CONFIDENTIAL BULLETIN FOR THE USE OF MEMBERS

THE HOSPITAL ENGINEER NEWS LETTER

No. 5 Issued JANUARY, 1947

Contents

Honorary Editor :
R. G. ROGERS,
"Elmfield,"
Stone,
Aylesbury, Bucks.

EDITORIAL.

BEST WISHES FOR 1947 TO ALL OUR MEMBERS.

THE last *Newsletter* contained the newly agreed scales of Salaries and conditions of service for Mental Hospital Engineers, and I trust that ere this *Newsletter* reaches you those recommendations will have been adopted and implemented by your authority and that your starting point within the range has been fixed to your satisfaction. If this is so, I am sure that you will feel more contented than you have for many years past, and the direct result of such contentment is that one can get down to the job in hand with undivided attention and renewed vigour. To our colleagues in the General and Voluntary Hospitals I would say that every endeavour is being made to discuss your case with the B.H. Association, and I am pleased to say that the position has somewhat improved since I last wrote on this matter, thanks to the untiring efforts of our Honorary General Secretary and our Chairman.

The Council met on September 6th, 1946 at Ashton's Hotel, Paddington, when all 18 Members were present, 25 applications for membership were received and after careful scrutiny all were accepted.

The Annual General Meeting was held at Westminster School of Medicine on 7th October, 1946, and was fairly well attended but the hall was by no means full to capacity. The members were addressed by Mr. Mason, Chief Technical Adviser to the Ministry of Fuel and Power, Mr. J. Hollins, J.P., and Mr. Riddick, who were all enthusiastically received. The Honorary Secretary stated that a member from Northern Ireland was present and he was given a special welcome by the meeting.

The following resolution from the Council was submitted to the General Meeting :—

Notice is hereby given that after December 31st, 1946 all Hospita Engineers seeking admission to the above Institution must pass the Institution's examinations or have other exempting qualifications.
This was carried.

The fourth Council Meeting for 1946 was held at Llandough Hospital, Cardiff on the 7th December 1946.

The members were very cordially received by Dr. Morgan (Medical Superintendent) who gave each Member a souvenir copy of the history and details of Llandough Hospital. The Council extend their sincere thanks to Dr. Morgan for the excellent facilities afforded them during their visit, and to Mr. Bemant (Engineer and Clerk of Works) for arranging the visit.

The Council dealt with 158 applications for Membership. Of these 44 were accepted as Members, 49 as Associate Members, 16 as Graduates, 39 were referred back for further details and 10 were rejected.

Owing to the enormous amount of work undertaken by the Honorary General Secretary, the Council felt that some assistance should be afforded him. Mr. H. S. Clarke was unanimously elected as Assistant Honorary Secretary, and will deal with all members' subscriptions and Benevolent Fund Subscriptions as from 1st January, 1947. (His address is printed elsewhere in this issue).

Mr. Elgin tendered his resignation as a Member of the Examination sub-Committee, and Mr. Brain was elected in his stead.

As reported in *Newsletter* No. 4, the Ministry of Fuel and Power requested this Institution to take part in the Fuel Efficiency Conference to be held on October 9th, 1946 at the Central Hall, Westminster, and Messrs. J. Tomlinson, King's College Hospital, R. G. Rogers, Bucks Mental Hospital and J. C. Chynoweth, Graylingwell, were asked to undertake the preparation of papers for this purpose. This they did and contributed to the section where "Power and Steam Needs Nearly Balance," under the heading "Steam and the Hospital Engineer." The session was attended by several members of the Institution.

EDITOR.

PART OF LECTURE GIVEN TO THE YORKSHIRE BRANCH ON FEBRUARY 10th, 1945.

BY MR. SEWELL

Chief Engineer, Messrs. Hopkinson's Huddersfield.

MAINTENANCE OF VALVES AND SEATS.

The work entailed in preparing valves and seats for lapping definitely requires the services of a skilled mechanic, who for preference can specialise on this work, and have a good conception of what a flat face really means.

There is a definite principle that underlies the lapping of any type of valve and seat, and this is :—the valve and seat should be lapped independently. It is quite wrong to lap the valve to the seat, as this is conducive to creating ridges on either one or the other, which prevents perfect seating.

We think it advisable to give some guide with regard to the condition of the valve or seat faces before a decision is made as to whether they can be made satisfactory by lapping alone. The decision of course depends upon the extent of the damage that has taken place. It is bad practice to attempt to lap out deep score marks, and it should be taken as a general axiom that the least possible amount of lapping—the better the result, and a little experience will show whether the imperfections can be lapped out in say ten minutes. If however, the damage is more severe than the indication we have given, it is better to skim the faces before lapping takes place, and we would stress the necessity of commencing the lapping on a good machined surface otherwise if too much lapping is done the seat may become convex, and it is impossible to remedy this by continuing lapping.

To carry out lapping on the lines we have suggested, means that some form of lapping plate is necessary to suit the particular design that is being dealt with, and we wish to suggest that the lapping tackle is kept specifically for the work which is intended to be done. If used as such, the plates will last almost indefinitely but we know the tendency for the unauthorised persons to make use of plates for purposes that very quickly render them useless. As we find it necessary in our own Works to take particular care how the plates are used, we think this is an important point, and therefore put forward our suggestions for suitable lapping equipment.

2ft. 6in. Square Cast Iron Smooth Lapping Plate.

We should regard this plate as being the most important item of equipment recommended.

The surface of this plate is specially machined true and flat and finely grooved to hold the lapping medium for reconditioning the seat lapping plates referred to later.

The surface of the plate is covered with tallow which is well rubbed in, using a flat circular plate for this purpose and then the surface is sprinkled with emery, grade 120, or its equivalent, which in turn is rubbed into the minute grooves.

Scratches which may appear on the face of the lapping plate are not drimental, in fact they are an advantage because they assist in holding the microscopic amount of abrasive, which is all that is necessary for satisfactory lapping.

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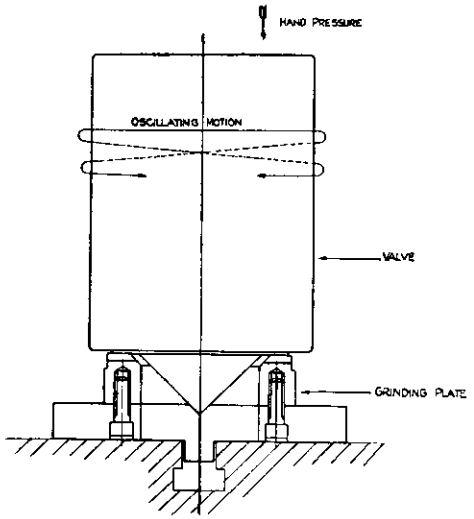

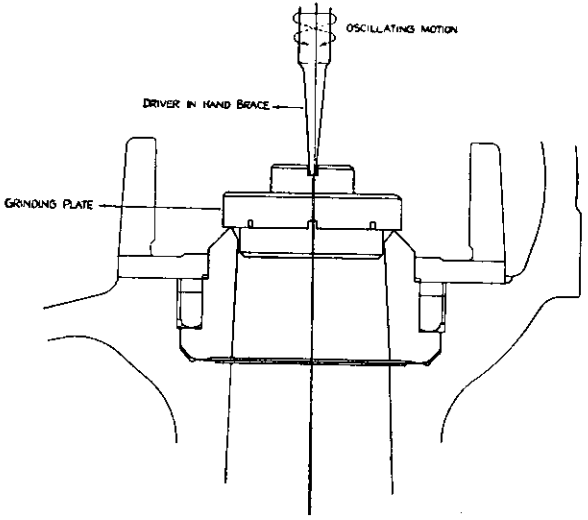

HOPKINSONS LIMITED, HUDDERSFIELD.

DATE	SCALE Full Size
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TITLE. DIAGRAM SHOWING METHOD OF LAPPING HYLIE VALVE & SEAT SIZE 3" FIGURE 709

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2ft. 6in. Square Cast Iron Rough Lapping Plate.

This plate is not the Toolroom surface plate with which all Engineers are familiar, but consists of a cast iron plate on which a flat surface is machined, leaving a witness of the planing marks, and also suitably grooved to hold the lapping compound.

In preparing the rough lapping plate for use, the grooves should be thoroughly brushed clean with a wire brush, and the surface of the plate covered with tallow, which should be rubbed down into the grooves and then rubbed off level using a flat circular plate for this purpose. Next sprinkle a liberal supply of emery—Grade 70 or its equivalent on the surface, and this in turn is rubbed down into the tallow using the flat circular plate previously mentioned—an operation which packs the emery into the tallow in the grooves. The plate is then ready for use.

Valve Disc Lapping.

Discs with flat surfaces, such as parallel slive valves, stop valves, and uniflow valves are first rough lapped on the rough lapping plate, by imparting a semi-rotary movement to the disc taking care to keep the disc flat. On large size discs such as 6in. and above, the effort required to produce this rotary movement is such that two men will be required for the operation, the movement can only be done slowly and only through an angle from 45 to 60 degrees. The disc is finished on the smooth lapping plate.

Seat Lapping Plates.

These usually consist of two pieces :—

1. The cast iron lapping disc with a dead flat surface, in which a number of slots have been cut.
2. A pilot which fits closely into a recess in the lapping plate and is secured by screws to it.

The pilot is of such a diameter as to give enough clearance in the seat bore to allow for a slight eccentricity of motion when rotated on the seat.

The lapping operation is carried out by a semi-rotary motion of the plate on the seat face produced by using a key of suitable design. Care should be taken to keep the lapped surface flat. To do this it is imperative that the lapping disc be kept perfectly flat, the pilot should be removed and the lapping plate reconditioned on the 2ft. 6in. square rough lapping plate after use on each seat.

The surface of the lapping plate should then be carefully cleaned with a clean soft rag, and the pilot re-fitted.

Parallel Slide Valves.

Should the seats or discs need machining before lapping, it is essential that these be skimmed up until all score marks have disappeared.

To machine the seats, care should be taken that the body is mounted with the seat faces square to the lid flange. The seat faces should also be machined perfectly parallel to each other, and equidistant from the centre of the valve. Platnam is a very hard material, and the best method to adopt for machining is to use a Tungsten Carbide tipped tool, such as " Wimet " with a cutting speed of about 20 feet per minute.

The finish of the valve seats should be as fine as practible, and without machining marks of vibration. The greater the degree of accuracy attained in machining, the less lapping necessary.

To machine the discs, these can be mounted in a lathe, and the general instructions followed as for the machining of the seats, care being taken to remove as little material as possible.

All surfaces after lapping should be wiped clean with a soft clean rag before reassembling.

Safety Valve and Stop Valve.

Valve seat reconditioning at an early stage is more likely to be necessary in the Safety Valves than any other pattern. This is probably due to the fact that in bringing a new boiler into service there is unfortunately, a considerable amount of boiler and pipe scale to be evacuated from the system, and it often happens that some of the scale is trapped, between the valve and seat, causing leakage.

Should the seats need machining before lapping it is essential that the seats be skimmed up until all the marks have disappeared, maintaining the same seat angles as originally supplied. The seat face after machining should be brought to a sharp edge. Lapping can then be done with the seat lapping plate, periodically removing the plate and redistributing the lapping compound, (mixture of carborundum and oil) over the face.

The final width of the seat face should be a bare 1/32 in. but before this stage is reached a second operation of lapping should be carried out with the plate in good condition, using a mixture of fine sand and tallow or fine grade Richford Lapping Compound. The seat should now be finished free from all marks, flat and square to the lid flange.

Particular care must be taken to use the lapping abrasive sparingly, and to keep the width of the seat face within 1/32 in. otherwise in the case of Safety Valves, the valve might be erratic in its lifting pressure.

The valve may be tested for contact bearing on its seat. First clean off all abrasive and give a smear of tallow to the faces. A light turning of the valve on its seat will show the bearing.

Perhaps we might summarize what we have already said under four headings, for easy reference, and which will cover the basic principles of good lapping.

1. Valves and seats must be lapped independently, bu the yse of suitable lapping plates.
2. Do not attempt to lap out deep imperfections. Much time is saved by refacing, and the least possible amount of time taken for a lapping operation, the better the result.
3. Use the lapping abrasives sparingly. The natural porosity of the lapping plate can hold all the abrasive that is necessary, particularly when finishing.
4. Keep the lapping plates perfectly flat, and after lapping any part, the lapping plate should be reconditioned before attempting any further work.

THE INSTITUTION OF HOSPITAL ENGINEERS.

RULES GOVERNING ADMISSION TO THE VARIOUS GRADES OF MEMBERSHIP OF THE INSTITUTION, TOGETHER WITH EXAMINATION REGULATIONS.

STUDENTSHIP.

An apprentice or pupil employed in the Engineering Department of a Hospital may register as a student of the Institution upon the recommendation of the Chief Engineer, or other member.

GRADUATESHIP.

The registered student will become eligible for Graduate Membership on completing a five years' apprenticeship in the Engineering Department of a Hospital, attaining the age of 21 years and successfully completing Part "A" of the examination.

Associateship.

A Graduate Member of the Institution, or other Engineer holding the position of Assistant Engineer in the Engineering Department of a Hospital shall be admitted to Associate Membership on completing Part "A" of the examination and attaining the age of 25 years.

Membership.

An Assistant Engineer shall be transferred to Membership on his promotion to the post of Chief Engineer and successfully completing the final examination of the Institution. The Council have power to waive the examination requirements, providing the applicant holds qualifications acceptable to them.

To Qualify for Membership :—

(*a*) The applicant must be the Chief Engineer in charge of the Engineering Department of a Hospital.

(*b*) He must have served a recognised apprenticeship in Engineering, electrical or mechanical, Engineering Department of a Hospital.

(*c*) He must satisfy the Council of the Institution on matters regarding his technical training in addition to his apprenticeship'

(*d*) He must have attained the age of 28 years or over in the year in which his application is made.

(*e*) He must complete the form of application and lodge the same with the Gen. Hon. Secretary together with the entrance fee of £1 1s. 0d. and first year's subscription.

(*f*) Candidates for the Final examination or Part "A" shall signify their intention of taking the examination, in writing to the Gen. Hon. Secretary, three months before the examination is held. The entrance fee for Part "A" shall be £1 1s. 0d. and for the Final examination £2 2s. 0d. The entrance fee shall in all cases accompany the notification.

(*g*) The examinations will be held in London or other suitable centre, annually, on two consecutive days in October, and each candidate will be notified of the venue on or about the 12th of September.

All candidates must be in the examination hall 15 minutes before the examination is scheduled to commence. Each candidate shall provide his own drawing instruments and slide rule (if desired).

Only such books of reference and tables as specified shall be permitted in the Examination Hall and no other books, papers or tables will be allowed. Non-observance of this or any other rule will constitute disqualification.

EXAMINATION.

PART "A"

Hours	*Subject.*
First Day 9.30 a.m. to 12.30 p.m.	English.
„ 2 p.m. to 5 p.m.	Applied Mechanics, Electrical Technology
Second Day 9.30 a.m. to 12.30 p.m.	Heat and Heat Engines, Machine Drawing.
2 p.m. to 5 p.m.	Steam Generation and Supply. ,

PART "B" FINAL.

Hours.	*Subject.*
First Day 9.30 a.m. to 12.30 p.m.	Electricity generation and Supply ; Characteristics and Efficiency.
„ 2 p.m. to 5 p.m.	Heating and ventilation ; Kitchen and Laundries.
Second Day 9.30 a.m. to 12.30 p.m.	Electrical communications. Works costing and Stores.
„ 2 p.m. to 5 p.m.	Theory of Structures. Building maintenance.

SYLLABUS PART "A".

English.

An essay under one of the following subject headings : Science, History, History of Engineering, Exercise in the ability to write reports, Exercise in Precis writing, Written description of some aspect of Hospital Engineering.

Applied Mechanics.

Force, Friction, Work ; Machines ; Velocity, acceleration ; Gravity ; Horsepower ; Centrifugal force ; Force and Motion ; Kinetic energy. Mathematics.

Machine Drawing.

Orthographic projection. Working drawings of machine details. Sections. Auxiliary views. Developments. Intersections. Bearings. Couplings. Pulleys. Pipe joints. Machine tool details. B.S.I. Classes of fit. Allowances and tolerances. Wheel gearing. Lubrication and alignment.

Electrical Technology.

Magnetic circuits. Units of Voltage, current ,resistance and energy Measuring instruments. Primary and secondary batteries. The principles and characteristics of d.c. machines. Alternating current, theory of transformers.

Heat and Heat Engines.

Temperature and its measurement. The expansion of solids, liquids and gases. Specific heat. Melting and boiling points. Heat transfer, Radiation, Convection and conduction. Mechanical equivalent of heat. Heat Engines.

Steam Generation and Supply.

Types of boilers. Boiler settings. Boiler fittings. Furnace and flue tubes. Fullering and caulking. Strength and quality of rivets. Testing. Feedwater treatment. Feed pumps. Injectors. Economisers. Superheaters. Boiler cleaning and scaling. Steam pipes and trapping. Pipe arrangement and expansion allowances. Fuel and evaporation.

Syllabus Part "B."

Electricity Generation and Supply.

Power Stations. Transmission systems. Distribution. Voltage drop. Fault localisation. Substations. Protective equipment. Switchgear.

Utilisation and application. Motors. Load equalisation. Power factor improvement. Switchgear. Illumination. Calculation and measurement. Gas discharge lamps. Electric heating, space heating and water heating.

Characteristics of motors. Back E.M.F. ; Speed, torque and brushgear. Starters.

Electro-medical apparatus. Faradism. Galvanism. Sinusoidal current. Motor transformers. Motor generators. The Pantostat. Diathermy. Rheostats. Voltage regulators. Radiant heat. Light baths. Ionisation. X-Ray apparatus. Measuring instruments and records.

Heating and Ventilating.

Low pressure hot water. Low presure steam. Exhaust steam. Heat emission. Heat losses by conduction. Heating systems calculations. Fuel values. Boiler efficiency. Products of combustion.

The function of ventilation. Ventilating systems. Water vapour. Air changes. The Plenum system. Humidification. The composition of air. Micro-organisms. Dust in atmosphere. Air conditioning.

Kitchens and Laundries.

Steam jacketted pans. Pressure ovens. The heat conservation system of cooking. Roasting ovens. Hot food conveyors. Refrigeration.

Simple analysis of water. Rotary washers. Hydro extractors. Calenders. Presses. Dryers. Irons.

Electrical Communications.

Telephone apparatus and systems. Battery systems. Automatic systems. Transmitters and receivers. Fault localisation. Radio installations. The thermionic valve. Velocity of sound. Frequency.

Works Costing and Stores.

Time recording. Stores issues and records. Invoicing. Progress and running costs. Costing. Works orders. Statistics and the use of graphs. Card index systems. Correspondence. Insurance and Employers' liability. Factory acts and I.E.E. regulations.

Theory of Structures.
(Building Maintenance).

Builders Quantities. Taking off. Squaring. Abstracting and billing. Excavations, Concreting, Draining, Roofs and roof coverings, Brickwork, Masonry, Joinery and Carpentry. Steel and ironwork. Plumbing and glazing. Plastering and painting.

Concrete. Properties of materials ; Mixes, Water content, Tests. Centreing. Construction, Curing, Working joints, Stripping, Surface treatment, levelling.

Design of beams, Columns, Floors, Retaining walls, Foundations, Simple concrete structures.

Building Construction. Foundations, Bonding in English and Flemish bonds, Brick footings, damp-proof courses, Simple roof trusses, Doors and door frames, Skirtings and architraves Slating and tiling, Gutters and R.W. pipes, Gullies and drains. Practical rules and specifications.

Hon. General Secretary :

MR. R. E. ROGERS,
17, PARK ROAD,
WHITCHURCH, CARDIFF.

LETTERS TO THE EDITOR.

SIR,

In three years we have emerged from an unknown section into an organisation with national status, and shortly we hope we will be granted our Charter, thanks to the efforts of the Council and our Secretaries and the Members themselves.

We are an Institution primarily formed with the object of improving our status and the working conditions of our members, whom we demand shall be properly qualified men. Although our membership is not as great as we would desire, we are nevertheless, a fairly strong body, strong enough to put forward any claim we may have to make to our employers and any other governing body. All of us soon will be under one national body, who presumably will formulate other agreements regarding conditions of service and will set up regional Committees to control the services for them. Staffs will come under an Administrator of the Hospital, but nobody can tell who this is to be, whether Medical or Lay. The question which concerns us is our own position under him, and what our position will be with regard to our responsibility to our respective Committees.

Certainly, I think, that we as a National body should be represented on these regional Committees, and that the Institution should approach the Minister to that end. Another point which it would be interesting to find out is whether there is a comparable organisation with ours in the Ministry of Health or Ministry of Works. I would be glad to hear the views of our Members expressed through our Journal.

Yours faithfully,

F. ARKLE, (London Branch).

OBITUARY.

We regret to announce the death of Mr. W. Garner, one of our very early members. Mr. Garner was the retired Chief Engineer at Abergavenny Mental Hospital, Monmouth and was 68 years of age. His colleagues of the Institution deeply regret his passing and offer their deepest sympathy to his family in their bereavement.

ANNOUNCEMENTS.

Appointment of Assistant Honorary Secretary.

Please note that as from 1st January, 1947, all Member's subscriptions and Benevolent Fund Subscriptions, should be addressed to :—

H. S. CLARKE,

14 The Villas, Gateshead Mental Hospital,

Stennington, Morpeth, Northumberland.

SUBSCRIPTIONS.

A few subscriptions for 1946 are still outstanding. Will those of you who have not yet fulfilled this rather important condition of Membership, please send your cheque to the Assistant Honorary Secretary without delay. Thank you !

May I also remind you that Subscriptions for 1947 are now due, and should be forwarded to Mr. H. S. Clarke at the above address.

BRANCH NEWS.

London Branch :

The Branch extend a hearty welcome to Mr. J. Craig and offer congratulations on his recent appointment to the London Hospital. Mr. Craig was previously the Secretary of the Scottish Branch, and a Member of Council for Scotland. His place on Council has now been taken by Mr. Smith of Glasgow.

West of England Branch :

A meeting was held at the Shire Hall, Taunton, on Saturday, the 28th September, 1946, when Mr. Paterson of the Ministry of Fuel and Power gave a most interesting address on " Industrial Dairy Process." The Branch decided to hold their next Meeting at Exeter, with a view to contacting Hospital Engineers in Devon and Cornwall.

Four Members of the Branch residing in the Salisbury area, requested to be transferred to the Southern Branch as it would facilitate their attendance at Branch Meetings. Their request was granted.

H. ADAMS, Branch Secretary.

Southern Branch :

The Branch held a Meeting at Graylingwell Mental Hospital on the 30th November, 1946, under the Chairmanship of Mr. Chynoweth. 19 Members attended, two of whom travelled 100 miles each way and several members travelled up to 50 miles each way, a great tribute to our Institution to find members prepared to travel these distances in foul November weather.

Four new members were approved, three of which were present and were welcomed by the Chairman. After the Branch business was concluded, tea was served at the Hospital and Mr. Chynoweth kindly conducted the Members around the Works Department of the Hospital, and many interesting discussions took place.

The Branch Membership is now 35.

F. TIVEY, Branch Secretary.

FREER AND HAYTER, PRINTERS, HIGH WYCOMBE