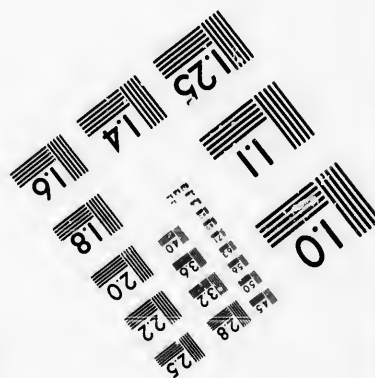
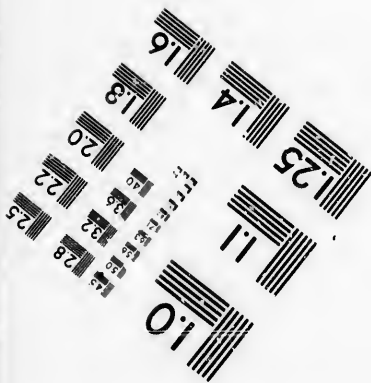
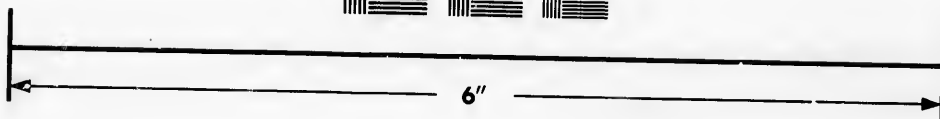
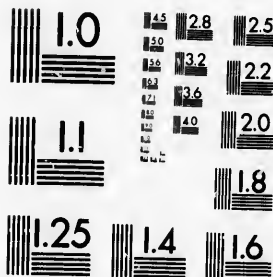


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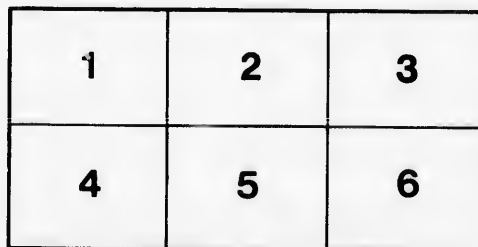
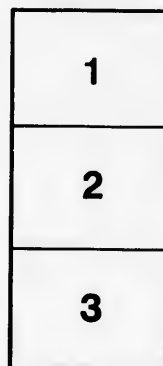
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BUCHANAN'S PATENT DETENT

FOR STOPPING THE PAPER BARREL OF STEAM-ENGINE INDICATORS.

SECURED BY LETTERS PATENT, Dated 9th May, 1887,

DIRECTIONS FOR WORKING THE DETENT.

FIX the Indicator to the engine, then pull out the cord of the paper drum to its full extent, the pawl of the Detent being in gear, then take the cord from the engine and connect it to the cord of the Indicator, adjust the cord with the cord-adjuster until the engine pulls upon the Indicator at each stroke, the paper drum can now be set in motion and stopped by pushing the spring of Detent up or down.

Sometimes a little elastic may be used to keep the cord always in position upon the pulley of the paper drum.

N.B.—As the pressure on the end of pawl must be removed before the pawl will fly out of gear, it may be necessary, if the Indicator has been standing, to give the cord a little additional tightening by touching it with the finger for an instant.

SOLE MANUFACTURERS:

HANNAN & BUCHANAN,

75 ROBERTSON STREET, GLASGOW.

RICHARD'S STEAM ENGINE INDICATORS WITH PATENT DETENT,

For High Pressure Triple-Expansion Engines.

THE SPRINGS ARE MADE TO SCALES AS FOLLOWS:—

No. I.	Indicates from - - - - -	15 to + 10	No.		Atmosphere, .. +
			7.	8.	
	$\frac{1}{8}$ -inch on the scale represents		7.	$\frac{1}{32}$.. + 100
	1-lb. pressure on the square		8.	$\frac{1}{10}$.. + 125
	inch.		9.	$\frac{1}{8}$.. + 150
			10.	$\frac{1}{56}$.. + 175
2.	$\frac{1}{12}$	—15 ... +	11.	$\frac{1}{64}$.. + 200
3.	$\frac{1}{18}$	—15 ... +	12.	$\frac{1}{72}$.. + 230
4.	$\frac{1}{20}$	—15 ... +	13.	$\frac{1}{80}$.. + 250
5.	$\frac{1}{24}$	—15 ... +	14.	$\frac{1}{100}$.. + 320
6.	$\frac{1}{30}$	—15 ... +	15.	$\frac{1}{120}$.. + 380

PRICES.

Indicator, with One Spring and Scale,	each, £8 10 0
Extra Spring and Scale,	" 0 10 0
„ Extra Paper Cylinder Spring,	" 0 1 6
Metallic Paper,	Per Packet, 0 4 0
Extra Cock, with Cap,	each, 0 8 0
Arrangement for Oscillating Engines,	" 0 10 0
REDUCING GEAR, for reducing the Stroke of the Engine down to that of the Indicator,	" 2 10 0
Extra Stroke,	" 0 1 6

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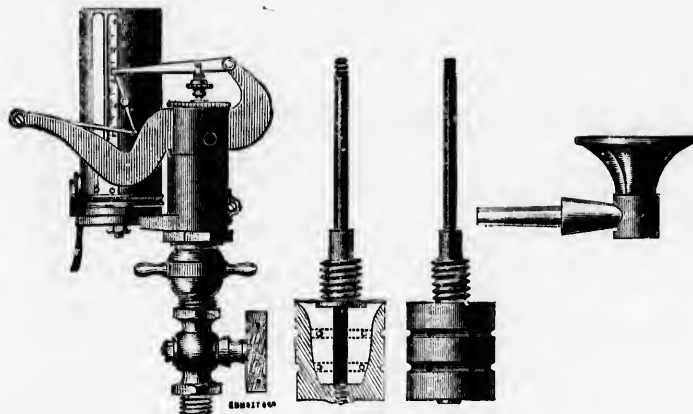
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Buchanan's Patent Steam Engine Indicators,

With Lubricating Piston
For High Pressure and Triple-Expansion Engines,

WITH PATENT DETENT.

(SECURED BY LETTERS PATENT, No. 5713.)



A FEW TESTIMONIALS.

Messrs. HANNAN & BUCHANAN,
75 ROBERTSON STREET.

LANEFIELD HOUSE,
GLASGOW, 22nd June, 1887.

DEAR SIRS,—In reply to yours of 21st June, we beg to state that the gauges you have supplied for H.M.S. "Australia" and "Galatea" have given us entire satisfaction. We have also fitted your gauges to a large number of merchant steamers, and in every case we have been pleased.

Yours truly,

Pro R. NAPIER & SONS,
BRUCE HARMAN.

Messrs. HANNAN & BUCHANAN.

DONALDSON LINE OF STEAMERS,
165 ST. VINCENT STREET, GLASGOW.

DEAR SIRS,—In reply to yours regarding your Patent Richard's Indicator, which we have had in use in our S.S. "Alcides" for the last sixteen months, I am pleased to say that it has given every satisfaction.

A. BLAIR, *Superintending Engineer.*

Messrs. HANNAN & BUCHANAN.

PERSEVERANCE IRON WORKS,
PENDLETON, NEAR MANCHESTER.

GENTLEMEN,—We have one of your Indicators for our High Pressure Engine, and are pleased to say it gives every satisfaction.

MAYBURY, MARSTON & SHARP.

Messrs. HANNAN & BUCHANAN.

HARBOUR ENGINE WORKS,
PORTMAN STREET, KINNING PARK,
GLASGOW, 17th August, 1887.

DEAR SIRs,—We are so pleased with the efficiency of your new patent Indicator that we will be obliged if you will, at your earliest convenience, send us another for 160-lbs. working pressure, with two extra springs, $\frac{1}{10}$ and $\frac{1}{50}$.

We are,

Yours truly,

MUIR & HOUSTON.

Messrs. HANNAN & BUCHANAN.

“STATE” STEAMSHIP WORKS,
PLANTATION QUAY, EAST GOVAN.

DEAR SIRs,—The Engine Indicators, to which you fitted your patent steam piston, has given every satisfaction since, and has been regularly used for 150-lb. steam, and can recommend it with confidence.

Yours faithfully,

GEORGE M'FARLANE, *Superintending Engineer.*

Messrs. HANNAN & BUCHANAN.

NAVAL ARCHITECTS, CONSULTING MARINE ENGINEERS AND SURVEYORS,
30 GREAT ST. HELENS, LONDON, E.C.

DEAR SIRs,—We have used your Patent Indicators for High Pressure and with Triple-Expansion Engines for the last two years, and have been entirely satisfied in all respects with the Indicators. We find we get good and accurate diagrams with them, which have enabled us promptly to detect faults not shown in the diagrams taken by other Indicators.

We are, DEAR SIRs,

Faithfully yours,

LINDSAY & CO.

Messrs. HANNAN & BUCHANAN.

ROSAMAND WOOLLEN COY.,
ALMONT, CANADA.

GENTLEMEN,—In reply to your enquiry, your instrument is a good serviceable adjunct to the Engine-Room. From our main engine, making 65 revolutions per minute, we get a splendid card.

I have the pleasure to remain, GENTLEMEN,

Yours truly,

JOHN R. BARRI,
Pro ROSAMAND WOOLLEN CO.

Messrs. HANNAN & BUCHANAN.

BUTZ PAPMEHL,
ENGINEERS AND SHIPBUILDERS, ST. PETERSBURGH.

GENTLEMEN,—We are quite satisfied with the Indicator delivered by you; it has proved correct. We find your price also MODERATE. Wishing you success,

I remain, GENTLEMEN,

Yours truly,

THOMAS EALES,
Engineer of Butz and Papmehl.

CARE AND USE OF THE INDICATOR.

IN taking the instrument apart for cleaning, the pieces should be laid down in full view on a sheet of paper, to avoid getting grit on them. The sooner the instrument is thoroughly dried, wiped clean and bright, and then well oiled after working, the better order it will be in, and the better work it will do. The cocks should be kept free from grit or dirt by caps screwed on them. The instrument may be easily picked and handled by the paper-barrel and inner-drum. When its cylinder is too hot to touch, sponge is better than waste for cleaning the instrument, as the fibres of the latter not only get tangled up in the lever motion, which is a nuisance, but small fibres are apt to get in the pivots and interfere with their lubrication and free action. Oil the joints well to relieve them from friction, as they are apt to get gummed up if the Indicator has been laid past for some time. In taking diagrams from new engines, care should be taken that all the core sand and iron filings are cleared out from the ports and cylinders, otherwise it will be impossible to take a diagram through the piston sticking in the cylinder of Indicator. One minute's working with this grit will do more damage to the instrument than years of working with clean cylinders.

SOLE MANUFACTURERS—

HANNAN & BUCHANAN,
75 ROBERTSON STREET, GLASGOW.

ALSO MAKERS OF

Buchanan's Patent Steam Engine Indicator for High Pressure or Triple-Expansion Engines,
BUCHANAN'S PATENT STEAM ENGINE INDICATOR,
BUCHANAN'S PATENT GAUGE FOR HIGH PRESSURE STEAM,

For Quick-Speed Engines, such as Torpedo Boats, Steam Launches, Steam Yachts, Locomotives, &c.

RICHARD'S IMPROVED PATENT INDICATOR.

BOURDON'S PATENT PRESSURE, VACUUM, AND COMPOUND GAUGES.
ENGINE COUNTERS, ENGINE TELEGRAPHS.

Reducing Gear for Indicating Engines, Salinometers, Thermometers, English Lever Marine
Clocks, Organ Steam Whistles, Harding's Patent Engine Counters, &c.

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