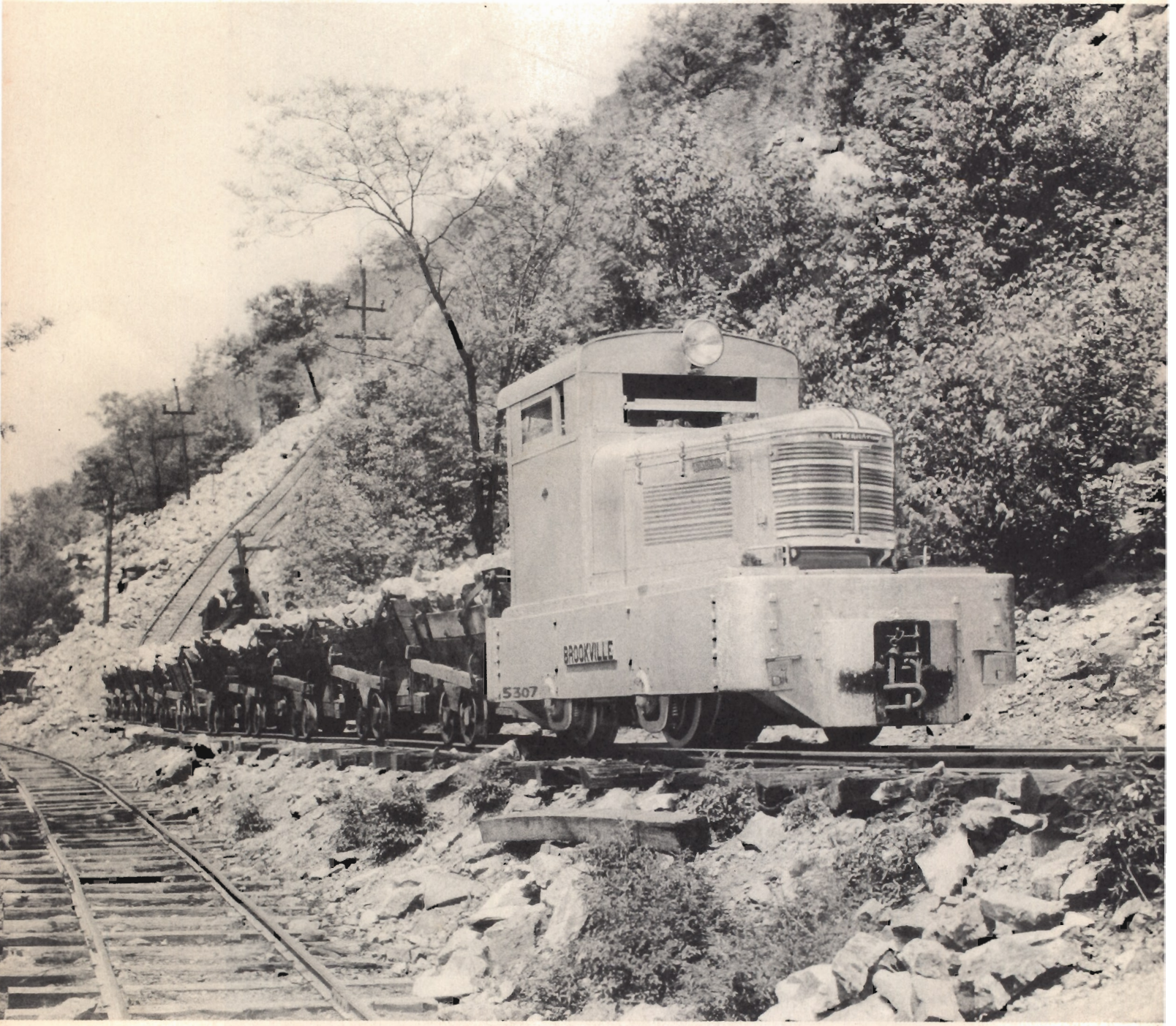
BMD

BROOKVILLE LOCOMOTIVES
POWERED BY INTERNATIONAL



BROOKVILLE LOCOMOTIVE WORKS, BROOKVILLE, PA., U. S. A.

PRINTED IN U. S. A.

BULLETIN I-101

LITTLE LOCOMOTIVES DOING BIG JOBS

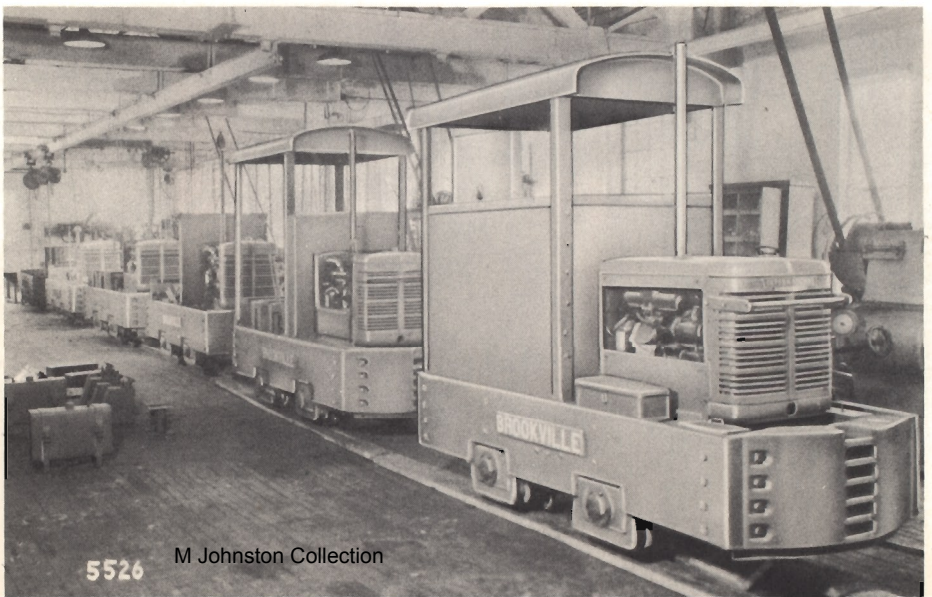
M Johnston Collection

"WORK" *not* WEIGHT *is what counts*

It is customary to designate industrial locomotives in terms of weight, but locomotive weight and haulage capacity are two different things. It's the amount of weight hauled *behind* the locomotive, not the amount carried in the locomotive, that counts. The amount of work that a locomotive will turn out depends not only upon its weight, but also upon:

- ✓ POWER
- ✓ SPEED
- ✓ TRACTION
- ✓ HANDLING EASE
- ✓ UNINTERRUPTED SERVICE

Brookville locomotives out-perform others weighing more and costing more. The engines of the International Harvester Company provide an abundance of reliable power, and the Brookville chassis incorporates many superior operating features developed over a period of twenty-five years. The moderate price of these locomotives is made possible only because the power plant, clutch and transmission are made in large quantities by the International Harvester Company; and the production of the chassis has been simplified and perfected over a period of many years, by a company specializing in this particular type of locomotive.

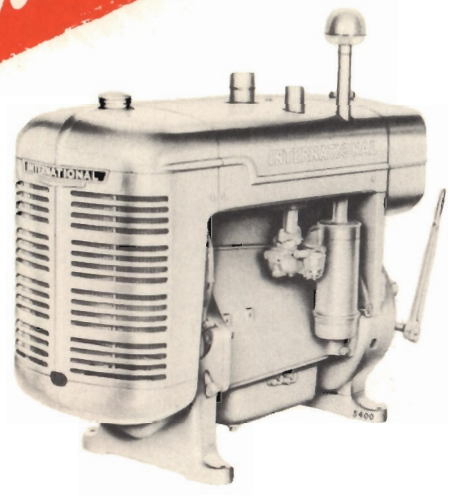


Production line at Brookville Works

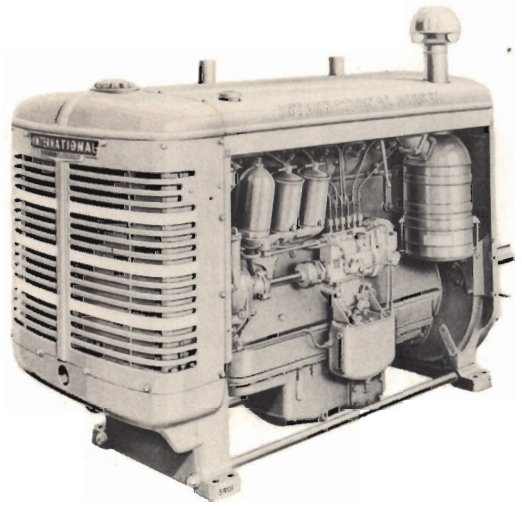
International

POWER

The "BMD" Series of Brookville locomotives is equipped with International Harvester engines, transmission and clutches—all products of a leader in the field, known everywhere for the quality and reliability of its products.



Gasoline



Diesel

POWER TO SPARE

International-powered Brookvilles have power to spare for starting their maximum rated loads, operating at high speeds, and climbing grades—all without subjecting the motor to the wear and tear of continuous operation at maximum output.

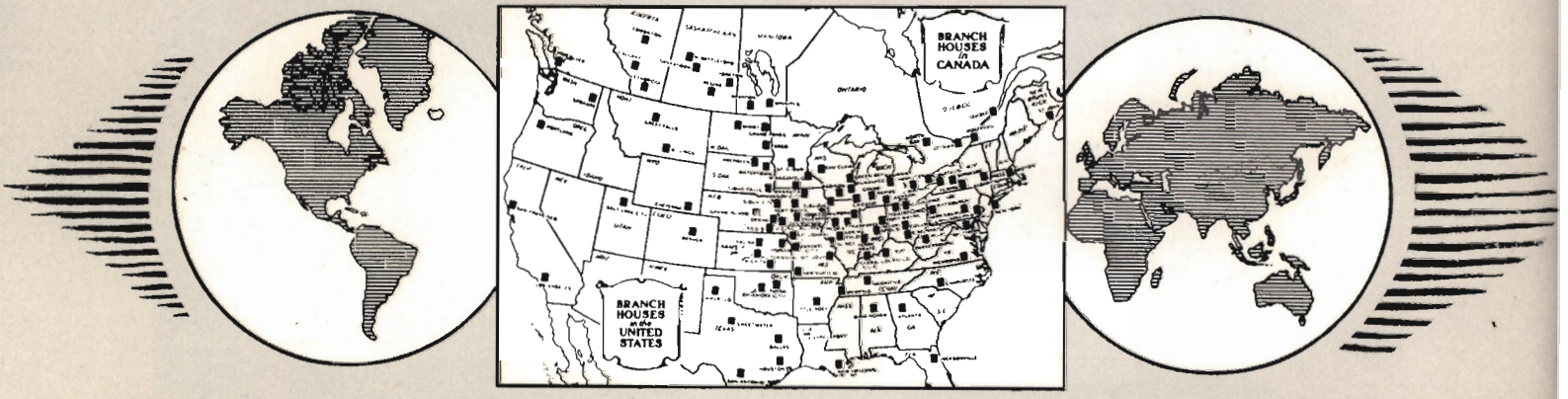
GASOLINE OR DIESEL

Both gasoline and Diesel engines are available. The gasoline engines can be equipped with special exhaust valves for burning kerosene or No. 1 distillate. The Diesels operate on low cost Diesel oil, using only about one-third to one-half as much fuel as a gasoline engine. They are just as easy to start and to operate as are the gasoline engines, and can be recommended without hesitation for any service in which the difference in fuel cost is sufficient to warrant the slightly higher first cost.

INTERNATIONAL SERVICE

In all parts of the world, wherever International engines are sold and serviced, International-powered Brookvilles can be repaired with standard International parts by expert mechanics, at moderate prices.

INTERNATIONAL SERVICE

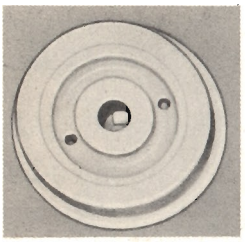


Brookville PERFORMANCE

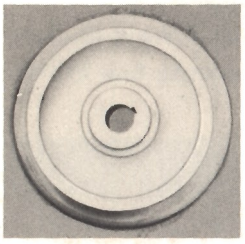
Features such as these definitely step-up the performance of Brookville locomotives.

SPEED

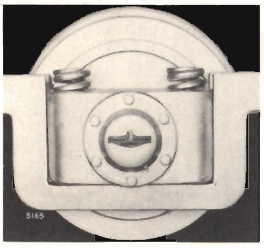
Working speed depends not only upon engine power, but also upon availability of transmission ratios. In this Series of Brookville locomotives, four or five separate speeds, depending on locomotive type, are available in *both* forward and reverse, allowing the operator to select the highest possible speed for any particular load and track condition. Inasmuch as a locomotive is called upon to operate almost equally in either direction, the Brookville reverse transmission, making all forward speeds available in reverse, greatly increases its operating capacity.



Wheel with cast center, rolled steel tire and flange



One-piece wrought steel wheels.



Dual-spring journal with Timken Bearings

HIGH TRACTION STEEL TIRES

A steel tire or wheel has 25 per cent more traction than an ordinary chilled face drive wheel. In other words, a 4 ton steel-tired Brookville will start as heavy a load as an ordinary 5 ton locomotive.

All Brookville locomotives are furnished standard with one piece rolled steel wheels. Cast center wheels with a combination rolled steel tire and flange can be furnished at extra cost.

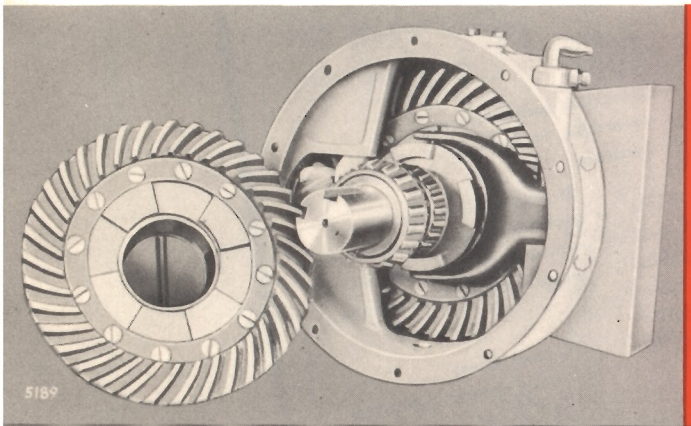
TIMKEN BEARINGS

Because of their reliability and low frictional resistance these famous bearings are standard equipment on all four wheels, as well as in the Brookville reverse transmission.

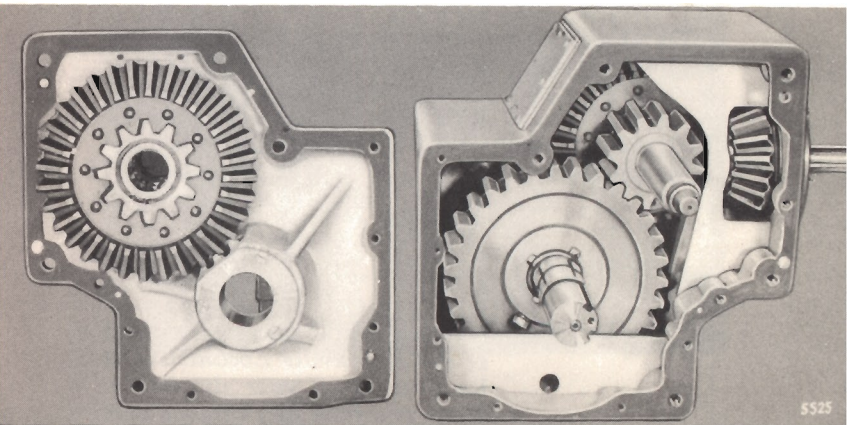
ALL-SPEED REVERSE

Since its introduction in 1930, the Brookville Type C combined reverse transmission and final drive has been used with remarkable freedom from trouble and is now standard equipment for all Brookvilles up to and including 6 tons in weight. It consists of a set of spiral bevel gears, constantly in mesh, turning on Timken bearings in an oil bath.

In the heavier models the equally satisfactory, but heavier, Type B or Type BR transmission is used.



Type "C" reverse transmission used on Brookvilles up to 6 tons in weight.



Type of reverse transmission used on Brookvilles of from 8 to 15 tons in weight.

RELIABILITY

The entire Brookville Locomotive, except for the engine, is absolutely guaranteed against breakage or failure due to inferior parts, faulty workmanship, ORDINARY WEAR, or any other natural cause, excepting misuse or accident, for a period of (6) months following delivery by the transportation company. Under the terms of this guarantee replacement parts are furnished without charge. This guarantee does not cover the cost of labor required for repair and replacement or contingent losses caused by inoperation of the locomotive. (The engine and other parts carry the warranty extended by the International Harvester Company.)

Guaranteed

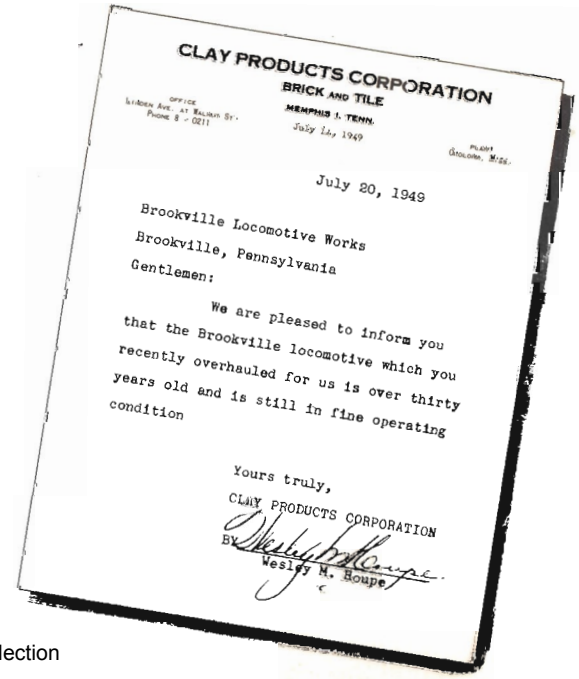
EVEN AGAINST ORDINARY WEAR!

The Brookville Locomotive Works employs power plants that can be serviced locally and makes a locomotive that requires a minimum of service. The aim of the company is to earn a reasonable profit upon the quantity sale of complete locomotives—not on repair parts. In fact, the Brookville is so rugged, simple and reliable that it is warranted against failure from ordinary wear and all other causes, except accident or misuse for a period of six months.

WHEN REPAIRS ARE NECESSARY . . .

Of course, certain wearing parts, such as wheels and tires occasionally require replacement, but, as a rule, such replacements can be anticipated weeks in advance; and the Brookville is so designed that they generally can be made without machine shop facilities.

One of the outstanding features of the Brookville Locomotive is its year after year durability. Time and time again repair part orders come in for locomotives 20 and even 30 years old.



CLAY PRODUCTS CORPORATION
BRICK AND TILE
MEMPHIS 1, TENN.

July 20, 1949

Brookville Locomotive Works
Brookville, Pennsylvania
Gentlemen:

We are pleased to inform you that the Brookville locomotive which you recently overhauled for us is over thirty years old and is still in fine operating condition

Yours truly,
CLAY PRODUCTS CORPORATION
By Wesley M. Houpe

DURABILITY

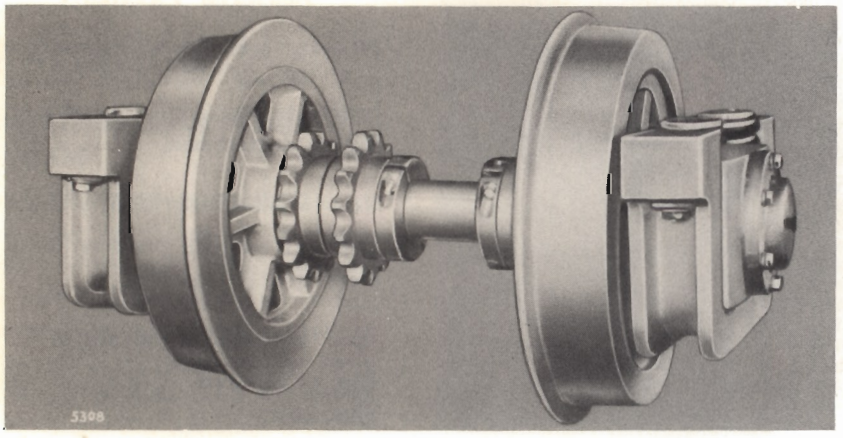
Inasmuch as weight is essential to traction, the Brookville Locomotive Works has chosen to make all working parts oversize and extra strong, instead of merely adding the necessary weight in the form of cheaper cast iron ballast. It is for this reason that the Brookville locomotive, with its heavily reinforced frame, over-size axles, amply proportioned chain drive, and heavy wheels is not only long wearing, but almost indestructible.

DUAL SPRINGS

Each wheel is suspended by two coil springs which allow the wheels to rise and fall over rough uneven track, thereby permitting maximum speed under all track conditions. The use of two springs on each journal, in place of the usual one, both allows greater flexibility and provides greater stability. The journal box itself is so designed as to permit the slight end movement and axle spread necessary to accommodate sharp curves and irregularities in track gauge. The springs are located inside of the journal cage, where they are protected from injury and dirt. Rubber snubbers, located at both top and bottom of the cage, take up excessive load, limit spring compression, and prevent spring breakage from sudden shock.

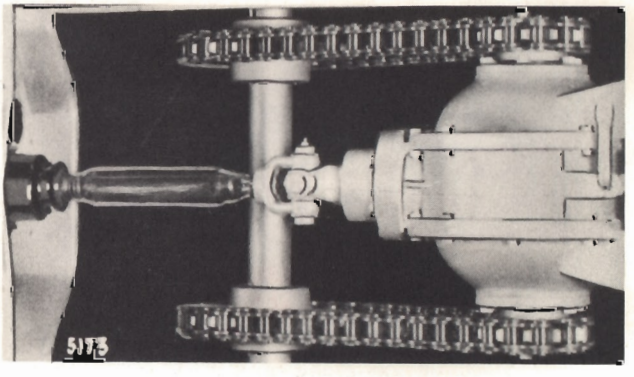
RELIABLE ROLLER CHAIN DRIVE

To accommodate the slight, but very necessary, freedom of journal movement, the Brookville locomotive employs roller chains for the final drive on all four wheels. This feature, combined with the use of 4″ wheel faces and short wheelbase, enables the Brookville to successfully negotiate rough track and short radius curves at speeds which would derail a more rigid locomotive.

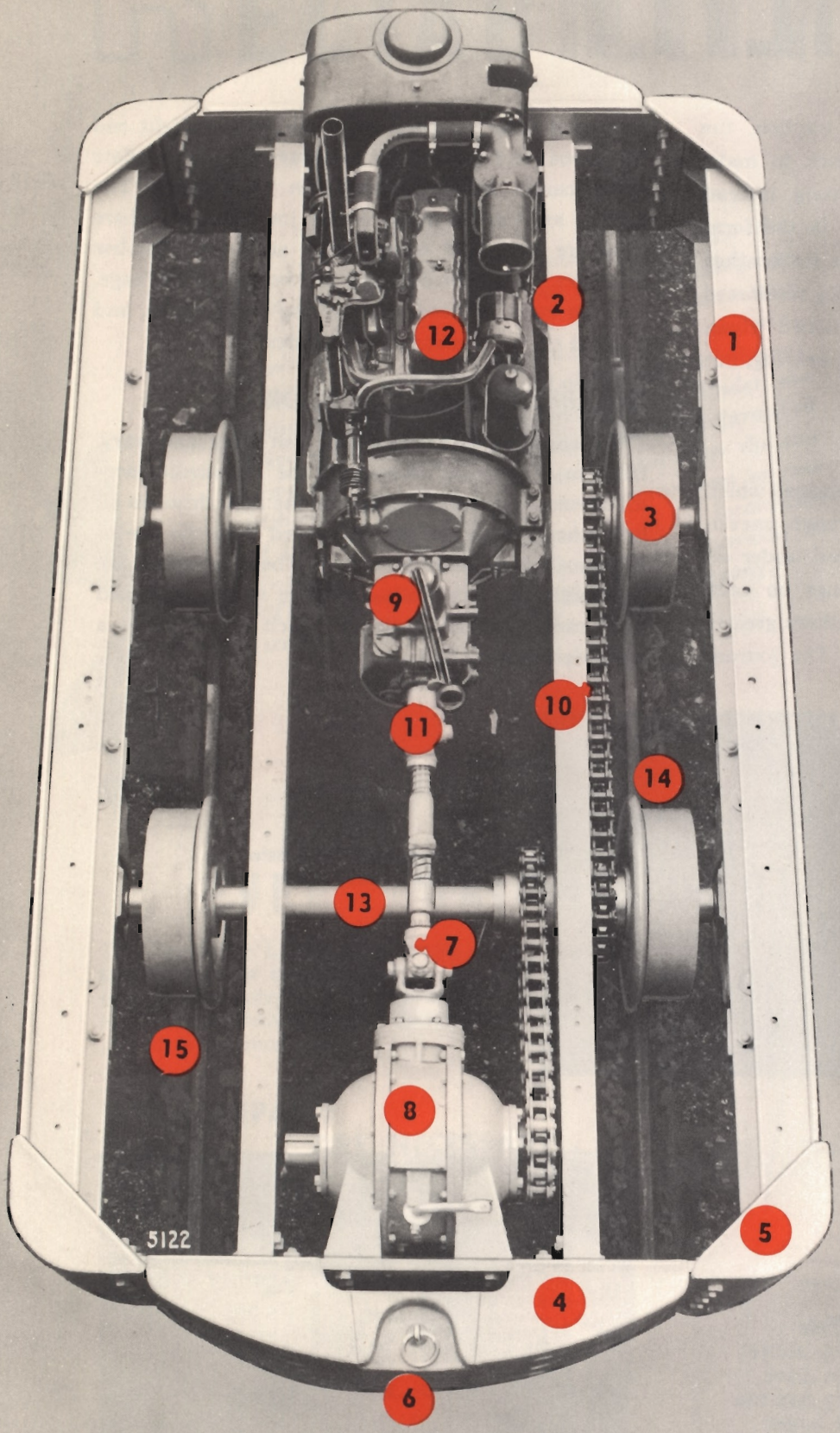


Axle and wheel assembly of 24″ gauge, 8 ton Brookville, showing massive 4″ axle, amply proportioned 24″ wrought steel face wheels, and enclosed dual springs.

Note:
Dual spring suspension and heavy axle.



Note:
Double roller chain drive, used on five ton and larger locomotives.



3, 4, 5 and 6 TON CHASSIS with single chain drive used on 3 and 4 ton units.

A READIL
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a Minimun

1 MAIN FRAME

Of rolled structural steel, Unlike cast iron, structural steel is unbreakable.

2 REINFORCING SUB-FRAME

Used on all models except 30" gauge and narrower, where space does not permit and compactness makes reinforcing unnecessary. This sub-frame also serves as a substantial mounting for engine, transmission and reverse.

3 WIDE 4" WHEEL FACE

4 ROUNDED, SEMI-STEEL COUPLER CASTINGS

Heavily built to withstand bumping and abuse. Rounded contour to negotiate track curves without binding or derailment.

4a SEMI-STEEL END SILLS

Integral coupler pockets; cast semi-steel, neatly rounded.

5 ROUNDED CORNERS

Made of cast steel and securely gussetted.

6 POCKET-TYPE COUPLER

"MCB" couplers also available. (See Specifications, page 12.)

7 DOUBLE UNIVERSAL JOINT

Eliminates strain, easily disconnected for access to transmission or reverse drive.

8 BROOKVILLE REVERSE GEAR

Makes all forward speeds also available in reverse.

SERVICED
INE

s Requiring
of Service

9 HEAVY DUTY CLUTCH

Designed for strenuous service.

10 OVER-SIZE ROLLER CHAIN DRIVE TO ALL FOUR WHEELS

11 HEAVY DUTY FOUR AND FIVE SPEED TRANSMISSION

No trouble ever reported in Brookville locomotives.

12 INTERNATIONAL ENGINE

Installed without alteration, to permit servicing with standard International replacement parts.

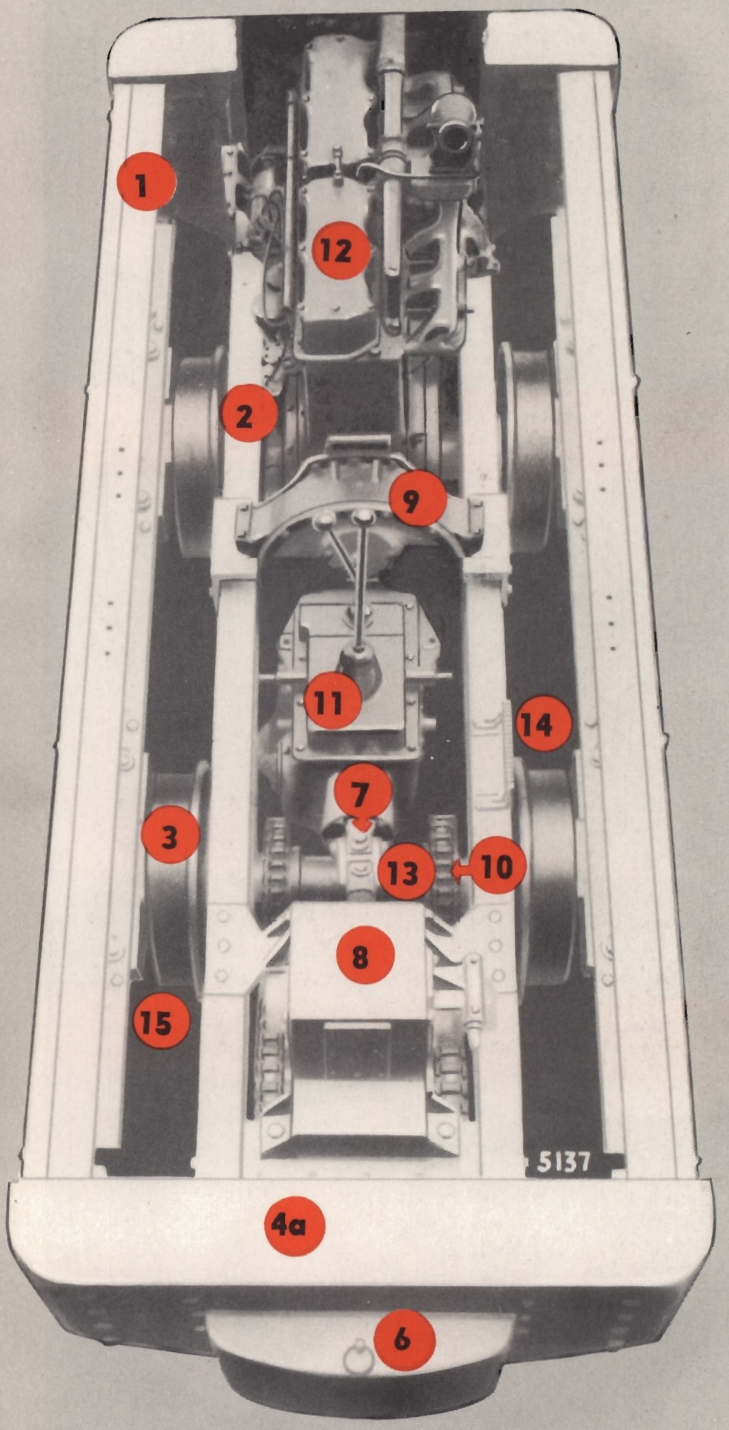
13 OVER-SIZE AXLE

14 IMPROVED FOUR-WHEEL BRAKES

Mechanical type, operated by hand lever in cab is standard, Pressure equalized upon all four wheels. Simple adjustment takes up wear. Long wear is assured by the use of extra large brake shoes with steel inserts which contact both the wheel face and flange. For instance, a 23-lb. brake shoe, having 50 square inches of surface, is used on the 20" wheels furnished as standard equipment for 6 ton locomotives. Bendix vacuum or Westinghouse air can be furnished at extra cost.

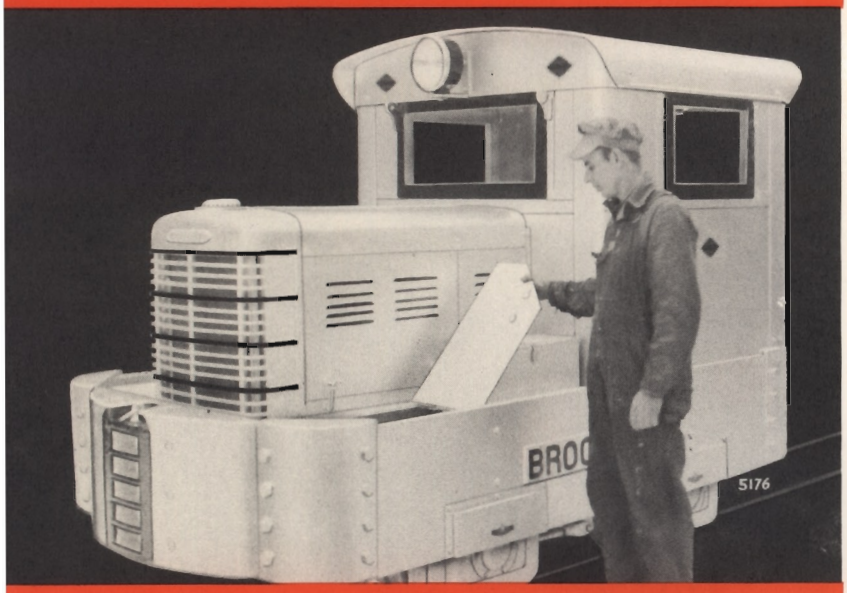
15 FOUR (4) FORWARD AND REVERSE SANDERS

Controlled by hand levers in cab. Sand is delivered immediately below all four wheel treads, for either forward or reverse operation.

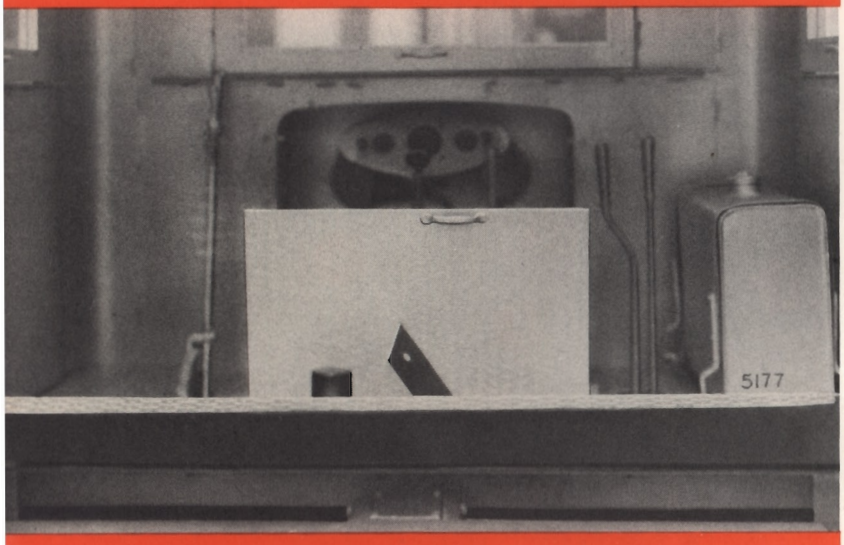


8, 10, 12 and 15 TON CHASSIS

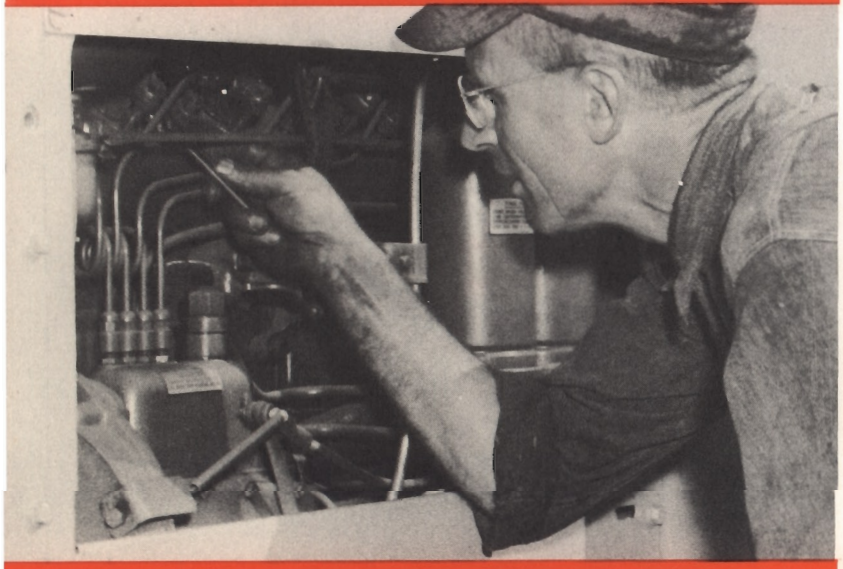
ACCESSIBILITY



Hinged floor plates bring sand boxes and running gear within easy reach.

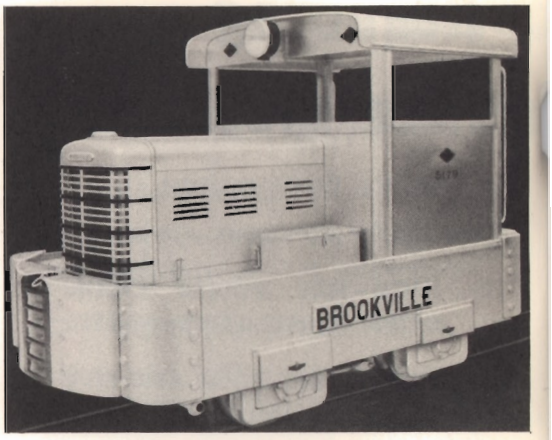


Hinged section in cabin floor opens way to final drive chain, universal joint, clutch adjustment and transmission.



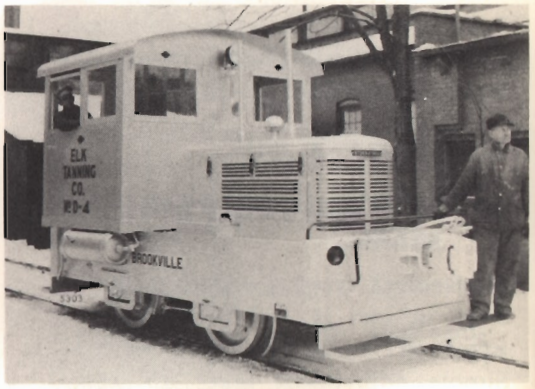
All parts, including engine, are easily reached for oiling and lubrication.

CHOICE



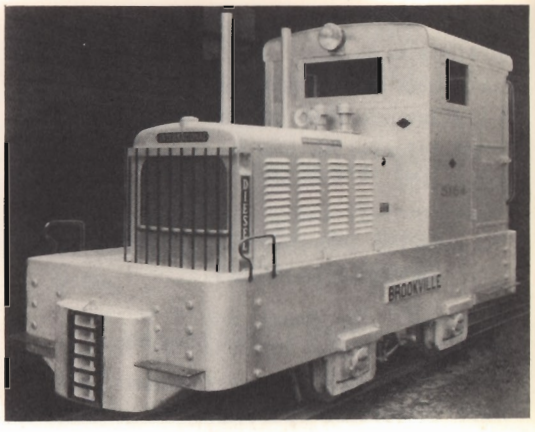
STANDARD OPEN CAB

*Substantial construction, *electric welded, equipped with hand rails at back and enclosed at sides. Detachable curtain with lights can be furnished for front, sides and rear, at extra charge.*



MCB COUPLERS

Standard freight car couplers, such as shown here, can be had on any model.



ENCLOSED CAB

Showing side door; rear door furnished if desired.

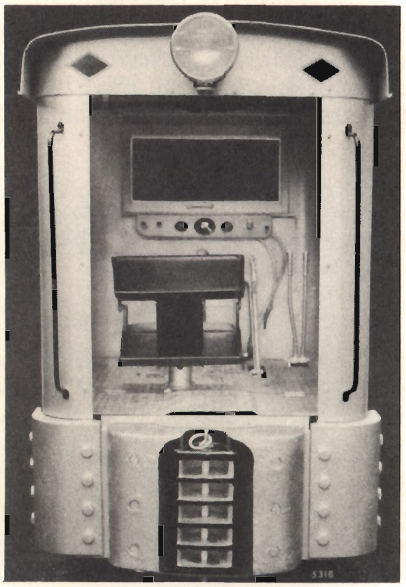
# of CABS

WINDOWS

Can be opened outward for ventilation, or swung inward and up to the roof so as to completely open the windows for hot weather ventilation and maximum visibility.

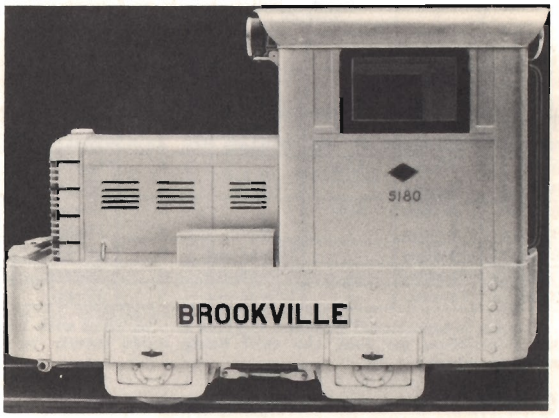
**FOR EXPORT*

***For export shipment, a cab of welded and bolted construction is furnished, so that the cab can be crated with the locomotive without requiring additional space.**



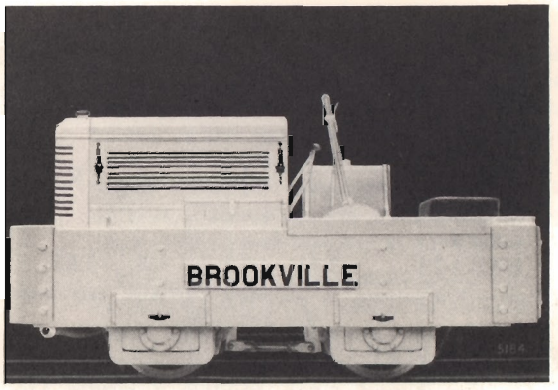
SEATING ARRANGEMENT

In both standard and fully enclosed models the seat is of comfortable design, padded with a sponge cushion, fitted with low padded backrest, and mounted on a pivot pedestal for convenience and comfort when running in reverse. Brakes, gear shift, sand levers, reverse lever, and clutch pedal all are within easy reach.



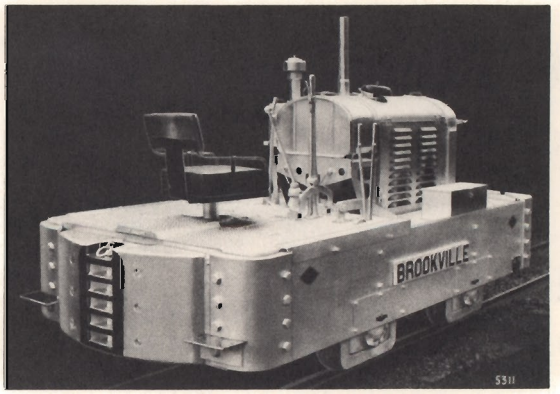
FULLY ENCLOSED STEEL CAB

*Round corners. *Electric welded construction. Equipped with full ventilating shatterproof plate glass front; and hinged shatterproof plate glass windows at sides. A drop curtain with light is standard at rear. A hinged rear door is optional.*



LOW MINE TYPE, WITHOUT CAB

For use where clearance above rails is so limited that standard seat and cab cannot be used. A special well is built into the floor in front of the seat for leg clearance. Low cabs also available.



OPEN CHASSIS

Standard chassis without cab, for indoor or fair weather work, where the cost of the cab can be saved.

STANDARD SPECIFICATIONS

INTERNATIONAL POWER UNITS

Model	Weight	International Engine		No. of Cylinders	Fuel	Governed Speed (RPM)
		Gasoline	Diesel			
BMD-3	3-tons	U-2-A		4	*Gasoline	1800
BMD-4	4-tons	U-6		4	*Gasoline	1500
BMD-4	4-tons		UD-6	4	Diesel	1500
BMD-5	5-tons	U-6		4	*Gasoline	1500
BMD-5	5-tons		UD-6	4	Diesel	1500
BMD-6	6-tons	U-6		4	*Gasoline	1500
BMD-6	6-tons		UD-6	4	Diesel	1500
BMD-8	8-tons	U-9		6	*Gasoline	1800
BMD-8	8-tons		UD-9	4	Diesel	1500
BMD-10	10-tons		UD-14-A	4	Diesel	1400
BMD-12	12-tons		UD-18-A	6	Diesel	1600
BMD-15	15-tons		UD-18-A	6	Diesel	1600

*** All International gasoline engines can be used with kerosene or No. 1 distillate for fuel, the shift being made merely by changing exhaust valves.**

CLUTCH

INTERNATIONAL dry disc.

TRANSMISSION

Heavy duty INTERNATIONAL transmissions are used in all BMD models. All speeds are available in *both* forward and reverse.

SPEEDS

	1st	*2nd*	*3rd*	*4th*	*5th*
BMD-3	1.9	3.9	7.2	12.2	none
BMD-4 thru BMD-8	1.7	3.0	5.0	9.0	12.7
BMD-10 thru BMD-15	2.1	4.2	7.8	13.7	none

(Note:—The above is standard. Higher and lower ranges are available.)

FINAL DRIVE

On the 3 and 4-ton models a single 1¾" pitch chain carries the drive from the Type C Brookville reverse transmission to rear axle. A double chain of similar size is used on the 5 and 6-ton models and a single chain of 1¾" pitch is used between axles. On the 8-ton and larger models, a double chain of 2" pitch carries the drive from the Type B transmission to the rear axle. A single chain of 2" pitch is used between the axles on the 8 and 10 ton models: 2 chains of similar size are used on the 12 and 15-ton models.

GAUGES

18" to 56½" is the normal gauge range of Brookville locomotives; gauge can be varied still more if so desired.

LENGTH

Lengths (Exclusive of Couplers):

BMD-3	105"	BMD-8	120"
BMD-4	108"	BMD-10	142"
BMD-5	108"	BMD-12	160"
BMD-6	110"	BMD-15	166"

WIDTH

On the 3 and 4-ton models, add 26" to track gauge for overall width. For example, the overall width of 36" gauge is 36" plus 26", or a total of 62". On all models, 5 tons or larger, add 28" to gauge. The outside frame with outboard bearings is standard on all gauges. We can, however, supply frame inside with inboard bearings on 36" gauge or larger. With the inboard bearings, etc., the overall width is track gauge plus 10".

OVERALL HEIGHT

Height varies widely with track gauge, power unit used, etc. The BMD-3 (with cab) and BMD-4 average 86". The BMD-5 and BMD-6 88", the BMD-8 98" and the BMD-10, BMD-12 and BMD-15 102". Locomotives furnished without cab are much lower. In cases of low clearance arrangements can be made to meet the special problems.

COUPLERS

Five pocket link and pin couplers are standard on 3, 4, 5 and 6-ton models. Six pocket link and pin couplers are standard with all larger locomotives. Location of pockets (center line) is as follows: 3 and 4-ton (16" wheels), 10½", 13½", 16½", 19½" and 22½"; 5 and 6-ton (20" wheels), 13¾", 16¾", 19¾", 22¾" and 25¾"; 8 ton and larger (24" wheels), 8¾", 11¾", 14¾", 17¾", 20¾" and 23¾".

The heights of pockets can be modified if so specified at time order is placed.

Other types of couplers; including MCB automatic couplers, full size, three-quarter, or one-half size are optional at additional cost. In such cases the height of the hitch on cars should be specified.

FRAME

Heavy structural steel with heavy steel subframe on all but narrow gauges such as 24", on which suspension is to main frame.

ENDSILLS

On 3, 4, 5 and 6-ton models, rounded corners, cast steel, end members wrought steel, with 5-pocket, semi-steel couplers attached. On 8-ton and larger models, endsill is a heavy semi-steel casting with six pockets.

DRIVE WHEELS

All locomotives are furnished standard with one-piece rolled steel wheels: 16" diameter for 3 and 4-ton models, 20" for 5 and 6-ton and 24" for 8-ton and larger models. A 33" wheel is also available for 8-ton and larger models.

20", 24" and 33" cast center wheels with combination rolled steel tire and flange are optional at additional cost.

STANDARD SPECIFICATIONS (cont'd)

WHEELBASE

36″ wheelbase is standard when 16″ wheels are used. 42″ wheelbase for 20″ wheels. 46″ wheelbase for 24″ wheels. These are subject to variation depending upon gauge of track and other special conditions encountered.

AXLES

Axles are made of heat treated alloy steel, 2-15/16″ for 3 and 4-ton models; 3½″ for 5 and 6-ton models; 4″ for 8-ton models; and 4¾″ for 10, 12 and 15-ton models.

WHEEL BEARINGS

Timken tapered roller bearings, standard equipment, with Brookville - Timken journal box and housings.

JOURNAL SUSPENSION

BROOKVILLE dual-spring type.

FUEL TANK

10 gallon capacity fuel tanks are standard on 3, 4, 5 and 6-ton models; 20 gallon on 8 and 10-ton and 30 gallons on 12 and 15-ton models.

SIGNAL

Electric horn standard. Gongs, bells, whistles, optional at slight additional cost.

TOOLS

Metal tool box, with a full set of tools, is included as standard.

STARTING AND LIGHTING

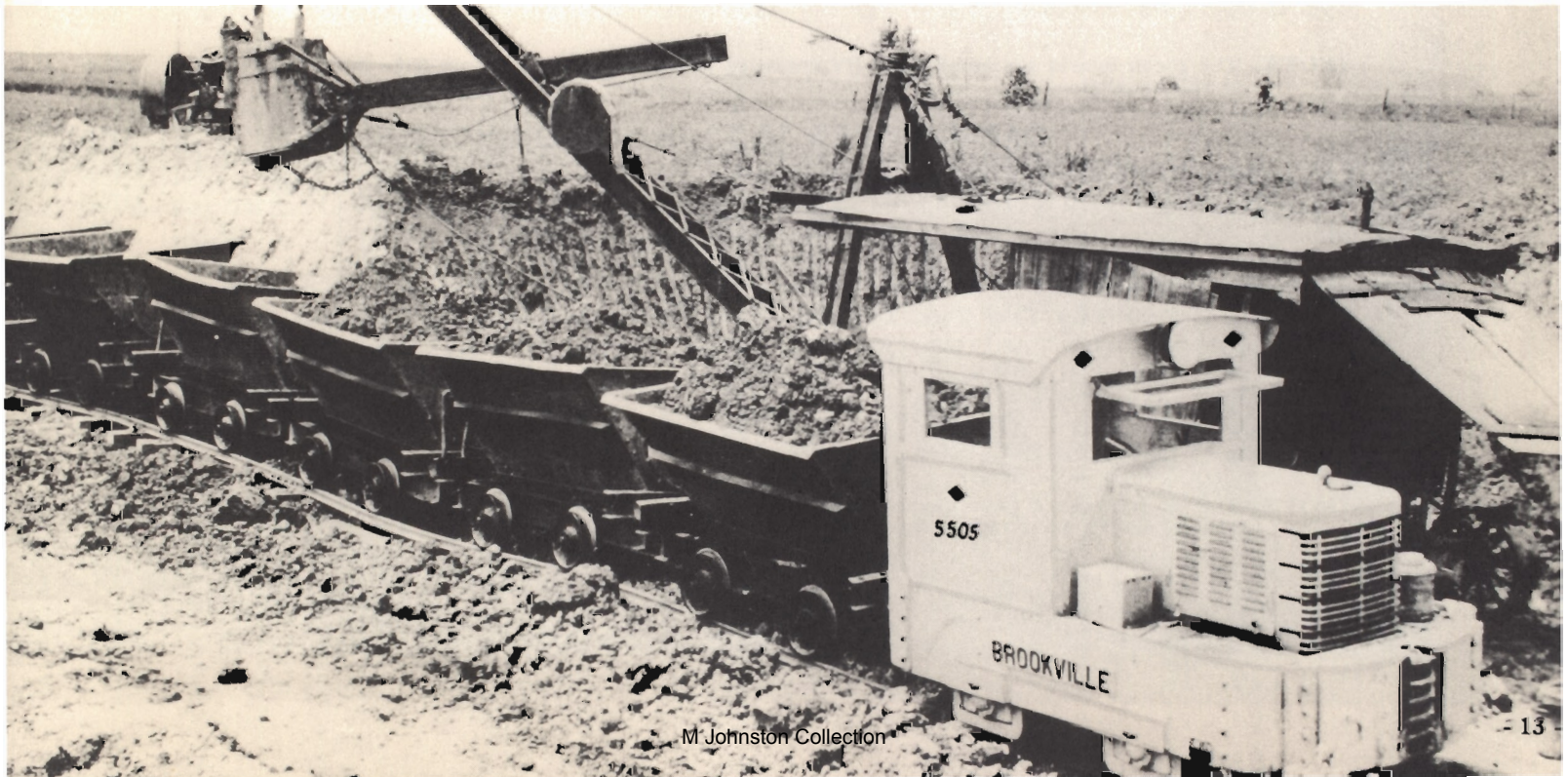
Electric starting and lights furnished as standard equipment.

EXPORT DIMENSIONS AND WEIGHTS

Model	Gross Weight 24″ Gauge	Cubic Feet 24″ Gauge	Factor W (See note)	Factor C
BMD-3	8,300 lbs.	250	20	4.2
BMD-4	10,600 lbs.	300	22	5
BMD-5	12,600 lbs.	300	22	5
BMD-6	14,600 lbs.	300	22	5
BMD-8	19,800 lbs.	450	25	7
BMD-10	24,000 lbs.	500	27	8.3
BMD-12	28,500 lbs.	575	30	9.5
BMD-15	35,000 lbs.	630	30	9.5

(Note) The weights and cubical content given are for 24″ gauge locomotives. The figures shown in the column headed Factor W represent the increase in tare weight for each increase of 1″ in track gauge over 24″. For example, the increase in weight of the 36″ gauge BMD-3 unit would be 12 × 20 = 240 pounds. The gross weight of a 36″ gauge BMD-3 would therefore be 8,540 pounds.

The figures used in the column headed Factor C can be used in a similar manner to determine the cubical content of a gauge wider than 24″.



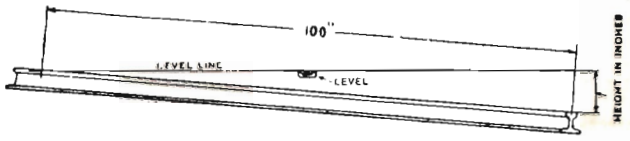
M Johnston Collection

HOW TO FIGURE HAULAGE CAPACITIES

Having an ample margin of overload when used with satisfactory cars and track, all Brookville Locomotives are fully capable of handling the maximum load ratings given in the tables, irrespective as to whether the controlling grade is one hundred feet or a mile in length. With a controlling grade of short duration, a reasonable overload can be safely carried by applying sand to the rail, while the use of sand on a wet rail will usually permit the full load. However, it is unwise to figure an overload over long, continuous grades.

Grade is based upon the rise or fall each 100 feet of track. To obtain grade over a 100 ft. stretch requires instruments that are often not available. However, by computing by inches rather than feet accurate grades can be obtained by means of a level and straight edge or string. For illustration refer to line cut at right. Use cord or straight edge 100 inches in length, in conjunction with level. Height in inches between the rail head at its lowest point, and the level line or straight edge equals the percentage of grade. If this distance is 4 inches it signifies a 4% grade. If 6 inches a 6% grade, etc.

Frictional resistance per ton at draw bar on industrial cars will vary from 10 lbs. per ton with the best track conditions and good roller bearing cars, to as high as 40 lbs. per ton with poor cars and trackage. But few of the smaller industrial cars require less than 15 lbs. per ton. Hence we are listing under 15 lbs., 20 lbs. and 30 lbs. When both track and car conditions are good the 20 lbs. schedule is conservative. When only fair the 30 lbs. is in turn conservative. In order to compensate for the average curve with moderate radius, add 1% to grade. For shorter radius add 2%. Curves as short as twenty or twenty-five feet will reduce load as much as two-thirds over straight track. These figures are approximate only. Weights given in the tables are gross, and include the weight of cars.



CAPACITY OF 3, 4, 5 AND 6-TON MODELS

(Steel Tires—No Sand)

Model	BMD 3-TON			BMD 4-TON			BMD 5-TON			BMD 6-TON		
Draw-bar Pull	1500 lbs.			2000 lbs.			2500 lbs.			3000 lbs.		
Frictional Resistance per Ton	15-lb.	20-lb.	30-lb.	15-lb.	20-lb.	30-lb.	15-lb.	20-lb.	30-lb.	15-lb.	20-lb.	30-lb.
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Level Track	100	75	50	133	100	66	167	125	83	200	150	100
1% Grade	40	37	30	56	50	33	66	58	45	80	69	54
2% Grade	24	22	17	36	33	22	40	37	31	49	44	37
3% Grade	17	16	14	27	25	17	28	26	23	34	32	27
4% Grade	13	12	11	21	19	13	21	20	18	26	24	21
5% Grade	11	10	9	17	15	11	17	16	14	20	19	17

(NOTE: The above figures are based on a dry unsanded rail. Sand will add from 25% to 40%, varying according to rail weight)

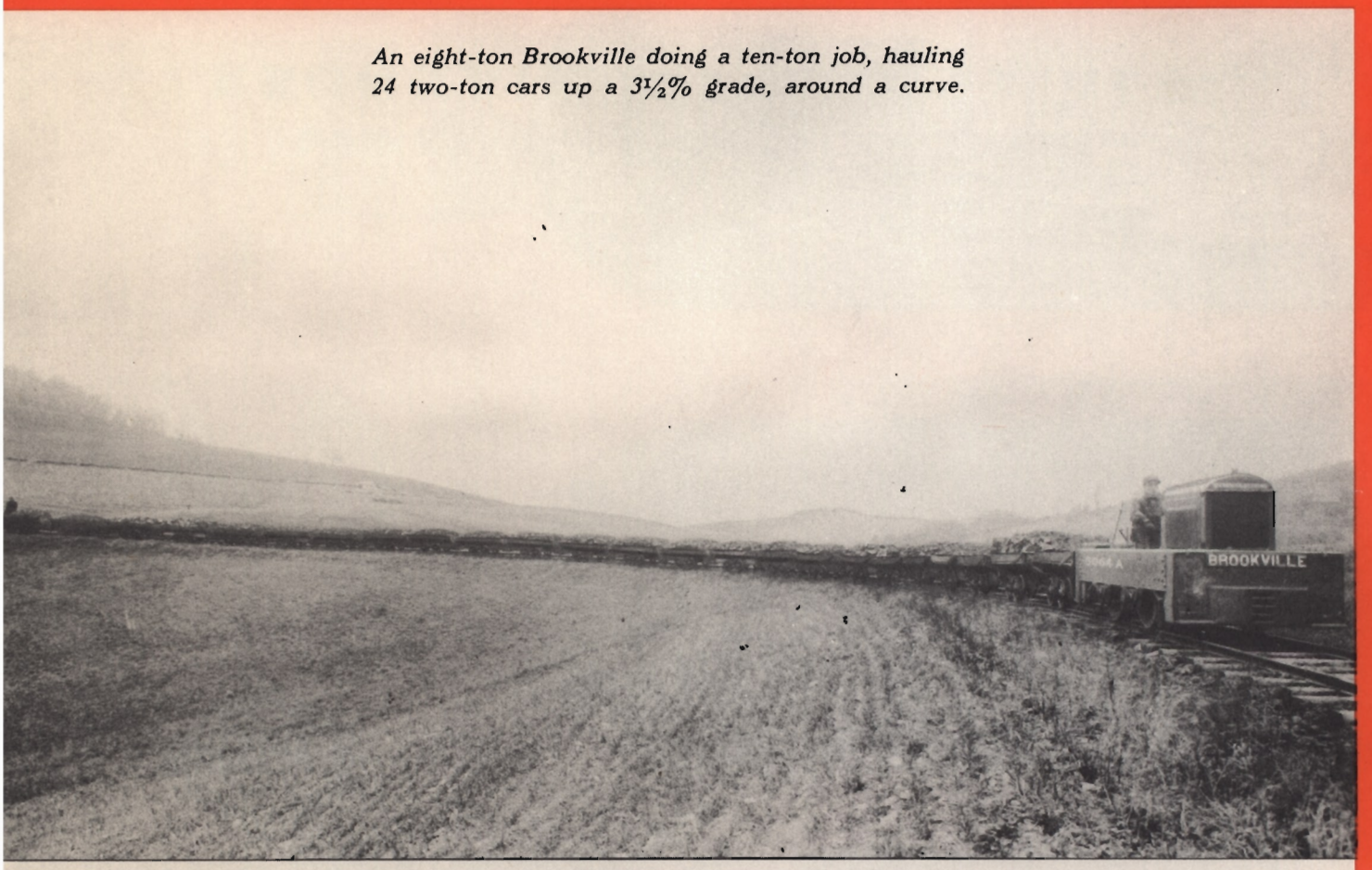
CAPACITY OF 8, 10, 12 AND 15-TON MODELS

(Steel Wheels—No Sand)

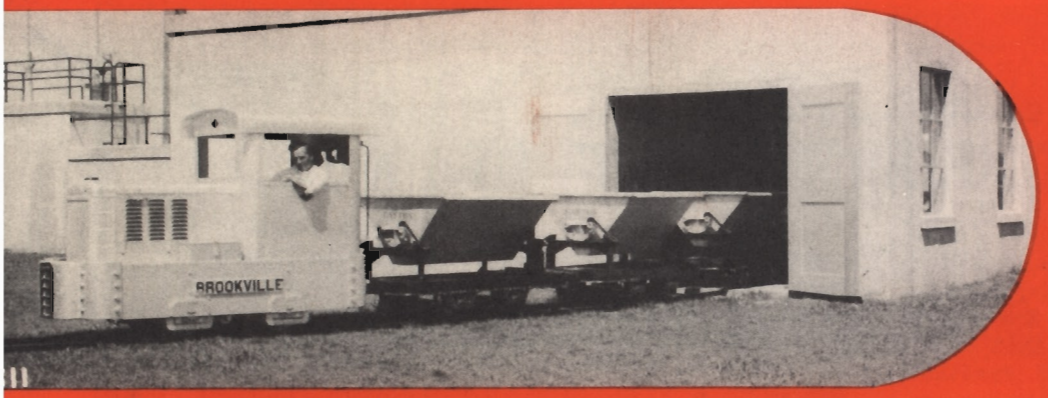
Model	BMD 8-TON				BMD 10-TON				BMD 12-TON				BMD 15-TON			
Draw-bar Pull	4000 lbs.				5000 lbs.				6000 lbs.				7500 lbs.			
Frictional Resistance per Ton	10-lb.	15-lb.	20-lb.	30-lb.	10-lb.	15-lb.	20-lb.	30-lb.	10-lb.	15-lb.	20-lb.	30-lb.	10-lb.	15-lb.	20-lb.	30-lb.
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Level Track	400	267	200	133	500	333	250	167	600	400	300	200	750	500	375	250
1% Grade	125	106	92	72	157	133	115	90	188	159	138	108	235	199	173	135
2% Grade	72	65	59	49	90	81	73	61	108	97	88	74	135	121	110	92
3% Grade	49	44	42	36	61	57	53	46	74	68	63	55	92	85	79	68
4% Grade	36	34	32	28	46	43	40	35	55	51	48	43	68	64	60	53
5% Grade	28	27	25	23	35	34	32	28	43	40	38	34	53	50	48	43

(NOTE: The use of chilled face wheels reduces friction 20% as compared to solid wrought steel or steel tired wheels, and, in turn, reduces loads 20% from tonnage schedules, above listed)

An eight-ton Brookville doing a ten-ton job, hauling 24 two-ton cars up a 3½% grade, around a curve.



Three-ton 24" gauge International powered Brookville on a sisal plantation.



Sewage disposal at Springfield, Mass., Sewage Disposal Plant.

ON THE *Job*

Sugar cane being hauled by Brookville locomotive on large plantation.

Gasoline BROOKVILLE Diesel

Pulling eight 3-ton cars up a 2% grade at A. P. Green Fire Brick Co.

BROOKVILLE LOCOMOTIVE WORKS

BROOKVILLE, PA. U.S.A.

Hauling sisal in Cuba. A 3½-ton, 24" gauge Brookville powered with an International gasoline engine.

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