 560
8	*	SOCKET FOR 3"
7	1	T - SOCKET 3"
6	*	DELIVERY PIPE (EXTENSION) 3" x *
5	1	EXHAUST PIPE 3" x *
4	1	TOPPIPE 3" x 750
3	4	PIPE 1/2" x 100
2	1	PUMPROD 3/4" x 950
1	1	PUMPROD EXTENSION 3/4" x *
NO	NUM	MATERIAL / NAME / REMARKS / MEASUREMENTS
6	OF	7
6	OF	7

5" PISTON PUMP FOR 12 PU 500

FOR INFORMATION :

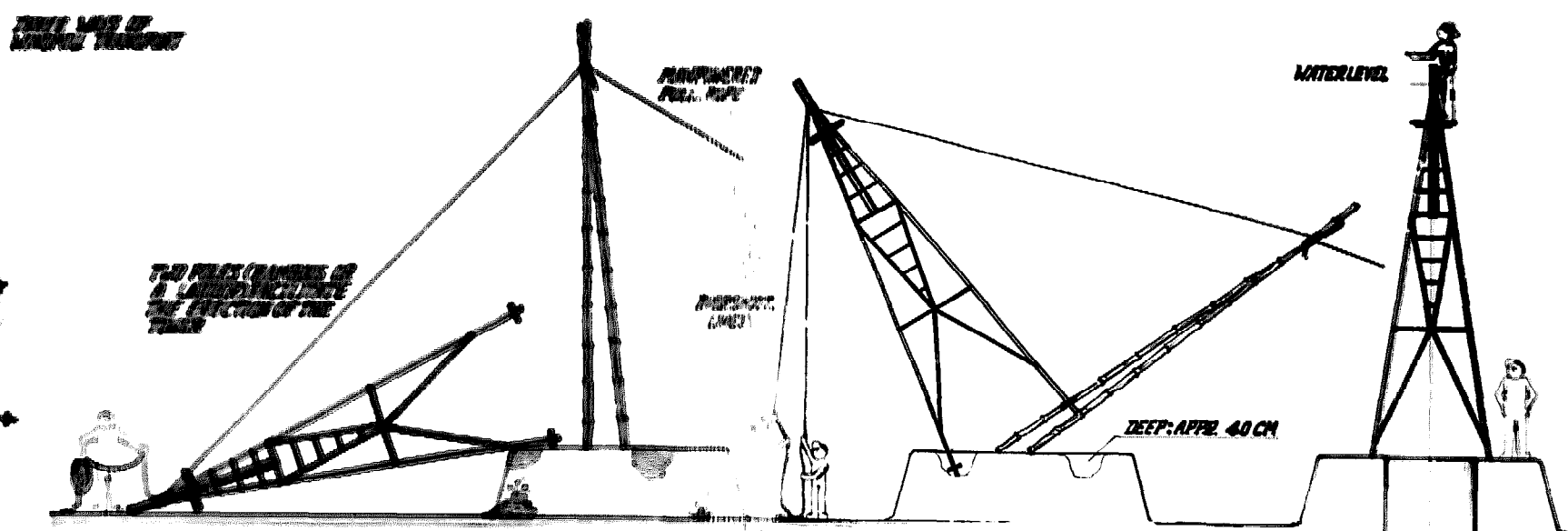
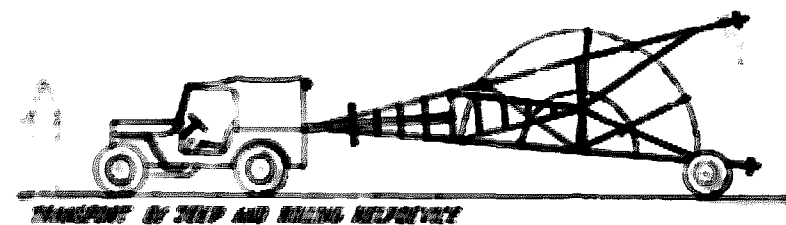
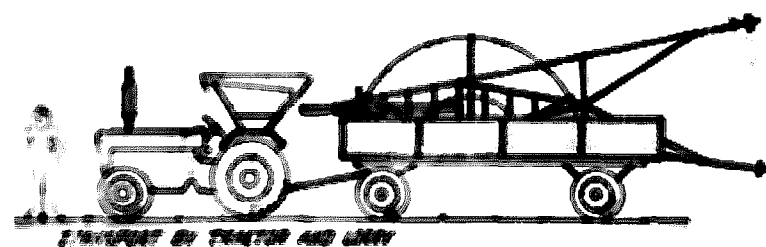
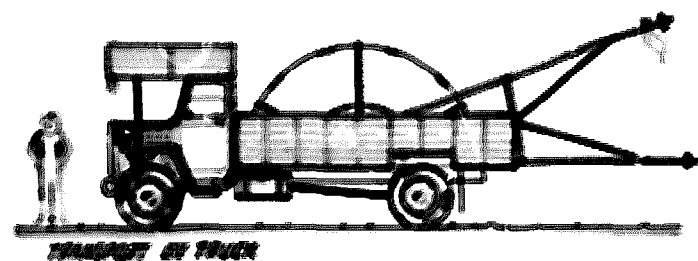
© 1982 WILEY-INTERSCIENCE
FOR FOUNDATION
WILEY-LISS & CO.
HOBOKEN, N.J.



* AMOUNT OR SIZE DEPEND ON CIRCUMSTANCES

36	1	WOODEN PUMPROD GUIDE	27 IN SHAWING NO 4	
35	2	CLAMP	ROD Ø 1 1/8" Ø 3/8"	
34	1	BOLT - NUT - WASHER	M 12 x 20 (Ø 1/2" x 5")	
33	4	BOLT NUT WASHER	M 12 x 20 (Ø 1/2" x 5")	
32	*	SPRING WASHERS	M 24 (Ø 1/8")	
31	*	NUTS	M 24 (Ø 1/8")	
30	*	THREAD STUD	M 24 x 10 (Ø 1/8" x 4")	
29	1	THREAD STUD	M 24 x 10 (Ø 1/8" x 4")	
28	*	GUN METAL BUSH	Ø 1 1/8" x 30	
27	*	STEEL BUSH	Ø 1 1/8" x 30	
26	1	PISTON	TEAM Ø 1 1/8"	
25	1	GASKET	SOLE LEATHER Ø 1 1/8" x 6	
24	2	VALVE	Ø 1 1/8" x 6	
23	1	RING	ROD Ø 8 (1/2") Ø 1/8"	
22	8	FILLING PIECE	Ø 8	
21	2	ANGLE IRON	40x40x6 (1 1/2" x 1 1/2" x 1/4")	
20	3	FLAT IRON	30 x 6 (1 1/8" x 1/4")	
19	*			Ø 300
18	1			Ø 450
17	1			Ø 100
16	4			Ø 60
15	12			Ø 85
14	1	FOOT VALVE	2 mm SHEET	Ø 170
13	2	CASING		Ø 300
12	1	CASING FLANGE		Ø 240
11	2	CASING FLANGE		Ø 240
10	1	CYLINDER SEAMLESS	6" GAS PIPE	Ø 450
9	1	DELIVERY PIPE	6"	Ø 900
8	*	SOCKET	FOR 4"	
7	1	T - SOCKET	4"	
6	*	DELIVERY PIPE (EXTENSION)	4"	
5	1	EXHAUST PIPE	4"	
4	1	TOP PIPE	4"	Ø 750
3	4	PIPE	4"	Ø 100
2	1	PUMPROD	4"	Ø 950
1	*	PUMPROD EXTENSION	4"	

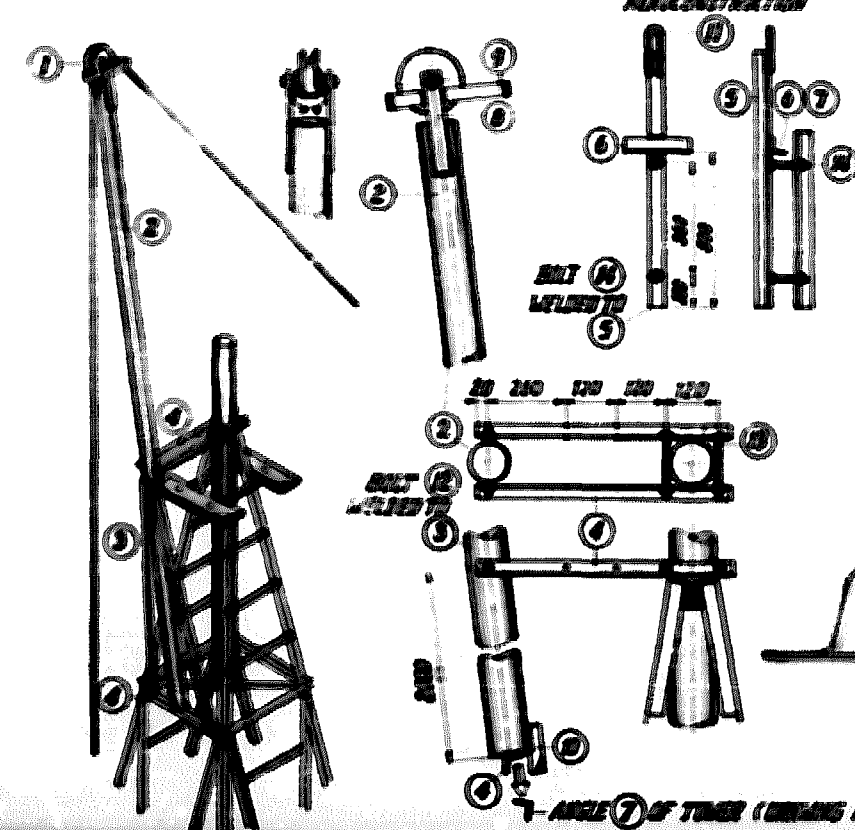
6 OF 7
PISTON PUMP FOR 12 PUSOH MONDYPOL
 FOR INFORMATION :
 Workshop on Development Methods
 T.H. Toren - Vijzel 132
 P.O. Box 217 Groningen
 The Netherlands



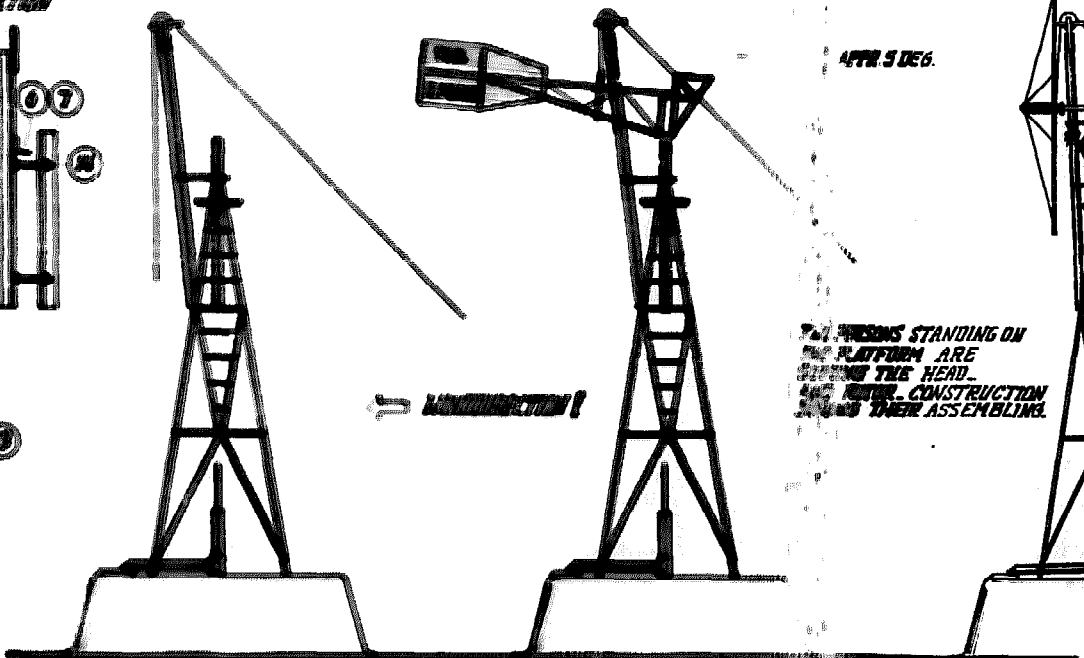
THE PILES (TRUNKS OF A LARVED) INCREASE THE STABILITY OF THE TOWER

REMARKS: AFTER PLACING THE TOWER THE TOWER PILES ARE POURED IN WITH CONCRETE AND AFTER APPROX 5 DAYS THE HEAD AND ROTOR CONSTRUCTION CAN BE DESIGNED SAFE AND QUICK BY MEANS OF LIFTING DEVICES. DURING THE DEPENDENCY OF THE CONCRETE FOUNDATION THE PISTON PUMP IS FORCED INTO THE WELL ACCORDING TO THE SPECIFICATIONS!

JIB - LIFTING HELPDVICE



LIFTING DEVICE FOR HEAD CONSTRUCTION



THE PERSONS STANDING ON THE PLATFORM ARE DURING THE HEAD AND ROTOR CONSTRUCTION SECURING THEIR ASSEMBLING.

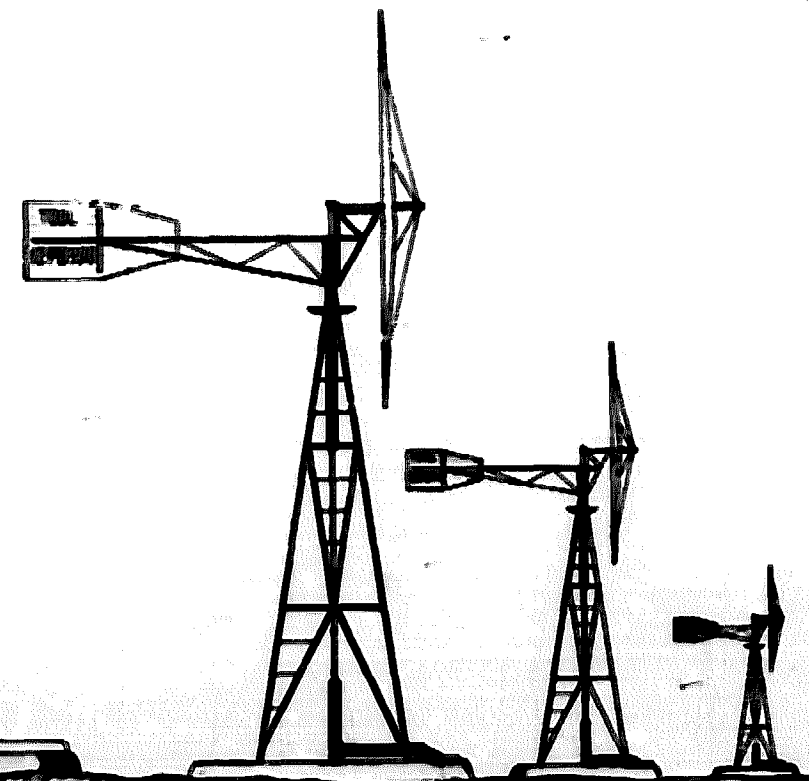
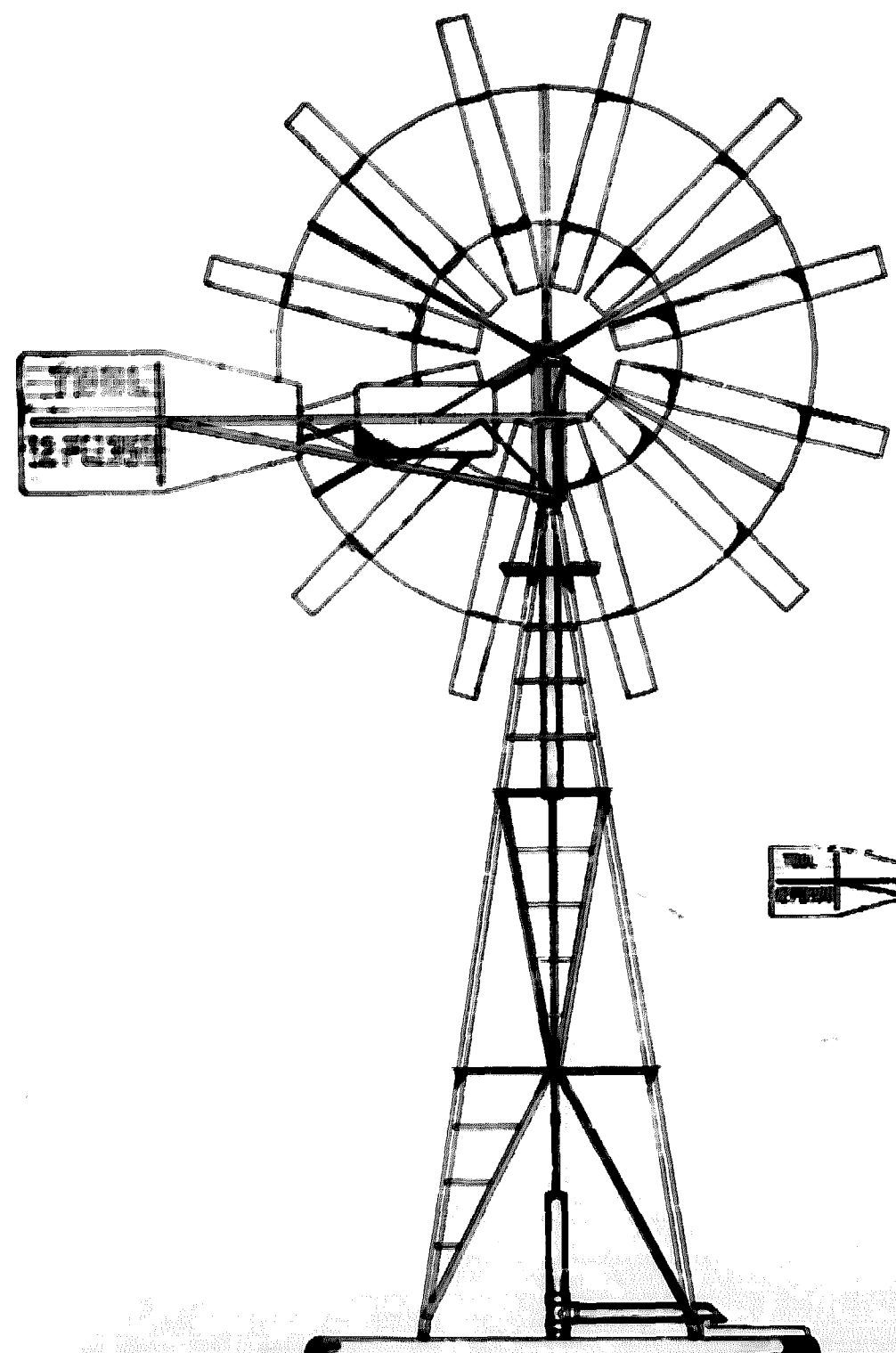
SINCE THE CENTRE OF GRAVITY OF THE HEAD CONSTRUCTION IS SITUATED ABOVE THE LOWER TOWER ANGLE A SPECIAL EXPERIMENT IS APPLIED. A WEIGHT SLIDING OVER THE TOWER IS ADJUSTED IF THE FRONT IS OUT OF BALANCE APPROX 5 DEG.

BEFORE IS LIFTED WITH THE SHAFT COMPLETE WITH BEARINGS FIXED IN THE ROTORHUB IN ITS ORIGINAL POSITION (CENTRE POINTS!) AND PLACED IN THE HEAD CONSTRUCTION. NOW THE TOWER CAN BE REMOVED AND THE BLADES, SAFETY DEVICE AND MOVING PARTS ARE ASSEMBLED.

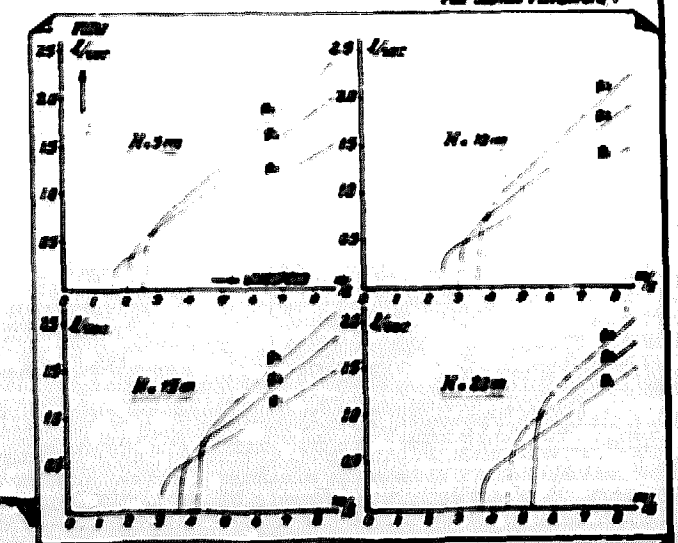
14	2	BOLT NUT WASHER	M12 x 75 (M12 x 5")
13	2		M12 x 100 (M12 x 6")
12	2		M12 x 50 (M12 x 2")
11	1	ROD	Ø 20 (Ø 3/4") x 200
10	1	FLAT	30 x 60 x 10 x 100
9	1		x 600
8	2		x 800
7	1	ANGLE IRON	40 x 40 x 4 (1 1/2") x 550
6	1		x 200
5	1		x 800
4	3		x 600
3	2		x 800
2	1	GASPIPE	Ø 3" x 400
1	1	PULLEY SHAFT AND ROPE OR STEELCABLE (Ø 10 MM)	
NO		MATERIAL / NAME / REMARKS / MEASUREMENTS	

INSTALLING THE WINDMILL - 12 FU 500 -

FOR INFORMATION:

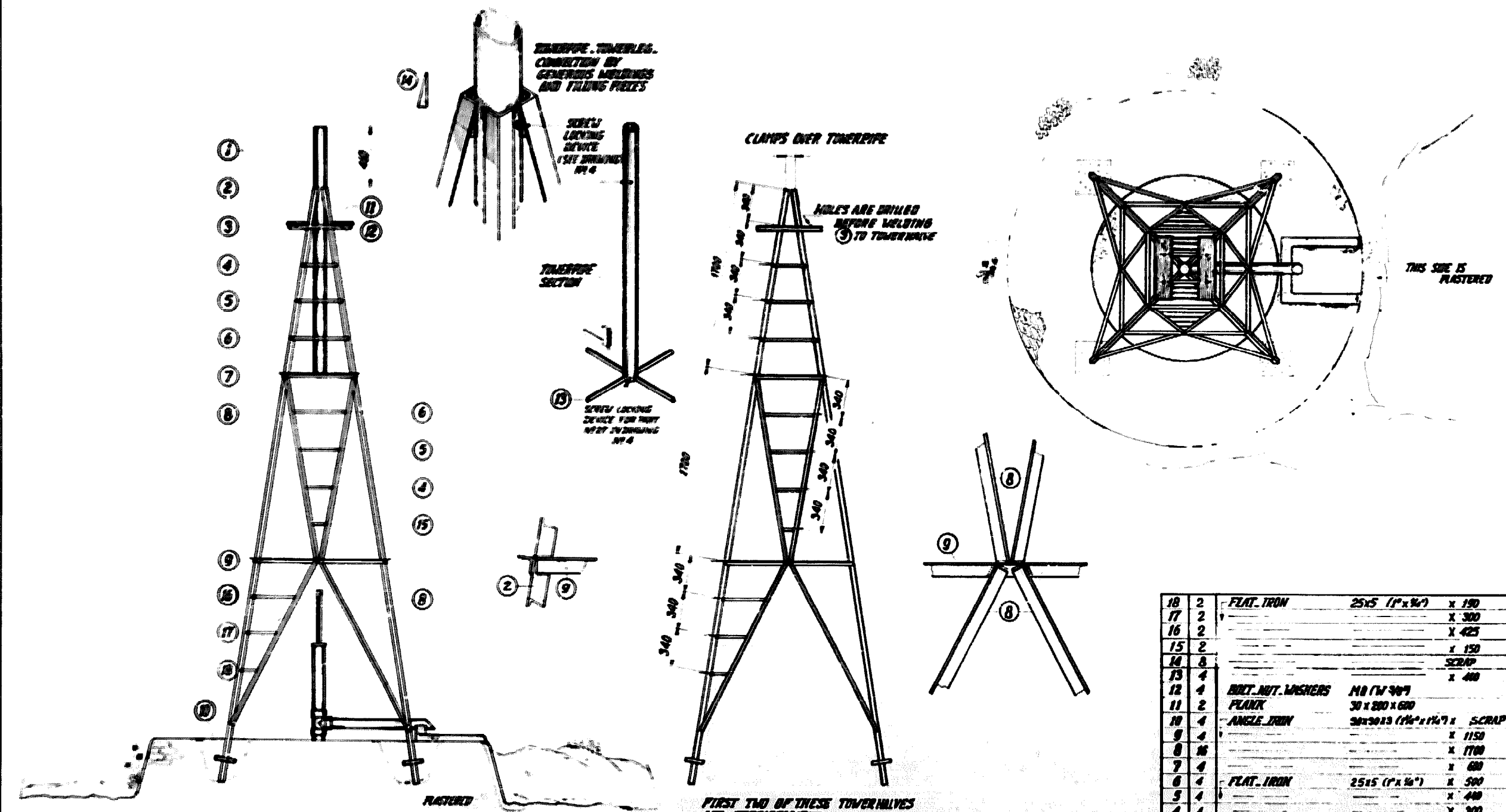


H - 4500000
 K - 45 mm
 L - 4500000
 M - 45 mm
 FOR 100-mm PERIPHERY:



12 PUSO MODEL FOR IRRIGATION

FOR IRRIGATION:

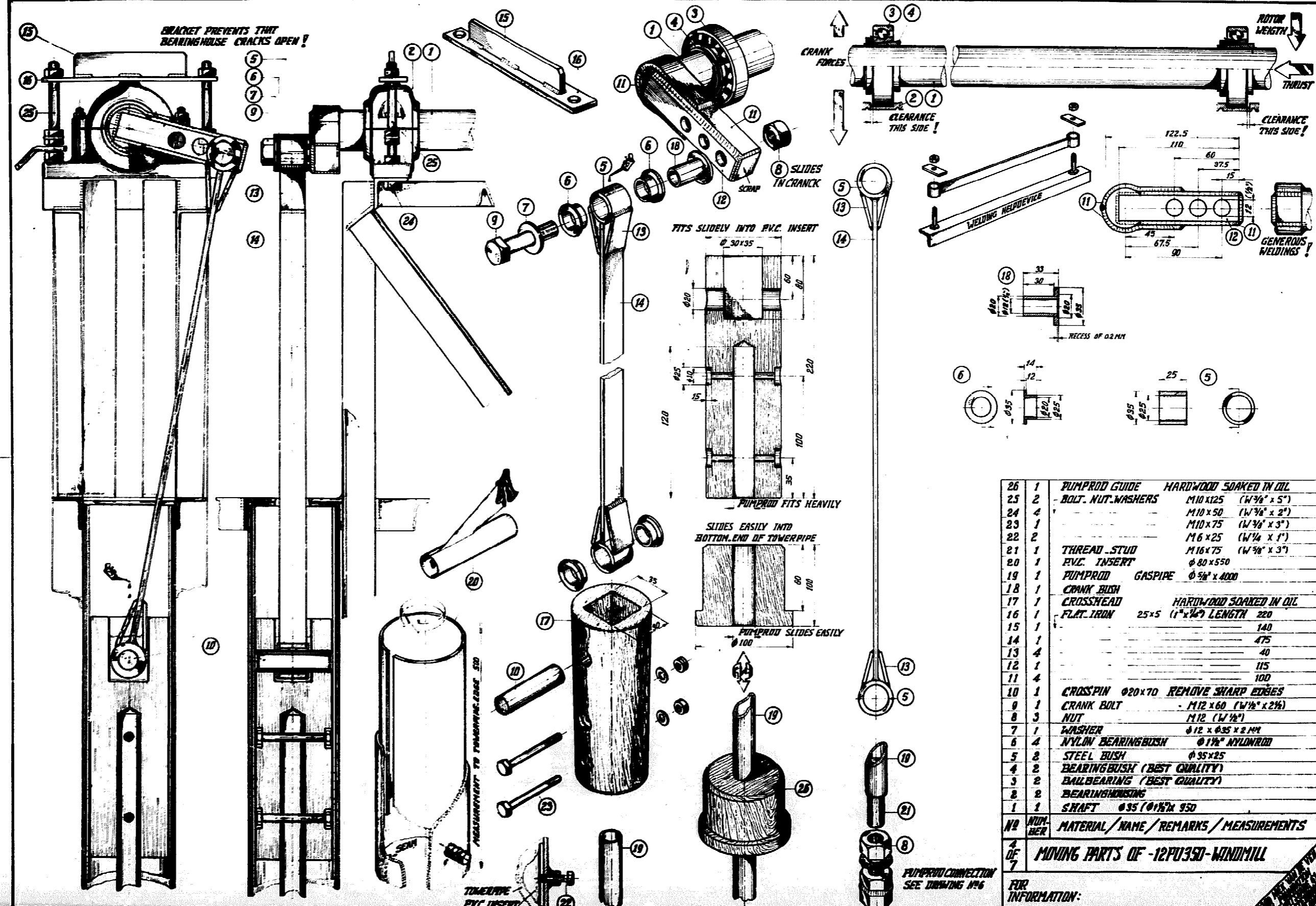


IF DESIRED THE LATTICE MEMBERS CAN BE PATTERNED AND WELDED INSIDE THE TOWERPILES RESULTING IN A MORE ATTRACTIVE APPEARANCE OF THE TOWER. HOWEVER THE FLANGES AT THE ENDS OF THE ANGLE IRON MEMBERS NO. 7 AND NO. 8 SHOULD BE CUT AT ANGLES OF 45 DEGREES.

FIRST TWO OF THESE TOWERHALVES ARE PREFABRICATED BOTH HALVES ARE COMPOSED AND THE TOWERPIPE SECTION IS SHIFTED IN AND A COMPLETE TOWER RESULTS

18	2	FLAT IRON	25x5 (1"x1/2")	x 190
17	2			x 300
16	2			x 425
15	2			x 150
14	8			SCRAP
13	4			x 400
12	4	BOLT. NUT. WASHERS	M8 (1/4")	
11	2	PLANK	30 x 200 x 600	
10	4	ANGLE IRON	30x30x3 (1 1/4" x 1 1/4")	SCRAP
9	4			x 1150
8	16			x 1700
7	4			x 600
6	4	FLAT IRON	25x5 (1"x1/2")	x 500
5	4			x 400
4	4			x 300
3	8	ANGLE IRON	30x30x3 (1 1/4" x 1 1/4")	550
2	4			5500
1	1	TOWERPIPE	5" GASPIPE	8150
NO	MEM	MATERIAL / NAME / REMARKS / MEASUREMENTS		

OF 7
-12 PU 350 - TOWER CONSTRUCTION
FOR INFORMATION:



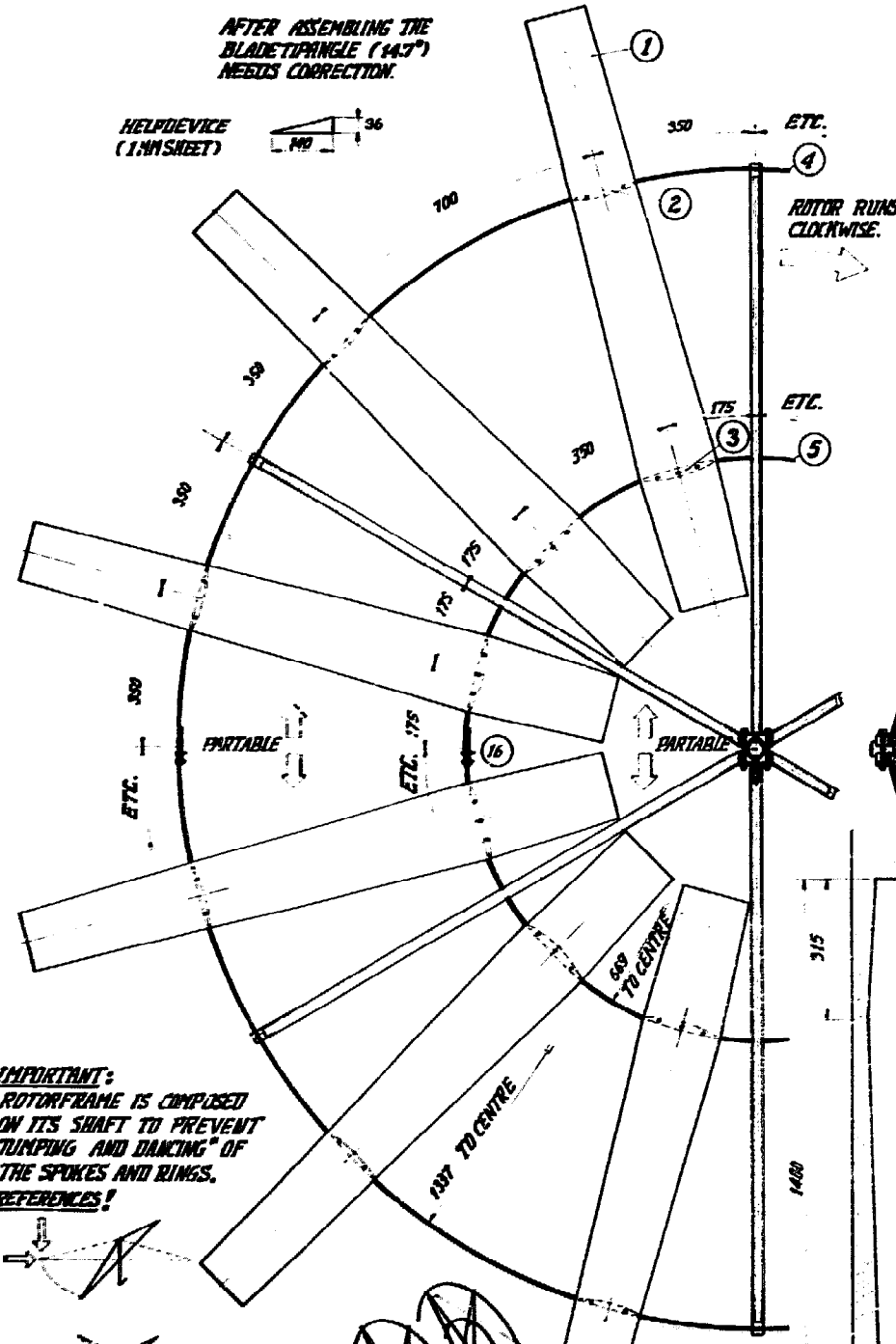
26	1	PUMP ROD GUIDE	HARDWOOD SOAKED IN OIL
25	2	BOLT, NUT, WASHERS	M10 x125 (W 3/8" x 5")
24	4		M10 x 50 (W 3/8" x 2")
23	1		M10 x 75 (W 3/8" x 3")
22	2		M6 x 25 (W 1/4" x 1")
21	1	THREAD STUD	M16 x 75 (W 3/8" x 3")
20	1	P.V.C. INSERT	φ 80 x 550
19	1	PUMP ROD	GASPIPE φ 3/4" x 4000
18	1	CRANK BUSH	
17	1	CROSSHEAD	HARDWOOD SOAKED IN OIL
16	1	FLAT IRON	25x5 (1" x 1/4") LENGTH 220
15	1		140
14	1		475
13	4		40
12	1		115
11	4		100
10	1	CROSS PIN φ 20 x 70	REMOVE SHARP EDGES
9	1	CRANK BOLT	M12 x 60 (W 1/2" x 2 1/4")
8	3	NUT	M12 (W 1/2")
7	1	WASHER	φ 12 x φ 35 x 2 MM
6	4	NYLON BEARING BUSH	φ 1 1/8" NYLON ROD
5	2	STEEL BUSH	φ 35 x 25
4	2	BEARING BUSH (BEST QUALITY)	
3	2	BALL BEARING (BEST QUALITY)	
2	2	BEARING HOUSING	
1	1	SHAFT	φ 35 (φ 1 1/8" x 950)

NO. 4 OF 7 MATERIAL / NAME / REMARKS / MEASUREMENTS

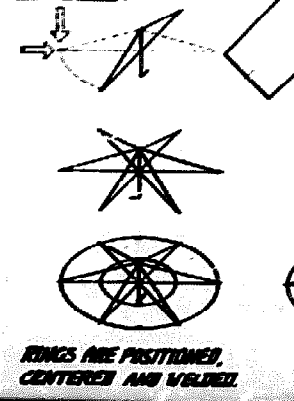
MOVING PARTS OF -12PU350-WINDMILL

FOR INFORMATION:

THIS DRAWING IS THE PROPERTY OF THE DRAWING OFFICE AND IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF THE DRAWING OFFICE.

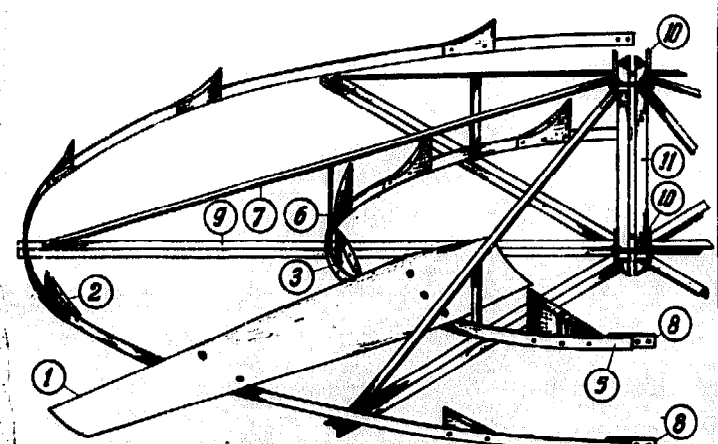
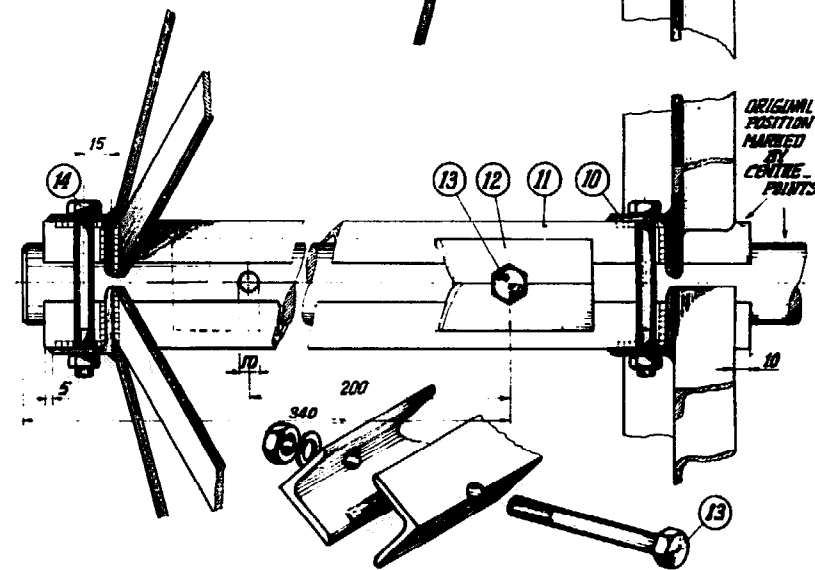
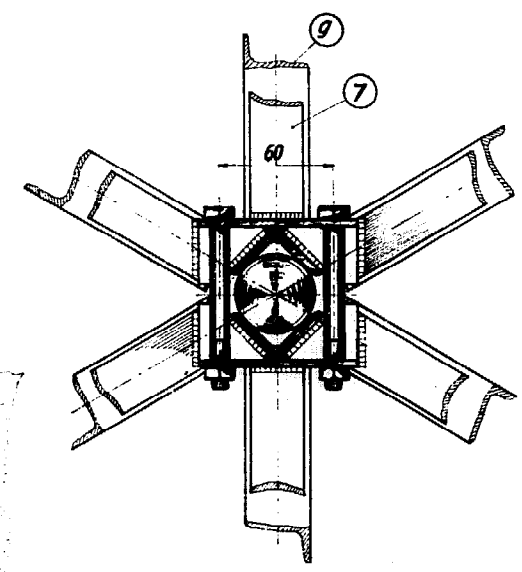
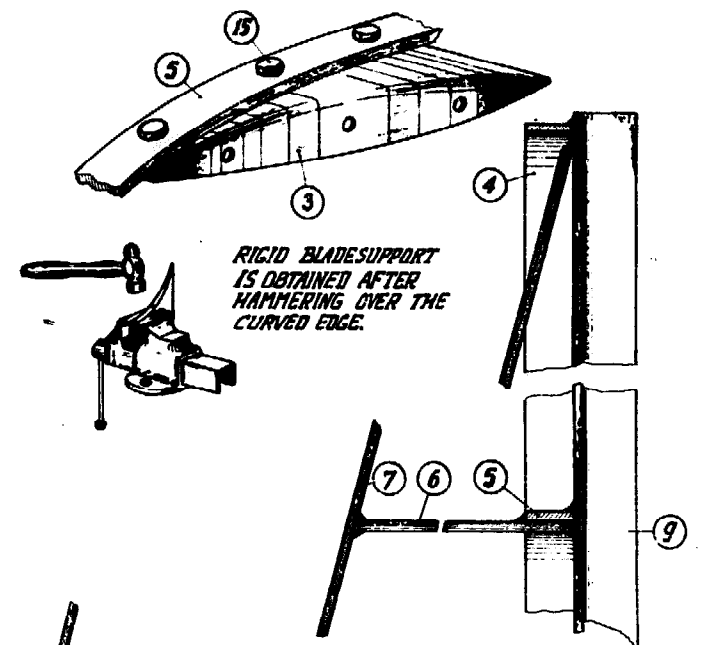
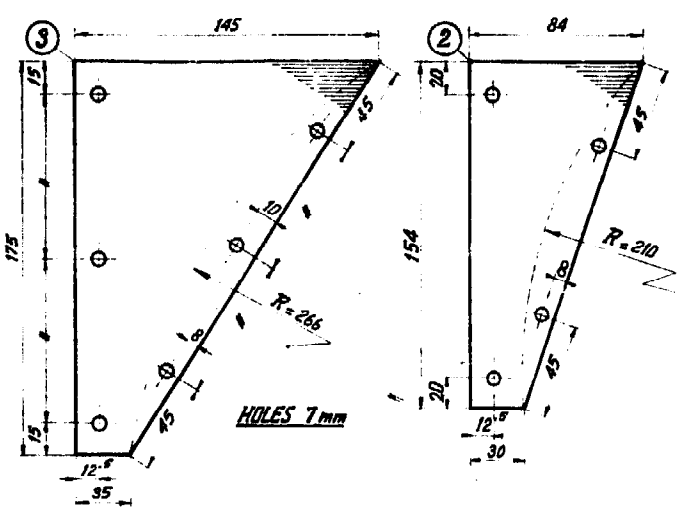


IMPORTANT:
 ROTORFRAME IS COMPILED
 ON ITS SHAFT TO PREVENT
 "JUMPING AND DANCING" OF
 THE SPOKES AND RINGS.
 REFERENCES!



SHAFT AND
 TWO ROTOR
 BLADES BELONG
 TOGETHER!

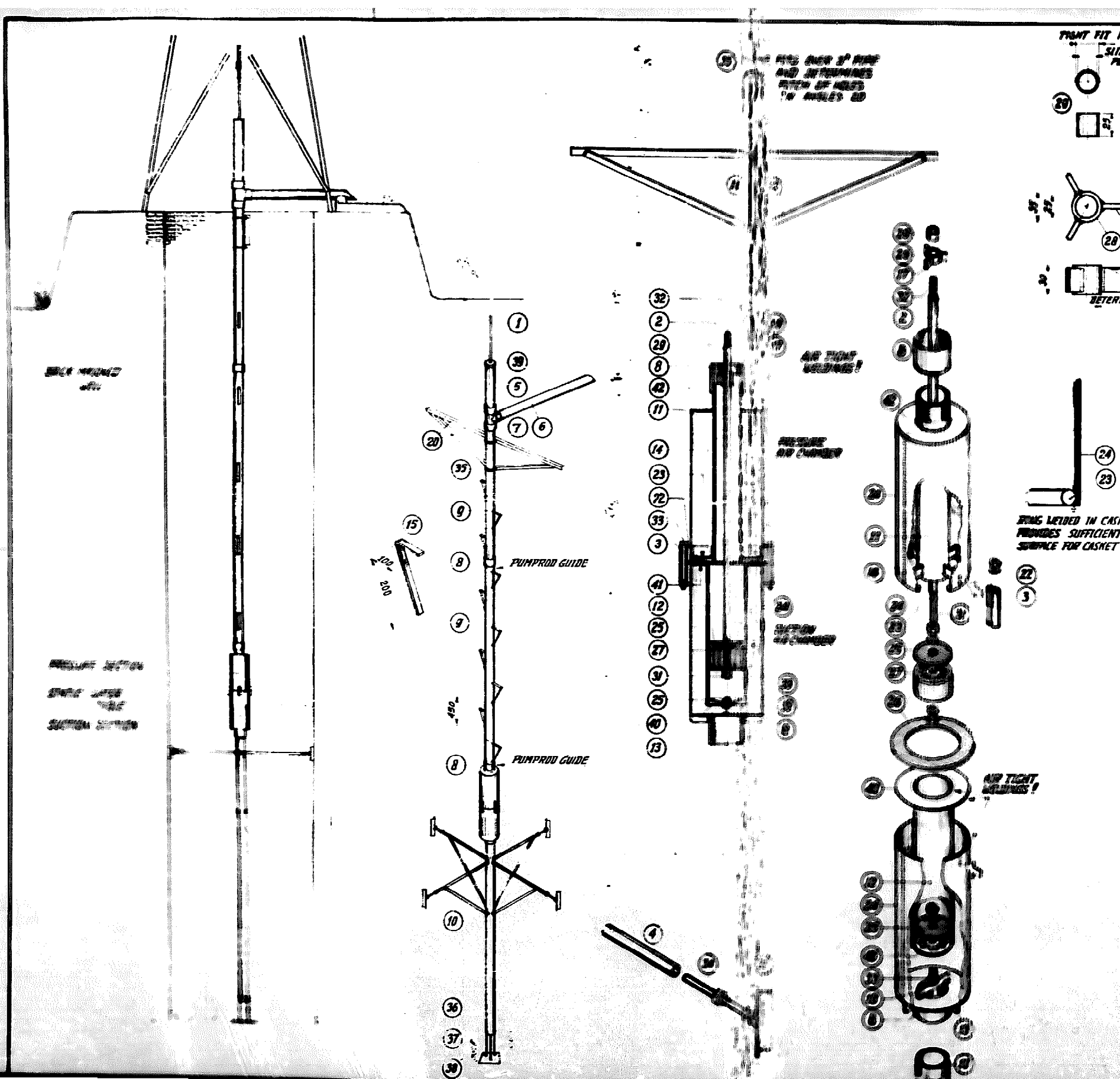
SHEET IS ROLLED
 IN A BENDING -
 RADIUS OF APPR.
 200 mm
 AFTER CUTTING
 THE RADIUS IS
 CORRECTED SO THAT
 10% CURVED AIRFOILS
 WILL RESULT.



ONE OF THE BLADES IS MOUNTED
 ON A WELL POSITIONED SET OF SUPPORTS
 (AVERAGE MEASUREMENTS!) AND IS USED
 AS A DRILLING MOULD FOR THE OTHER
 11 BLADES.

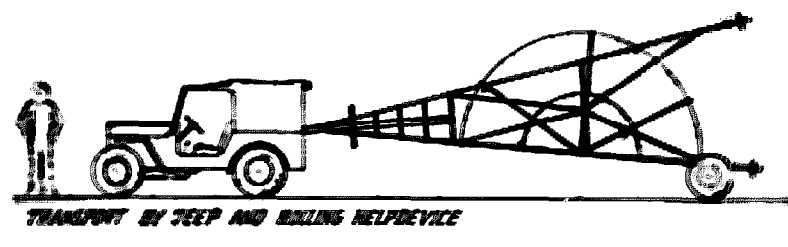
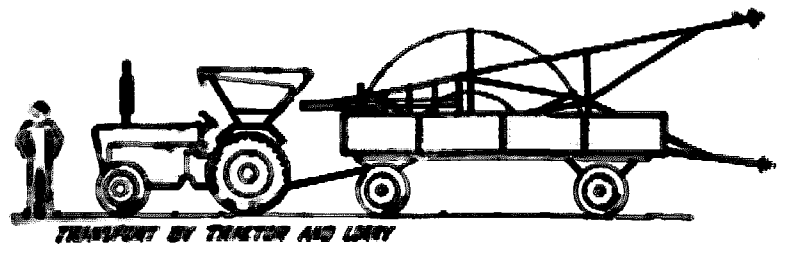
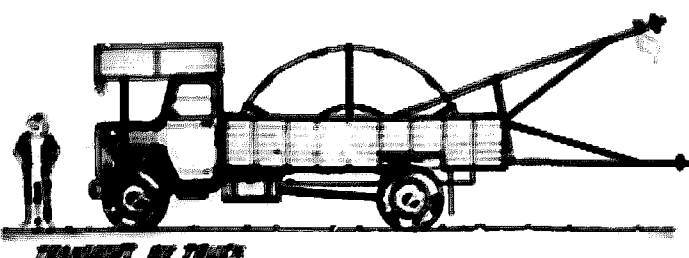
16	8	BOLT NUT WASHER	M10x25 (W3/8"x1")
15	120		M6x15 (W1/8"x1/2")
14	4		M10x100 (W3/8"x4")
13	2		M10x100 (W3/8"x4")
12	2	ANGLE IRON	30x30x3 (1 1/4"x1 1/4")x300
11	2		x465
10	4		x100
9	6		x1330
8	4	FLAT IRON	25x5 (1"x1/4") x120
7	6		x1330
6	6		x190
5	1		2 x2100
4	1		2 x4200
3	12	BLADE SUPPORT	1mm SHEET
2	12		
1	12	BLADE	1mm SHEET

NO. 12
 DEF. 7
ROTOR FOR - 12 PU350 - WINDMILL (A-2)
 FOR INFORMATION:

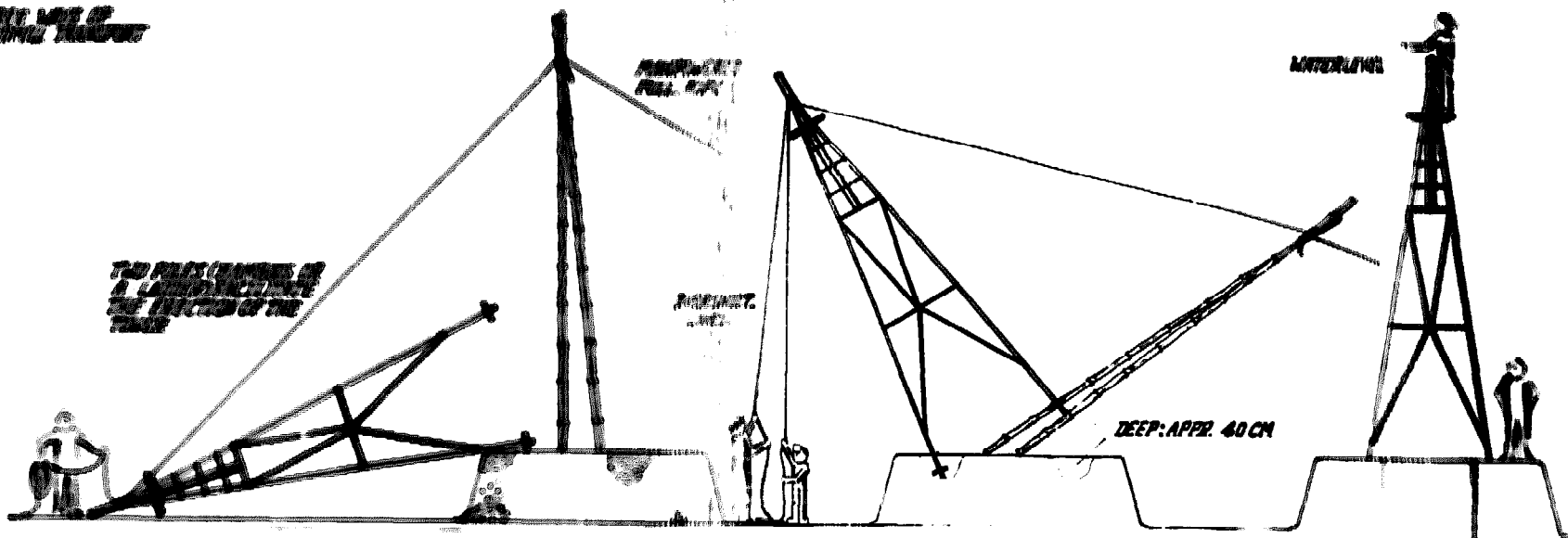


42	2	CASING - FLANGE	2mm SHEET 300
41	1	FOOT VALVE	(SHAP FROM NO.41)
40	1	WOODEN PUMP ROD GUIDE: 21 IN DRILLING NO. 8	
39	1	BOTTOM SHEET	2mm SHEET 300
38	1	MESH	Ø 300
37	1	FOOT BAR	Ø 10 (1/2")
36	3	CLAMP	Ø 8 (5/16")
35	2	BOLT - NUT	M10x25 (3/8"x3")
34	4	BOLT - NUT, WASHER	M10x25 (3/8"x3")
33	5	THREAD STUD	M10x25 (3/8"x3")
32	*	NUTS	M16 (1/2")
31	*	BRONZE BUSH	Ø 25 x 25
29	1	STEEL BUSH	Ø 25 x 25
28	1	PISTON / FOOTVALVE	TEARWOOD
27	2	GASKET	SOLE LEATHER Ø 250 x 6mm
26	1	VALVE	Ø 100 x 6mm
25	2	CASING	2mm SHEET 300 x 400
24	2	RING	Ø 8 (1/2")
23	1	FILLING PIECE	Ø 8 (1/2") x 40
22	4	ANGLE IRON	30x30x3/8" (1 1/4"x1 1/4"x3/8")
21	4	FLAT IRON	25x5 (1"x1/2") x 100
20	2		
19	4		
18	1		
17	3		
16	1		
15	*		
14	4		
13	4		
12	1	CYLINDER SEAMLESS	4" Ø PIPE 1200
11	1	DELIVERY PIPE	3" 1000
10	1	SUCTION PIPE	3" 100
9	1	DELIVERY PIPE (EXTENSION)	3" 1000
8	*	SOCKET	FOR 3"
7	1	T-SOCKET	3"
6	1	EXHAUST PIPE	3" 100
5	1	TOP PIPE	3" 1000
4	4	POSITIONING PIPE	1" 100
3	4	PIPE	Ø 3" 100
2	1	PUMP ROD	Ø 1" 1000
1	*	PUMP ROD EXTENSION	Ø 1" 100
NO	NUM BER	MATERIAL / NAME / DIMENSIONS / MEASUREMENTS	

6 OF 7
4" PISTON PUMP FOR 12 PUSSED WINDMILL
 FOR INFORMATION:



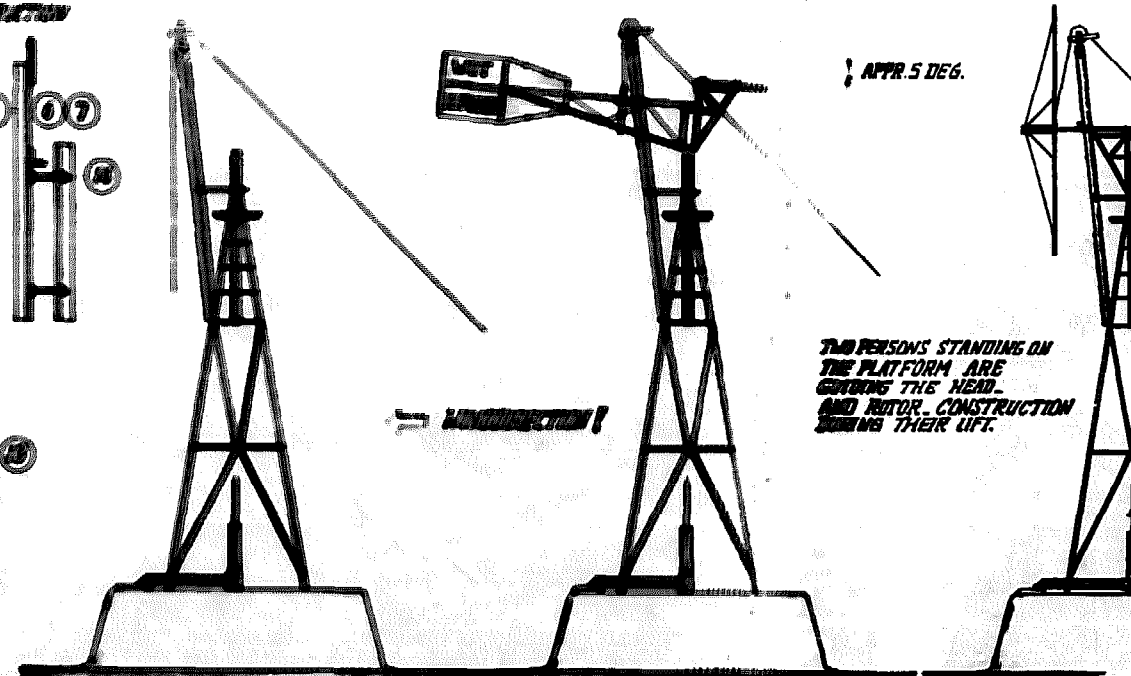
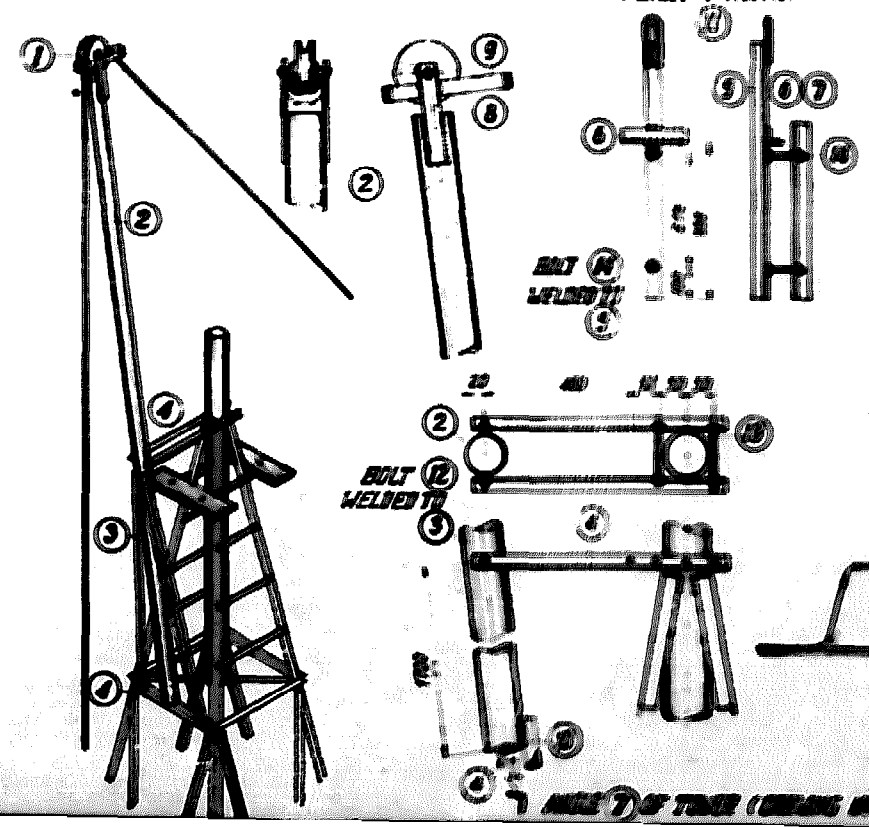
THEY ARE OF LIGHTWEIGHT



THE FIRST STAGES OF A LIFTING OPERATION ARE THE POSITIONING OF THE TRUCK

IMPORTANT: AFTER PLACING THE TOWER THE TOWERLESS ARE FILLED IN WITH CONCRETE AND AFTER APPROX 5 DAYS THE HEAD AND ROTOR CONSTRUCTION CAN BE INCREASED SAFE AND QUICK BY MEANS OF LIFTING DEVICES. DURING THE DRYING PERIOD OF THE CONCRETE FOUNDATION THE PISTON PUMP IS POKED INTO THE WELL ACCORDING TO THE SPECIFICATIONS!

TOWER LIFTING HELPDEVICE



SINCE THE CENTRE OF GRAVITY OF THE HEAD CONSTRUCTION IS SITUATED ABOVE THE UPPER TOWER ANGLE A SPECIAL EXPANSION IS APPLIED A SLIGHT SLIDING OVER THE TOWERPIPE IS ADVISED IF THE FRONT IS OUT OF BALANCE APPROX 5 DEGR.

HEAD IS LIFTED AND POSITIONED AT THE TOP OF ITS SHAFT AND SHIFTED TO ITS ORIGINAL POSITION (CENTRE POINTS) AND FORCED. NOW THE TOWER CAN BE REMOVED AND THE SLACKS SAFETY DEVICE AND MOVING PARTS ARE ASSEMBLED.

14	2	BOLT NUT WASHER	M 10 x 25 (M 10 x 5")
13	1		M 10 x 25 (M 10 x 5")
12	2		M 10 x 50 (M 10 x 2")
11	1	ROD	Ø 20 (Ø 1 1/2) x 200
10	1	FLAT	12 x 3 (1 1/2 x 3) x 100
9	1		x 500
8	2		x 200
7	1	ANGLE IRON	20 x 20 (1 1/2 x 1 1/2) x 200
6	1		x 200
5	1		x 500
4	3		x 1000
3	2		x 1000
2	1	GASPIPE	Ø 3" x 400
1	1	PULLEY SHAKT AND ROPE OR STEEL CABLE (Ø 20)	
Nº		MATERIAL NAME / REMARKS / MEASUREMENTS	
7		INSTALLING THE WINDMILL - 12 PU 350 -	
7		FOR INFORMATION:	