

(No. 3389.)

"CITY OF MONTREAL" (S.S.)

The Merchant Shipping Acts, 1854 to 1876.

IN the matter of the formal Investigation held at the Crown Court, Liverpool, on the 18th, 19th, 20th, and 21st of October 1887, before H. C. ROTHERY, Esquire, Wreck Commissioner, assisted by Captains CASTLE and PARFITT as Assessors, into the circumstances attending the abandonment, on fire, of the steamship "CITY OF MONTREAL," of Liverpool, on the 12th of August last, whilst on a voyage from New York to Queenstown.

Report of Court.

The Court, having carefully inquired into the circumstances of the above-mentioned shipping casualty, finds, for the reasons annexed, that the loss of the said vessel was due to her cargo of cotton having caught fire, arising probably, not from spontaneous combustion, but from a spark having fallen on some loose cotton and ignited it; and that the rapid spread of the fire was caused by the loose and improper way in which the bales were packed. The Court is also of opinion that, although it would have been better to have stopped the vessel as soon as the fire was discovered instead of proceeding on for some 8 or 9 hours at full speed, great credit is due to the master, officers, and crew, and indeed to all on board, for the efforts which they made to extinguish the fire and save the vessel.

Dated this 21st day of October 1887.

(Signed) H. C. ROTHERY,
Wreck Commissioner.

We concur in the above report.

(Signed) JOHN S. CASTLE, } Assessors.
WM. PARFITT, }

Annex to the Report.

This case was heard at Liverpool on the 18th, 19th, 20th, and 21st days of October instant, when Mr. Mansel Jones appeared for the Board of Trade, and Mr. Baden Powell for the owners, master, and officers of the "City of Montreal." Eighteen witnesses having been produced by the Board of Trade and examined, and the depositions of five witnesses taken at New York having been put in and read, Mr. Mansel Jones handed in a statement of the questions upon which the Board of Trade desired the opinion of the Court. Mr. Baden Powell having then put in and read the depositions of five witnesses taken at Jersey City, and three taken at New York, addressed the Court on behalf of his parties, and Mr. Mansel Jones having been heard in reply, the Court proceeded to give judgment on the questions upon which its opinion had been asked. The circumstances of the case are as follow:—

The "City of Montreal" was an iron screw steamship of 4,495 tons gross, and 2,940 tons net register, and was fitted with engines of 600 horse power. She was built at Glasgow in the year 1872, was registered at Liverpool, and was the property of the Inman and International Steamship Company, Limited, Mr. Edmund Taylor, of No. 22, Water Street, Liverpool, being the manager. She left New York on the 6th August last for Liverpool, with a crew of 97 hands all told, 145 passengers, and a general cargo, of which a large portion consisted of bales of cotton. Nothing particular occurred until about 9 or half-past 9 p.m. on the 10th of the same month, when Crook, a steward, who was on watch in the forward upper steerage, observed smoke coming up through a small hatchway in the after part of the steerage just forward of the boiler room casing. He at once went on deck and informed

the chief officer, whose watch it was, and who thereupon went and called the captain, leaving the deck in charge of the third officer. The captain and chief officer immediately went forward to see what was the matter, and on lifting the covers of the small hatchway, a dense smoke came out, upon which orders were at once given to call all hands, and to bring along the hoses and hand grenades. It seems there were on board about three dozen hand grenades, and on these being thrown down the hatchway, the fire was for the moment stifled, and they could then see that the bales of cotton on the port side of the little hatchway, under the floor of the pantry, were on fire. The hoses were accordingly turned on in that direction, and water was poured upon the burning bales of cotton; and with the view of getting at the seat of the fire, No. 3 hatchway, which was some 20 feet further forward, was opened, and some 15 or 16 bales having been taken out in the way of the hatchway, one of the two hoses was brought forward and water poured forward in the direction in which the fire was burning. The forward deck pump was also connected, and water poured on to the pantry floor, which had become heated, and was beginning to buckle. During all this time the engines were kept going at full speed, the vessel making from 12½ to 13 knots an hour, and as the wind was from the N.W., the course was altered from E. or E. ½ S. to about N.E., partly, as we were told, to bring the wind abeam, and partly to get into the track of the outgoing steamers, which was to the north of them. About midnight No. 3 hatch was closed, and both hoses were taken back to the little hatchway, which was also closed as far as it could be, leaving only room for the two hoses, in the hope of thus stifling the fire. Orders were also given to get the boats ready in case it should be necessary to abandon the vessel. It seems that she had eight boats, the four aftermost, of which two were pinnaces, and two jolly boats, being swung out-board; whilst the four foremost, all of which were lifeboats, were swung in-board, and rested on chocks, but with the tackles rove, and hooked on to the davits. These latter were accordingly hauled up to the davits, and all the boats were provisioned and got ready to be lowered in case of need. At about 2 a.m. it was thought that the fire had been got well in hand, and at about 5 a.m. the chief engineer went down No. 4 hatchway, just forward of the engine room casing, to the alley way in the lower deck, through which the main steam pipe is carried from the boilers to the engine. This alley way, which ran on the port side of the main mast, and extended from the boiler to the engine room casing, was about 6 or 7 feet wide, and was boarded at the sides so as to keep it clear of cargo. The chief engineer told us that on going down he found a good deal of smoke between the upper and the main decks, but none on the lower deck or in the alley way, and that there was not then any appearance of fire on either deck. At about 6 a.m., however, fire was seen to be coming out through No. 4 hatchway on the upper deck, and on the hatches being taken off, it was found that the cotton between the upper and the main decks was on fire all round the hatchway. Upon which orders were at once given to bring one of the hoses aft, and lay it on to No. 4 hatchway. The engines also were stopped, and the boats having been lowered and manned, the women and children were first put into them, and then the male passengers, and orders were given to them to remain by the ship. Between 9 and 10 a.m. all the boats had been safely lowered into the water, and put off; and the master, chief steward, and a quartermaster being the only persons on the bridge, and thinking that everybody had left the vessel, went forward and got into lifeboat No. 3, which was waiting for them; but in pulling round the vessel it was found that there were still a number of persons in the after part of the vessel, upon which the boat put back and took some of them off, and the remainder were subsequently taken off by the other boats. It was then found that seven of the boats still remained alongside the vessel, and at about 3 p.m., a German barque, called the "Trabant," having come up, took them all on board, and on the following day they were transferred to the "York City,"

which landed them on the 19th at Queenstown. The remaining boat, No. 8, which had two A.B's, two firemen, a coloured steward, and the interpreter, as well as seven male passengers in her, had been obliged to cast off to save herself from being stove by one of the life-boats; and on attempting to bring her head round, it was found that, besides the man at the tiller, there were only two hands on board who could handle an oar; they were therefore obliged to run before the wind and sea until the 12th, when the weather having abated they hauled her head round, and on the 13th got back to the ship, which they found still afloat. On attempting however to board her, it was found impossible to do so owing to the fire. They therefore remained alongside, and on the 15th a German schooner, called the "Mathilde," attracted by the burning vessel, came up, and took them on board, and landed them at Falmouth on the 21st of the same month. Nothing more is known of the vessel, but there can be no doubt that she must have foundered shortly afterwards.

These being the facts of the case, the first question upon which our opinion has been asked is, "Was the cotton stowed on board the 'City of Montreal' in a proper condition for transport?" I should state that as well in the second main lower steerage, where the fire was first discovered, as in the after square, where it subsequently broke out, there were stowed nothing but bales of cotton, and the question which we have to consider is, whether this cotton when shipped was in a proper condition for transport. Affidavits have been brought in by the Board of Trade and by the owners, showing that the cotton was in good condition, clean and dry, and free from oil or other impurities. We have also the evidence of Dr. Dupré, a Fellow of the Royal Society, and Professor of Chemistry to the Westminster Hospital, and one of the first Analysts of the day, to whom samples of the same cotton which had come to this country in the steamship "Ohio," had been submitted for analysis, and who told us that he made a careful analysis of this cotton, and had found it to be very clean, very free from any impurities which would be likely to cause ignition, and in all respects in a proper condition for transport.

The second question which we are asked is, "Was it protected from fire and sparks during the process of loading?" We are told that the greatest care was taken to prevent any sparks or fire from getting to the cotton whilst it was being shipped, as well as to prevent the men who were stowing it from smoking whilst they were at work. It was said that the wharf at which the cotton was shipped belonged to the company, and was lighted by electricity, and that the men employed in stowing it were in the company's employ, and that any man discovered smoking whilst the cargo was being put on board, would be instantly dismissed from the company's service.

The third question which we are asked is, "Was it stowed in a safe and proper place on board the vessel?" The place where the fire was first discovered, was on the lower deck in the second main lower steerage, immediately forward of the boiler room casing, and above the recess in which the donkey boiler was placed. The place where it afterwards burst out, was on the main deck and in the upper square immediately in front of the engine room casing, and between it and the boiler room casing. It seems that, when the vessel had a good number of passengers, these compartments were fitted up for them, but that at other times they were used for cargo. Being in such close proximity to the engine room and boiler spaces, these compartments would no doubt be tolerably warm, but not so warm as to be liable to produce ignition of the cotton, for if so they would hardly have been used for passengers. Dr. Dupré told us that to produce ignition of the cotton you must get the temperature up to nearly 1000°, and that in his opinion the cotton might have been put upon the boilers without igniting. We have therefore no reason to think that the compartments, in which this cotton was stowed, were not safe and proper places.

The fourth question which we are asked is, "Whether proper and sufficient means existed on board for extinguishing fire in case of necessity, and whether it is desirable that steam fire extinguishers should be fitted into all cargo carrying compartments?" We are told that in addition to two movable hoses, which could be connected with the main boilers, and the two force pipes on deck, there were two steam fire extinguishers, which were laid on to the fore hold and fore orlop, to the main hold, main orlop, and main

lower steerage, and to the after hold and after orlop. They were not, however, laid on to the second main lower steerage, nor to the upper square, where the fire occurred; and the reason given for this was that these compartments were frequently used for passengers, and that it was not expedient to lay the steam on to compartments where passengers are berthed, lest by some accident steam should be let into them. But it appears to us that this could easily be prevented by a good system of stops; and as a fact we find that the steam was laid on to the main and lower steerages, which were used for passengers as well as for cargo. And the Assessors see no reason why steam extinguishers should not be fitted to all cargo carrying compartments, even though they might be occasionally used for passengers. At the same time it is proper to observe that, by the English law, there is no obligation on ship owners to have any such steam fire extinguishers laid on to any of the compartments, and that, by the American Regulations, they are only required to be laid on to compartments which are exclusively used for cargo, and that a certificate was produced from the Custom House at New York, stating that the "City of Montreal" had complied with the Regulations in all respects.

I will now take the eighth question, which is as follows:—"Whether, in the opinion of the Court, American cotton as now packed and exported, is specially liable to ignition, and whether any, and if so what, precautions could be taken to render it less liable to ignition?" It appears that American bales are covered with a material of the most flimsy description, which is very easily torn, the ends and even sides being frequently not covered at all. The steel bands too which go round the bales are often so badly secured, being merely clamped, and not riveted, that they frequently fly off. The result is that we often find loose pieces of cotton projecting from the ends and sides; and in this state we are told by Dr. Dupré that they are very liable to catch fire if a spark fell on the loose cotton, and that in that case the fire would spread almost with the rapidity of gunpowder. That evidence was confirmed by two gentlemen, who have had a very great experience of cotton fires, Mr. Longbottom, the superintendent, and Mr. Yelland, the chief officer, of the Fire Salvage Corps at Liverpool, who told us that there was a great contrast between the American and the Indian or Surat bales. They stated that the Indian bales are much more tightly pressed, are covered with a much stronger material, and are bound with a greater number of steel bands, the ends being firmly riveted together. The consequence is that you seldom find any loose cotton projecting from the Surat bales, so that, even if sparks fell upon them, they are not liable to catch fire. According to Messrs. Longbottom and Yelland American bales are 10, and even 20, times more liable to catch fire than the Surat bales. The precaution then, which should be taken to render the American bales less liable to fire, is to pack them more carefully and more like the Surat bales.

The ninth question which we are asked is, "Whether, in the opinion of the Court, American and Indian cotton are, or either of them is, liable to spontaneous combustion, and if so, what are the circumstances which would be likely to favour or give rise to the development of heat in such cargo or cargoes?" Dr. Dupré told us that he had analysed large quantities of American and Indian cotton, and as there seems to be a strong impression that cotton is liable to spontaneous combustion, it may be well to state the result of that analysis. He told us that American cotton gave on the average 7.2 per cent. of moisture, .7 of fatty matter, 1 per cent. of resinous matter, 1.56 of organic matter soluble in water, and 1.46 of organic matter insoluble in water or ash, making a total of something like 12 per cent. of foreign matter, leaving 88 per cent. of cotton fibre. On the other hand Indian cotton gave on an average 7.4 per cent. of moisture, 1.04 of fatty matter, 1.7 of resinous matter, 1.9 of organic matter soluble in water, and 5.7 of organic matter insoluble in water or ash, giving an average of about 17 per cent. of foreign matter, and about 83 per cent. of cotton fibre. The result he said showed that American was cleaner and purer than Indian cotton, and much freer from husks and seeds. At the same time he stated that the quantity of foreign matter, and especially of fatty matter, contained in even the Indian cotton, was so small, that he did not think it possible, except under very exceptional circumstances, for spontaneous combustion to be set up. He told us that if a portion of cotton highly saturated with oil or other fatty matter, and surrounded with a quantity of loose

cotton, so as in an atmosphere of combustion require all the heat that it had had on it, had been possible, confirmed by those who told us of something of the kind in an instance that they had outside and

I will now follow:—"discovered the fire on August 21st officers of the distinct origin fact that the second main room casing main deck in ward of the further aft. has satisfied common opinion. We were told as I have of the boiler pantry. At a thickness observed to out there by There was heard aft along the port side tight bulkheads would be turned there would cool, it would bales of cotton the main deck in its spread be separated and in which find its way opinion, the main and opinion believe, now

The question We were told sible for a then gone more days, either by through sm burst out in also told us without its affinity for might with a piece of lo readily absorbed remains, w cotton to been offered from the v there were partment w intended to it was used spark from ventilator, the stoke-h zontal tube cotton. Bu could be cl and that, ev difficult to u eccentric cr stead of co there would draught. A that, if lam might very a loose piec although th fire might burst out ag

cotton, so as to prevent the escape of heat, were placed in an atmosphere of say 250° Fahrenheit, spontaneous combustion might no doubt be set up; but that it would require all these conditions to do it, and that he did not think that in such cotton as the "City of Montreal" had had on board, spontaneous combustion would have been possible. Dr. Dupré's evidence was very strongly confirmed by that of Messrs. Longbottom and Yelland, who told us that, during the whole of their experience of something like twenty years, they had never known an instance of spontaneous combustion in cotton, and that they had always found the fire to begin at the outside and gradually to work inwards.

I will now return to the fifth question, which is as follows:—"What was the cause of the fire, which was discovered on the night of the 10th of August, and of the fire discovered on the morning of the 11th of August?" It was at first thought by the master and officers of the ship that the two fires had had a totally distinct origin; and they based that opinion upon the fact that the first fire occurred on the lower deck in the second main lower steerage, just forward of the boiler room casing, whilst the second fire was observed on the main deck in what is called the after square, just forward of the engine room casing, and some 150 feet further aft. But a careful examination of the facts has satisfied us that the two fires must have had a common origin, and that it occurred in this way. We were told that the fire, when first seen, was, as I have said, on the lower deck, just forward of the boiler space casing, and immediately under the pantry. After a time the deck, which was of iron with a thickness of some 3 or 4 inches of wood upon it, was observed to buckle, but the fire was prevented bursting out there by the water poured upon the pantry floor. There was however nothing to prevent the fire spreading aft along the alley way between the boiler space and the port side of the ship, until it came to the water-tight bulkhead at the end of the boiler space, when it would be turned upwards to the deck above. And as there would not be any water there to keep the deck cool, it would speedily pass through it and set fire to the bales of cotton, which were stowed in the port wing on the main deck. Once there, there would be no difficulty in its spreading to the upper square, from which it would be separated by a bulkhead which was not water-tight, and in which there were doors; whence it would speedily find its way to No. 4 hatchway. That is, in our opinion, the way in which the fire spread, and the captain and officers of the "City of Montreal" are, we believe, now also of the same opinion.

The question however is, how did the fire originate? We were told by Dr. Dupré that it would be quite possible for a piece of cotton which had been ignited, and then gone out, to smoulder for four, five, and even more days, and when the cotton came to be disturbed, either by removing a bale or by the bale collapsing through smouldering and being eaten through, it might burst out into a flame on the air being admitted. He also told us that the fire might smoulder for a long time without its being perceived, cotton having a very strong affinity for smells and smoke; and he stated that a person might without danger go into a very dense smoke with a piece of loose cotton over his mouth and nose, the cotton readily absorbing the smoke. The question however remains, whence came the first spark which caused the cotton to ignite? On this various suggestions have been offered to the Court. And first we were told that from the ventilators leading down to the stoke-hole, there were tubes running horizontally into the compartment where the fire was first seen, and which were intended to give ventilation to that compartment when it was used for passengers; and it was suggested that a spark from the funnel might have gone down the ventilator, but instead of going straight down into the stoke-hole, it might have passed along this horizontal tube into the compartment, and so ignited the cotton. But we were told that these horizontal tubes could be closed with slides, and that they were closed; and that, even if they had not been closed, it would be difficult to understand why a spark should have taken the eccentric course of going along this horizontal tube, instead of straight down into the stoke-hole, into which there would necessarily have been a very strong draught. Another suggestion made by Dr. Dupré was that, if lamps were used in stowing the cargo, a spark might very well have flown off, and if it had fallen upon a loose piece of cotton, it might have set it on fire; and although the light might go out almost immediately, the fire might still continue to smoulder, and ultimately burst out again. This no doubt is one way in which

the accident might have occurred. A third suggestion was that the men in stowing the cargo might have been smoking, and that the ashes from a pipe might have fallen upon and ignited the cotton. We were told however that the greatest precautions are taken to prevent the men from smoking whilst they are stowing the cargo; that they are in the company's regular pay, and that, if they are detected doing so, they are immediately dismissed. But we know how strong is the temptation to those accustomed to smoke, and how difficult to prevent them smoking, even when it is attended with the greatest danger to themselves, as for instance when working in coal mines. And however stringent the precautions might be, it is impossible to say, that some one might not have been smoking, whilst the cargo was being loaded, and the ashes from a pipe dropped amongst the bales. A fourth suggestion is, that not unfrequently matches have been found in cargoes of cotton, and occasionally also cartridges, and once too a revolver; not necessarily placed there with any intention of setting the cargo on fire, but dropped amongst the bales by accident. In such a case the working of the cargo might cause the matches to ignite or the gunpowder to explode, and the result might be that the cargo would be set on fire. A fifth suggestion was that the starting of one of the steel bands, a not infrequent occurrence, we were told, with American bales, might have given off a spark, which, if it lighted on a loose piece of cotton, would very likely set it on fire. And Dr. Dupré and Mr. Longbottom told us that they had, by striking some of these bands together, obtained sparks. Indeed a dock labourer, named Byrne, told us that on one occasion he was passing a bale which was lying on the quay, when he heard a crack, and on turning round he saw that one of the bands had started, and that the bale was on fire; and that, with the assistance of some other men he put the fire out. Mr. Yelland also, the chief officer of the Liverpool Salvage Corps, stated that, having occasion to move a quantity of bales which were stowed high up in a warehouse, he observed that, as they fell, the bands gave off sparks, which, falling on the cotton, set it on fire in a great many places, and that his men had to put it out with their hands. These then are some of the ways in which it is suggested that the fire might have been caused; but it is of course impossible to say in which of these ways the fire on this occasion was caused. It is certain, however, that if the cotton had been packed in the efficient way in which the Surat cotton is packed, not only would there have been less likelihood of any of the bands starting, but also less chance of the bales catching fire, even if any sparks had fallen upon them.

I will take the sixth and seventh questions together; they are as follow:—"Was every possible effort made to extinguish such fires?" and "Was every possible effort made to save the vessel, and whether the captain stood by her as long as was consistent with the safety of those under his command and charge?" We were told that from the time the fire was first discovered, at about 9.30 p.m., till about 10 a.m. the following morning, when it burst out of No. 4 hatchway, the vessel was kept with her engines going at full speed, and with the wind on the port beam; the object, according to the captain, being to get her into the track of outgoing steamers, which lay somewhat to the northward of their position. The assessors, however, are disposed to think that this was hardly a judicious course, for even with the wind abeam, there would almost necessarily be a considerable draught, which would tend to drive the fire aft, with the vessel going at a speed of from 12½ to 13 knots an hour. They think that it would have been better, if the vessel had been brought to rest, as soon as the fire was discovered; and we fail to see what object the master could have had in trying to get into the track of outward bound steamers, seeing that his destination was to England, and that he would be in the track of homeward bound steamers. But, apart from this, nothing could have been better or more praiseworthy than the conduct of the master, officers, and crew, and I may add of the passengers also. There was no panic on board; the boats were all safely lowered into the water, well supplied with provisions; and the women and children were first put into them, and then the male passengers. It may indeed seem invidious to mention the name of any one, when all behaved so well; but it is perhaps, only right to call attention to the conduct of the chief officer, who remained at the hatchway for so long trying to put out the fire, all the time exposed to the

dense and pungent fumes of the burning cotton, that he lost the use of his eyes for some three or four days afterwards. As some questions too were asked on the subject in the course of the inquiry, it may be well to say that no blame in our opinion attaches to the owners in this case. The vessel seems to have been admirably equipped in all respects; she had boat accommodation greatly in excess of the requirements of the Act of Parliament, and was insured for only 40,000*l.*, which would necessarily be much below her value, seeing that she had had no less than 46,000*l.* spent upon her in the

year 1883, and nearly 4,000*l.* more between October and March last, besides the usual and ordinary repairs. The freight too, which we are told amounted to 2,630*l.*, but of which no portion had been advanced, was insured for only 2,515*l.*

(Signed) H. C. ROTHERY,
Wreck Commissioner.

We concur.

(Signed) JOHN S. CASTLE, } Assessors.
WM. PARFITT, }

The M

In the matter
Royal C
28th of
quire, V
RONALDS
circumst
sailing
ness, on

The Court
circumstances of
finds, for the
left the Tyn
and seawort
leak in her
Frend, the
Frend, the m
found that s
out where th
water was g
port, or put
water; and
insured for a

Dated this

We con

This case
on the 26th
Mr. Pyke ap
for the own
underwriter
been produc
Mr. Pyke ha
which the E
Court. Mr.
Court on b
Pyke having
to give judg
had been as
follow :—

The " W
162 tons gr
Blythe, in t
1855, and at
the Port of
William Br
Kent, Mr. I
manager.

She left th
12th of Sep
I understand
of coal, and
as the mast
ordinary sea
the mate's v
was pumped
a fair wind
a quarter to
some four o
trying the p
of water in
an hour or t
the mate's v
starboard si
thought she

50022