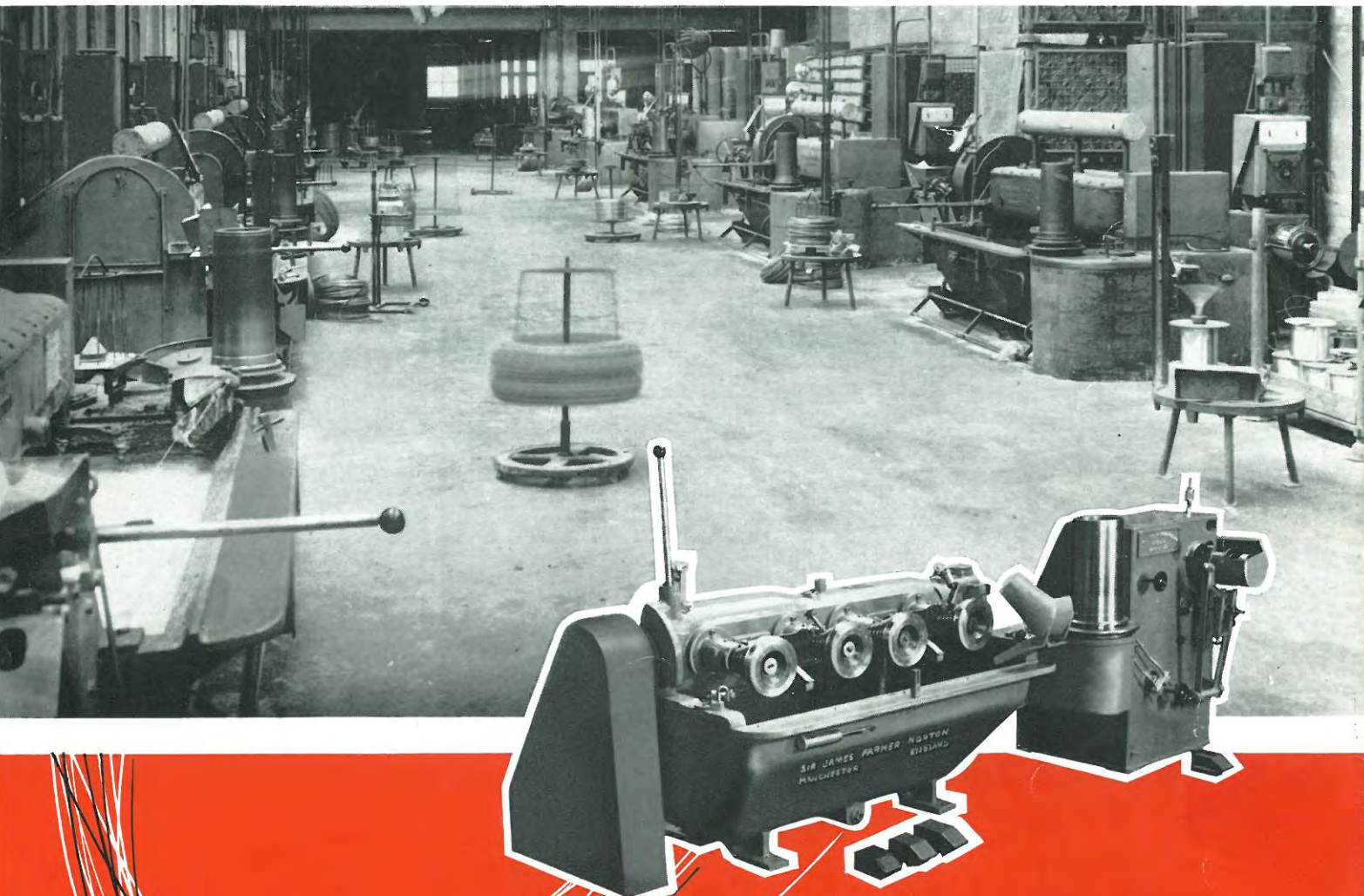
Farmer Norton high efficiency **WIRE DRAWING MACHINES**

for fine wires



FARMER NORTON

Farmer Norton

FN3A WIRE DRAWING MACHINE

This is a machine designed for the drawing of high carbon rope wire, tyre wire, card wire and similar specifications. Mild Steel and Carbon Steel to 36's gauge, also for brass, copper, zinc, aluminium and all non-ferrous wires, 9 or 11 drafts.

The machine consists of a main Gearbox carrying the drawing cones. This is mounted on trunnion bearings which enables the cones to be brought into the horizontal position for threading up. For drawing the cones are lowered into the liquor tank. The raising and lowering of the cones is motorised and controlled by push button.

The machine is equipped throughout with ball and roller bearings and machine cut Solid Steel Bevel Gears running in a totally enclosed gearbox.

The machine operates on the slip principle and consequently the drawing cones are manufactured from special high grade steel hardened and ground to a fine finish. This is necessary to withstand the abrasive action of the wire on the cones.

The dies and cones are entirely immersed in the liquor tank during drawing. As the largest diameter cones are in the deepest part of the trough, the turbulence of the liquor on the surface is so small that splashing cannot take place. This turbulence in the bath ensures that the dies are kept free from foreign matter and also keeps the drawing cones and the dies cool. The temperature of the liquor is kept low by means of cooling coils fitted into the trough. Liquor is forced to the final die by means of a pump ensuring full lubrication up to the last possible moment. Provision for dry drawing at the first die can be arranged.

The drive to the machine is by a single floor mounted motor of between 7½ and 12 H.P. and is usually one of the following Types.

(1) D.C. with 2 or 3; 1 Speed variation.
(2) A.C. Slip Ring fixed speed.
(3) A.C. Slip Ring with 2, 3, 4 or 6 Speed Gear Box.

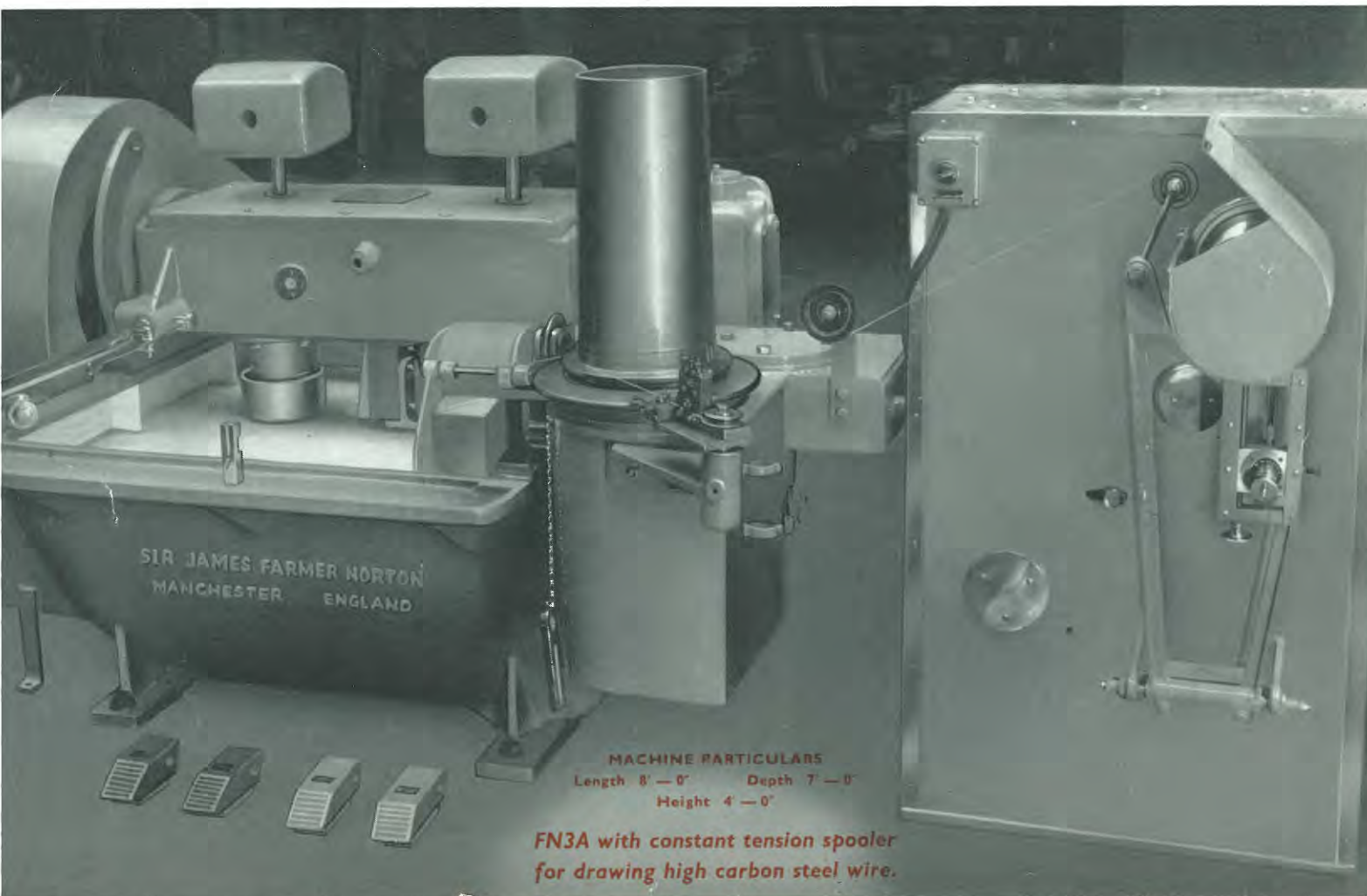
The control gear is arranged to give inching and a steady start to the motor to facilitate threading up of the machine.

The machine is usually supplied with an 8″ (200 mm) diameter finishing block and can be fitted with a spooling gear in addition enabling the wire to be finished either in coils or on spools.

The spoolers are designed according to the material to be handled. However, these are of two basic types:—

(1) For steel wire the drive to the spooler is by means of a fractional H.P. A.C. motor or, alternatively, the drive can be by means of a series wound D.C. motor. Both these drives ensure constant tension throughout the build-up.

(2) For non-ferrous wires and fine steel wires below 0·004″ diameter (0·102 mm). The spooler is driven by means of a fractional H.P. motor and magnetic coupling. This gives a very sensitive control during build-up. The tension can be regulated to within very fine limits.



FN3A with constant tension spooler for drawing high carbon steel wire.

DRAFTS for FN 3A MACHINE

	WIRE INLET DIAM.	1	2	3	4	5	6	7	8	9	10	11
MILD STEEL AND PHOS BRONZE WIRE	1·53 ·0600	1·35 ·053	1·21 ·0475	1·08 ·0425	0·966 ·0380	0·864 ·0340	0·763 ·0305	0·699 ·0275	0·628 ·0247	0·564 ·0222	0·508 ·0200	0·458 ·0180
	1·40 ·0550	1·23 ·0485	1·09 ·0430	0·966 ·0380	0·864 ·0340	0·763 ·0305	0·693 ·0273	0·623 ·0245	0·559 ·0220	0·503 ·0198	0·452 ·0178	0·407 ·0160
	1·22 ·0480	1·08 ·0425	0·953 ·0375	0·851 ·0335	0·762 ·0300	0·681 ·0268	0·610 ·0240	0·546 ·0215	0·488 ·0192	0·439 ·0173	0·396 ·0156	0·356 ·0140
	1·02 ·0400	0·902 ·0355	0·800 ·0315	0·711 ·0280	0·636 ·0250	0·572 ·0225	0·513 ·0202	0·462 ·0182	0·417 ·0164	0·376 ·0148	0·338 ·0133	0·305 ·012
	0·813 ·0320	0·724 ·0285	0·648 ·0255	0·579 ·0228	0·509 ·0205	0·470 ·0185	0·424 ·0167	0·381 ·0150	0·343 ·0135	0·310 ·0122	0·280 ·0110	0·254 ·0100
	0·661 ·0260	0·585 ·023	0·521 ·0205	0·470 ·0185	0·424 ·0167	0·381 ·0150	0·345 ·0135	0·310 ·0122	0·280 ·0110	0·254 ·0099	0·227 ·0089	0·204 ·0080
	0·559 ·0220	0·496 ·0195	0·447 ·0175	0·399 ·0157	0·358 ·0141	0·323 ·0127	0·290 ·0114	0·262 ·0103	0·236 ·0093	0·214 ·0084	0·192 ·00755	0·173 ·0068
CARBON STEEL FINISHING 105/144 Tons sq. in.	1·53 ·0600	1·36 ·0535	1·22 ·0480	1·09 ·0430	0·991 ·0390	0·894 ·0352	0·813 ·0320	0·742 ·0292	0·676 ·0266	0·615 ·0242	0·559 ·0220	0·508 ·0200
	1·40 ·0550	1·25 ·0490	1·105 ·0435	0·991 ·0390	0·890 ·0350	0·803 ·0316	0·727 ·0286	0·661 ·0260	0·602 ·0237	0·549 ·0216	0·501 ·0197	0·458 ·0180
	1·22 ·0480	1·09 ·0430	0·978 ·0385	0·876 ·0345	0·793 ·0312	0·717 ·0282	0·650 ·0256	0·592 ·0233	0·539 ·0212	0·490 ·0193	0·447 ·0176	0·407 ·0160
	1·02 ·0400	0·915 ·0360	0·826 ·0325	0·750 ·0295	0·681 ·0268	0·618 ·0243	0·564 ·0222	0·516 ·0203	0·470 ·0185	0·430 ·0169	0·392 ·0154	0·356 ·0140
	0·813 ·0320	0·737 ·0290	0·671 ·0264	0·610 ·0240	0·554 ·0218	0·506 ·0199	0·460 ·0181	0·419 ·0165	0·381 ·0150	0·348 ·0137	0·318 ·0125	0·290 ·0114
	0·661 ·0260	0·602 ·0237	0·549 ·0216	0·501 ·0197	0·458 ·0180	0·419 ·0165	0·384 ·0151	0·351 ·0138	0·320 ·0126	0·293 ·0115	0·257 ·0105	0·244 ·0096
	0·559 ·0220	0·508 ·0200	0·463 ·0182	0·422 ·0166	0·386 ·0152	0·351 ·0138	0·320 ·0126	0·292 ·0115	0·267 ·0105	0·244 ·0096	0·224 ·0088	0·204 ·0080

PRODUCTION

Material	Mild Steel		Carbon Steel Finishing 105 Tons/□"		Phosphor Bronze	
Finished dia. of Wire	Productions in Lbs./Hour	Speed in Ft./Min.	Production in Lbs./Hour	Speed in Ft./Min.	Production in Lbs./Hour	Speed in Ft./Min.
·0275	68	600 (3 met/sec)	57	500	78	650
·0253	54	600	45	500	60	650
·0236	54	650	41	500	52·5	650
·0220	45·5	650	35	500	43·5	650
·0200	37	650 (3·75 met/sec)	29	500	46	650
·0180	37·5	800	23·5	500	33	650
·0160	30·1	800	19·0	500	27	650
·0140	27	1000	16	600	29	1000
·0120	20·8	1000	20·8	1000	28	1300
·0100	14·7	1000	17·5	1000	16	1000
·0080	13·8	1500 (7·6 met/sec)	9·3	1000	14·5	1300
·0068	9·75	1500	6·5	1000	9	1300

FN3B WIRE DRAWING MACHINE

This machine is suitable for high speed drawing of the copper, bronze, brass, mild and carbon steels, stainless and nickel chrome wire for finishing between 36's and 40's gauge.

This machine is in design and construction similar to the FN3A except that the machine is equipped with four sets of drawing cones compared with the FN3A which has two. This machine can therefore be built to accommodate either 13, 15, 17, 19, 21 or 27 dies according to the number of drafts required.

To draw through a reduced number of dies, the first one or two die positions can be by-passed or alternatively, the finishing block slowed down and the last few dies omitted.

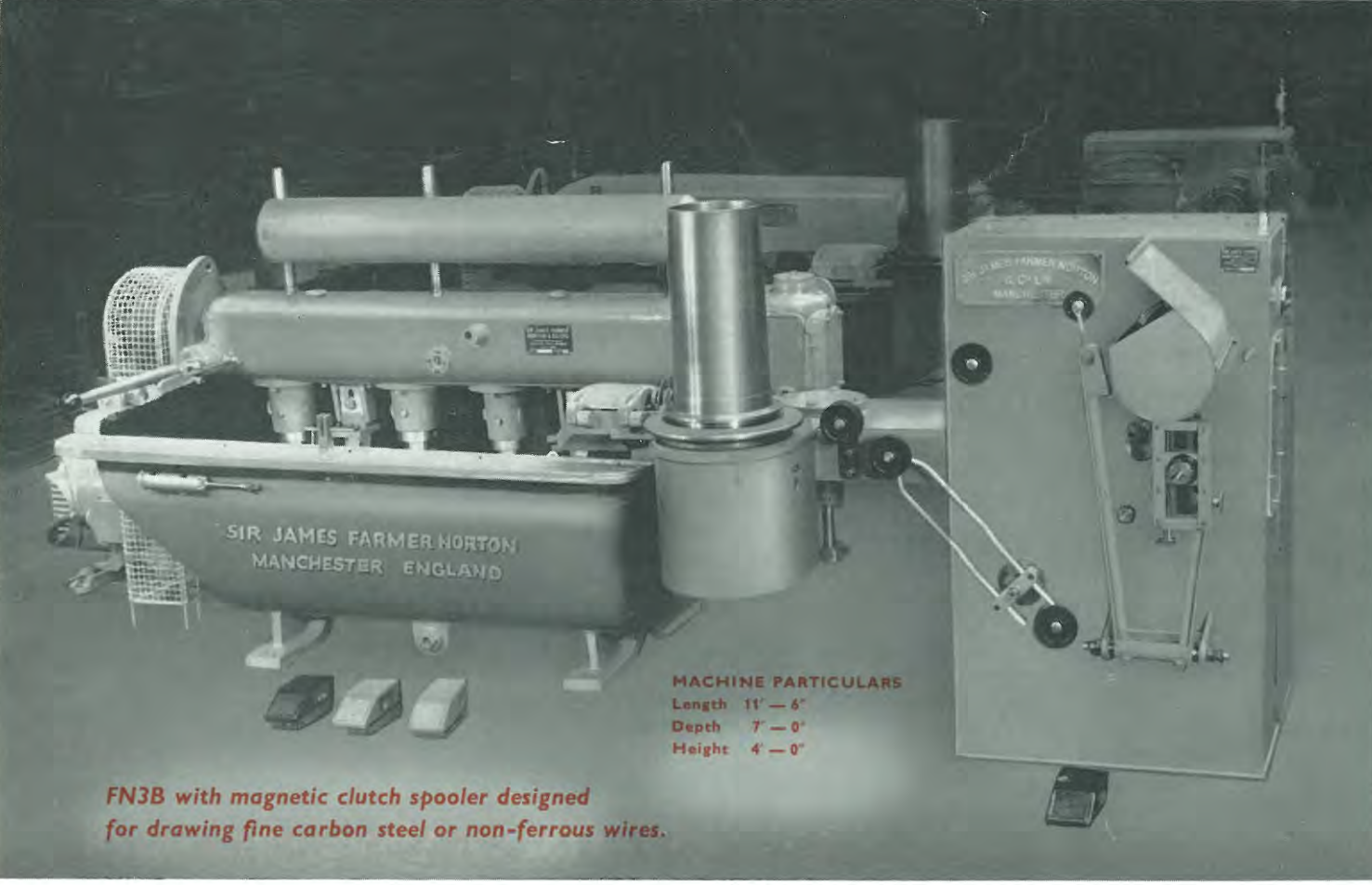
The standard machine is fitted with spoolers similar to those mentioned above.

The main drive to the machine is by a floor mounted electric motor and is usually one of the following:—

(1) D.C. with 2 or 3: 1 speed variation.

(2) A.C. Slip Ring with single speed pulley drive.

(3) A.C. Slip Ring with 2, 3, 4 or 6 speed Gear box.



FN3B with magnetic clutch spooler designed for drawing fine carbon steel or non-ferrous wires.

DRAFTS FOR FN3B MACHINE

WIRE INLET DIAM.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2·04 ·080	1·83 ·072	1·65 ·065	1·48 ·0585	1·33 ·0525	1·21 ·0475	1·08 ·0425	0·97 ·0382	0·87 ·0343	0·79 ·0309	0·71 ·0278	0·58 ·0250	0·57 ·0225	0·51 ·0202	0·47 ·0182	0·42 ·0164	0·37 ·01475	0·34 ·01353	0·30 ·012	0·28 ·0108
1·83 ·072	1·64 ·0645	1·46 ·0575	1·31 ·0515	1·18 ·0463	1·06 ·0417	0·95 ·0375	0·86 ·0338	0·775 ·0305	0·70 ·0275	0·58 ·0248	0·57 ·0224	0·51 ·0202	0·47 ·0182	0·42 ·0163	0·37 ·0147	0·33 ·0132	0·30 ·0119	0·27 ·0107	0·244 ·0096
1·62 ·064	1·46 ·0575	1·31 ·0515	1·18 ·0463	1·06 ·0417	0·95 ·0375	0·86 ·0338	0·775 ·0305	0·70 ·0275	0·58 ·0248	0·57 ·0224	0·51 ·0202	0·47 ·0182	0·42 ·0163	0·37 ·0147	0·33 ·0132	0·30 ·0119	0·27 ·0107	0·244 ·0096	0·219 ·0086
1·40 ·055	1·25 ·049	1·11 ·0438	1·00 ·0393	0·90 ·0354	0·81 ·0318	0·73 ·0286	0·65 ·0257	0·57 ·0231	0·53 ·0208	0·476 ·0187	0·428 ·0168	0·38 ·0151	0·345 ·01355	0·31 ·0122	0·28 ·011	0·254 ·0099	0·227 ·0089	0·204 ·0080	0·183 ·0072
1·22 ·048	1·09 ·043	0·98 ·0385	0·878 ·0345	0·78 ·0310	0·708 ·0278	0·63 ·0250	0·573 ·0225	0·557 ·0202	0·463 ·0182	0·417 ·0164	0·377 ·0148	0·338 ·0133	0·302 ·0119	0·272 ·0107	0·249 ·0096	0·220 ·00865	0·198 ·0078	0·178 ·0070	0·160 ·0063
1·01 ·040	0·915 ·036	0·818 ·322	0·731 ·0290	0·661 ·0260	0·595 ·0234	0·531 ·0210	0·481 ·0189	0·432 ·017	0·389 ·0153	0·351 ·0138	0·316 ·0124	0·295 ·01115	0·254 ·0100	0·2282 ·0090	0·2051 ·0081	0·185 ·0073	0·166 ·00655	0·150 ·0059	0·135 ·0053
0·813 ·032	0·731 ·0288	0·658 ·0259	0·592 ·0233	0·531 ·0209	0·477 ·0188	0·429 ·0169	0·386 ·0152	0·347 ·01365	0·312 ·0123	0·279 ·0111	0·254 ·0100	0·228 ·0090	0·2051 ·0081	0·185 ·0073	0·167 ·00658	0·150 ·00592	0·135 ·00532	0·122 ·0048	0·109 ·0043
0·712 ·028	0·640 ·0252	0·574 ·0226	0·52 ·0203	0·462 ·0182	0·417 ·0164	0·375 ·01475	0·337 ·01325	0·302 ·0119	0·273 ·01075	0·247 ·0097	0·222 ·00874	0·201 ·00788	0·180 ·0071	0·162 ·0064	0·147 ·00577	0·132 ·0052	0·117 ·0046	0·107 ·00422	0·0966 ·0038

Aluminium from 2·04 ·080″ Copper from 1·83 ·072″ Brass from 1·22 ·048″ Steel from 1·01 ·040″

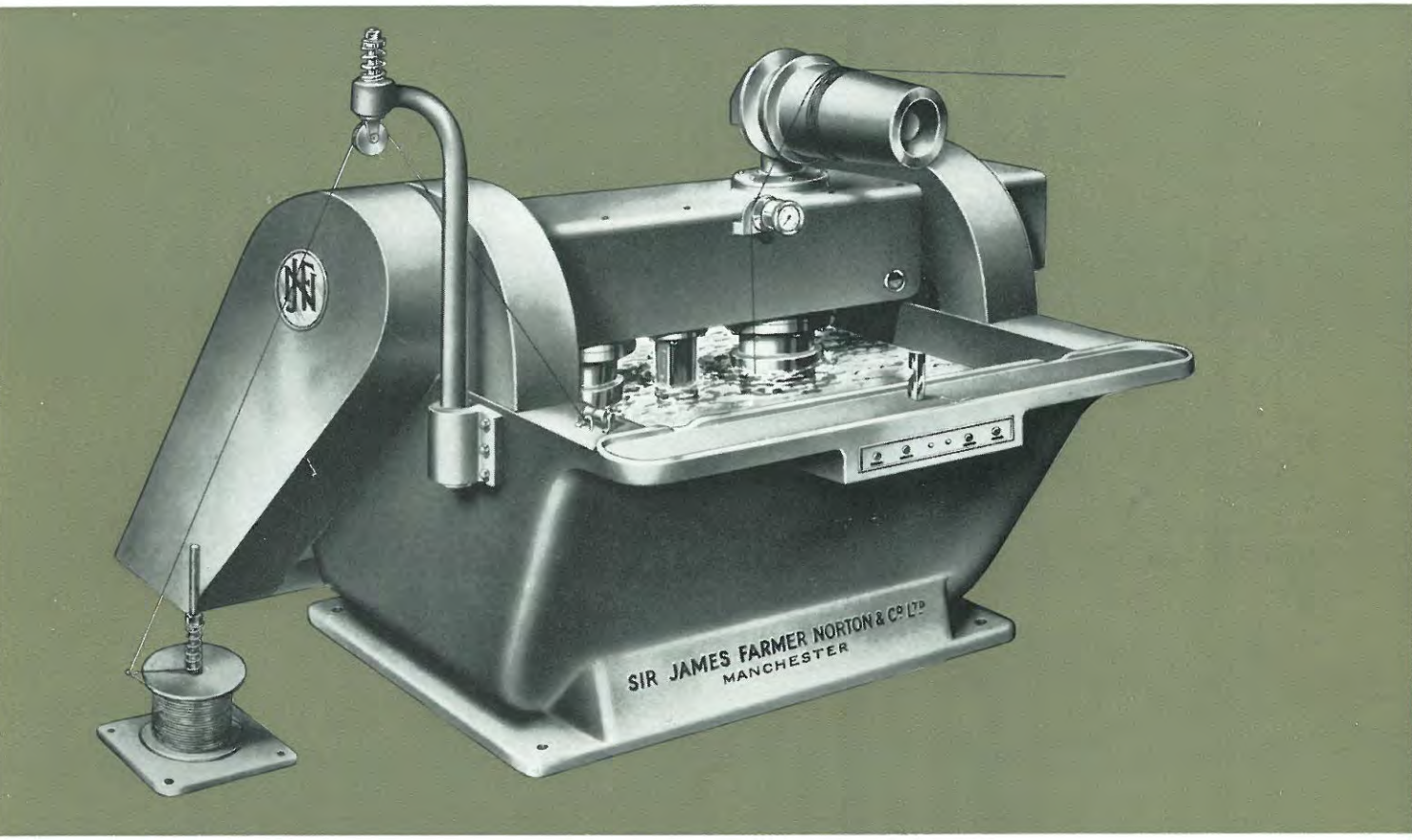
Attention for drawing Iron or Steel Wires 1 man 5 — 6 machines

PRODUCTION

Material	Copper		Brass		Carbon Steel		Mild Steel	
Finished Dia. of Wire	Production in Lbs./Hour	Speed in Ft./Min.	Production in Lbs./Hour	Speed in Ft./Min.	Production in Lbs./Hour	Speed in Ft./Min.	Production in Lbs./Hour	Speed in Ft./Min.
·0136	63·5	2400	44	1700	16·25	600	27	1000 (5 m/sec)
·0124	63	2700	45	2000	14·5	650	22·3	1000
·0110	56·75	3000	40·5	2200	12·25	700	26·2	1500
·0108	52	3000	36·0	2200	10·5	700	22·5	1500
·0100	46	3000	36·5	2400	10	700	21·4	1500
·0092	45·5	3500	30	2400	9·5	800	17·8	1500
·0084	38	3500	26	2500	8·25	800	20·6	2000 (10 m/sec)
·0076	32	4000	26	3000	7·75	900	17·3	2000
·0072	31	4000	24	3000	7·5	1000	15	2000
·0068	30	4000	22·5	3000	7	1000	14	2000
·0064	26	4000	20	3000	5·5 6	1000	15	2500
·006	22	4000	15·5	3000	4·5 5·5	1000	13·5	2500
·0056	17·5	4000	13	3000	4·5	1000	11·5	2500
·0052	15	4000	11·5	3000	4	1000	12	3000 (15 m/sec)
·0048	13	4000	10	3000	3·25	1000	9·75	3000
·0044	12	4000	9	3000	2·75	1000	8·25	3000
·0040	11	4000	8	3000	2·25	1000	6·75	3000

FN4A WIRE DRAWING MACHINE

This is an intermediate drawing machine for finishing wire in the same range as our model FN3B that is ·006 (·0152 mm) to ·0038 (·096 mm) in 9 or 11 dies from a maximum inlet of ·014 (·356 mm). This is basically the same as our other slip machines, but the whole machine is smaller. The usual driving motor is 5 H.P. with finishing speeds up to 2000 ft./min. (10 metres/sec) Spooling gear is always provided with the machine to handle spools up to 30lbs (13·6 kgms). The drawing cones are made either of alloy steel or ceramic materials.



This small drawing machine was originally designed for the production of 0·0059″ (·015 mm) tyre wire drawn from ·014 (·356 mm). The spooler is driven by means of a fractional horsepower motor either of the A.C. or D.C. type.

Sir James Farmer Norton & Company

LIMITED

ADELPHI IRON WORKS · SALFORD 3 · MANCHESTER

Telephones: Blackfriars { 3613-4-5 / 6392-3

Telex No: 66492

Telegrams: Agricola Manchester

GFS/1M/10/64

Printed in England