

EXPLOSION OF GUNPOWDER WORKS.

About 7 o'clock on Monday morning a series of frightful explosions took place at the Government Gunpowder Works near Waltham. In order to trace the origin of the disaster and show its effects it is necessary briefly to describe the construction and mode of working these mills. At the end of the buildings is the engine-house, where a shaft, running under the entire length of the mills, is worked. This shaft, in turn, causes the "runners," or wheels, to revolve over the powder for the purpose of crushing it. The "bed plates" upon which the powder is placed for grinding are, like the runners, made of iron. Those in the mills destroyed were formed of two slabs of iron, three inches thick, bolted together. The men had been at their work about an hour, when one of them, it is said, commenced the removal of the runner in the mill second from the engine-house, to enable him to sweep the powder from under it. Applying, it is alleged, a crowbar, or some implement of the same description in order to force the roller out of position, he saw the powder flash, and remembered nothing further until he found himself being extricated from a stream of water, into which he had thrown himself headforemost to extinguish his burning clothes. After the first explosion the flames seem to have penetrated into the three adjoining mills very rapidly indeed, for scarcely a moment elapsed between the subsequent explosions. The effect of each was most destructive. The iron roofs, sides, &c., were blown in all directions, and large pieces were found many yards off standing in the ground, into which they had been forced upon descending.

A large number of the workpeople after the explosion repaired to the spot and rendered valuable assistance. One unfortunate man, named James Woodham, was found lying in the long grass in front of the mill, his clothes in one mass of flame. His apparel was torn and cut from his body as rapidly as possible, but before this could be accomplished he was so frightfully burnt that his life is almost despaired of. Last evening he was in a most pitiable condition. His face is so dreadfully burnt that not a single feature can be distinguished, and he is for the present, we regret to say, totally deprived of sight. Three other poor fellows are also badly burnt. All the sufferers are married men.

As soon as the ruins had cooled sufficiently to be inspected a careful investigation was made with a view of ascertaining the extent of destruction, and, if possible, the cause of the first explosion, and the mode by which the adjoining walls were blown up. The mills were not in work, and it was presumed there was not more than a few pounds of powder left in either of them, but the explosion proved the supposition to have been erroneous. The mills had been built with thick party walls of solid brick, which it was believed would have had the effect, in the event of an explosion taking place in one, of leaving all the others uninjured. The explosion has shown in this respect that the steps adopted were fallacious. Some persons, who assume to possess a familiar acquaintance with the mode of manufacture at the Government Works, express a belief that the process of grinding had forced a considerable quantity of powder into the tanks below the tables, and that, as it was known several men were at work there with lights at the time of the accident, the explosion was occasioned thereby, and the flames rapidly extended along the shaft to the other mills. Others, and they are the more numerous, believe that the crowbar with which the runner was being removed, coming into contact with the iron plate, caused friction, which produced sparks and ignited the powder. As the loss of life might have been great the matter is exciting considerable discussion. There were several very narrow escapes. Some half-dozen men or more were under the mills making some repairs to the shaft at the time of the explosion. The smoke made its way down the "manhole," and had not assistance arrived some of the engineers would have been suffocated. Two were in an insensible state when they were dragged up by the hair and rapidly taken into the air to restore animation. While the interior repairs were proceeding it was decided to paint the iron roofs, and just before the explosion took place a body of painters arrived to commence this operation. They had procured a ladder to get upon the roofs, but it was found too short, and while another was being obtained the mills blew up. Had the explosion been delayed a few moments longer the men would have commenced their work, and would doubtless been blown to atoms, as scarcely a vestige of the roofs is left in either case.

The Board of Ordnance will, we understand, make a searching inquiry into every circumstance connected with the explosion.

27.5.1861

Full Text: Copyright 1861, The Times

Article CS201627837

The jury then returned the following verdict:- "We find that the deceased met with his death from an explosion of gunpowder, at the works at Waltham Abbey, caused by not using the hide leathers provided for their use in removing the runners, and the jury would recommend that the foreman be instructed to see that the leathers are used by the men; and any other precautionary measure be adopted that the authorities may deem fit."

Colonel Askwith assured the jury that every possible precaution was adopted for carrying out the manufacture of powder at Waltham with safety, but it could not be foreseen that four men would have been so foolhardy to remove six runners without leathers, or using the ordinary precautions. He would see that leathers were provided for every runner in the establishment.

The proceedings then closed.

Transcribed from "Morning Chronicle",
29th May 1861, p. 6

Frightful Explosion at the Government Gunpowder Works

Waltham, Tuesday Evening - About seven o'clock yesterday morning the inhabitants of the district surrounding the Government Gunpowder Works, which cover an area of about two miles, and are situated a little over a mile from the above station on the Eastern Counties Railway, were startled by a very loud report, followed almost simultaneously by three others of equal intensity. It was at once known that what is called in the neighbourhood a "blow" had taken place at the works; and crowds of persons immediately hurried in that direction. People living near the spot are accustomed to "blows", more or less violent, but on the present occasion the reports being so numerous and so heavy, induced the belief that the result to the persons employed must be of a very serious character. And this fear was greatly strengthened when, upon approaching the entrance to the works, the alarmed inhabitants met injured men being borne away on shutters either to their own homes or to the nearest medical men. It is gratifying, however, at this point to be enabled to state, that although several of the workmen have sustained very bad injuries - two being terribly, and perhaps fatally burnt, the accident has, altogether, been attended with far less deplorable results than were at first anticipated; and there were several very narrow escapes from a frightful death.

27. 5. 1861 Group A Milk

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Transcribed from "Illustrated London News",
Vol. XXXVIII, p. 505 (1st June 1861)

An explosion occurred on Monday morning at the Royal Gunpowder Manufactory, Waltham Abbey, resulting in serious injuries to five of the persons employed. Two of the injured men are not expected to survive.

From the "Morning Chronicle", 7th June 1861

THE TERRIBLE EXPLOSION AT THE ROYAL GUNPOWDER WORKS.

SEXUAL NEGLECT IN A GOVERNMENT ESTABLISHMENT—SPECIAL VERDICT.

Waltham Chase, Sunday Evening.

The afternoon, Mr. Matthew Selwyn, the deputy coroner for Hertfordshire, opened an inquiry at the White Hart Inn, into the circumstances attending the death of Samuel Wadham, aged thirty-five, who died from the effects of an explosion which occurred at the Government Gunpowder Works on the morning of Monday last.

The three witnesses were

Colonel Aske with, who, upon being sworn, said: I am superintendent of the Royal Gunpowder Factory at Waltham Chase. The deceased, and the three other men who were employed there as millmen, the Saturday last were given to Mr. Adams, the master working that the mills—group six—were to be perfectly cleared down for the repair of the engine and other machinery by the millmen. All the powder in the mills had been removed on Saturday, with the exception of a small quantity upon which the runners rested. The proper method to extract it is by moving the runners with a wooden handle, having placed large pieces of India leather to receive the runners upon, and prevent contact with the bed. It appears, however, that this was neglected, and was the cause of the explosion. The means by which the explosion took place were, that while the deceased and the other three men were having at the hammer, the fire was caused by the bed in consequence of the leather not being placed to receive the runners upon. The point of the handle he caught the parts. At the time of the explosion the men had removed the powder from under some of the runners.

Coroner: About these leathers, why were they not used on this occasion?

Colonel Aske with: I really cannot say. It is a well known matter at the millmen that the leathers should be placed to receive the runners upon.

Coroner: But they were not used, you say. How do you account for that?

Colonel Aske with: I can't account for it at all. The deceased had been employed as a millman at the factory since June, 1858, and was then his duties. The other men had been employed as millmen for two or three years. My own opinion is, that had the men taken the proper precautions by putting the India leather to receive the runners, the explosion would not have taken place. I don't consider there is anything in the construction of the mill

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The jury, after having heard the evidence, returned a verdict of death, which was pronounced at the usual hour of the day; while the coroner, who was also present, also made a small portion of the evidence.

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Other evidence having been given,

The Coroner thought there could be no doubt that the neglect of the men had contributed to the cause of death. It appeared clear to him that the men ought to have been provided with the leathers, and it was also very clear that, in such a critical occupation, unless the very best precautions were adopted, the works would be highly dangerous to the neighbourhood, and to the persons employed therein. If, therefore, the jury should be of opinion that more careful supervision should be exercised over the men, to prevent such occurrences for the future, they had better say so by their verdict.

The jury then returned the following verdict:—"We find that the deceased met with his death from an explosion of gunpowder, at the works at Waltham Abbey, caused by not using the hide leathers provided for their use in removing the runners, and the jury would recommend that the foreman be instructed to see that the leathers are used by the men; and any other precautionary measure be adopted that the authorities may deem fit."

Colonel Askwith assured the jury that every possible precaution was adopted for carrying out the manufacture of powder at Waltham with safety, but it could not be foreseen that four men would have been so foolishly to remove six runners without leathers, or using the ordinary precautions. He would see that leathers were provided for every runner in the establishment.

The proceedings then closed.

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From the Daily Telegraph

THE GUNPOWDER EXPLOSION AT WALTHAM.

On Saturday, Mr. Matthew Longmore, deputy coroner for Hertfordshire, held an inquest on the body of Samuel Woodham, aged 35, who died from the effects of an explosion at the Government Gunpowder Works, at Waltham, on Monday morning last.

The jury, after being sworn, proceeded to view the body, which presented a frightful appearance. The face was burnt almost to a cinder, the skin being completely peeled off; while the eye balls had been blown out of the sockets, which were filled with pieces of wood. The thighs were also much burnt, and also the arms, on which not the smallest particle of skin remained.

Colonel Askwith, superintendent of the factory, said, that on Saturday, the 25th, orders were given, that the mills (group 6) should be cleaned, in order that the engine and other machinery might be repaired. All the powder was accordingly removed, with the exception of a small quantity upon which the runners rested. That powder ought to have been extricated by moving the runners with a wooden handspike, large pieces of hide leather being placed to receive the runners and prevent their coming in contact with the bed. It appears that on the present occasion the deceased and the other men neglected to place the leathers, and, consequently, the friction caused by the handspike ignited the powder. He could not account for the hide leathers not being placed, as all the mill-men were perfectly aware of their use. The deceased had been a mill-man at the factory since 1865, and well knew his duties. Five mills were destroyed, the roofs being blown off and the glass broken. The bed plates of four of the mills were destroyed by the explosion of the other mills in succession.

Major Henry, assistant-superintendent of the factory, said he could not agree with Colonel Askwith as to the cause of the fire, as he did not believe an explosion could be produced with wood and iron. He thought it was caused by the friction between the heavy iron runners and the bed. Each of the runners weighs 4 tons 1 cwt. It is highly dangerous to move runners without leather, or striking them with a mop. After the accident, he said to the deceased, "Woodham, do you think you had moved the runners?" and his reply was, "Yes, we had moved them a distance. I think it must have come on to the bed."

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Group A Mills 22.5.1861

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Richard Adams deposed that he was master worker at the mill, and the deceased and the other injured men were under him. He told them to sweep the mill down for repairs, and left them doing it. It was not his duty to see the men provided with the leathers; they were all experienced hands, and ought to have done the work properly. After the accident he saw that the leathers had not been used. The men's dresses were impregnated with gunpowder, and they took fire very rapidly.

Edward Findlay said he was assistant master worker at the mill. It was not his duty particularly to see the men provided with leathers. On the morning of the explosion he was ordered to go to Purbeck, so that, although he happened to be at the mill on that day, he was not there for the purpose of doing his usual work.

John Wilson, a millman, deposed that, in his experience leathers were used for runners to fall upon. He saw the present explosion, but knew nothing beyond that.

Arthur Priest, surgeon of the works, described the nature of deceased's injuries, and said that everything possible that could be done was done to save his life, but without effect. He stated that he had moved the runner before the explosion took place.

Colonel Ash said that no person was entrusted with a mill until he had proved his capability of managing it. All the men were trained in other departments of the works before they were promoted to take charge of a mill. They were never appointed until they had thoroughly learned the business, and their conduct was approved of by the authorities. All these men well knew their duties, and they should never have dreamed of moving the runner without the long leathers.

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men will neglect their duties if they are not looked after, and in such a dangerous avocation they ought to be looked after most carefully. It is important to ascertain whether it was the duty of anyone to look after these men, or whether they were allowed to do as they liked.

The Coroner: It seems to me that they were regarded as experienced men, and were trusted to do what was right.

A Juror: Yes, to do as they liked, without anyone to overlook them.

Colonel Askwith said that was not quite the fact. There was a man to overlook the work, but he was called to another portion of the works at the time.

The Juror: If he had other duties to perform which called him away, that amounted to no superintendence at all.

James Bell (who had been fetched from the works) deposed: I am foreman of the mills. The deceased and the other three men were under me. They ought to have used the leathers.

Did you see whether they did use them on this occasion?—Witness: No.

Why did you not? Is it not your duty to do so?—Not particularly.

How is that?—Because I was ordered to inspect the charges in another part of the works, and I went to do so. Before I could get back the mills had exploded.

If you had not had to attend to other duties, would you have seen that the men were provided with the leathers before they commenced moving the runners?—Yes, I should; but this morning I had no time.

Have you known runners to be moved before without the leathers being used?—Yes, I have.

Why did you not see that the men were using the leathers before you went to inspect the charges?—Because I thought the men knew they ought to use them. If I had had time I should have seen that the men had leathers, but I thought they were to be trusted.

Major Henry said, in cases where runners had been moved without leathers, precaution had been taken to wet the powder with a mop, but he found, from a conversation he had had with all the wounded men, that even that precaution was not taken in the present instance.

The Coroner thought there could be no doubt that the neglect of the men had contributed to the cause of death. It appeared clear to him that the men ought to have been supplied with the leathers, and that they were very close that in such a critical occupation, unless the very best precautions were adopted, the works would be highly dangerous to the neighbourhood, and to the persons employed therein.

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In reply to a juror,

Colonel Arkwith said he had heard of explosions taking place at Hounslow through the moving of runners, but none had taken place before at Waltham from that cause. The previous explosion at the Royal factory did not arise from that cause.

The jury then returned the following verdict: "We find that the deceased met with his death from an explosion of gunpowder, at the works at Waltham Ams, caused by not using the hide leathers provided for their use in removing the runners; and the jury would recommend that the foreman be instructed to see that the leathers are used by the men; and any other precautionary measures be adopted that the authorities may deem fit."

Colonel Arkwith assured the jury that every possible precaution was adopted for carrying on the manufacture of powder at Waltham with safety; but it could not be known that four men would have been so careless as to remove runners without leathers or using the provided precautions. He would see that leathers were provided for every runner in the establishment.

The proceedings then closed.

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Transcribed from "Illustrated London News"
Vol. XXXVIII, p. 537 (8th June 1861)

Gunpowder Explosion near Waltham

We give on the first page an Engraving of the scene of the terrible explosion at the Government gunpowder-works, Waltham Abbey, which took place on Monday week. Some men were clearing a "nest of mills", and one of them, using a wooden handspike, saw the powder flash, and remembered nothing further until he found himself being extricated from a stream of water where he had thrown himself to extinguish his burning clothes. Several other explosions followed. One unfortunate man named Samson Woodham, who was found lying on the long grass in front of the mill, his clothes in a mass of flame, died on Thursday week. Three other poor fellows, John Rule, William Argent, and William Burgess, are badly burnt. After the first explosion the flame seems to have penetrated into the three adjoining mills, for scarcely a moment elapsed between the subsequent explosions. The effect of each was most destructive. The iron roofs and sides of the buildings were blown in all directions, and large pieces were found, many yards off, forced deep into the ground. - Last Saturday afternoon an inquest was held on the body of Woodham, when evidence was taken to considerable length. The following verdict was returned by the jury:- "We find that the deceased met with his death from an explosion of gunpowder, at the works at Waltham Abbey, caused by not using the hide leathers provided for their use in removing the runners, and the jury would recommend that the foreman be instructed to see that the leathers are used by the men; and any other precautionary measure be adopted that the authorities may deem fit."

Transcribed from "Morning Chronicle",Monday, 3rd June 1861, p.3The Terrible Explosion at the Royal Gunpowder Works
Singular Neglect in a Government Establishment - Special VerdictWaltham Cross, Saturday Evening

An explosion on May 27th, 1861, showed, however, that a great deal of laxity and carelessness still prevailed. A mill had been stopped for repairs and four experienced millmen had been sent in to clean it. While moving the runners off the cake it exploded, and four other mills in the group of six followed rapidly (the remaining one had just been cleaned). It appeared that the ordinary precautions of using leathers to prevent contact of the runners with the bed or of damping the runners and bed had not been taken. As a result three of the men were badly burnt and the fourth died of his injuries. At the inquest the following verdict was returned by the jury: "we find that the deceased met his death by an explosion of gunpowder, at the Works at Waltham Abbey, caused by not using the hide leathers provided for use in moving the runners, and the jury would recommend that the foreman be instructed to see that the leathers are used by the men and any other precautionary measures be adopted the Authorities may deem fit.

It is clear that by now the public conscience was beginning to be affected by the continual explosions and the "Morning Chronicle" of June 3rd reported this inquest with a headline "Singular Neglect in a Government Establishment".

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Coroner: About these leathers; why were they not used on this occasion?

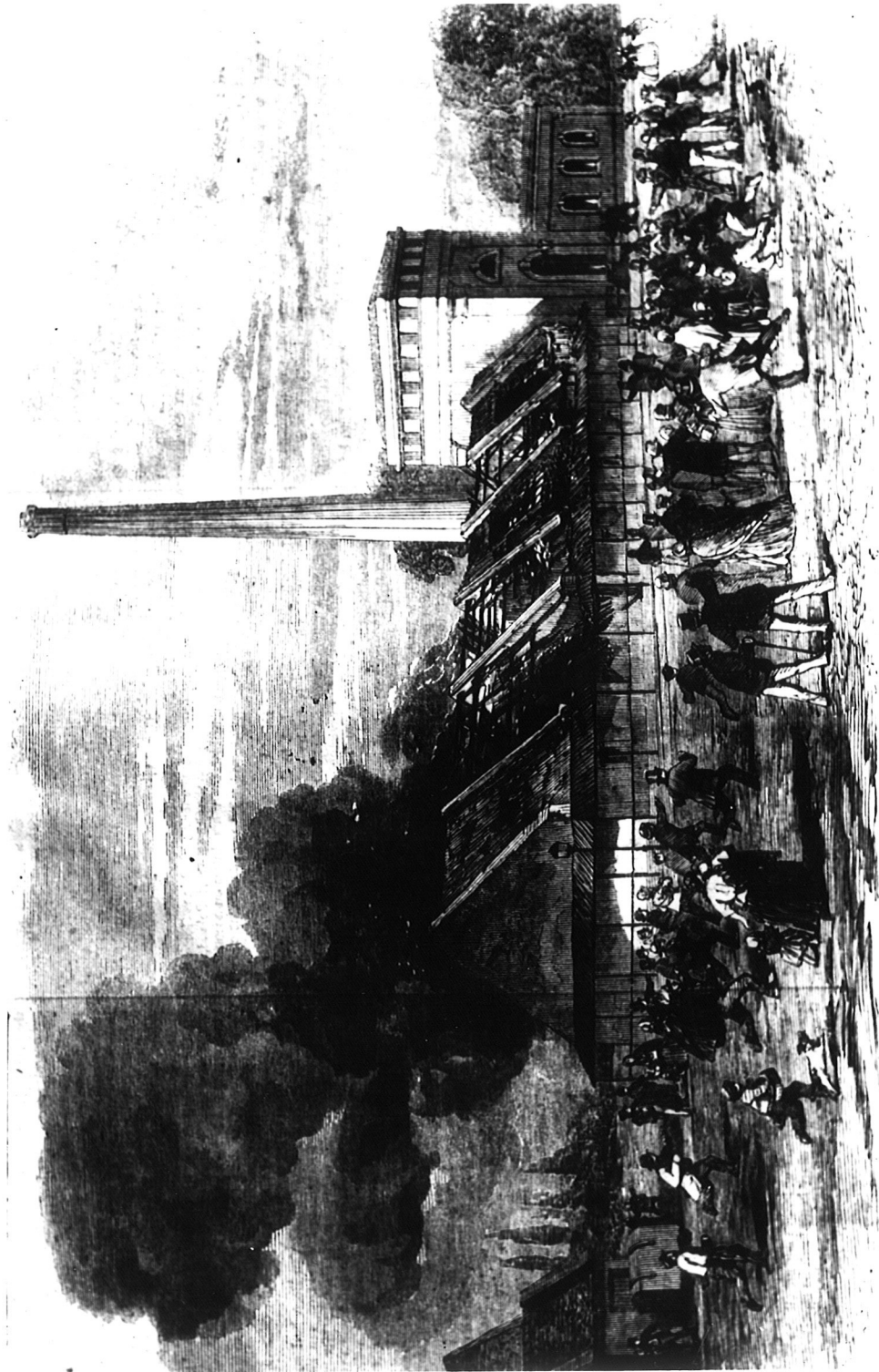
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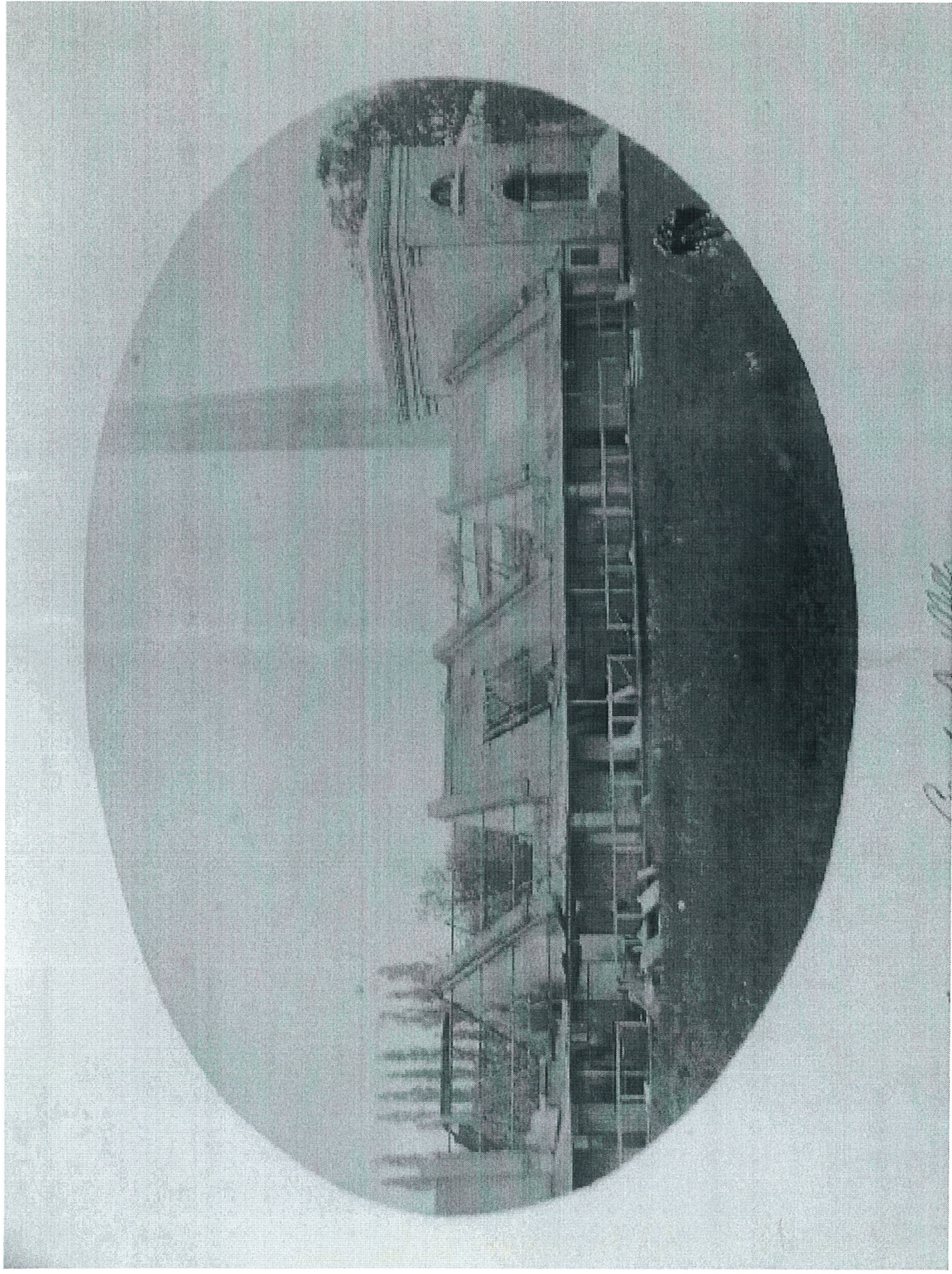


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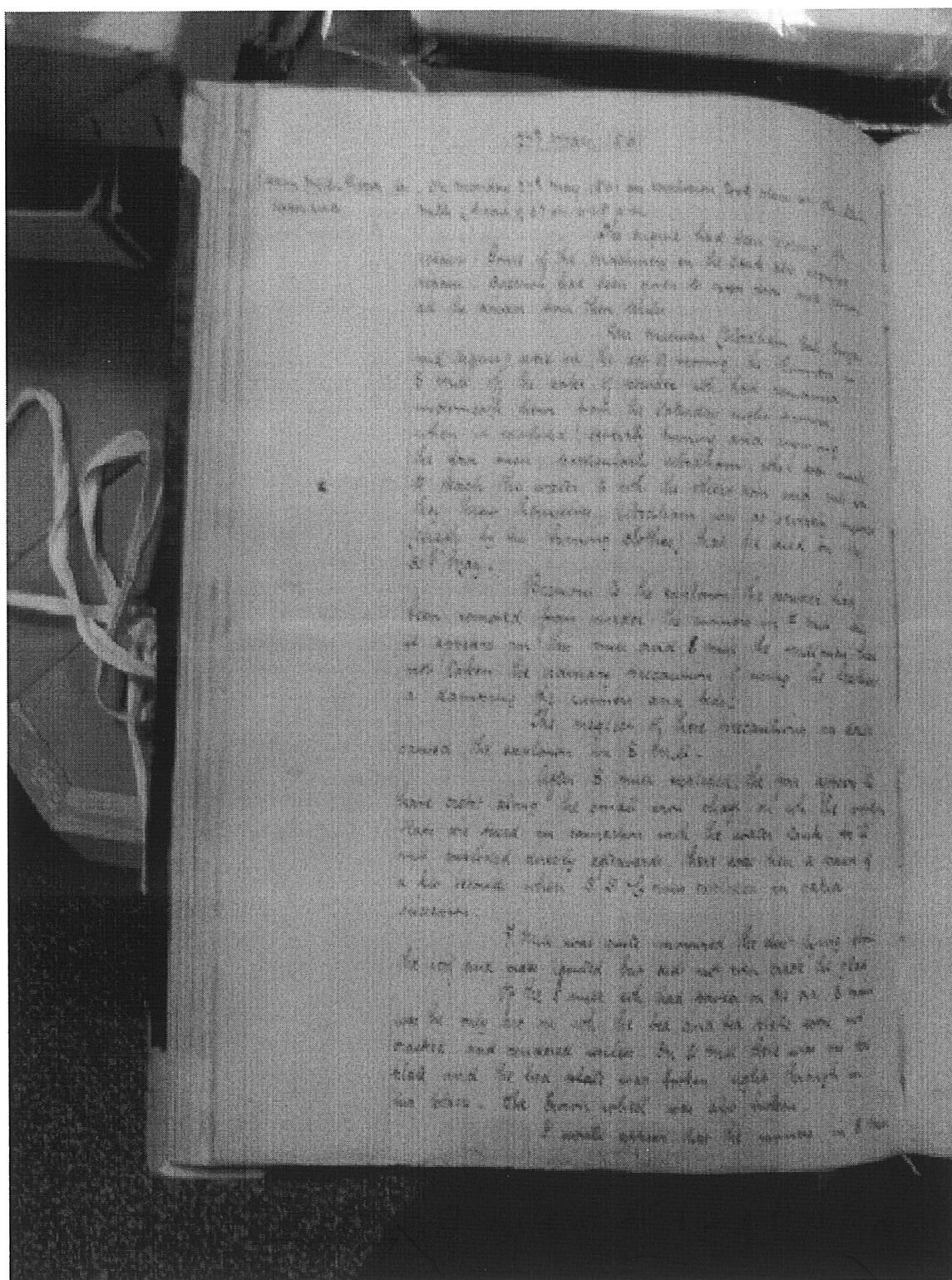
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Group A Mills after explosion 27.5.1861

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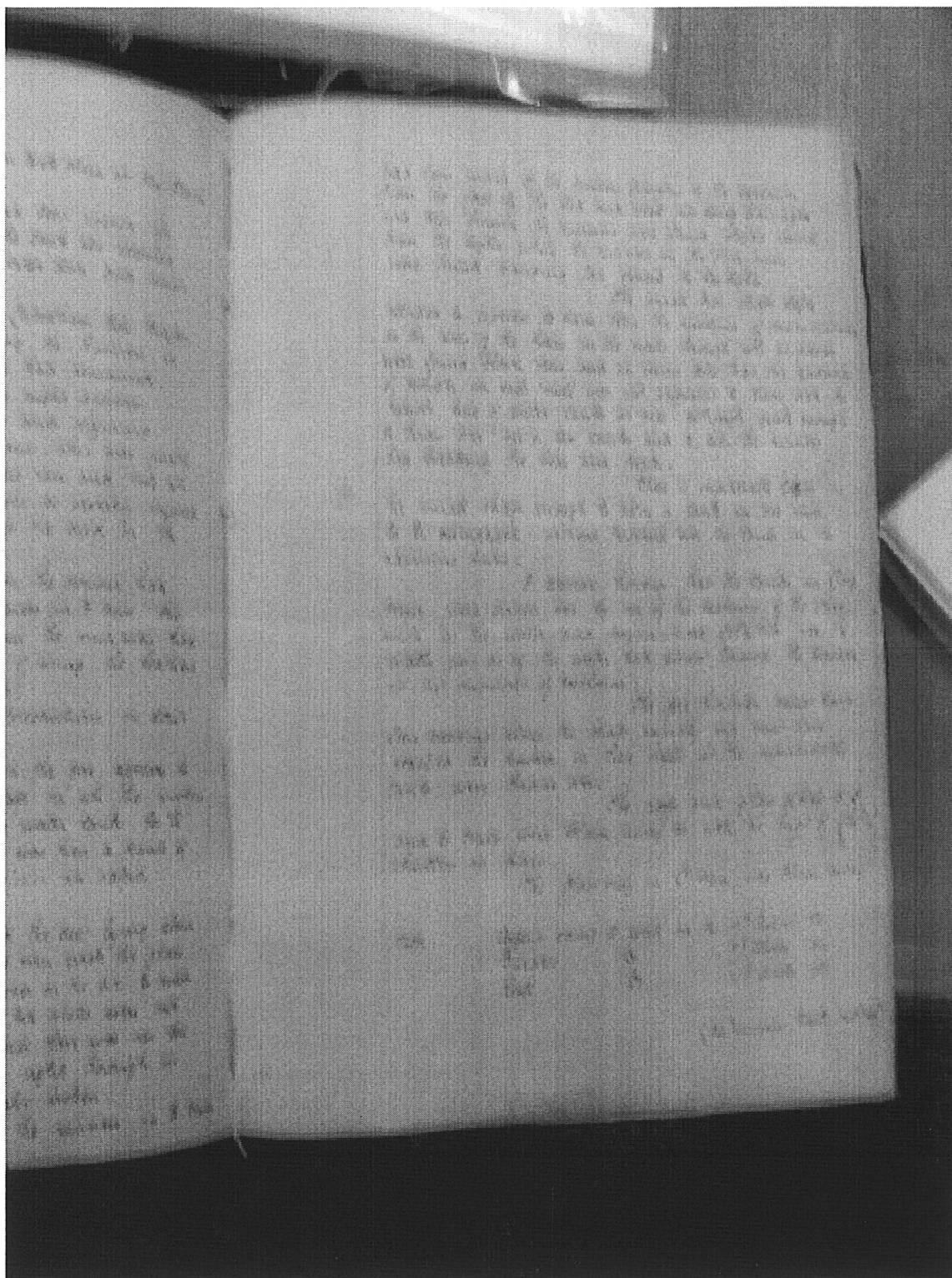
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Report ~~into~~ of explosion at Group A Steam Mills
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EXPLOSION OF GUNPOWDER WORKS.

About 7 o'clock on Monday morning a series of frightful explosions took place at the Government Gunpowder Works near Waltham. In order to trace the origin of the disaster and show its effects it is necessary briefly to describe the construction and mode of working these mills. At the end of the buildings is the engine-house, where a shaft, running under the entire length of the mills, is worked. This shaft, in turn, causes the "runners," or wheels, to revolve over the powder for the purpose of crushing it. The "bed plates" upon which the powder is placed for grinding are, like the runners, made of iron. Those in the mills destroyed were formed of two slabs of iron, three inches thick, bolted together. The men had been at their work about an hour, when one of them, it is said, commenced the removal of the runner in the mill second from the engine-house, to enable him to sweep the powder from under it. Applying, it is alleged, a crowbar, or some implement of the same description in order to force the roller out of position, he saw the powder flash, and remembered nothing further until he found himself being extricated from a stream of water, into which he had thrown himself headforemost to extinguish his burning clothes. After the first explosion the flames seem to have penetrated into the three adjoining mills very rapidly indeed, for scarcely a moment elapsed between the subsequent explosions. The effect of each was most destructive. The iron roofs, sides, &c., were blown in all directions, and large pieces were found many yards off standing in the ground, into which they had been forced upon descending.

A large number of the workpeople after the explosion repaired to the spot and rendered valuable assistance. One unfortunate man, named James Woodham, was found lying in the long grass in front of the mill, his clothes in one mass of flame. His apparel was torn and cut from his body as rapidly as possible, but before this could be accomplished he was so frightfully burnt that his life is almost despaired of. Last evening he was in a most pitiable condition. His face is so dreadfully burnt that not a single feature can be distinguished, and he is for the present, we regret to say, totally deprived of sight. Three other poor fellows are also badly burnt. All the sufferers are married men.

As soon as the ruins had cooled sufficiently to be inspected a careful investigation was made with a view of ascertaining the extent of destruction, and, if possible, the cause of the first explosion, and the mode by which the adjoining walls were blown up. The mills were not in work, and it was presumed there was not more than a few pounds of powder left in either of them, but the explosion proved the supposition to have been erroneous. The mills had been built with thick party walls of solid brick, which it was believed would have had the effect, in the event of an explosion taking place in one, of leaving all the others uninjured. The explosion has shown in this respect that the steps adopted were fallacious. Some persons, who assume to possess a familiar acquaintance with the mode of manufacture at the Government Works, express a belief that the process of grinding had forced a considerable quantity of powder into the tanks below the tables, and that, as it was known several men were at work there with lights at the time of the accident, the explosion was occasioned thereby, and the flames rapidly extended along the shaft to the other mills. Others, and they are the more numerous, believe that the crowbar with which the runner was being removed, coming into contact with the iron plate, caused friction, which produced sparks and ignited the powder. As the loss of life might have been great the matter is exciting considerable discussion. There were several very narrow escapes. Some half-dozen men or more were under the mills making some repairs to the shaft at the time of the explosion. The smoke made its way down the "manhole," and had not assistance arrived some of the engineers would have been suffocated. Two were in an insensible state when they were dragged up by the hair and rapidly taken into the air to restore animation. While the interior repairs were proceeding it was decided to paint the iron roofs, and just before the explosion took place a body of painters arrived to commence this operation. They had procured a ladder to get upon the roofs, but it was found too short, and while another was being obtained the mills blew up. Had the explosion been delayed a few moments longer the men would have commenced their work, and would doubtless been blown to atoms, as scarcely a vestige of the roofs is left in either case.

The Board of Ordnance will, we understand, make a searching inquiry into every circumstance connected with the explosion.

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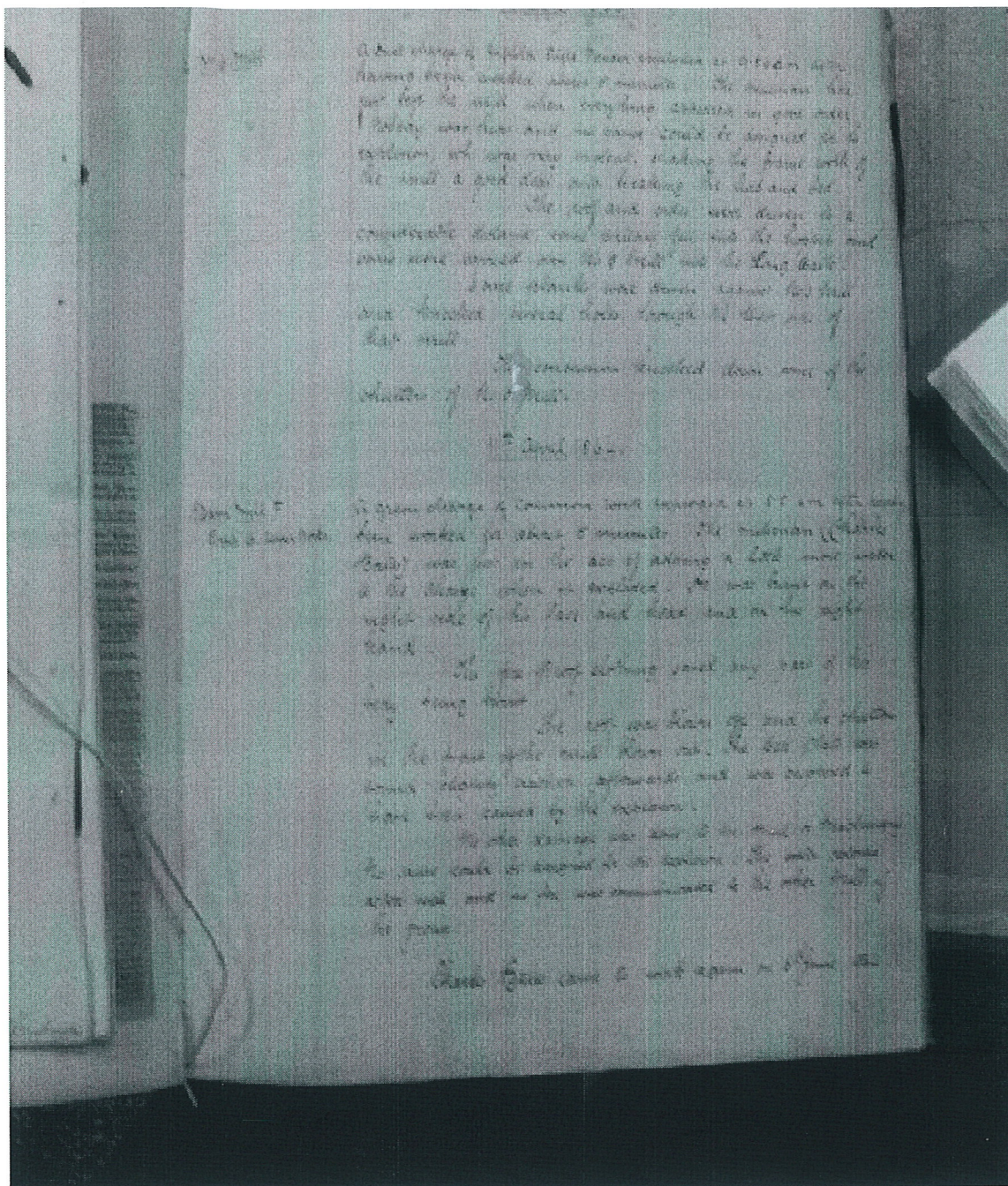
Article CS201627837

11.4.1864

2.2.1863

64/16B

In the report of a small explosion in 1864 we find for the first time a mention of a man whose face and hand were burnt but "the fireproof clothing saved any part of his body being burnt". It looks as if this is the first mention of lasting cloth for factory wear and its use may have been connected with a remark at the inquest on the 1861 explosion that the men's clothing was saturated with gunpowder and took fire very rapidly.



Report of Explosion in Steam Mill F.

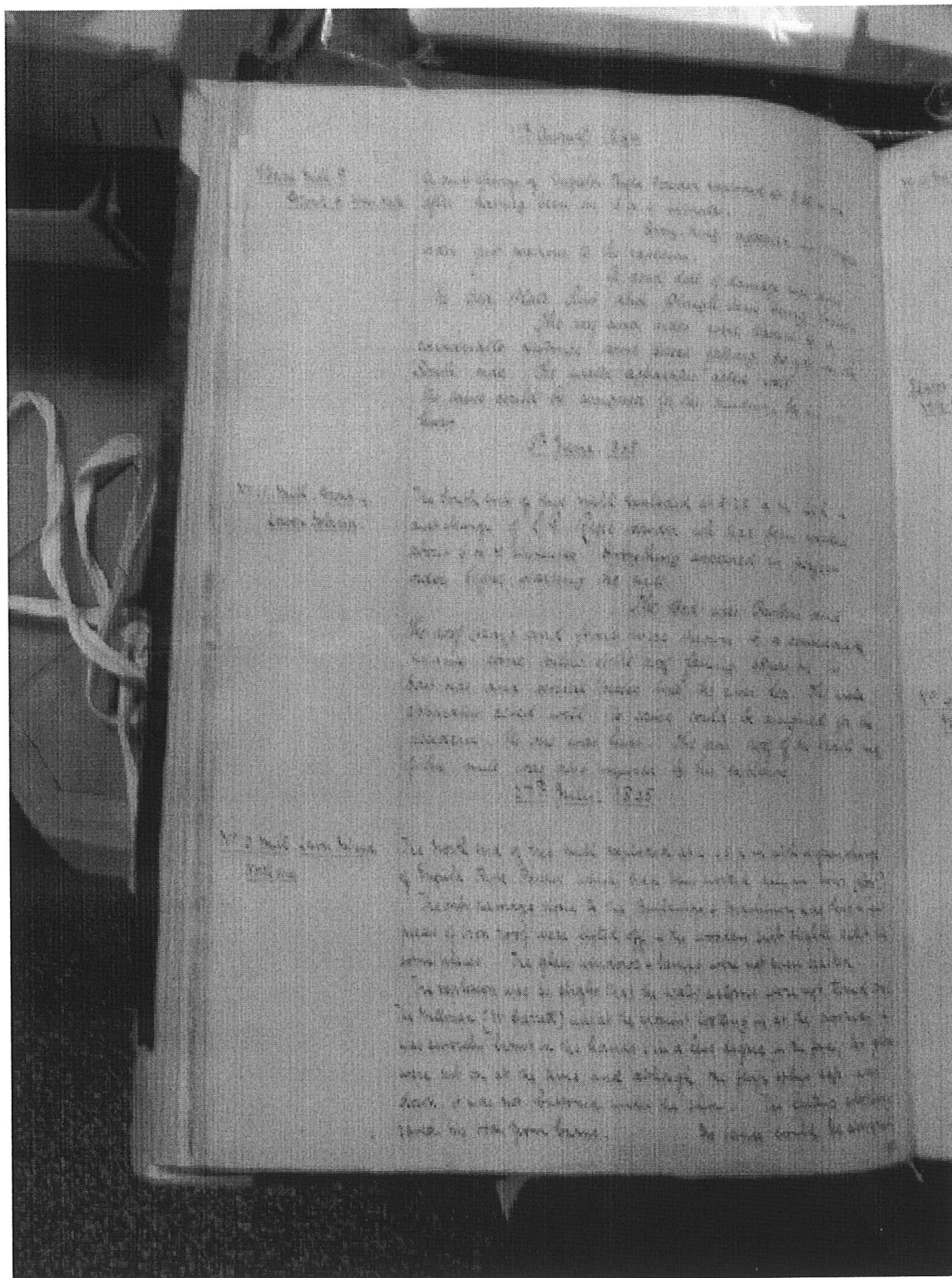
11.4.1864

No 6 Mill

22.1863

11. 8. 1864
5.6.1865
27.7.1865

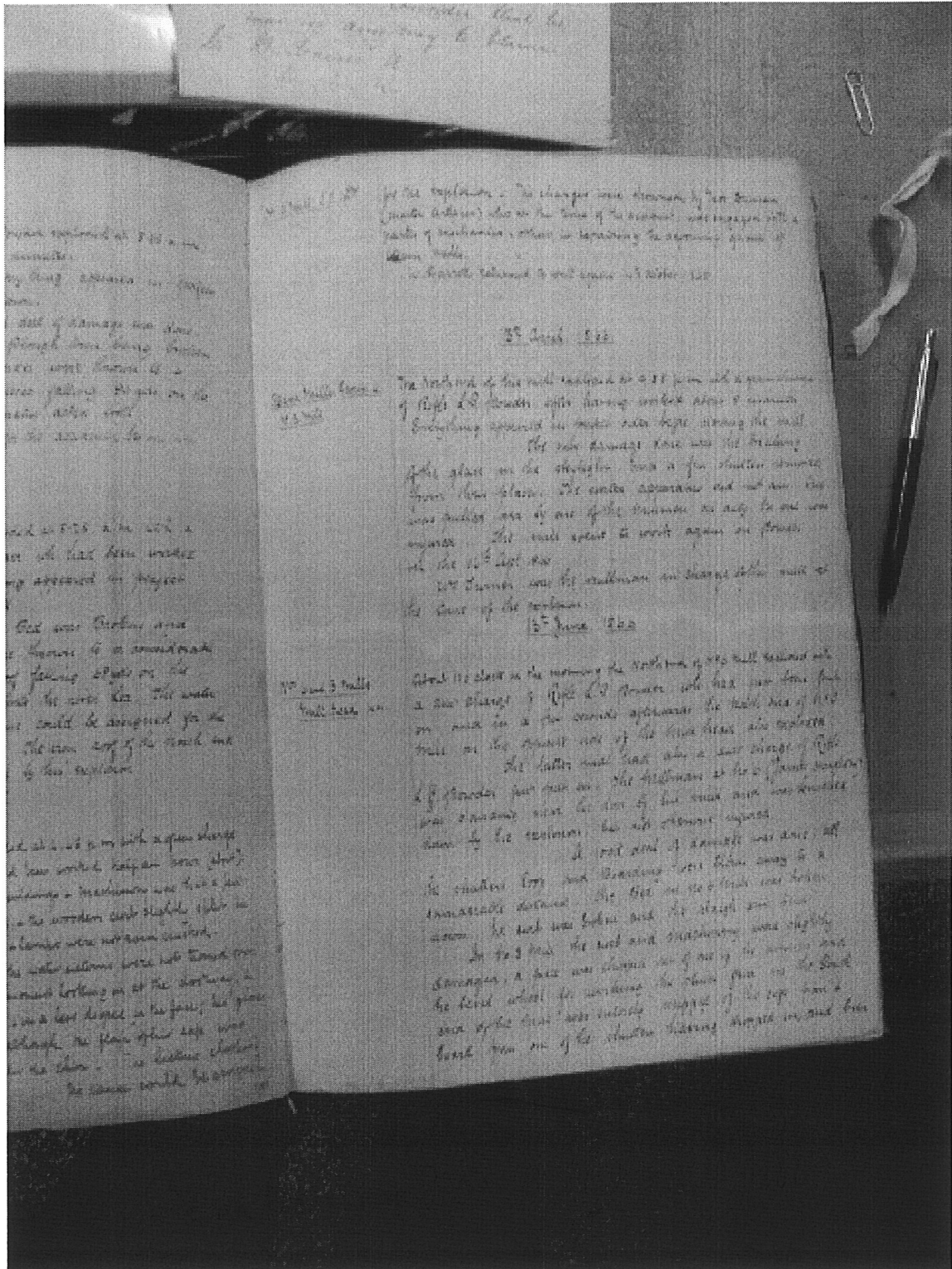
9
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Steam Mill f. 11. 8. 1864
~~No. 11~~ Mill Lower/s/and 5.6.1865
 No 10 Mill Lower/s/and north end 27.7.1865

13.7.1866
15.6.1866

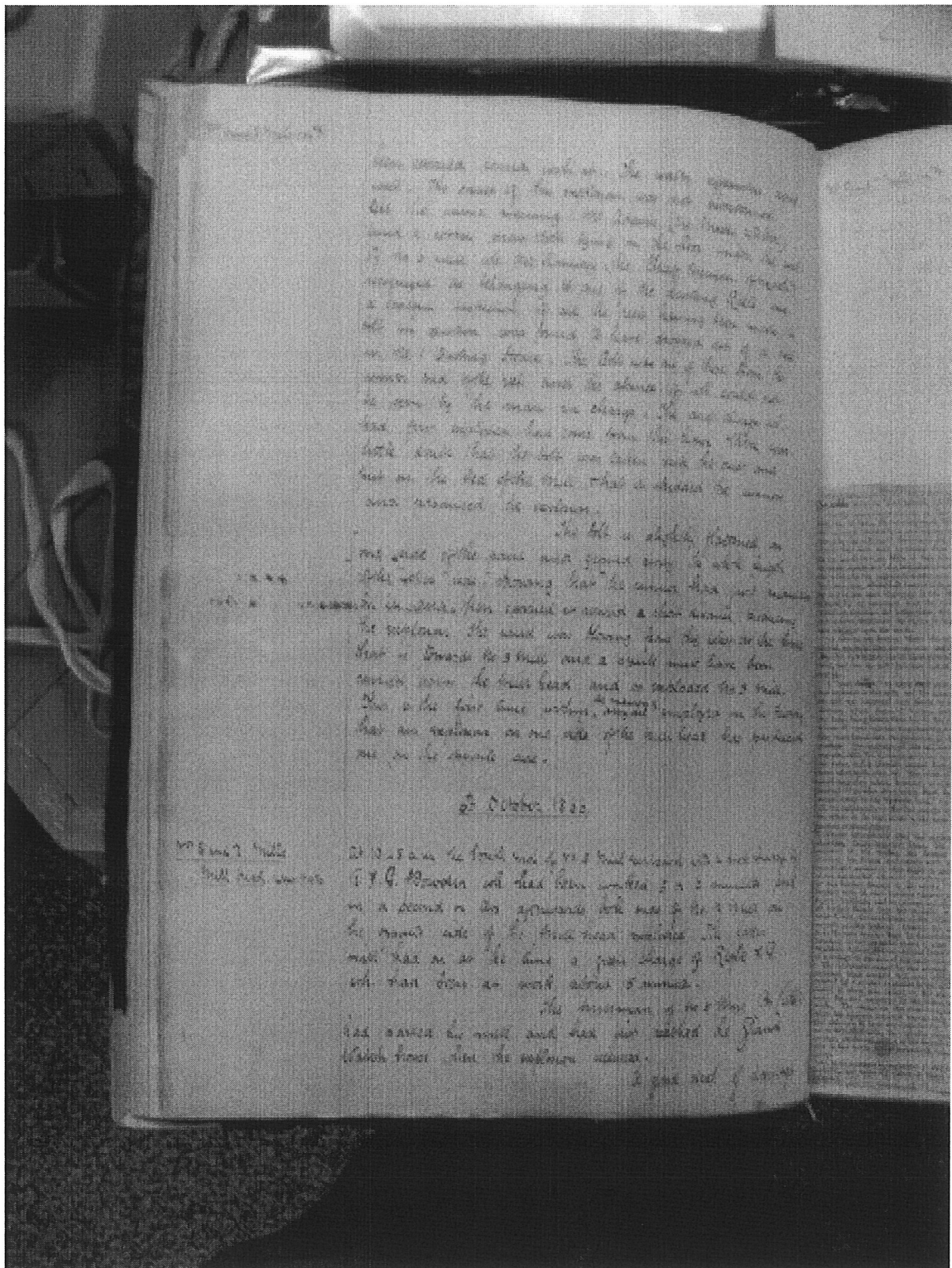
67/70



Green Mills Group? No. 13. Mill 13.7.1866
E No 6 + 3 Mills - Mill Head 13.6.1866

13.6.1866 cont
6.10.1866

64/71



continuation of 64/70 13.6.1866
and No 5+2 Mills - Mill head 6.10.1866

6.10.1866 cont

65/72

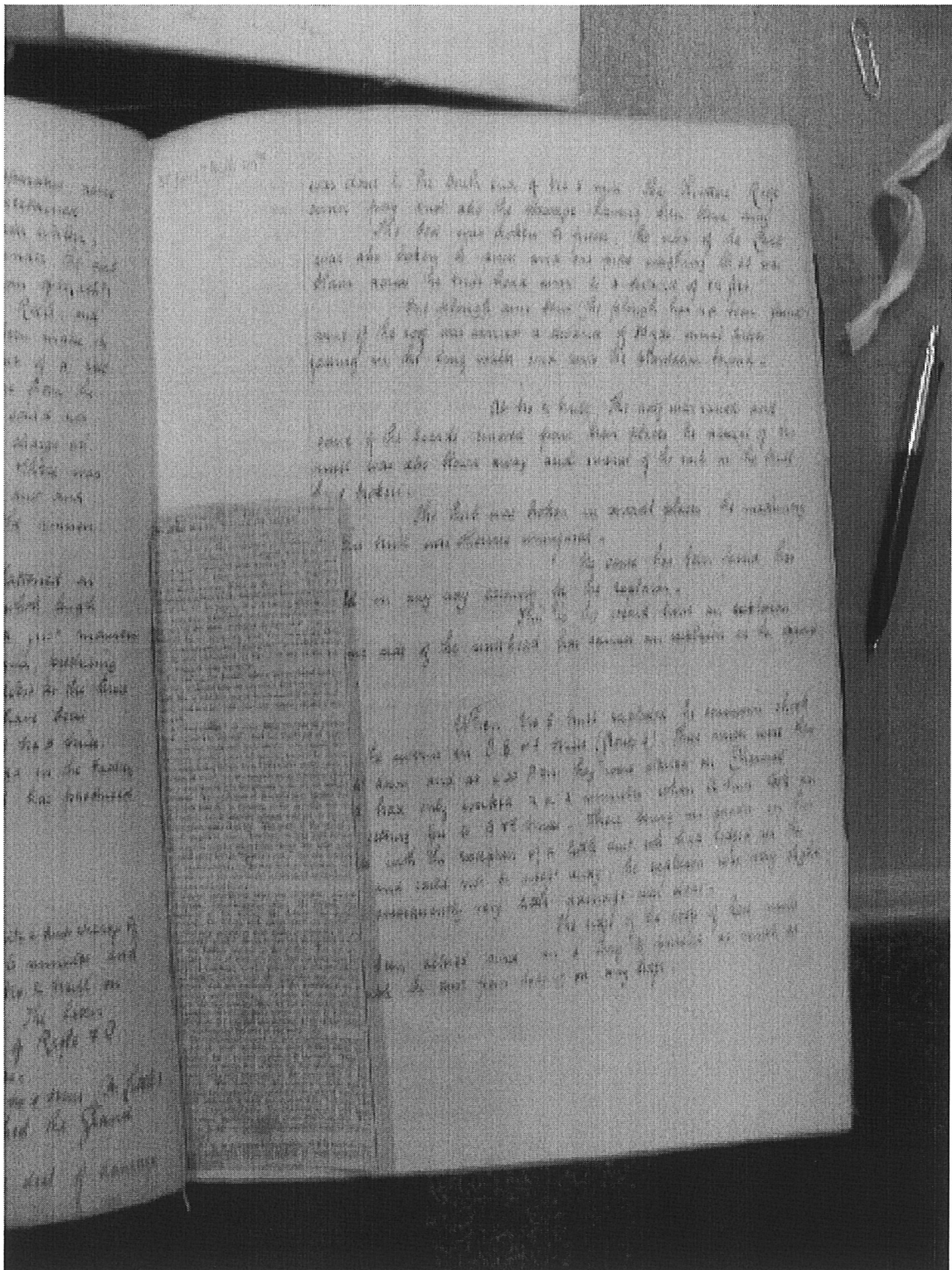
slightly flattened on
away its whole length
runner had just mounted
a short distance, producing
from the west at the time
it must have been
it exploded the 5 mill.
not involved in the explosion
mill head has produced
carried with a down charge of
head 5 or 6 minutes and
end of the 2 mill on
explosion. The latter
charge of Rifle & C
5 minutes.
man of the 5 mill & further
reached the ground
was.
A great deal of damage
mill was also blown away
broken.
The 5 mill was broken
the mill was blown away
on my way down
the side of the mill head
When the
the car was on 2 1/2 ft
down and at 1.30 P.M.
had only worked 2 or
setting the 2 1/2 ft mill
with the exception of a
and could not be set
consequently very little
been altered since
the 5 mill was blown
away.

THE MILL WAS BLOWN AWAY
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Piers Lopez V Explosion at
No 3 Mill. 6.10.1866

6.10.1866

64/73

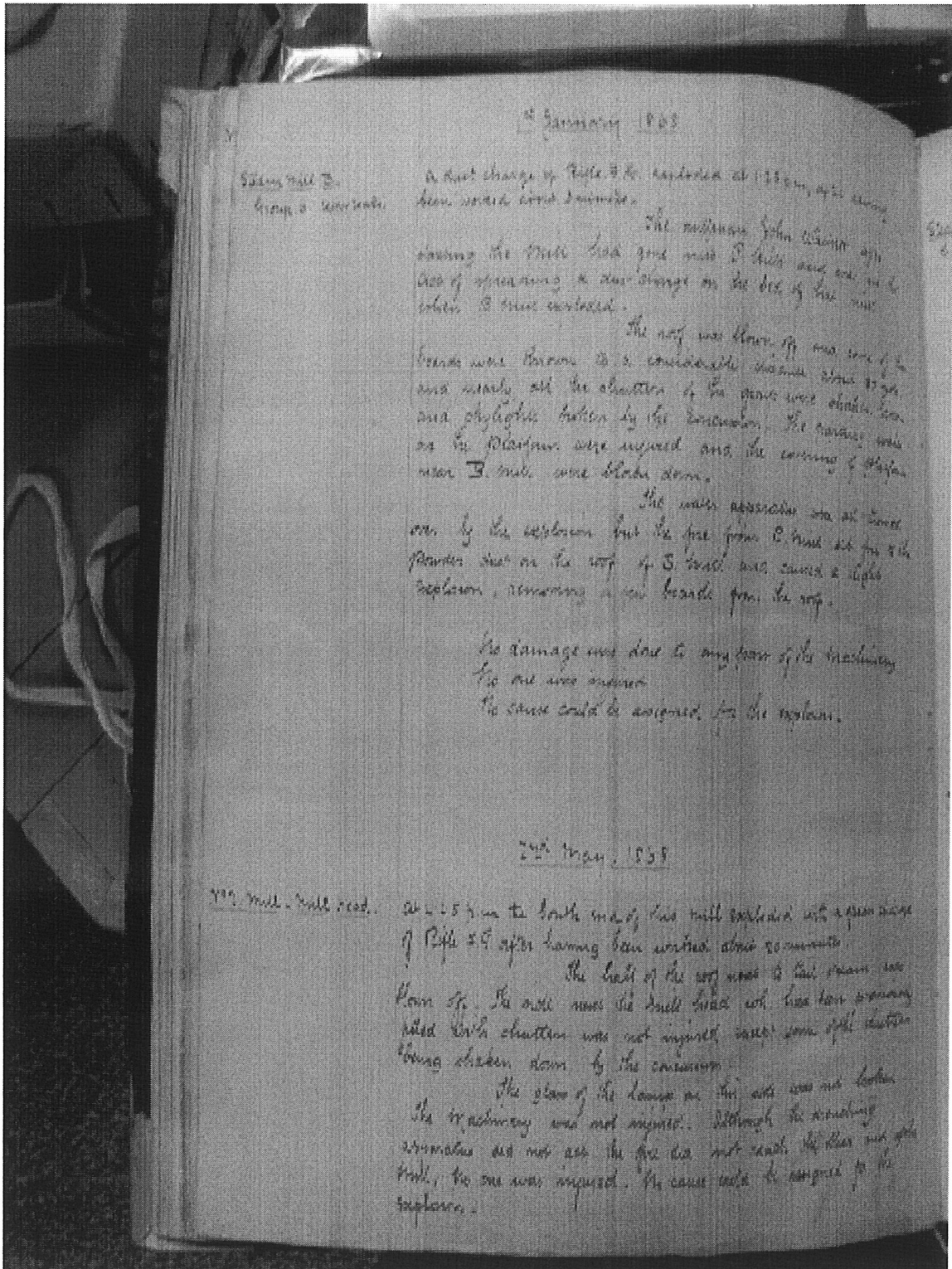


No 5 Mill
Continuation of report. 6.10.1866.

1. 1. 1868

2. 5. 1868

67/74



Steam Mill B, Group 6 Upper Works, 1. 1. 1868

No 2 Mill, Mill Head 2. 5. 1868

5 7. 1869
14. 8. 1869

67/75

12.5 p.m. after coming
John Wickett and
which was in the
bed of the river
on the river and some of the
distance about 100 yds.
was done down from
the landing with
a covering of glass
water was all turned
to find out for the
the river & closed
the river.
of the machinery
a explosion.

13th July 1869
A change of light & darkness at 5 p.m. after having
about 2 minutes.
The millman John Wickett after coming to
the mill was walking towards the back room and door
nearer the door when the mill exploded.
He was shaken off his feet
and found he had lost his shoe.
The only damage done was to the
mill and the other mill received any injury.
The water of the mill was not turned over, and the
there acted as a check. The mill was communicated to the
millman is any of the other mills. The millman Wickett
came to work again on 13th July.
The mill commenced work again after having the
millman and the mill.

14th August 1869
A change of light & darkness at 5 p.m. after having
about 2 minutes.
The millman John Wickett after coming to
the mill was walking towards the back room and door
nearer the door when the mill exploded.
He was shaken off his feet
and found he had lost his shoe.
The only damage done was to the
mill and the other mill received any injury.
The water of the mill was not turned over, and the
there acted as a check. The mill was communicated to the
millman is any of the other mills. The millman Wickett
came to work again on 13th July.
The mill commenced work again after having the
millman and the mill.

Steam Mill A 5.7.1869.
17.8.1869