No. 193 A.—G.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

ACCOUNT.

General.

Calcutta, the 16th December 1890.

Date up to which reports of modifications of Revised Estimates for 1890-91 and Budget Estimates for 1891-92 will be received.

Read—

Public Works Department Resolution No. 147 A.—G., dated 21st October 1890.

" " " Circular No. 12 R., dated 21st October 1890.

Finance Department Resolution No. 5676, dated 5th December 1890.

Public Works Department Resolution No. 186 A.—G., dated 6th December 1890.

RESOLUTION.—The Government of India is pleased to direct that if any important alteration becomes necessary after the Revised and Budget Estimates for the current and ensuing financial years have been submitted, a report of the modification, together with an explanation of the reasons for such alteration may be sent so as to reach the Government of India not later than the 1st March 1891.

2. The date up to which telegraphic information of any change likely to seriously affect the estimates may be sent, will be communicated hereafter.

3. This resolution applies to all estimates dealt with by the Public Works Department of the Government of India.

The Governments of Madras and Bombay (General and Railway), Bengal, the North-Western Provinces and Oudh, and the Punjab.
The Chief Commissioners of the Central Provinces, Burma, Assam, and Coorg.
The Resident at Hyderabad.
The Agents to the Governor General for Central India, Rajputana, and Baluchistan.
The Accountant General, Public Works Department.
The Director General of Railways.
The Consulting Engineers to the Government of India for Railways, Calcutta, Lucknow, and Central Division.
The Superintendent of Port Blair and Chief Commissioner, Andaman and Nicobar Islands.
The Director General of Telegraphs.
The Director General of Military Works.

ORDER.—Ordered, that the foregoing be communicated to the Local Governments, Administrations and Officers noted in the margin, for information and guidance.

Ordered also, that a copy be forwarded to the Military Department for information.

A. G. BEGBIE, *Lieut.-Colonel, R.E.,*
Deputy Secy. to the Govt. of India.

Government of India Central Printing Office—No. 1123 P. W. D.—18-12-90—1,000.

Communicated to the Consulting Engineers for Railways for information and guidance.

24/12/90

D. R

Cons. Please see our No 593 W dt 7-1-91.

DP
9-1-91

To
The Consulting Engrs for Rys
" Ext Gr Railways
" do P.W. Lucknow
" do East Coast Railway
" Financial Secretary.

Mo. 5.1.91
R 8.1.91

No. 528 D.

Government of Madras.

PUBLIC WORKS DEPARTMENT,

Ootacamund, 29-VII-1890.

OFFICE NOTE.

om W.

To C.

437 Your office note No: dated 21st July 1890.

2. It is now seen that the rules in Madras Code para 935 are not in accordance with the rules in India Code Volume I, Chapter IX para 15.

3. Would not all audit difficulties be removed if rules 3 and 4 in the Madras Code were expunged and the Government of India asked to substitute the following for rule

No: 59 W 27-1-91

Comm to the Chief Engr for Irrigation and the Consg Engr for Rys.

Col P.

W

The Chief Engr for Irrn
Consg Engr for Rys
Exam Branch.

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Government of India Central Printing Office—No. 1123 P. W. D.—18-12-90—1,000.

d 3 of the India Code-
"they must be paid
by the day or month and
their pay must be
covered by the provision
for "petty supervision"
in the estimates for the
works on which they
"employed."

4. Rule 5 in the Ma[illegible]has
Code seems a good [illegible]one
and might be relax[illegible]ed.

Ques[illegible]
29.7.80 W.

Cir

No. 6822 d/19.[illegible]-20

To W. [illegible]hanges pro-

Yes, I think the f 29th. July
posed in your No.548 D[illegible]ment, inas-
1890 would be an impro[illegible] all sugges-
much as it would remo[illegible] such estab-
tions of a necessity[illegible]ained or sanc-
lishments being ente[illegible]n specific
tioned for employmen[illegible]

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Deputy Secy. to the Govt. of India.

Government of India Central Printing Office—No. 1123 P. W. D.—17-12-90—25.

To
The Joint Secy to the Govt of Madras P.W.D. Rly Br

No. 596 W. dy 7 January

Communicated to the
Chief Engineer for Irrig
& the Consulting Engineer
for Railways.

Sd/ R.R.O.B.

The Chief Engr: for Irrig
" Consulting Engr: for
" Exr: P.W. accts
" Exr: Ry: accts
" Exr: E.C. Ry: accts

No. 193 A.—G.

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Deputy Secy. to the Govt. of India.

Government of India Central Printing Office—No. 1123 P. W. D.—18-12-90—1,000.

Enclosure to Director General of Railways' Circular No. 30 of 1890.

RATE LIST.

CLASS B.

ENGINEERS' PLANT

(*excluding Petty Tools*)

FOR 1889.

G. C. Press, Simla.—No. 435 P. W. D.—19-11-90.—1,000.

Enclosure to Director General of Railways' Circular No. 30 of 1890.

RATE LIST.

CLASS B.

ENGINEERS' PLANT

(excluding Petty Tools)

FOR 1889.

Enclosure to Director General of Railways' Circular No. 30, dated 7th November 1890.

Statement showing the average rate per ton for entire sea freight on Class B Stores imported from England at the several ports during 1889-90.

Class of Stores.	Port of Bombay.	Port of Calcutta.	Port of Karachi.	Port of Rangoon.	Remarks.
	s. d.	*s. d.*	*s. d.*	*s. d.*	
Class B.—"Engineer's Plant" (excluding Petty Tools) ...	25 6	26 0	26 0	32 0	

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
2675, 13-8-89 ...	Anchors ...	With iron stocks (Martin's patent) 4 cwt.	3	0	0	Cwt.	
" "	" ...	" " " 3 cwt.					
2130, 16-3-89 ...	Barrows ...	For hot ashes, ungalvanized, "Victoria;" body made of plate iron or steel ...	1	10	0	Each.	
1918, 4-2-89 ...	Blocks ...	Differential, pulley (Weston's), with chain complete, 1 ton, No. 6	2	2	0	Set.	
" "	" ...	" " " " 10 cwt.	1	8	0	"	
2642, 31-7-89 ...	Cranes ...	Light, Derrick, to lift 2 tons	70	0	0	Each.	
2476, 22-6-89 ...	Engines.	Coupled, horizontal, high-pressure, non-condensing, stationary, steam winding, mounted on strong cast-iron beds of hollow section, supplied with duplicate parts, an automatic dial indicator and ball to show the position of the cage in a shaft 300 feet deep, of 5 inches bore, straight wrought-iron steam piping, with one tee and three right angled bends and all necessary fittings, pipes, valves, bolts, washers, &c., for the complete connection, erection, and fixing of the engine ready for work in India.	1,103	0	0	Each.	
		Duplicate parts of above.					
		One spare set of rings and springs for each piston.					
		One spare set of brasses for each bearing of the engine and winding drum shafts.					
		One spare set of connecting rod brasses for both ends of both brasses.					

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
2820, 7-10-89 ...	Engines, steam, portable. Spare parts of—	Injectors, gun metal, Giffords 10 m. m., all the cones being made removable for renewal	15	0	0	Each.	
		Pistons with rings	9	15	0	„	
		Piston rods, crucible, cast steel, carefully annealed	4	10	0	„	
2847, 17-10-89 ...		Ferrules, steel, $1\frac{1}{4}$″ long × $\frac{5}{32}$″ thick, to suit boiler tubes $2\frac{1}{4}$″ inside diameter ...	4	0	0	Per %	
2672, 13-8-89 ...	Engines, winding, spare parts.	Spur wheels for winding engines without pinions	46	0	0	Each.	
2790, 23-9-89 ...	Glasses, gauge ...	15″ × $\frac{1}{2}$″ } Plain glasses	0	2	10	Dozen.	
„	„	14″ × $\frac{1}{8}$″ }	0	3	6	„	
1885, 29-1-89 ...	Gauges ...	Rail, platelayers, steel, 5′ 6″ gauge. They are to be made not less than 6′ 6″ long over all, of mild steel $\frac{3}{4}$″ diameter in the middle.	0	7	9	Each.	
2630, 23-7-89 ...	Hempstead	26′. $4\frac{1}{2}$″ wide, on rolled beams and cast-iron columns, 2 screens and kick-ups or tipplers, with corrugated iron roof	911	18	0	Each.	For dscriptive schedule, *vide* Appendix A.
		Ormeroids safety hooks or links	46	15	0	For 3.	
		Compensating springs	24	0	0	Ditto.	
		Cages, steel	306	10	0	Ditto.	
		Catches or keeps for cages	132	4	0	For 2 pairs.	

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
2126, 16-3-89 ...	Jacks, screw.	Bottle, traversing, 10 tons, height 16″ when down, 10″ traverse	3	7	6	Each.	
2256, 14-5-89 ...		Traversing, 10 tons, height 16″ when down, traverse 10″, complete with ratchets ...	3	7	6	„	
2943, 2-11-89 ...		Traversing, 10 tons, height 16″ when down, traverse 13″	3	10	0	„	
2944, 2-11-89 ...		„ 12 „ 16″ „ „ „ 13″ (tested to 15 tons) ...	4	0	0	„	
3147, 23-12-89 ...		Bottle, traversing, with ratchet and lever, 10 tons, height 24″ when down, traverse 10″	5	10	0	„	
2660, 7-8-89 ...		Traversing, with levers and ratchets, 20 tons, with steel cylinders, screws, and angles and cross nuts	3	18	6	„	
2256, 14-5-89 ...	Jim crows.	Without lever, for 41½lbs. flat-footed rails	2	8	0	Each.	
2126, 16-3-89 ...		With lever „	2	10	0	„	
3068, 28-11-89 ...		„ „ „	2	12	6	„	
1880, 26-1-89 ...		With lever, for 75lbs. flat-footed rails, the span 24″ and the screw $2\frac{3}{4}$″ diameter, each jimcrow weighs 200 lbs.; lever 6′ 6″ long by 1½″ diameter	3	10	6	„	
2661, 7-7-89 ...		„ „ and double-headed rails ditto	3	17	3	„	

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
1899, 28-1-89 ...	* Machine, rock drill	Improved "Climax," each fitted with patent liner adjusting cradles or jacket, also latest improved patent (reversible tappet valve), also gunmetal stuffing boxes and glands, complete with unions and spanners	64	10	0	Each.	* R. Stephen and Son's patent.
1899, 26-1-89 ...	Machine, rock drill	Spare valves and tumblers for—	1	15	0	Set.	For details, see Appendix B, page 12.
3044, 26-11-89 ...	Monkeys	Pile, driving, ½ ton	5	15	0	Each.	
1847, 21-1-89 ...	„ Steam, ...	Improved direct acting pile driver—, cylinder 9½" diameter and 6' 6" stroke, piston rod 3½ diameter, and steam hose, with flanges and connections, but without boiler and steam winch (E. size 30 cwt.) with 40 feet flexible tubing and 20 feet steam pipe	108	0	0	„	Total weight 2¾ tons.
2274, 17-5-89 ...	Oars ...	Ashwood, 14 and 16 feet	0	0	5½	Foot.	
1995, 16-2-89 ...	Presses ...	Rail, straightening, for 50 lbs. flat-footed rails. The machine is to be made in accordance with drawing B. 155, but arranged for punching and bending rails ...	33	0	0	Each.	With two sets of punches and dies for punching holes 1" diameter.
2685, 23-8-89 ...	Pump ...	Cameron's patent, double ram	626	18	0	Each.	*Vide* Appendix.
2094, 5-3-89 ...	„ spare parts ...	Brass liners, 5 feet long × 14⅛" external diameter, 14" internal diameter, for working barrel for Attock pumps	173 or 28	0 3	0 9½	To 1 Each.	
2813, 3-10-89 ...	Ramps ...	Russell's, cast steel, engine and carriage, double, for 75 lbs. Vignole section rails No. 5.	10	10	0	Set.	
2644, 1-8-89 ...	„ ...	Russell's, cast steel, double, left and right combined, two to a set. Suitable for re-railing engines, heaviest load on any pair of wheels being 16 tons or 8 tons per wheel.	12	10	0	„	

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
2177, 29-3-89 ...	Ramps ...	Stroudley's patent, 2' 10" long for 41¼ lbs. flat-footed rails (4 in a set—2 right hand and 2 left), suitable for re-railing engines weighing 22 tons, heaviest load on any pair of wheels being 8 tons	10	0	0	Set.	
2761, 18-9-89 ...	Rings ...	India-rubber, for gauge glasses	0	4	3	Per %	
2019, 21-2-89 ...	Ropes wire.	Wire, in lengths of 500 feet, with spliced eye at each end, suitable for a working load of 8 tons. Each rope is to take a breaking strain of 80 tons, and is to work round a barrel 4 feet in diameter. A thimble is to be spliced in each end of rope; such splice to be tested to 50 tons. The rope is to be made six strands each of 24 wires, with hemp centres, and is to be of the best quality of improved patent crucible steel, taking a breaking strain of about 90 tons to 95 tons to the square inch.	51	15	0	Each.	£ s. Weight of 2 ropes 42½ cwt., at 40 cwt. ... ... = 85 0 Splicing 4, at £ 1 each ... = 4 0 Reels and packing 2, at £ 2 each = 4 0 Testing 210 tons, at 1s. a ton = 10-10 Total for 2 ropes ... 103-10
2181, 4-4-89 ...		Best plough steel, 500 feet in length, with spliced eye at each end, the splices to be suitable for pit work, estimated weight ½ ton	50	10	0	Each.	
		Description of rope. The rope is to be suitable for a working load of 8 tons, and to work round a drum 4 feet in diameter. The breaking strain of the rope is to be not less than 80 tons. The rope is to have a spliced eye at each end and the splices warranted for a load of 50 tons.					
2296, 20-5-89 ...		(1) Winding, plough, steel, Lang's patent, 80 fathoms, weight 7¼ lbs. per fathom @ £ 3-7-0 cwt.	17	19	0	Each.	
		Conical socket for rope	0	12	6	„	
		(2) For guide, with steel core 50 fathoms long, weight 9 lbs. per fathom, @ 0-15- 0 cwt.	3	0	3	„	
		Conical sockets for above	0	10	6	„	

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
2296—contd.	Ropes wire—*contd.*	*Description of rope*—contd.					
		Item 1.—The ropes to be composed of 6 strands with 12 wires in each strand. Core to be of hemp, to be supplied with a nose or cap fitted on each. The noses or caps for above ropes are to be of Lowmoor iron and solid taper; no rivets going through rope; the wires to be turned back and neatly finished for a safe working load of 64 cwt.					
		Item 2.—Each rope to have a solid nose or cap at one end; no rivets going through rope, and, when fitted on to rope, white metal to be run in to fill up all crevices. Each guide rope is to consist of seven wires, *viz.*, one core wire and 6 outside wires made of Siemens Martin steel.					
		The rolled wires of which the ropes are made are to be of such strength and quality that they shall be equal to the undermentioned strains, and shall indicate the contraction of the original area at the point of fracture and the percentage of elongation that follow, *viz.*:—					
		Tensional strain per square inch. / Percentage of elongation in a length of 10 inches. / Percentage of contraction of fractured area.					
		Not less than 28 tons or more than 32 tons. / Not less than 13 per cent. / 55					
2474, 22-6-89 ...		Steel, 850 fathoms long, working load 5 tons	292	17	10	Each or	
			2	0	0	cwt.	
			2	0	0	for reel and packing	
			2	10	0	for testing 50 tons.	

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
2474—contd.	...	*Description of rope.*					
		The rope is to take a breaking strain of 50 tons, thus allowing a margin of safety over the working load of 10 to 1. To be made 6 strands each of 19 wires, and the wire to be best selected improved patent crucible steel. The heart of the rope to be of best Russian hemp. The rope is to weigh 19 lbs. to the fathom.					
2747, 13-9-89 ...	Ropes wire—*concld.*	Craddocks plough steel, Lang's patent, 2¼" circumference 350 feet long, estimated weight of 1 rope ... ... cwt. 2, qr. 3, lbs. 7	3 28	7 4	0 9	Cwt. or for 3 ropes.	
		Particulars of rope.					
		Circumference of rope, ... 2¼ inches					
		Number of strands 6					
		Number of wires in each strand 7					
		Diameter of each wire ... ... ·081 inches					
		Breaking strain of wire ... ... 1,330 lbs.					
		Breaking strain of each strand ... ... 9,334 lbs.					
		Safe working load ... ... 2½ tons					
		Weight per fathom of rope ... ... 5·4 lbs.					
		Diameter of drum round which the rope will safely work ... 60 inches					

CLASS OF STORES B, ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*concld.*

Contracted for in 1889.

Number and date of Contract.	Articles.	Details.	Rate—Free on Board. Amount. £	s.	d.	Unit.	Remarks.
1831, 15-8-90 ...	Trollies Platelayer's.	Heavy material, 5′ 6″ gauge : wheels with axles and bearings for —; wheels about 1′ 6″ diameter, tyres not less than 4 inches wide, axles about 1¼″, suitable for carrying about 2 tons per trolly	4	5	0	Set.	
2658, 7-8-89 ...		Light, 5′ 6′ gauge : wheels with axles and bearings for— ; wheels 2′ 3″ diameter with 4″ steel tyres, axles not more than 1″	6	5	0	,,	
3137, 14-12-89 ...		Light 5′6″ gauge : wheels with axles and bearings for :—	5	3	0	,,	
		,, metre gauge : wheels and axles for— ; diameter of wheels 27″	5	17	6	,,	
1997, 16-2 89 ...		Gun metal bearings for—ditto, metre gauge	0	7	6	Pair.	
		Wheels, cast steel for—; bored, and key way cut and ground on tread	2	19	0	Set of 4 wheels.	
2099, 7-3-89 ...	Tubs mining.	Metre gauge, bottom plates of 10 lbs. per foot and side plates of 7 lbs. per foot ...	6	8	0	Each.	
		Specification of Tubs.					
		The size of the underframe of oak 5″ × 4″, cross slotts 5″ × 3″, body to be 4 feet long by 3 feet × 2 feet inside, to hold 25 cubic feet when full. The wheels to be of steel 12″ diameter. The axles to be of steel 2″ diameter, a strong bar to run round top edge of body, in which end door is to hinge. The bottom of door to be fastened with tripping hooks be allow the tubs to be tipped from a tipping frame. No springs or fancy work required, but good strong tubs.					

APPENDIX A.

Appendix A.

Heapstead, 26′ 4½″ wide, on rolled beams and cast iron columns, 2 screens and kick-ups or tipplers with corrugated iron roof; as per schedule below. Contract No. 2630.

	Descriptive Schedule.	Cwt.	qrs.	lbs.	£	*s.*	*d.*
Item (*a*)	One Heapstead, consisting of cast iron columns, corrugated iron roof, ridge and spouts, wrought iron Principals and Tie Rods, Heapstead Floor formed of wrought iron rolled Girders, and covered with wrought iron Flat sheets, planed edges, 2 Jigging Screens fitted with screen bars, Vibrating Suspending Links, 2 Coal Shields or flats with suspending chains and weights; all the necessary Shafting, Eccentric Sheaves, and Rods to give motion to the jigging screens 2 wrought iron Kick-ups with Shield Plates, Steam Engine to drive Shafting and jigging screens with 10″ cylinders, 18″ stroke fitted with Fly Wheel and Governor complete	774	0	0	911	18	0
Item (*b*)	3 Ormeroid's Patent Safety Hooks, cylinders, and connections, for a working load of 4 tons	10	0	0	46	15	0
Item (*c*)	3 Compensating Springs, Shackles and Pins complete for a working load of 4 tons	4	0	0	24	0	0
Item (*d*)	3 Steel Cages, each made to suit two of the trollies on one deck, and to allow of the coal being loaded 18″ above the top of the trolly; to be fitted with 6 cage chains with adjusting screw catches for fastening trollies, wrought iron roof with doors to take in long material, the sides of the cage to be fitted with Brackets and Brasses to suit the Guide Ropes; the cages to be packed in pieces, so that they can be put together on arrival	100	0	0	303	10	0
Item (*e*)	2 Sets of Batches or Keeps to suit the before mentioned Cages, made of the best-forged iron for a 14′ 0″ diameter Shaft, to be easily worked by Bankmen at top of pit by lever at either end of the cage; and made so that they fall to on their own accord as soon as the cage has passed, 2 wrought iron Beams for supporting the cages and to which they will be fitted, all complete to a 14′ 0″ diameter shaft and the centres of cages ...	75	0	0	132	4	0
	TOTAL ...	963	0	0	1,421	7	0

Appendix B.

Schedule of Machine Rock Drill, "Climax," with duplicate parts and Tunnel bars, supplied by R. Stephens & Son, Wheal Crofty Iron Works, Carn Brea, Cornwall, as per contract No. 1899-A.

		£	s.	d.	Unit.
For drills ...	18—4″ Improved "Climax" Rock Drills each fittted with R. Stephens & Son's patent liner, adjusting cradles or jackets, also latest improved patent (reversable tappet valve) also *Gunmetal Stuffing Boxes and Glands*, complete with unions and spanners. Cylinders 4′ diameter ...	64	10	0	Each.
Clamps ...	18—Improved Universal Steel Clamps each fitted with steel grippings, plates, set screws and washers	6	0	0	,,
Hose ...	18—1¼″ bore × 6 ply best quality Rubber and Canvas Hose Pipes, each 20′ 0″ long, outside to be covered with tarred marline, and fitted with strong brass unions and air taps.	5	0	0	,,
Water Hose ...	18—¾″ × 5 ply best Rubber and Canvas Hose, each 20′ 0″ long, covered with marline and fitted with brass unions, taps, and water jets complete	3	0	0	,,
Tunnel bars ...	9, Steel Tube Tunnel Bars, each 6′ 6″ long over all when closed × 4⅜″ diameter, × ⅝ thick finished, each fitted with self-tightening conical brass nuts, and wrought iron jacking screws, to be worked by Capstan Bars	10	0	0	,,
Borers ...	90 Borers, each 1′ 6″ long × 1⅝″ steel × 2½″ bits 90 Ditto 2′ 6″ ,, × 1⅝″ ,, × 2½″ ,, ...	0	8	2	,,
	Duplicate parts.				
Ratchets ...	4 sets Steel Ratchet Wheels for each Machine, in all 72 wheels	0	15	0	,,
Bars ...	4 Steel Twisting Bars for each Machine, in all 72 bars ...	2	0	0	,,
Cylinders ...	4—4″ "Climax" Cylinder	10	0	0	,,
Cradles ...	4 Improved liner Adjusting Cradles	6	0	0	,,
Pistons ...	6′—4″ Steel Piston Rods complète, with Twisting Nuts and Steel Collars	7	0	0	,,
Feed screws ...	12 Steel Feed Screws, complete, with Locking Nuts ...	2	0	0	,,
Nuts ...	24 Steel Feed Nuts	1	10	0	,,
Rings ...	12 dozen India Rubber Buffer Rings	0	2	0	,,
,, ...	6 ,, Wrought Iron Piston Rings	0	5	0	,,
Pawls ...	4 ,, Steel Pawls	0	5	0	,,
Covers ...	6 *Improved Gun-metal Stuffing Boxes and Glands* ...	4	0	0	,,
Back covers ...	6 Back Covers	2	5	0	,,
Springs ...	4 dozen Steel Pawl Springs	0	0	6	,,
,, ...	12 ,, ,, Piston ,, ...	0	0	3	,,
,, ...	12 Coils Steel Spiral Springs	0	6	0	Coil.
Buffers ...	4 dozen Valve Box Buffers	0	2	0	Each.
Bolts ...	12 Valve Bolts complete with Cones and Nuts	0	12	0	,,
Rings ...	12 Steel Front Buffer Rings	0	8	0	,,
Screws ...	4 Stretcher Bar Screws and Nuts	4	0	0	,,
Packing ...	20 lbs. Machine Packing	0	2	6	lb.
Bolts ...	12 steel Swivel Bolts and Nuts	0	12	6	Each.
Nuts ...	12 Brass Twisting Nuts	0	12	0	,,

Appendix C.

Specification of Pump, &c., showing prices in detail as per contract No. 2685.

		£	s.	d.
Pump ...	One 9″ Double Ram Pump, 12½″ stroke with 18″ Steam Cylinders, with back cut off Valves, capable of discharging 20,000 gallons per hour to a height of 255 feet with 40 lbs. Steam pressure when running, about 65 revolutions per minute, with governor and equilibrium valve ...	274	0	0
Condenser ...	Camerons make of Condenser	16	0	0
Cocks ...	Two 3½″ Gun-Metal Cocks (three way) with handles and pipes to Condenser	25	0	0
Priming cocks ...	Two Priming Cocks and Pipes	2	10	0
Drawings ...	Drawings and Photo	25	0	0
Packing ...	Packing all parts except Columns, Fly Wheels and Bed Plate which would be sent loose	10	0	0
	Carriage to Liverpool or Birkenhead	5	5	0
	Carriage to London	10	10	0
	Weight about 8 tons	...	...	...
Pipes ...	For Delivery, 280′ 6″ galvanized Cast Iron Pipes faced flanges, 4 bends, 1 T piece with bolts, nuts and joints for Suction, 20′ 7″ galvanized Cast Iron Pipes, faced flanges, 2 bends with bolts, nuts and joints ...	140	0	0
	These weigh about 8½ tons—			
	Delivery and Suction Pipes packed in 3 cases	10	0	0
	Carriage to Liverpool or Birkenhead	5	11	6
	Carriage to London	11	3	0
Steam pipes ...	350′ 4″ Wrought Iron Screwed Steam Pipes with flanges faced and drilled, 6′ 4″ bends, one 4″ T piece with bolts and nuts... ...	99	0	0
	Weight about 2 tons packed in one case	3	10	0
	Carriage to Liverpool or Birkenhead	1	7	6
	Carriage to London	2	15	0
Foot valve ...	One Foot Valve and Strainer suitable for 7½″ Suction Pipe... ...	9	0	0
	Weight about 8 cwts.—			
	Carriage to Liverpool or Birkenhead	0	5	0
	Carriage to London	0	10	0