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Indian Explosives Act (IV of 1884)  
Indian Petroleum Act (VIII of 1899)

THIRTY-EIGHTH ANNUAL REPORT

OF THE

Chief Inspector of Explosives  
(45) in India

*Being his Annual Report for the year ending 31st March 1937*

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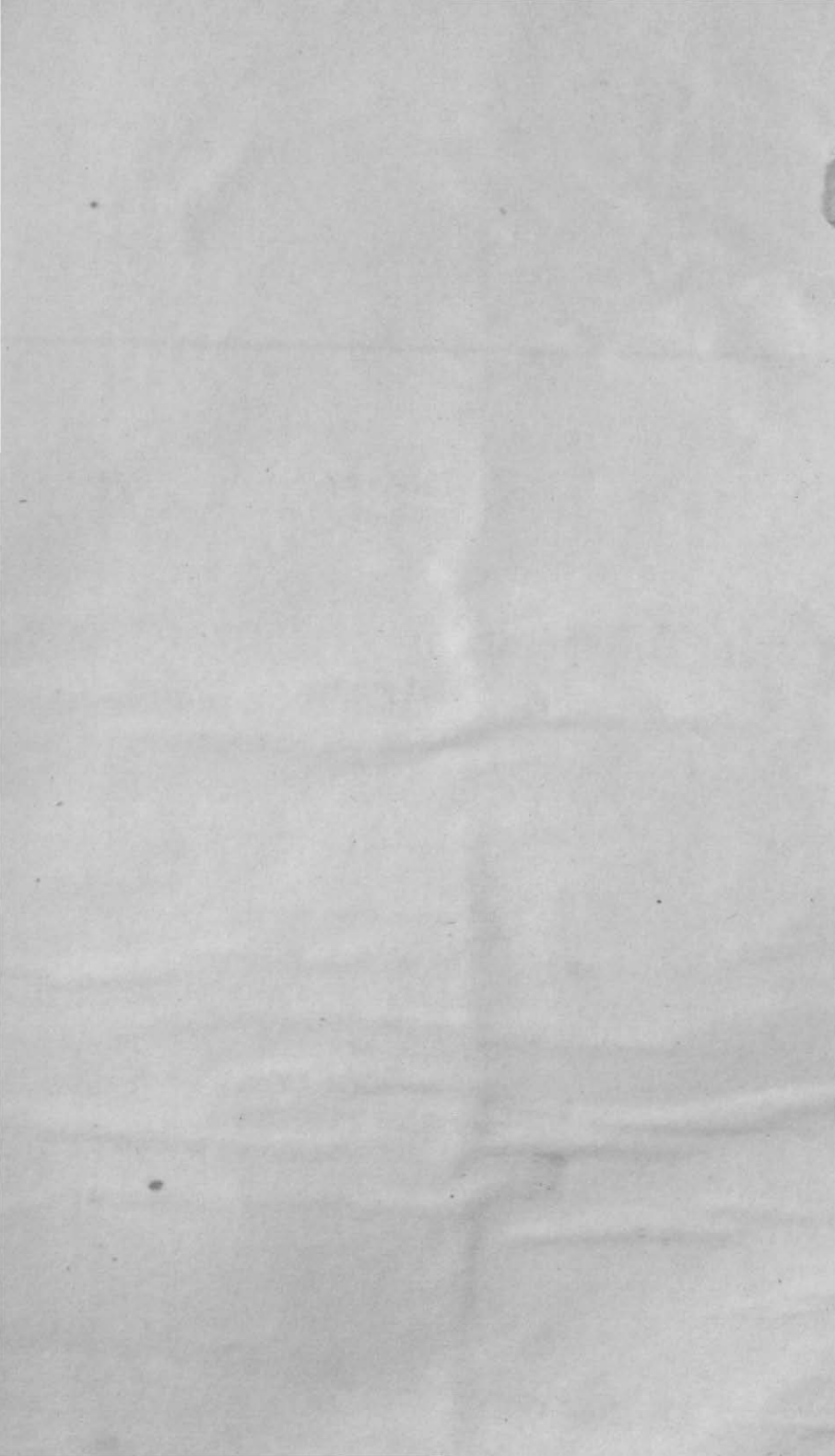
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# Thirty-eighth Annual Report of the Chief Inspector of Explosives in India.

No. G.-28 (1)-11.

FROM

GORDON PEACE, ESQR., F.I.C., F.R.A.S.,

*Chief Inspector of Explosives in India,*

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,

DEPARTMENT OF LABOUR,

NEW DELHI.

*Calcutta, the 4th January 1938.*

Sir,

I have the honour to submit herewith a report of the work of the Department of Explosives during the year ending 31st March 1937.

2. *Personnel*—On return from leave Mr. A. K. Sen, M.Sc., was posted as Inspector of Explosives, West Circle, with headquarters at Bombay with effect from the 9th April 1936, relieving Mr. B. N. Pal, M.Sc., who was transferred and posted as Inspector of Explosives, South Circle, with headquarters at Madras with effect from the 13th April 1936.

Dr. M. K. Maitra, Ph.D. (Lond.), D.I.C., A.I.C., Inspector of Explosives, East Circle, Calcutta, was granted leave out of India on average pay for 7 months, combined with leave on half average pay for 9 months with effect from the afternoon of the 15th October 1936.

Mr. B. N. Pal, M.Sc., Inspector of Explosives, South Circle, Madras, was transferred to Calcutta and he assumed charge with effect from the forenoon of the 26th October 1936 of the office of the Inspector of Explosives, East Circle, Calcutta in addition to his own duties.

### Explosives.

3. *Number of magazines.*—During the year 1936, 198 licenses were granted in British India under Rule 46 and items 10 and 11 of Schedule II to the Indian Explosives Rules, 1914. The number of magazines licensed was 236 or 11 less than in 1935 and is in excess of the number of licenses granted, because in a number of cases firms have two or more magazines in one place under one license. A statement showing the number and location of the magazines and also the number of licenses granted in British India during the year 1936 is given in Appendix A, and a statement showing the number of magazines and licenses granted during the past ten years is shown in Appendix B.

4. *Inspection of explosives magazines during the year.*—During the year 185 inspections of magazines were made, a number of magazines being inspected two or three times. Those magazines are inspected most frequently which are situated in the neighbourhood of towns or in populous localities, or which contain large quantities of explosives, or any explosive which on account of its greater susceptibility to decomposition and possible ignition, it is considered advisable to examine and test more frequently than other explosives.

5. *Condition of magazines.*—The magazines generally are in good order and as usual magazine-owners have been found most willing to carry out recommendations even when involving considerable expense, and my thanks are due to them for making my duties easy in this respect.

6. *Condition of explosives in magazines.*—The physical condition of all the explosives in the different magazines during the year was found to be good with the following exceptions, which were found to have become defective and were destroyed :—

- (a) 59½ lbs. of Dynamite Cartridges from the explosives magazine of The Dewarkhand Cement Co., Ltd., at Khalari.
- (b) 174 lbs. of Dynamite from the explosives magazine of the C. P. Cement Co., Ltd., at Kymore.
- (c) 110 lbs. of L. G. Gelatine 1¼", 30% from the explosives magazine of Messrs. Best & Co., Agents, Messrs. Nobel's Explosives Co., Ltd., at Sydapuram.
- (d) 147 Cartridges of Dynamite, 52 Detonators and 2 Coils of Gutta Percha Tape fuse from the magazine of the B. B. and C. I. Railway Co., Ltd., at Jekot.
- (e) 149 lbs. 6 ozs. of Gelignite from the explosives magazine of the General Manager, Ballarpur Collieries at Ghugus.
- (f) 26 Cartridges of Gelignite from the explosives magazine of the General Manager, Ballarpur Collieries at Ballarpur.
- (g) 80 lbs. of 7-8" and 180 lbs. of 1¼" Polar Ammon Gelignite from the explosives magazine of Messrs. Best & Co., Agents, Messrs. Nobel's Explosives Co., Ltd., at Korukupet.

- (h) One case of Dynamite and 5 cases of Gelignite from the explosives magazine of the Port Engineer, Aden Port Trust, on Ras Morbat.
- (i) 3 cases of Dynamite from the explosives magazine of the Assam Railways and Trading Co., Ltd., at Margherita.
- (j) 9 boxes each containing 5 lbs. of Dynamite from the explosives magazine of The South Indian Railway Co., Ltd., at Coonoor.
- (k) 8 lbs. and 6 ozs. of Stonobel from the explosives magazine of Messrs. Shaw Wallace & Co., Agents, Nazira Coal Co., Ltd. at Kongon.
- (l) 78½ cases of Dynamite from the explosives magazine of The Anglo-Siam Corporation Ltd., Agents, Messrs. Nobel's Explosives Co., Ltd., at Ghizri.
- (m) 163 cases and 40 lbs. of Dynamite from the explosives magazine of the Anglo Siam Corporation Ltd., Agents Messrs. Nobel's Explosives Co., Ltd., at Antop Hill.
- (n) 318 cases of Dynamite belonging to Messrs. Gillanders Arbuthnot & Co., and 61 cases belonging to Messrs. Shaw Wallace & Co., from the explosives magazine of the former Company at Bally.
- (o) 600 cases, 8 cases and 15 lbs., 84 cases, 2 cases and 10 lbs., 30 lbs., and 63 cases of Dynamite from the explosives magazines of Messrs. Gillanders Arbuthnot & Co., Agents, Nobel's Explosives Co., Ltd., at Fuleswar, Barakar, Gondoodih, Choitodih, Giridih and Kodarma respectively.
- (p) 4,950 lbs. of Gelignite from the Magazines of Messrs. Shaw Wallace & Co.

7. *Thefts*.—During the year under report no cases of theft of explosives were reported.

8. *Import of explosives*.—Two thousand three hundred and sixteen tons of explosives were imported into British India during the year 1936, the value being Rs. 46,32,460. Full details showing the different kinds of explosives imported, and the value of each are given in Appendix C. A comparative statement showing the quantity of explosives imported during the last 10 years is given in Appendix D.

9. *Authorised explosives*.—A list of explosives authorised for importation into British India was published in the *Gazette of India* for information and is given in Appendix E.

10. *Manufacture of explosives*.—Four licenses granted by the Governor General in Council for the manufacture of gunpowder, viz., one in the District of Manbhum in Bihar, two in the Districts of Chanda and Chhindwara respectively in the Central Provinces, and one in the District of Jhelum in the Punjab, were renewed for the year 1937.

A new license was granted by the Governor General in Council to the Manager, Kargali Colliery for the manufacture of Liquid Oxygen Explosives at Kargali Colliery for the year 1936 but the license has not been renewed for the year 1937.

The license granted by the Governor General in Council to the Indian Oxygen and Acetylene Co., Ltd., Calcutta, for the manufacture of Liquid Oxygen Explosives for the year 1936 has been renewed for the year.

The license granted by the Governor General in Council for the manufacture of Electric Sparklers and Serpent powder in the Bombay Suburban District in the Bombay Presidency was also renewed for the year 1937.

### Petroleum.

11. *Number of Petroleum Premises.*—During the year under report 9,679 licenses for the storage of dangerous and non-dangerous petroleum, regarding which this Department was concerned or consulted, were granted. A list of these premises, corrected up to 31st December 1936 and showing the districts in which they are located, is given in Appendix F.

12. *Storage of dangerous petroleum in bulk.*—A large number of special licenses were granted under rule 6, Chapter IV, Part II of the Petroleum Rules for the storage of dangerous petroleum in underground tanks fitted with pumps.

A large number of depôts for the storage of dangerous petroleum in bulk erected to plans approved by this Department have been taken into use.

13. *Combined storage of petrol, kerosene and liquid fuel.*—Several combined petrol, kerosene and liquid fuel depôts erected to plans approved by this Department have also been taken into use.

14. *Inspection of Petroleum premises during the year.*—In all 2,590 inspections of petroleum premises were made.

15. *Condition of major installations.*—The large petroleum installations are usually under efficient supervision and are in good order and well looked after. There is, however, a tendency on the part of the newer oil firms to put in responsible charge of such installations employees with insufficient practical experience and technical knowledge.

16. *Condition of minor installations.*—The small or minor petroleum installations are installations in which not more than 50,000 gallons of kerosene or liquid fuel in combined bulk and non-bulk are stored. The oil for these installations is supplied from the major installations at the different ports, and the retail trade is carried out from them. A great deal of inspection of these minor installations has been done by this Department with the result that their condition is improved and many of them are in better order. Many however still fall below the standard it is desirable to maintain.

### Accidents.

17. *Number of accidents.*—A list of accidents that have occurred with explosives, inflammable substances, dangerous goods, etc., between the 1st January and 31st December 1936, is given together with a short account of each in Appendix G. It will be seen from a perusal of the details that practically all the accidents were caused by gross neglect of ordinary precautions. 58 such accidents resulting in 56 deaths and injuries to 139 persons were reported to this Department. Comparative statements given in Appendices I and J show the total number of accidents and the number of



persons killed or injured by them during the last ten years. Very few of the accidents that occur are reported to this Department unless, as a result of information from other sources, a reference has been made to the Local Authority concerned. The statistics given must therefore considerably understate the real number of accidents.

The only accidents entered in Appendix G are those which are non-political.

18. *Gunpowder, Class I.*—There were ten accidents from gunpowder during the year causing fifteen deaths and injuries to eight persons.

19. *Nitro-compounds, Class III.*—One accident from Nitro-compounds causing death to one person and injuries to three others, was reported.

20. *Chlorate mixture, Class IV.*—No accident from explosives classed as Chlorate mixtures was reported.

21. *Fulminates, Class V.*—No accident from the use of fulminates, as such, were reported. Firework accidents previously reported under this head are classified under Fireworks, Class VII.

22. *Ammunition, Class VI.*—There was no accident from ammunition reported.

23. *Fireworks, Class VII.*—I was informed of 31 accidents from fireworks involving the death of 23 persons and injuries to 56 others. The majority of these accidents were caused by the use of a prohibited sensitive mixture of potassium chlorate and sulphur or sulphuret and in many cases prosecutions are pending.

24. *Liquid oxygen explosives.*—No accident from Liquid oxygen explosives was reported.

25. *Petroleum.*—There were twelve accidents from petroleum reported during the year. They were responsible for eleven deaths and injuries to thirty-three persons. It will be seen from a perusal of the accidents in Appendix G that carelessness is a prominent feature and that many of them are caused by naked lights being brought into close proximity to oil vapour.

26. *Chemicals.*—One accident from chemicals was reported to this Department. This was not attended with any loss of life or injury to any person.

27. *Miscellaneous.*—Three miscellaneous accidents were reported and were responsible for 6 deaths and injuries to 39 persons.

#### General Remarks.

28. *Government Magazines in charge of civil officers.*—Only four reports of the inspection of these magazines by civil officers have been received in this office. There is no doubt that the introduction of the system of sending these reports to this office was desirable. All magazines in charge of civil officers should be inspected at least once a year and the reports forwarded to me for comment. I have come across many instances of want of expert knowledge which might have caused disasters. High explosives in these magazines have frequently never been tested and I have, in dealing with these reports, recommended always that samples of explosives should be sent at least once a year for test.

Four Railway magazines were inspected by this Department during the year. Arrangements have, however, now been made for this Department to make more frequent inspections of Railway magazines than has been the practice in the past.

**29. Delegation of power to the Political Agent and District Magistrate, Quetta-Pishin to grant licenses under the Indian Explosives Rules, 1914.**—In his Notification No. 4727 R., dated the 9th September 1936, the Agent to the Governor General and Chief Commissioner in Baluchistan authorised the Political Agent and District Magistrate, Quetta-Pishin to grant licenses to possess in a magazine and to possess in and sell from a magazine explosives in accordance with the procedure laid down in Chapter VI of the Indian Explosives Rules, 1914.

**30. Packing of Detonators.**—The permission granted to the Agents of Messrs. Nobel's Explosives Co., Ltd., authorising the importation of detonators packed in cases with a clear space of not less than one inch, instead of not less than three inches (as required by the regulations for package of explosives given in Schedule IV to the Indian Explosives Rules, 1914) was further extended by one year from 6th June 1936.

**31. Small Gunpowder and Firework Factories.**—The conditions under which gunpowder and fireworks are manufactured and handled continue to give rise to anxiety. In many cases the most elementary precautions are completely ignored and the safety of the public and surrounding property given no consideration whatever. It must be admitted that these omissions are largely due to lack of technical knowledge and to failure to appreciate the dangers involved, but this does not justify the continued licensing of premises which in any way fail to comply with the conditions laid down on the license forms. No technical knowledge is required to ensure that the number of persons on the premises is limited, that the explosive is manufactured in a tent or lightly constructed building exclusively appropriated for the purpose and separated from any dwelling house, highway, street, public thoroughfare or public place by the necessary safety distances, that the licensed quantity is not exceeded and that explosives as manufactured are immediately removed to a safe place of storage and not allowed to accumulate in the place of manufacture. The maximum quantity of gunpowder or fireworks which may be possessed under the usual license to manufacture is 200 lbs. 200 lbs. of fireworks contain a relatively small amount of explosive and it is on this fact that the elementary conditions attaching to the licenses for these small factories are laid down. Unfortunately it is a very common practice for the licensed quantity to be grossly exceeded; with disastrous results when an accident does occur. Admittedly expert knowledge is necessary before any efficient control can be exercised over the explosive mixtures used in making up the actual fireworks but I do feel that Licensing Authorities can do much to reduce the distressing number of accidents which occur each year by insisting on the observance of safety distances and other elementary precautions and by enforcing the quantity limits prescribed by the license.

**32. Petroleum Act, 1934 and the rules framed thereunder**—In their Notification Nos. M-826(5) and M-826, dated the 23rd and 30th March 1937 respectively, the Government of India, Department of Industries and Labour, brought the Petroleum Act, 1934 and the rules framed thereunder into force with effect from the 30th March 1937.

33. *Carbide of Calcium Rules, 1937.*—In their Notification No. M-8261, dated the 18th March 1937, the Government of India, Department of Industries and Labour, published the Carbide of Calcium Rules, 1937.

34. *Enquiries.*—A very large number of enquiries of a varied nature were received during the year from District Officials, private individuals, firms, Port Authorities and Railways. These were all dealt with.

35. *Red Pamphlet.*—This Department was consulted by the Indian Railway Conference Association in connection with numerous amendments and additions to the rules contained in Red Pamphlet No. 13 (Rules and Rates for the conveyance of Explosives and other Dangerous Goods by Rail).

36. *Number of Inspections made.*—The number of inspections made by this Department during the year was 2,775, and was greater than last year, but very many magazines and petroleum premises still remained uninspected owing to the limitations imposed by the grant for Travelling Allowances. (Owing to the introduction of the Petroleum Rules, 1937 and the re-organisation of the Explosives Department which this has necessitated it is hoped that a very much larger percentage of the premises licensed by this department will be visited annually in future.) To give some idea of the work and ground covered I give the following details of the tours made by the Inspectors of Explosives during the 12 months, 1st April 1936 to 31st March 1937 :—

	Days on tour.	Inspections made.	Distance travelled.
			Miles.
Inspector of Explosives—			
North Circle . . . . .	172	888	24,264
South Circle . . . . .	151	565	20,186
East Circle . . . . .	78*	301	7,312
West Circle . . . . .	120	795	16,874

\* Absent on leave 167 days.

The Chief Inspector of Explosives was on tour for 135 days, travelling 24,909 miles, went on inspection duty to the Punjab and Burma Oil fields and visited the ports of Calcutta, Bombay, Karachi, Madras, Rangoon, Cochin and Aden.

I have the honour to be,  
Sir,

Your most obedient Servant,

G. PEACE,

Chief Inspector of Explosives in India.

## APPENDIX A.

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1914, for the year 1936.

Presidency or Province.	District.	MAGAZINES.			LICENSES.		
		Under renewed licenseo.	Under new license.	TOTAL.	Renewed.	New.	TOTAL.
Aden . . . .	Aden . . . .	5	...	5	4	...	4
	TOTAL . . . .	5	...	5	4	...	4
Assam . . . .	Cachar . . . .	...	1	1	...	1	1
	Lakhimpur . . . .	5	...	5	5	1	6
	Naga Hills . . . .	1	...	1	1	...	1
	TOTAL . . . .	6	1	7	6	2	8
Bengal . . . .	Burdwan . . . .	9	...	9	6	...	6
	Hooghly . . . .	4	...	4	1	...	1
	Howrah . . . .	1	...	1	1	...	1
	24-Parganas . . . .	2	...	2	1	...	1
	TOTAL . . . .	16	...	16	9	...	9
Bihar . . . .	Gaya . . . .	3	...	3	3	...	3
	Hazaribagh . . . .	16	1	17	13	1	14
	Manbhum . . . .	24	...	24	22	...	22
	Ranchi . . . .	1	...	1	1	...	1
	Saran . . . .	...	1	1	...	1	1
	Shahabad . . . .	1	...	1	1	...	1
	Singhbhum . . . .	10	...	10	8	...	8
TOTAL . . . .	55	2	57	48	2	50	

## APPENDIX A—contd.

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1914, for the year 1936—contd.

Presidency or Province.	District.	MAGAZINES.			LICENSES.		
		Under renewed license.	Under new license.	TOTAL.	Renewed	New.	TOTAL.
Bombay . . .	Ahmedabad . .	4	...	4	4	...	4
	Bombay . . .	9	...	9	5	...	5
	Bombay Suburban.	6	...	6	6	...	6
	Broach and Panch Mahals.	4	...	4	4	...	4
	Dharwar . . .	1	...	1	1	...	1
	Kolaba . . .	1	...	1	1	...	1
	Surat . . .	2	...	2	2	...	2
	TOTAL . . .	27	...	27	23	...	23
Burma . . .	Amherst . . .	1	...	1	1	...	1
	Bassein . . .	2	...	2	2	...	2
	Hantawaddy . .	4	...	4	2	...	2
	Kyaukse . . .	1	...	1	1	...	1
	Magwe . . .	1	...	1	1	...	1
	Mandalay . . .	1	...	1	1	...	1
	Northern Shan States.	9	...	9	5	...	5
	Pakoku . . .	1	...	1	1	...	1
	Pegu . . .	1	...	1	1	...	1
	Carried over . .	21	...	21	15	...	15

## APPENDIX A—contd.

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1914, for the year 1936—contd.

Presidency or Province.	District.	MAGAZINES.			LICENSES.		
		Under renewed license.	Under new license.	TOTAL.	Re-newed.	New.	TOTAL.
Burma—concl'd.	Brought forward	21	...	21	15	...	15
	Tavoy . . .	6	...	6	4	...	4
	Ihaton . . .	7	...	7	6	...	6
	Thayetmyo . . .	...	1	1	...	1	1
	Toungoo . . .	1	...	1	1	...	1
	Yamthin . . .	1	...	1	1	...	1
	TOTAL . . .	36	1	37	27	1	28
Central Provinces . . .	Balaghat . . .	2	...	2	2	...	2
	Bhandara . . .	2	...	2	2	...	2
	Bilaspur . . .	1	...	1	1	...	1
	Chanda . . .	5	...	5	5	...	5
	Chhindwara . . .	9	...	9	9	...	9
	Jubbulpur . . .	2	...	2	2	...	2
	Nagpur . . .	4	...	4	4	...	4
	Rajpur . . .	3	...	3	4	...	4
TOTAL . . .	28	...	28	29	...	29	

## APPENDIX A—concl'd.

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1914, for the year 1936—concl'd.

Presidency or Province.	District.	MAGAZINES.			LICENSES.		
		Under renewed license.	Under new license.	TOTAL.	Renewed.	New.	TOTAL.
Madras	Chingleput	1	...	1	1	...	1
	Chittoor	3	...	3	3	...	3
	Coinbatore	1	...	1	1	...	1
	Guntur	1	...	1	1	...	1
	Madras	14	...	14	8	...	8
	Madura	3	...	3	3	...	3
	Nellore	2	...	2	1	...	1
	North Arcot	3	...	3	3	...	3
	South Arcot	3	...	3	3	...	3
	South Kanara	...	1	1	...	1	1
	Tanjore	5	...	5	5	...	5
	Tinnevely	2	...	2	2	...	2
	Trichinopoly	3	...	3	3	...	3
Vizagapatam	2	..	2	1	...	1	
	TOTAL	43	1	44	35	1	36
Orissa	Sambalpur	1	...	1	1	...	1
	TOTAL	1	...	1	1	...	1
Punjab	Attock	4	...	4	2	...	2
	Jhelum	2	...	2	2	...	2
	TOTAL	6	...	6	4	...	4
Sind	Karachi	5	...	5	3	...	3
	Sukkur	1	...	1	1	...	1
	TOTAL	6	...	6	4	...	4
United Provinces	Meerut	1	...	1	1	...	1
	Shahjahanpur	1	...	1	1	...	1
	TOTAL	2	...	2	2	...	2

## SUMMARY.

Presidency or Province.	MAGAZINES.			LICENSES.		
	Under renewed license.	Under new license.	TOTAL.	Renewed.	New.	TOTAL.
Aden . . . . .	5	...	5	4	...	4
Assam . . . . .	6	1	7	6	2	8
Bengal . . . . .	16	...	16	9	...	9
Bihar . . . . .	55	2	57	48	2	50
Bombay . . . . .	27	...	27	23	...	23
Burma . . . . .	36	1	37	27	1	28
Central Provinces . . . . .	28	...	28	29	...	29
Madras . . . . .	43	1	44	35	1	36
Orissa . . . . .	1	...	1	1	...	1
Punjab . . . . .	6	...	6	4	...	4
Sind . . . . .	6	...	6	4	...	4
United Provinces . . . . .	2	...	2	2	...	2
TOTAL . . . . .	231	5	236	192	6	198

## APPENDIX B.

*Summary of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II for the ten years ending 1936.*

YEAR.	MAGAZINES.			LICENSES.		
	Under renewed license.	Under new license.	TOTAL.	Renewed.	New.	TOTAL.
1927 . . . . .	247	13	260	207	13	220
1928 . . . . .	258	19	277	217	16	233
1929 . . . . .	264	14	278	221	14	235
1930 . . . . .	268	8	276	226	8	234
1931 . . . . .	267	9	276	223	9	232
1932 . . . . .	251	7	258	210	7	217
1933 . . . . .	237	8	245	198	8	206
1934 . . . . .	238	5	243	199	5	204
1935 . . . . .	238	9	247	199	9	208
1936 . . . . .	231	5	236	192	5	197



## APPENDIX C.

Statement showing the imports of explosives by sea into British India from other countries in the year 1936.

Explosives.	Bengal.	Bombay.	Sind.	Burma.	Madras.	TOTAL.
<i>Quantity.</i>						
Gunpowder, black . lbs.	33,975	36,525	2,050	2,430	4,058	89,438
"    smoke- " less.	17,975	125	500	...	200	18,800
Dynamite . . . "	...	5,000	...	20,250	10,000	35,250
Blasting gelatine . "	5,000	25,750	500	57,650	447,500	536,400
Gelignite or gelatine dynamite. "	445,000	90,000	15,000	341,400	311,750	1,293,150
Other nitro-compound explosives. "	85,420	...	...	...	...	85,420
Detonators . No.	1,650,000	587,060	56,060	920,000	2,000,000	5,213,120
Fireworks . lbs.	223,100	1,620,467	30,651	128,380	661,404	2,664,002
Total quantity of all lbs. explosives other than Detonators.	810,470	1,777,867	59,101	550,110	1,431,912	4,632,460
<i>Value in rupees.</i>						
Gunpowder, black .	21,570	19,963	9,030	1,341	2,103	54,007
"    smokeless .	19,571	530	625	...	125	21,151
Dynamite . . . .	...	3,577	...	28,553	7,165	39,285
Blasting gelatine . .	4,251	21,065	770	50,617	3,79,535	4,56,238
Gelignite or gelatine dynamite.	309,413	64,026	18,610	3,56,243	5,39,631	9,87,923
Other nitro-compound explosives.	48,958	...	...	...	...	48,958
Detonators . . . .	48,214	9,526	2,920	37,385	26,698	1,24,743
Fireworks . . . .	84,093	4,23,333	17,074	43,964	1,91,320	7,59,784
TOTAL .	5,36,370	5,42,020	49,029	5,18,103	8,46,567	24,92,09

### APPENDIX D.

*Comparative statement showing the imports of explosives by sea into British India from other countries for the ten years ending 1936.*

Explosives.	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Gunpowder, black . . . lbs.	178,550	164,100	111,680	127,875	71,750	62,951	97,130	78,785	125,335	89,438
„ smokeless . . . „	21,238	11,587	15,950	14,888	16,355	5,645	6,060	7,645	9,480	18,800
Dynamite . . . . „	364,750	451,550	495,750	386,050	226,300	67,500	202,900	198,894	296,525	35,250
Blasting gelatine . . . „	271,500	410,800	492,800	245,500	396,850	536,500	518,450	523,400	630,500	536,400
Gelignite or gelatine dynamite . „	924,001	1,128,700	1,082,000	920,050	1,088,706	761,500	710,350	1,202,850	1,301,700	1,203,150
Other nitro-compound explosives „	150,025	130,000	221,500	203,000	142,400	131,050	60,000	78,550	124,000	85,420
Detonators . . . . No.	6,910,498	8,872,023	8,022,326	6,446,558	5,395,946	4,398,994	3,298,150	6,006,500	6,601,187	5,213,120
Fireworks . . . . lbs.	3,819,378	4,422,887	4,940,692	2,244,621	1,203,083	1,881,039	2,605,474	2,625,439	2,958,435	2,664,002
Total quantity of all explosives other than Detonators. „	5,729,742	6,717,604	7,360,372	4,141,984	3,145,144	3,446,185	4,200,364	4,715,663	5,445,975	4,632,460

**APPENDIX E.**  
**DEPARTMENT OF EXPLOSIVES.**

NOTIFICATION.

Calcutta, the 8th July 1936.

**No. E. 11(1).**—With reference to the following Notifications publishing rules to regulate the manufacture, possession, sale, transport and importation of explosives, the following list of "Authorised Explosives" referred to in the rule mentioned against each Notification is published for general information:—

Rule 4 (3) of Notification No. 4013—33, dated the 6th June 1914, of the Government of India, Department of Commerce and Industry.

Rule 4 (3) of Notification No. 1183, dated the 11th November 1914, of the Chief Commissioner, Central Provinces, applicable to Berar.

Rule 4 (3) of Notification No. 14, dated the 23rd April 1915, of the Resident in Mysore, applicable to the Civil and Military Station of Bangalore and on the Railways in Mysore under British jurisdiction.

Rule 4 (3) of Notification No. 67-J, dated the 28th August 1914,

Rule 4 (3) of Notification No. 34-J., dated the 20th April 1915,

} of the Resident at Hyderabad applicable to the Cantonments of Secunderabad and Aurangabad, the Hyderabad Residency Bazars and the Railway lands in the Hyderabad State.

Rule 3 (3) of Notification No. 99, dated the 19th July 1916, as amended by Notification No. 41, dated the 30th July 1928 of the Government of Burma applicable to the Federated Shan States.

Rule 3 (3) of Notification No. 5313, dated the 29th October 1918, of the Agent to the Governor General in Rajputana.

Rule 3 (3) of Notification No. 1812-B., dated the 10th November 1919, of the Agent to Governor-General in Central India, applicable to Railway lands in Central India, specified in the Notification of the Government of India in the Foreign Department, No. 261-I. B., dated 10th February 1913.

LIST OF AUTHORISED EXPLOSIVES.

The following explosives are at present authorised for importation into British India for general sale:—

CLASS 1.—GUNPOWDER.

*The term "gunpowder" means gunpowder ordinarily so-called.*

GUNPOWDER.

## CLASS 2.—NITRATE-MIXTURE.

*The term "nitrate-mixture" means any preparation, other than gun-powder ordinarily so-called, formed by the mechanical mixture of a nitrate with any form of carbon or with any carbonaceous substance not possessed of explosive properties, whether sulphur be or be not added to such preparation and whether such preparation be or be not mechanically mixed with any other non-explosive substance, and includes any explosive containing a perchlorate and not being a chlorate-mixture, fulminate or nitro-compound as defined in Rule 4 of the Indian Explosives Rules, 1914.*

EVERY BLASTING EXPLOSIVE IN THIS CLASS, IN WHICH NITRATE OF AMMONIUM, NITRATE OF SODIUM OR CHLORIDE OF SODIUM ARE USED AS INGREDIENTS, SHALL BE CONTAINED IN CARTRIDGE WRAPPERS OR CASES (OR IN FIVE-POUND INNER PACKAGES) MADE THOROUGHLY WATERPROOF WITH MELTED PARAFFIN OR OTHER SUITABLE WATERPROOFING MATERIAL.

## BOBBINITE.

Cardox Composition.

## CLASS 3.—NITRO-COMPOUND.

*The term "nitro-compound" means any chemical compound possessed of explosive properties or capable of combining with metals to form an explosive compound, which is produced by the chemical action of nitric acid (whether mixed or not with sulphuric acid) or of a nitrate mixed with sulphuric acid upon any carbonaceous substance, whether such compound is mechanically mixed with other substances or not.*

*The nitro-compound class has two divisions.*

EVERY EXPLOSIVE IN THIS CLASS AND EVERY EXPLOSIVES INGREDIENT THEREOF SHALL BE SO THOROUGHLY PURIFIED AND OTHERWISE OF SUCH CHARACTER AS TO SATISFY A TEST KNOWN AS THE HEAT TEST, AND SPECIFIED IN THE RULE FOR TESTING EXPLOSIVES PUBLISHED WITH GOVERNMENT OF INDIA, DEPARTMENT OF COMMERCE AND INDUSTRY, NOTIFICATION NO. 4013—33, DATED THE 6TH JUNE 1914, REFERRED TO ABOVE.

EVERY BLASTING EXPLOSIVE IN THIS CLASS, IN WHICH NITRATE OF AMMONIUM, NITRATE OF SODIUM, CHLORIDE OF SODIUM OR NITRO-GLYCOL ARE USED AS INGREDIENTS, SHALL BE CONTAINED IN CARTRIDGE WRAPPERS OR CASES (OR IN FIVE-POUND INNER PACKAGES) MADE THOROUGHLY WATERPROOF WITH MELTED PARAFFIN OR OTHER SUITABLE WATERPROOFING MATERIAL.

**DEPARTMENT OF EXPLOSIVES.**

*ompound  
partly of*

NOTIFICATION.

Calcutta, the 10th February 1937.

**No. E.-11 (1).**—In this Department Notification No. E.-11 (1), dated 8th July 1936, published on pages 962—967 of Part II of the *Gazette of India*, dated the 18th July 1936, insert "Amon Gelatine" and "Polar Ammon Gelatine Dynamite" below the entries "A. I. Rounkol" and "N. S. Gelignite", respectively, in the list of explosives given under Class 3-Nitro-Compound, Division I.

G. PEACE,

Chief Inspector of Explosives in India.

PROVIDED THAT EVERY EXPLOSIVE IN THIS DIVISION SHALL BE OF SUCH CHARACTER AND CONSISTENCY AS NOT TO BE LIABLE TO LIQUEFACTION OR EXUDATION OF NITRO-GLYCERINE.

PROVIDED ALSO THAT AN EXPLOSIVE WHICH IS REQUIRED BY DEFINITION TO BE ISSUED IN WATERPROOF INNER PACKAGES MAY BE EXEMPTED FROM SUCH REQUIREMENT BY SPECIAL AUTHORITY, WHEN AND SO LONG AS THE CONDITIONS OF SUCH AUTHORITY ARE OBSERVED.

## DIVISION 2.

*Division 2 comprises the following explosives and any nitro-compound as before defined which is not comprised in division 1:—*

Alumatol. }	Guncotton.
Ammonal. }	Negro Powder No. 2.
Amberite No. 2.	Nobel Rim Neonite.
Baelenite.	N. S. Smokeless.
Di-nitro-phenol.	Picric Acid.
Economic Smokeless Sporting Powder. }	Picric Powder.
E. C. Sporting Powder. }	Roburite No. 4.
Eley Smokeless Sporting Powder. }	Ruby Powder.
Empire Powder }	Schultze Gunpowder.
Ideal Powder. }	Smokeless Diamond.
Light Load Smokeless. }	Tonite or Cotton Powder.
Nobel's Special Powder. }	Tri-nitro-toluol.

## CLASS 4.—CHLORATE MIXTURE.

*The term "chlorate mixture" means any explosive containing a chlorate.*

*The chlorate mixture class has two divisions.*

EVERY EXPLOSIVE IN THIS CLASS AND EVERY EXPLOSIVE INGREDIENT THEREOF SHALL BE SO THOROUGHLY PURIFIED AND OTHERWISE OF SUCH CHARACTER AS TO SATISFY A TEST KNOWN AS THE HEAT TEST, AND SPECIFIED IN THE RULE FOR TESTING EXPLOSIVES PUBLISHED WITH GOVERNMENT OF INDIA, DEPARTMENT OF COMMERCE AND INDUSTRY, NOTIFICATION No. 4013—33, DATED THE 6TH JUNE 1914, REFERRED TO ABOVE.

EVERY BLASTING EXPLOSIVE IN THIS CLASS, IN WHICH NITRATE OF AMMONIUM, NITRATE OF SODIUM OR CHLORIDE OF SODIUM ARE USED AS INGREDIENTS, SHALL BE CONTAINED IN CARTRIDGE WRAPPERS OR CASES (OR IN FIVE-POUND INNER PACKAGES) MADE THOROUGHLY WATERPROOF WITH MELTED PARAFFIN OR OTHER SUITABLE WATERPROOFING MATERIAL.

## DIVISION 1.

*Division 1 comprises any chlorate preparation which consists partly of nitro-glycerine or of some other liquid nitro-compound.*

*Nil.*

PROVIDED THAT EVERY EXPLOSIVE IN THIS DIVISION SHALL BE OF SUCH CHARACTER AND CONSISTENCY AS NOT TO BE LIABLE TO LIQUEFACTION OR EXUDATION OF NITRO-GLYCERINE.

## DIVISION 2.

*Division 2 comprises any chlorate mixture as hereinbefore defined which is not comprised in Division 1.*

*Nil.*

## CLASS 5.—FULMINATE.

*The term "fulminate" means any chemical compound or mechanical mixture, whether included in the foregoing classes or not, which, from its great susceptibility to detonation, is suitable for employment in percussion caps or any other appliances for developing detonation, or which, from its extreme sensibility to explosion, and from its great instability (that is to say, readiness to undergo decomposition from very slight exciting causes), is especially dangerous.*

*This class consists of two divisions.*

## DIVISION 1.

*Division 1 comprises, such compounds as the fulminates of silver and of mercury, and preparations of those substances, such as are used in percussion caps; and any preparation consisting of a mixture of a chlorate with phosphorus or certain descriptions of compounds of phosphorus, with or without the addition of carbonaceous matter, and any preparation consisting of a mixture of a chlorate with sulphur, or with a sulphuret, with or without carbonaceous matter.*

*Nil.*

## DIVISION 2.

*Division 2 comprises such substances as the chloride and the iodide of nitrogen, fulminating gold and silver, diazobenzol, and the nitrate of diazobenzol.*

*Nil.*

## CLASS 6.—AMMUNITION.

The term "ammunition" means any explosive of any of the foregoing classes when the same is enclosed in any case or contrivance, or is otherwise adapted or prepared so as to form a cartridge or charge for small-arms, cannon or any other weapon, or for blasting or to form any safety or other fuze for blasting or for shells, or to form any tube for firing explosives or to form a percussion cap, detonator, fog-signal, shell, torpedo, war-rocket, or any other contrivance other than a firework.

The term "percussion cap" does not include a detonator.\*

The term "detonator" means a capsule or case which is of such strength and construction and contains fulminate in such quantity, that the explosion of one capsule or case would communicate the explosion to other like capsules or cases.

The term "safety fuze" means a fuze for blasting which burns and does not explode and which does not contain its own means of ignition and which is of such strength and construction and contains an explosive in such quantity that the burning of such fuze will not communicate laterally with other like fuzes.

The ammunition class has three divisions.

## DIVISION 1.

Nobel's Safety Electric  
Time Fuzes.  
Percussion Caps.  
Railway Fog-Signals.

Safety Cartridges.  
Safety Fuzes for blasting.  
Safety Electric Fuzes.

## DIVISION 2.

Division 2 comprises any ammunition as hereinbefore defined, which does not contain its own means of ignition and is not included in Division 1.

Cartridges for Blasting or other like purposes.

Cartridges for Small Arms which are not Safety Cartridges.

Cordeau Bickford.  
Cordtex. }  
Detonating Fuze. }  
Electric Fuzes.  
Electric Primers.  
Fuze Lighters.  
Instantaneous Fuze.  
Port Fires.  
Tubes for firing Explosives.  
Quick Match.

\* In consequence of the results of experiments carried out, it has been decided that a percussion cap can only be properly classed as such if it contains less than 0.6 grain of a composition of the 1st Division of the fifth (Fulminate) class of which not more than 25 per cent. consists of fulminate of mercury or less than 0.5 grain of any other explosive of the 1st Division of the 5th (Fulminate) class: and it has been further decided that percussion caps shall not be classed as such when they contain anvils or have their composition unprotected by tin foil or other suitable substance, as under those circumstances they are liable to explode *en masse*.



## DIVISION 3.

*Division 3 comprises any ammunition as hereinbefore defined which contains its own means, of ignition, and is not included in Division 1.*

Cartridges for Small Arms which are not Safety Cartridges.

Detonators.

Electric Detonators.

Friction Tubes.

Nobels' Electric Delay Action Detonators.

Percussion Primers.

Tubes for firing Explosives.

## CLASS 7.—FIREWORK.

*The term "firework" comprises firework composition and manufactured fireworks.*

## DIVISION 1.

## FIREWORK COMPOSITION.

*The term "firework composition" means any chemical compound or mechanically mixed preparation of an explosive or inflammable nature, which is used for the purpose of making manufactured fireworks, and is not included in the former classes of explosives, and also any star and any coloured fire composition subject to the proviso to the definition of manufactured fireworks.*

Nil.

## DIVISION 2.

## MANUFACTURED FIREWORKS.

*MANUFACTURED FIREWORKS, consisting of any explosive of the classes 1, 2, 3, 4 and 6 and any firework composition, when such explosive or composition is enclosed in any case or contrivance or is otherwise manufactured so as to form a squib, cracker including Chinese crackers, toy cap or amorce, serpent, rocket (other than a war-rocket), maroon, lance, wheel, Chinese fire, Roman candle, or other article specially adapted for the production of pyrotechnic effects, or pyrotechnic signals or sound signals.*

*Provided that a substantially constructed and hermetically closed metal case, containing not more than one pound of coloured fire composition of such a nature as not to be liable to spontaneous ignition shall be deemed to be a "manufactured firework" and not a "firework composition".*

Aluminium Torches. }  
 Electric sparklers. }  
 Magnesium Torches. }  
 Amorces.  
 Chinese Crackers.  
 Distress Signal Rockets,  
 Manufactured Fireworks.  
 Pyrotechnic Matches.  
 Socket Light Signals.  
 Sparklers.  
 Very Signal Cartridges.

G. PEACE,

Chief Inspector of Explosives in India.

## APPENDIX F.

\*List of petroleum premises licensed during the year 1936.

Presidency or Province.	District.	No.	Presidency or Province.	District.	No.
Aden	Aden	34		Brought forward	93
	TOTAL	34		Bogra	35
Ajmer-Merwara	Ajmer	31		Burdwan	100
	TOTAL	31		Calcutta	275
Andaman and Nicobar Islands.	Port Blair	2		Chittagong	37
	TOTAL	2		Dacca	86
	Cachar	36		Darjeeling	100
	Darrang	24		Dinajpur	12
	Goalpara	31		Faridpur	44
	Kamrup	42		Hooghly	30
Assam	Khasi and Jaintia Hills.	4		Howrah	80
	Lakhimpur	68	Bengal—concl'd.	Jalpaiguri	100
	Naga Hills	7		Jessore	39
	Nowgong	21		Khulna	32
	Sibsagar	102		Malda	18
	Sylhet	99		Midnapur	87
	TOTAL	434		Murshidabad	32
				Mymensingh	46
Baluchistan	Loralai	4		Nadia	49
	Quetta	26		Noakhali	11
	TOTAL	30		Pabna	22
				Rajshahi	35
	Backerganj	46		Rangpur	79
Bengal	Bankura	27		Tippera	70
	Birbhum	20		24-Parganas	133
	Carried over	93		TOTAL	1,645

\* This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

## APPENDIX F—contd.

\* List of petroleum premises licensed during the year 1936—contd.

Presidency or Province.	District.	No.	Presidency or Province.	District.	No.
Bihar and Orissa.	Angul . . . .	3	Bombay— concl.	Brought forward .	195
	Balasore . . . .	29		Bijapur . . . .	16
	Bhagalpur . . . .	67		Bombay . . . .	358
	Champaran . . . .	30		„ Suburban . . . .	2
	Cuttack . . . .	18		Broach and Panch Mahals.	29
	Darbhanga . . . .	57		Dharwar . . . .	106
	Gaya . . . .	90		Hyderabad (Sind)	9
	Hazaribagh . . . .	53		Kaira . . . .	60
	Manbhum . . . .	60		Kanara . . . .	59
	Monghyr . . . .	59		Karachi . . . .	38
	Muzaffarpur . . . .	47		East Khandesh . . . .	108
	Palamau . . . .	15		West Khandesh . . . .	30
	Patna . . . .	118		Kolaba . . . .	41
	Puri . . . .	17		Kolhapur . . . .	5
	Purnea . . . .	37		Larkana . . . .	7
	Ranchi . . . .	22		Nasik . . . .	76
	Sambalpur . . . .	21		Poona . . . .	113
	Saran . . . .	46		Ratnagiri . . . .	76
	Shahabad . . . .	81		Satara . . . .	37
Singhbhum . . . .	73	Sholapur . . . .	49		
Sonthal Parganas . . . .	57	Sukkur . . . .	11		
TOTAL . . . .	1,000	Surat . . . .	35		
Bombay . . . .	Ahmedabad . . . .	83	Thana . . . .	46	
	Ahmednagar . . . .	30	TOTAL . . . .	1,535	
	Belgaum . . . .	82			
	Carried over . . . .	195			

\* This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

## APPENDIX F—contd.

\* List of petroleum premises licensed during the year 1936—contd.

Presidency or Province.	District.	No.	Presidency or Province.	District.	No.	
Burma	Amherst . . .	11	Burma—concl'd.	Brought forward . . .	341	
	Bassein . . .	4		Southern Shan States.	10	
	Bhamo . . .	3		Tavoy . . .	6	
	Hanthawaddy . . .	8		Tharrawaddy . . .	12	
	Insein . . .	3		Thaton . . .	7	
	Katha . . .	3		Thayetmyo . . .	13	
	Kyaukpyu . . .	1		Toungoo . . .	11	
	Kyaukse . . .	1		Upper Chindwin . . .	4	
	Lower Chindwin . . .	8		Yamethin . . .	7	
	Magwe . . .	68		TOTAL . . .	411	
	Mandalay . . .	14		Central India	Bhopal (Ry. land).	9
	Maubin . . .	7			Sehore (Ry. land).	8
	Meiktila . . .	12		TOTAL . . .	17	
	Mergui . . .	11		Central Provinces.	Akola . . .	93
	Minbu . . .	22	Amraoti . . .		81	
	Myaungmya . . .	10	Balaghat . . .		18	
	Myingyan . . .	7	Betul . . .		13	
	Myitkyina . . .	7	Bhandara . . .		51	
	Northern Shan States.	16	Bilaspur . . .		33	
	Pakokku . . .	21	Buldana . . .		66	
	Pegu . . .	31	Chanda . . .		40	
	Prome . . .	11	Chhindwara . . .		25	
	Rangoon . . .	57	Damoh . . .		6	
	Sagaing . . .	2	Drug . . .		21	
	Sandoway . . .	3	Hoshangabad . . .		38	
	Carried over . . .	341	Jubbulpore . . .		44	
			Mandla . . .		8	
		Carried over . . .	537			

\*This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

## APPENDIX F—contd.

\*List of petroleum premises licensed during the year 1936—contd.

Presidency or Province.	District.	No.	Presidency or Province.	District.	No.
Central Provinces—concl'd.	Brought forward . . .	537	Madras—concl'd.	Brought forward . . .	416
	Nagpur . . .	77		Guntur . . .	64
	Narsingpur . . .	6		Kistna . . .	44
	Nimar (Khandwa). . .	29		Kurnool . . .	33
	Raipur . . .	46		Madras . . .	119
	Saugor . . .	10		Madura . . .	79
	Seoni . . .	9		Malabar . . .	152
	Wardha . . .	32		Nellore . . .	29
	Yeotmal . . .	41		The Nilgiris . . .	46
TOTAL . . .	787	North Arcot . . .	91		
Coorg . . .	Coorg . . .	14	Ramnad . . .	77	
TOTAL . . .	14	Salem . . .	49		
Delhi . . .	Delhi . . .	91	South Arcot . . .	54	
TOTAL . . .	91	South Kanara . . .	73		
Hyderabad . . .	Hyderabad . . .	36	Tanjore . . .	115	
	Secunderabad . . .	59	Tinnevely . . .	47	
	TOTAL . . .	95	Trichinopoly . . .	64	
Mysore . . .	Anantapur . . .	49	Vizagapatam . . .	65	
	Bellary . . .	31	TOTAL . . .	1,617	
	Chingleput . . .	40	Bangalore . . .	52	
	Chittoor . . .	38	TOTAL . . .	52	
	Coimbatore . . .	85	North-West Frontier Province.	Bannu . . .	11
Cuddapah . . .	12	Dera Ismail Khan . . .		8	
Ganjam . . .	48	Hazara . . .		26	
East Godavari . . .	60	Kohat . . .		20	
West Godavari . . .	53	Peshawar . . .		78	
Carried over . . .	416	TOTAL . . .	143		

\* This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

## APPENDIX F—contd.

\*List of petroleum premises licensed during the year 1936—contd.

Presidency or Province.	District.	No.	Presidency or Province.	District.	No.	
Punjab . . . . .	Ambala . . . . .	57	Rajputana . . . . .	Jaipur (Ry. Land) . . . . .	2	
	Amritsar . . . . .	32		Alwar ( " ) . . . . .	2	
	Attock . . . . .	20		TOTAL . . . . .	4	
	Dera Ghazi Khan . . . . .	7		United Provin- cos. . . . .	Agra . . . . .	42
	Ferozapore . . . . .	22			Aligarh . . . . .	55
	Gujranwala . . . . .	27			Allahabad . . . . .	57
	Gujrat . . . . .	12			Almora . . . . .	3
	Gurdaspur . . . . .	48			Azamgarh . . . . .	26
	Gurgaon . . . . .	15			Bahraich . . . . .	16
	Hissar . . . . .	38			Ballia . . . . .	9
	Hoshiarpur . . . . .	12			Banda . . . . .	13
	Jhang . . . . .	2			Bara Banki . . . . .	11
	Jhelum . . . . .	8	Bareilly . . . . .		17	
	Jullundur . . . . .	25	Basti . . . . .		45	
	Kangra . . . . .	5	Benares . . . . .		50	
	Karnal . . . . .	30	Bijnor . . . . .		17	
	Lahore . . . . .	67	Budaun . . . . .		7	
	Ludhiana . . . . .	18	Bulandshahr . . . . .		24	
	Lyalpur . . . . .	42	Cawnpore . . . . .		65	
	Mianwali . . . . .	6	Dehra Dun . . . . .		35	
	Multan . . . . .	13	Etah . . . . .		10	
	Muzaffargarh . . . . .	5	Etawah . . . . .		13	
	Patiala . . . . .	5	Furrukhabad . . . . .		27	
	Rawalpindi . . . . .	80	Fatehpur . . . . .	15		
	Shahpur . . . . .	13	Fyzabad . . . . .	14		
	Sheikhupura . . . . .	22	Garhwal . . . . .	7		
	Sialkot . . . . .	17	Ghazipur . . . . .	12		
	Simla . . . . .	3	Carried over . . . . .	590		
	TOTAL . . . . .	651				

\* This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

## APPENDIX F—concl'd.

\* List of petroleum premises licensed during the year 1936—concl'd.

Presidency or Province.	District.	No.	Presidency or Province.	District.	No.
	Brought forward .	590			
	Gonda . . . .	35			
	Gorakhpur . . .	30			
	Hamirpur . . . .	8			
	Jalaun . . . . .	4			
	Jaunpur . . . . .	4			
	Jhansi . . . . .	33			
	Kheri . . . . .	28			
	Lucknow . . . . .	70			
	Mainpuri . . . . .	10			
	Meerut . . . . .	59			
	Mirzapur . . . . .	19			
United Provinces—concl'd.	Moradabad . . . .	9			
	Muttra . . . . .	19			
	Muzaffarnagar . .	23			
	Naini Tal . . . . .	16			
	Partabgarh . . . .	28			
	Pilibhit . . . . .	3			
	Rae Bareli . . . . .	11			
	Saharanpur . . . .	32			
	Shahjahanpur . . .	12			
	Sitapur . . . . .	23			
	Sultanpur . . . . .	11			
	Unao . . . . .	9			
	TOTAL . . . . .	1,086			

\* This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.



## SUMMARY.

Presidency or Province.	No.
Aden . . . . .	34
Ajmer-Merwara . . . . .	31
Andaman and Nicobar Islands . . . . .	2
Assam . . . . .	434
Baluchistan . . . . .	30
Bengal . . . . .	1,645
Bihar and Orissa . . . . .	1,000
Bombay . . . . .	1,535
Burma . . . . .	411
Central India . . . . .	17
Central Provinces . . . . .	787
Coorg . . . . .	14
Delhi . . . . .	91
Hyderabad . . . . .	95
Madras . . . . .	1,617
Mysore . . . . .	52
North-West Frontier Province . . . . .	143
Punjab . . . . .	651
Rajputana . . . . .	4
United Provinces . . . . .	1,086
TOTAL	9,679

## APPENDIX G.

*Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1936 to 31st December 1936.*

## EXPLOSIVES.

## Gunpowder.

1. 3rd April 1936. Udayapatti. One killed and 2 injured.—During the course of a temple festival an explosion occurred on the bank of a pond where gunpowder was being fired from a home made apparatus. The trustee of the temple was prosecuted under sections 23 and 176 of the Indian Arms Act and Indian Penal Code respectively and sentenced to pay a fine of Rs. 20.
2. 29th May 1936. Mangrul. One injured.—A spark in a blacksmith's shop fell on a bundle containing blasting powder kept in the shop; the powder exploded.
3. 17th June 1936. Jamei. One killed.—A person was burnt to death by a fire which took place in a hut where saltpetre was dissolved. The cause of the fire was not ascertained but it was probably due to the ignition of some quantity of gunpowder, or gunpowder mixture, kept in the hut.
4. 7th July 1936. Dhubri. 1 injured.—Setting fire to a tin containing a small quantity of gunpowder resulted in the injury of the person concerned.
5. 14th August 1936. Shew-Myin-din quarry, near Belin village. 1 injured.—While digging the ground where a shot had missed-fire the day before, the charge of gunpowder exploded.
6. 18th August 1936. Jagi Road, Assam. One killed and one injured.—Two persons were engaged in drilling holes for shots for blasting purposes. One of them struck an old hole which was concealed from view and contained an unexploded charge. The charge exploded.
7. 29th August 1936. Illuppayurani. 4 killed and 2 injured.—An explosion on premises licensed for the manufacture and possession of gunpowder at Illuppayurani was apparently caused by grinding a gunpowder mixture containing grit. As the licensee had contravened one of the conditions under which he was licensed, his license was cancelled.
8. 25th September 1936. Rajkharswan. 6 killed.—While 13 cases containing blasting powder booked from Asansol to Noamundi were being transhipped into another wagon on the goods transhipment platform a person who was supervising the unloading and loading operations lit a cigarette and threw the burnt match onto the boxes of powder. It is considered more than probable that some of the boxes were leaking and that a certain amount of powder was lying on the top of the box on which the match fell. The resulting explosion caused the death of six persons.
9. 26th November 1936. Bombay. One killed.—A passer-by was killed by flying debris from blasting operations connected with the demolition of an old building.
10. 16th December 1936. Punwar. One killed.—During the unloading of a miss-fire in a shot hole made at the bottom of a well, the charge of gunpowder exploded causing fatal injuries to one of the labourers.

## Nitro-compounds.

11. 17th September 1936. Coonoor. One killed and 3 injured.—The Inspector-in-charge, Nilgiri Mountain Railway at Coonoor received orders from the District Engineer to destroy 9 five pound boxes of dynamite condemned as unfit for use. Together with his orders to destroy the explosive he received a set of instructions for the destruction of the dynamite. In complete disregard of his detailed instructions he emptied the boxes one at a time into a zinc bath tub placed in the office compound and set fire to the cartridges with a match. The contents of 3 boxes were burnt in this manner without accident but the fourth exploded shattering the tub.

## Fire works.

12. 2nd January 1936. Venkatagiri. One killed.—A person smoking a bidi entered a shop where fireworks were being manufactured; a spark from the bidi fell on a heap of crackers and ignited them.
13. 29th January 1936. Mangrulpir. Two injured.—A licensee and his two servants were manufacturing fireworks in a small room situated within the compound of his licensed premises. The servants were placing the explosive mixture in a vessel when it is said a large particle of grit fell in to the mixture from the roof causing an explosion. It would appear that an unduly sensitive mixture was being used.

14. 25th February 1936. Mahim, One injured.—Pounding chlorate of potash and sulphide of arsenic in a mortar exploded the mixture causing extensive burns all over the body of the person concerned. He was convicted under section 6 (3) of the Indian Explosives Act, 1884, and sentenced to pay fine of Rs. 120.

15. 3rd April 1936. Badagara. 1 killed and 1 injured.—The son of a licensee with two coolies was manufacturing fireworks on the licensed premises. While testing a rocket it exploded causing injuries to the two coolies, one of whom subsequently died.

16. 28th April 1936. Inam Ayyarmalai. 2 injured.—Two boys found an unexploded rocket in the street and set fire to it when it exploded causing serious injury to both of them.

17. 29th April 1936. Mathurapur. 2 killed and 8 injured.—During a marriage ceremony, a boy dropped a bottle containing crackers which exploded injuring 10 persons; two fatally. It seems probable the crackers contained a chlorate mixture.

18. 4th May 1936. Devarmalai. One injured.—A person sustained injuries while assisting at the display of fireworks during the Marianmon festival.

19. 10th May 1936. Byadgi. One killed and 7 injured.—Of two godowns licensed respectively for the storage of gunpowder and fireworks the gunpowder godown, reported to contain only 40 lbs. of country powder, is said to have suddenly exploded completely destroying the building. The adjoining firework godown collapsed and the fireworks took fire. The godown it was said had been properly locked and had not been opened on the day of the explosion. Spontaneous ignition was suggested as the probable cause and the presence of fireworks containing Aluminium Powder and Potassium Chlorate on the site of the accident lends weight to this view. The explosive premises were in the vicinity of a well round which the villagers were in the habit of gathering to draw water and all the casualties occurred among these people.

As the licensee had contravened the conditions of his license he was convicted under rule 138 of the Indian Explosives Rules, 1914, and sentenced to pay a fine of Rs. 50 for each offence or in default to undergo simple imprisonment for one week for each offence.

20. 1st July 1936. Orange Street, Karachi. One injured.—A small heap of chlorate of potassium (?) is said to have caught fire on premises used for the manufacture of fireworks. In spite of all efforts to extinguish the fire an explosion occurred. The licensee was prosecuted under rule 138 (9) of the Indian Explosives Rules, 1914 and sentenced to pay a fine of Rs. 100.

21. 23rd July 1936. Madarganj. 2 killed.—While a cartload of fireworks intended for a display in a village was being transported by road the consignment suddenly exploded fatally injuring two of the attendants. The presence of unstable chlorate mixtures is suspected.

22. 20th August 1936. Mogra, Andheri. 2 killed.—An explosion resulting in the death of 2 workmen occurred in a fireworks factory at Mogra, Andheri, during the operation of filling paper tubes with explosive material. Evidence as to the actual cause of the accident was somewhat conflicting but sulphur-chlorate mixtures were found on the premises. The licensee was convicted under section 6 (3) of the Indian Explosives Act, 1884 and rule 138 (9) of the Indian Explosives Rules, 1914, and sentenced to pay a fine of Rs. 400 and Rs. 100 respectively or in default to undergo simple imprisonment for one month for each offence.

23. 31st August 1936. Pappdi. 2 killed and 3 injured.—A serious explosion resulting in the death of 2 persons, including the licensee, and injuries to 3 others occurred in the house of the licensee. He was in the habit of preparing a mixture of Potassium Chlorate and Arsenic Sulphide for the manufacture of Crackers and at the time of the accident had as usual entered the house to issue the explosive. It is presumed that in handling the highly sensitive mixture it received a sufficient shock to detonate it—possibly the vessel containing it was dropped.

24. 14th September 1936. Lahore. One injured.—While pounding a mixture of potassium chlorate and sulphide of arsenic the mixture exploded.

25. 18th September 1936. Kalagujan. 1 killed and 10 injured.—A stock of fireworks intended to be used during a marriage festival was accidentally ignited and the resulting explosion killed one and injured 10 of the spectators.

26. 5th October 1936. Calcutta. No one injured.—A fire in a firework dealer's shop is said to have been caused by the dropping of two tins containing match boxes. It is said the matches ignited and set fire to the stock of fireworks.

27. 6th October 1936. Sivakasi. Three injured.—An explosion resulting in injuries to 3 persons took place in a firework factory during the operation of manufacturing fire-

works. Fireworks containing a mixture of Barium Nitrate, Aluminium Powder, Iron Filings and Dextrin were, according to two of the injured persons, being cut to size with an iron chisel when they exploded. The licensee was prosecuted and sentenced to pay a fine of Rs. 50.

28. 18th October 1936. Hoti Mardan. 3 killed and 1 injured.—Three persons were burnt to death and one sustained injury by a fire which broke out in the house of a licensee while he was preparing fireworks. The fire was probably due to the ignition of the inflammable firework materials by a spark from an oven in the vicinity.

29. 26th October 1936. Calcutta. 1 killed.—A person sustained fatal injuries by the explosion of a mixture of potassium chlorate and sulphide of arsenic with which he was preparing crackers.

30. 30th October 1936. Calcutta. 3 injured.—While a person was preparing throw-downs a spark from a bidi, which one of two other persons who were sitting close by was smoking at the time, fell on the explosive mixture and ignited it causing an explosion which injured them all.

31. 3rd November 1936. Calcutta. 3 injured.—Three boys were preparing fireworks with a mixture of potassium chlorate and arsenic sulphide when the mixture exploded injuring all of them.

32. 4th November 1936. Berhampur. 2 killed.—An explosion resulting in fatal injuries to two persons occurred in a dwelling house. It seems probable that the two people in question were preparing crackers at the time of the accident.

33. 4th November 1936. Papdi. No one injured.—A second explosion took place in a house hired by the late licensee for the manufacture of Crackers and in which the materials rescued from the debris of a first explosion had been stored. The exact cause of the explosion was not ascertained but it was probably due to the spontaneous ignition of a Sulphur/Sulphide Chlorate mixture used by the licensee in the manufacture of the fireworks.

34. 8th November 1936. Proddatur. 4 killed.—A serious explosion resulting in the death of 4 persons occurred in the dwelling house of a person licensed to manufacture fireworks. The explosion was probably due to friction caused by grit in the materials being ground.

35. 12th November 1936. Palakkarai. No one injured.—A boy is said to have entered a shop licensed for the sale of fireworks and to have thrown some yellow substance over the stock setting fire to it.

36. 13th November 1936. Calcutta. 1 injured.—A throw-down exploded in a boy's hand, apparently as a result of his holding it too tight.

37. 13th November 1936. Calcutta. No one injured.—A buffalo cart loaded with straw was passing along Raja Dinendra Street when a boy threw a pataka (throw-down) on the heap of straw. The fire was immediately extinguished and there was very slight damage.

38. 13th November 1936. Calcutta. 1 injured.—The burning cover of a firework fell on and ignited firework composition in the course of preparation.

39. 14th November 1936. Calcutta. 3 injured.—Three persons sustained injuries as a result of an explosion which took place while they were preparing patakas (throw-downs). Probably a chlorate mixture was being used.

40. 15th November 1936. Calcutta. 1 injured.—Breaking up small fireworks, apparently containing an unduly sensitive firework composition, and loading the contents into larger cases resulted in an explosion which injured the operator.

41. 5th December 1936. Darbhanga. 1 killed and one injured.—Two persons were preparing fireworks, probably from a mixture of Potassium Chlorate and Sulphide of Arsenic, when there was an explosion; both persons sustained injuries which proved fatal in the case of one of them.

42. 8th December 1936. Kakkavadi. 2 injured.—Two labourers were mixing Chlorate of Potassium and sulphur in a well when the mixture caught fire and injured them both.

#### Petroleum.

1. 29th January 1936. Sion. 1 injured.—While refuelling with petrol from a pump the switch-board of lorry caught fire and the flames spread to the petrol tank of the vehicle. The origin of the fire was not ascertained.

2. 4th April 1936. Asansol. 1 killed and 1 injured.—A motor-cycle, being refuelled while the gas headlamp was alight, caught fire.

3. 19th April 1936. Bombay. 14 injured.—Petrol being filled from a pump into the tank of a motor-bus dropped on to the hot silencer and ignited.

4. 26th April 1936. Rangoon. 3 injured.—A tug towing two oil flats was struck by lightning. One of the flats exploded and caught fire. The tug and the other flat were also ignited but fortunately no further explosion occurred.

5. 30th April 1936. Peshawar City. 1 injured.—During the filling of an underground petrol tank from a tank lorry the dip cap of the former tank was removed. The escaping gas was ignited by a spark from the electrical equipment of a near-by air compressor.

6. 27th May 1936. Howrah. 2 killed and 2 injured.—The pressure caused by the use of compressed air as a means of transferring oil from a tank in the workshop premises of Messrs. Burn & Co., Ltd., Howrah, caused the collapse of the bottom of the tank. The tank in falling injured 4 persons in its vicinity, 2 fatally.

7. 3rd August 1936. Sadar. 1 injured.—While decanting petrol from a two gallon drum into a metal gallon-jug, a hurricane lamp in the vicinity ignited the petrol slightly burning the hands of the person concerned.

8. 26th August 1936. Calcutta. No one injured.—A person stealing petrol from the tank of a bus ignited the spirit with an oil lamp.

9. 1st November 1936. Mathuravoyal. 2 killed, 4 injured.—A lorry while negotiating a curve, skidded owing to the slippery state of the road surface, dashed against a telephone post and capsized. The petrol escaping from the tank burst into flames injuring 6 persons.

10. 15th November 1936. Kyankse. 2 killed.—A person using a naked light while stealing petrol from the tank of a motor car set fire to the spirit which fatally injured both the thief and another person present.

11. 8th December 1936. Ponnani. No one injured.—A cargo boat after landing 138 barrels of petrol was being washed out, one of the crew lit a fire in the caboose under the aft deck in order to cook food and threw a burning match into the hold of the vessel. Petrol which had leaked from the barrels was ignited and set fire to the boat.

#### Petroleum Gas.

12. 27th July 1936. Digboi. 4 killed and 4 injured.—A serious accident occurred in the refinery of the Assam Oil Company at Digboi. The refinery boilers are gas-fired by natural gas piped into the refinery from the oil-field. At intervals on the pipe there are traps, fitted with drain-pipes, valves and plugs, to catch any condensate in the pipes and one of these traps was fitted inside the boiler house about 4 feet away from the forced draught fan for the furnaces. Apparently trouble with the fires indicated that the trap needed draining, the valve was found to be jammed, and contrary to the Company's standing instructions the Engineer-in-Charge unscrewed the valve and plug without first shutting off the gas. The escaping condensate and gas were sucked into the fan and exploded in the boiler furnace, blowing off the furnace doors and igniting the gas supply. Since the accident a new trap has been inserted in the pipe line clear of the fan suction.

#### Chemicals.

1. 1st December 1936. Pudi. No one injured.—Smoke was seen issuing from a wagon containing acid jars in crates. The wagon was at once opened and it was found that one of the crates had broken. The fire was considered to have been due to spontaneous combustion caused by the action of the acid on the packing.

### MISCELLANEOUS.

#### Matches.

1. 8th October 1936. Chittoor. No one injured.—A fire, which blew off the roof of the shed, broke out in a shed at the eastern end of the Chittoor Match Factory where unfinished matches were stored. The cause of the fire is not known.

#### Compressed Gases.

2. 7th September 1936. Calcutta. 1 killed and 2 injured.—While the brine-cooling coil-tank of a refrigerator containing sulphur dioxide gas was being unscrewed for repair the cap of the tank blew off. The discharge of the gas which was still in the tank injured two mechanics and fatally injured a boy-servant who was near.

3. 18th September 1936. Moghalpura. 5 killed and 37 injured.—At about 9.35 hours on the 18th September, 1936, in the Erecting Shop in the Loco. Shops, Moghalpura, an Oxygen Gas Cylinder, which was being used for decarbonizing locomotive valve ports exploded. 2 men as a result were killed outright; 5 received serious injuries, 3 proving fatal; and 35 others received minor injuries. Considerable damage was caused in the shop by flying pieces of metal.

The cylinder, an ordinary issue from stock, was brought to the site of the work and coupled up in the usual way to the fitment already in use. Immediately the oxygen jet was directed on to a piece of lighted waste in the locomotive valve chamber in order to start the decarbonization the cylinder exploded with tremendous violence hurling pieces of metal a great distance from the site of the accident. An investigation into the history of the cylinder disclosed the fact that, prior to its last filling with oxygen, it had been filled with natural gas and there seems little doubt it contained, instead of oxygen, an explosive mixture of oxygen and natural gas the ignition of which caused the explosion.

## APPENDIX H.

Summary of accidents during the year 1936.

Explosives or dangerous and inflammable substances.	ACCIDENTS CAUSING LOSS OF LIFE AND BODILY INJURY.			Accidents not causing loss of life or bodily injury.	Total number of accidents.
	Number of accidents.	NUMBER OF PERSONS.			
		Killed.	Injured.		
<i>Explosives.</i>					
Gunpowder . . .	10	15	8	...	10
Nitro-compounds . . .	1	1	3	...	1
Chlorate Mixture . . .	...	...	...	...	...
Fulminates . . .	...	...	...	...	...
Ammunition . . .	...	...	...	...	...
Fireworks . . .	27	23	56	4	31
Liquid Oxygen . . .	...	...	...	...	...
<b>TOTAL</b> . . .	<b>38</b>	<b>39</b>	<b>67</b>	<b>4</b>	<b>42</b>
<i>Petroleum.</i>					
Petroleum generally . . .	10	11	33	2	12
<b>TOTAL</b> . . .	<b>10</b>	<b>11</b>	<b>33</b>	<b>2</b>	<b>12</b>
Chemicals . . .	...	...	...	1	1
<b>TOTAL</b> . . .	<b>...</b>	<b>...</b>	<b>...</b>	<b>1</b>	<b>1</b>
Miscellaneous . . .	2	6	39	1	3
<b>TOTAL</b> . . .	<b>2</b>	<b>6</b>	<b>39</b>	<b>1</b>	<b>3</b>
<b>GRAND TOTAL</b> . . .	<b>50</b>	<b>56</b>	<b>139</b>	<b>8</b>	<b>58</b>

# APPENDIX I.

*Detailed statement showing the number of accidents and persons killed and injured during the ten years ending 1936.*

Year.	GUN POWDER.			DYNAMITE AND OTHER NITRO-COMPOUND BLASTING EXPLOSIVES.			CHLORATE MIXTURE.			FULMINATE.			AMMUNITION.			FIREWORKS.			LIQUID OXYGEN EXPLOSIVES.		
	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.
1927	8	5	7	2	6	18	...	...	...	6	1	22	3	1	4	23	16	20	...	...	...
1928	14	12	17	3	1	10	...	...	...	5	...	5	3	...	3	10	7	63	...	...	...
1929	6	21	4	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1930	4	7	1	2	1	6	...	...	...	2	1	1	1	...	1	6	11	13	1	3	...
1931	9	16	13	3	1	4	...	...	...	4	...	7	3	1	8	39	42	36	...	...	...
1932	2	3	1	...	...	...	...	...	...	2	...	3	2	...	3	11	12	60	...	...	...
1933	1	1	...	...	...	...	...	...	...	5	4	15	2	...	2	13	22	17	...	...	...
1934	10	12	21	...	...	...	...	...	...	4	2	5	1	...	1	14	25	37	...	...	...
1935	4	2	9	1	...	2	...	...	...	...	...	...	...	...	...	23	26	39	...	...	...
1936	10	15	8	1	1	3	...	...	...	...	...	...	...	...	...	39	35	39	...	...	...
TOTAL	68	94	81	13	13	43	...	...	...	40	13	81	17	2	29	200	219	380	...	3	...
AVERAGE	7	10	8	1	1	4	...	...	...	4	1	8	2	1	3	20	22	38	1	1	...



## APPENDIX I—concl'd.

Detailed statement showing the number of accidents and persons killed and injured during the ten years ending 1936—concl'd.

Year.	PETROLEUM.			CHEMICALS.			MISCELLANEOUS.		
	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.
1927 . . . . .	9	5	8	2	...	9	1	...	...
1928 . . . . .	9	61	26	1	...	3	2	2	1
1929 . . . . .	16	26	28	...	...	...	4	1	5
1930 . . . . .	8	2	11	...	...	...	1	...	1
1931 . . . . .	10	19	6	...	...	...	1	...	1
1932 . . . . .	4	9	10	...	...	...	2	...	2
1933 . . . . .	4	8	1	...	...	...	1	1	1
1934 . . . . .	13	26	53	3	...	1	2	...	5
1935 . . . . .	14	11	7	4	2	2	4	...	12
1936 . . . . .	12	11	33	1	...	...	3	6	39
TOTAL	89	178	183	11	2	15	21	10	67
AVERAGE	9	18	18	1	1	1	2	1	7

## APPENDIX J.

Comparative statement showing the number of accidents and persons killed and injured during the ten years ending 1936.

Year.	ACCIDENTS CAUSING LOSS OF LIFE OR BODILY INJURY.			Accidents not causing loss of life or bodily injury.	Total number of accidents.
	Number of accidents.	NUMBER OF PERSONS.			
		Killed.	Injured.		
1927 . . . . .	49	36	88	5	54
1928 . . . . .	46	83	128	1	47
1929 . . . . .	37	64	52	4	41
1930 . . . . .	52	53	70	...	52
1931 . . . . .	37	48	90	1	38
1932 . . . . .	28	38	47	...	28
1933 . . . . .	25	37	45	...	25
1934 . . . . .	42	64	119	9	51
1935 . . . . .	50	50	71	16	66
1936 . . . . .	60	56	139	8	58
TOTAL	416	529	849	44	460
AVERAGE	42	53	85	4	46

