Factory Department,
Home Office,
Whitehall,
London, S.W.1.

8th October, 1931.

Encl:

Dear Dr. Kehoe,

I receive regularly the Industrial Hygiene Bulletin published by the New York State Department of Labor. In the issue for August 1931 (copy of which I enclose herewith) I find a short article dealing with Tetra-Ethyl Lead, and statement occurs in this dealing with absorption through the skin. I understood from conversations with representatives of the Ethyl Gasoline Corporation in this country that further experiments carried out by yourself not only confirmed, but strengthened, your view that absorption of lead from petrol containing the small proportion of tetra-ethyl lead usual in motor fuel was, if not absent, almost negligible. In the article I appreciate that the writer refers to splashing of tetra-ethyl lead, but read in the context, it could easily be taken to mean absorption of lead from petrol containing tetra-ethyl lead.

I am writing to you because it would, perhaps, be possible for you to approach the Department of Labor, as I feel that if this is not corrected it may lead to misunderstanding and re-start the agitation.

I trust you are keeping well? I take it, as I have not had the pleasure of seeing you, that you have not been in England recently. I hope, if you do come over, you will come and see me.

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With kind regards,

Yours sincerely,

John C. Bridge

Dr. R.A. Kehoe,
Assistant Professor of Physiology,
University of Cincinnati,
Cincinnati, Ohio,
U.S.A.

WHEN YOU HAVE FINISHED READING THIS POST IT ON YOUR BULLETIN BOARD

INDUSTRIAL HYGIENE BULLETIN

PUBLISHED BY THE

NEW YORK STATE DEPARTMENT OF LABOR

STATE OFFICE BLDG., ALBANY, N. Y.

FRANCES PERKINS—INDUSTRIAL COMMISSIONER

ISSUED MONTHLY BY THE DIVISION OF INDUSTRIAL HYGIENE—J. D. HACKETT, Director

80 CENTRE STREET, NEW YORK CITY

Vol. VIII AUGUST, 1931 No. 2

SPECIAL HOODS FOR ABRASIVE WHEELS

By JOHN H. VOGT, B.S.

Section 299 of the New York State Labor Law requires that all machines creating dust shall be equipped with hoods, pipes and fans to remove it.

It is also required by rules 733 to 739 of the New York State Industrial Code that every grinding, polishing or buffing wheel, except wheels used in the manufacture of articles of gold and platinum, and those used occasionally for grinding tools in a workshop, or those upon which water is used at the point of grinding contact, from which no dust is disengaged, shall be provided with hoods and pipes to remove the created dust.

The hoods for various types of wheels on which material of an unusual size or shape is ground, polished or buffed must naturally vary in size, shape, and material of which made, in order to protect the operator and prevent the escape of dust from the machine.

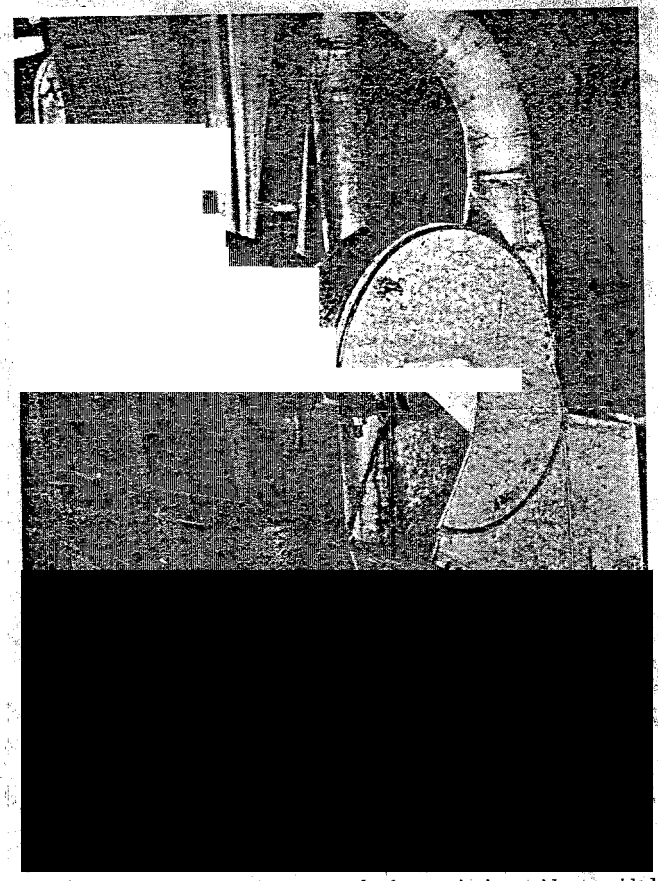
A great amount of time has recently been devoted by the Department of Labor towards the designing of hoods which shall effectively prevent the escape of abraided material from abrasive wheels, without in any way hindering the operator in the performance of his work or interfering with production.

For the benefit of manufacturers who use abrasive wheels, in connection with which plates, bars, springs and articles

(*Continued on page* 8, *column* 1)

Illustration No. 1

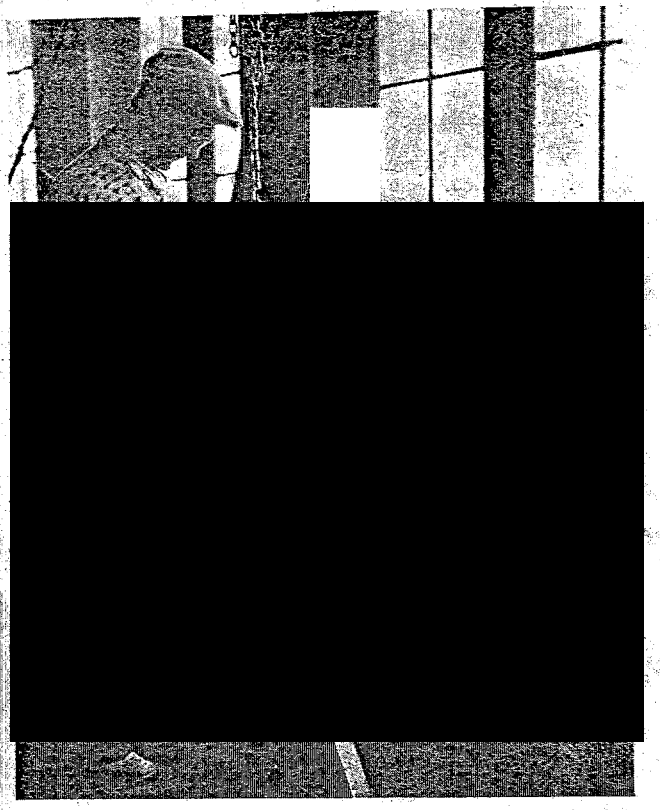
GRINDING WHEEL ON WHICH LONG BARS ARE GROUND



Hood for fourteen inch diameter wheel, two inches wide provided with hood and trap for the grinding of bars of metal of any length. Through the opening at the rear of the hood, through which the bars project, there is maintained an inward air movement of sufficient velocity to prevent escape of dust from the hood. Two exhaust pipes, in advantageous positions provide the necessary air movement to draw the created dust from the wheel.

Illustration No. 2

GRINDING WHEEL ON WHICH PROPELLERS ARE GROUND



Grinding wheel is provided with a hood to which two 4-inch pipes are connected, indicated by letters "A". The air movement of a high velocity creates an air current through the hood which enables the grinding at any angle, allowing no dust to escape from the hood. Side doors "B" are hinged, capable of being opened toward the back of hood enabling large propellers to be surfaced. A strong foot rest "C" of 2" x 2" angle iron is provided at the base of the hood for the operator.

FUR INDUSTRY HEALTH HAZARDS

JACOB LERMAN, Medical Inspector

The making of furs involves numerous hazards owing to the many processes involved. The preparing, preserving, tanning, dyeing and sewing of furs are fraught with different dangers and are usually performed in different establishments.

Handling the raw fur in itself may involve some danger. Anthrax, although not as frequent among fur-bearing animals as among cattle and sheep, still can be caused by skins. This is a severe infectious disease caused by a specific germ. In the beating and dressing of furs considerable dust is evolved which on inhalation may give rise to bronchitis and asthma. The asthma reported among furriers is usually anaphylactic in nature and may be due to sensitivity either to the hair or to the dye.

Anthrax may be prevented by disinfecting skins coming from possible anthrax regions, doing all beating and other dusty processes with hood exhausts. Cases of illness such as the appearance of a boil or bronchial conditions should be promptly reported for medical attention. Asthmatics who have a high sensitivity to certain furs should not work with these furs or should undergo desensitization.

The most usual affections of furriers are the various skin conditions caused by substances used in the preparation, dyeing or assembling of furs. Such substances are: arsenic, acids, caustic soda, bichromates and numerous dyes.

Statistics of the Division of Industrial Hygiene show that cases of dermatitis have occurred in the tanning of furs with bichromate solution. The solution used is usually dilute, and the dermatosis is caused in employees who are unusually sensitive to chrome. This condition can be prevented by making the vats water tight; washing the skins before removal from vats, and applying an ointment of lanolin and petrolatum to the hands before working with the solution.

The occupational disease statistics show that in skin affections one of the most frequent causes for compensation is dermatitis due to fur dyes. Such cases seem to occur more among furriers handling the dyed furs than among dyers. This may be explained by the fact that some dyes are not properly fixed and come off on the fingers of the employees. Thus, fur nailers will frequently be found to have their hands colored black from handling moist black furs.

The dyes causing dermatitis are varied. The most hazardous dye seems to be paraphenylene-diamine, a black dye. This dye has been reported to cause bronchitis, asthma, and dematitis from a mild erythema to a severe eczema with ulcers and cellulitis. It has also been reported to have caused various deformities of the nails. The asthma occurs only in a selected number of individuals and some authorities believe that most cases of furriers asthma is due to a hypersensitivity to this dye. The dermatosis caused by this dye may also be anaphylactic in nature.

The prevention of such conditions involves simple measures. Individuals who are asthmatics and hypersensitive to the dyes should be removed from contact or possibly desensitized.

The dye should be made adherent or fixed on the furs and all excess should be washed off thoroughly, that none should come off on the hands in handling.

It has been found that the poisonous effects of paraphenydiamine may be minimized by combining it chemically with other compounds. More research work should be done on this subject. The use of a harmless substitute for this dye is desirable.

Intact rubber gloves should be worn in handling dyes or dyed furs.

Good washing facilities should be provided and the hands washed often.

Employees should report any cough or skin condition immediately for treatment.

Periodic physical examinations of all employees should be done to detect, and treat the conditions in the early stage.

TETRA-ETHYL LEAD

This substance has become an industrial hazard since the introduction of ethyl gasoline. The knock in a motor car has always been a source of annoyance to motorists. Investigations have shown that tetra-ethyl lead used in gasoline, because of its slow explosive character, reduces the knock by producing a more constant pressure on the piston. There is also increase in power and mileage.

Tetra-ethyl ($Pb(C_6H_5)_4$) is a heavy liquid insoluble in water. Ethyl gasoline contains less than 0.1% tetra-ethyl lead.

The hazard exists principally in the manufacture of tetra-ethyl lead and in mixing it with gasoline. Investigation by the U. S. Public Health Service and others has shown that the hazard of tetra-ethyl lead from exhaust fumes of ethyl gasoline is negligible. If the carbon monoxide hazard is eliminated, automatically the tetra-ethyl lead goes with it.

Tetra-ethyl lead is an organometallic compound and owing to its volatility it is absorbed through the lungs; thus poisoning is more rapid and severe than when the salts of the metals are taken through the alimentary tract. The cerebral symptoms, which show early in poisoning with tetra-ethyl lead, rarely occur in cases of poisoning by inorganic salts. Besides the lungs, tetra-ethyl lead is also absorbed through the skin on which it can produce local lesions.

Tetra-ethyl lead is characterized especially by the acute cerebral symptoms due to the direct transportation of the lead through the blood to the brain.

In order of their appearance the symptoms of poisoning by terta-ethyl lead are: (1) Insomnia; (2) Anorexia, nausea and vomiting; (3) Vertigo and headache; (4) Muscular weakness; (5) Hallucinations and maniacal symptoms.

The objective signs of this intoxication are:

1. Pallor (out of proportion to anemia).
2. Hypotension.
3. Subnormal temperature.
4. Loss of weight.
5. Tremor, exaggerated reflexes, muscular irritability.
6. Violent twitchings.
7. Increase in respiratory and pulse rate.

The diagnosis is made by a history of exposure to tetra-ethyl lead, and finding lead, into the urine and feces.

Prevention

Garages should follow the same rules of ventilation as for the carbon monoxide hazard. Double lockers and good washing facilities should be provided. Care should be taken to clean all apparatus, clothing and hands if in contact with any amount of lead products. Absorption through the skin is a great danger and care should be taken to clean the skin immediately following splashing of tetra-ethyl lead. This is accomplished by washing the part first with kerosene and then with green soap. Ethyl gas should not be used as a cleanser for clothing or anything else and should have a distinctive coloration.

Treatment

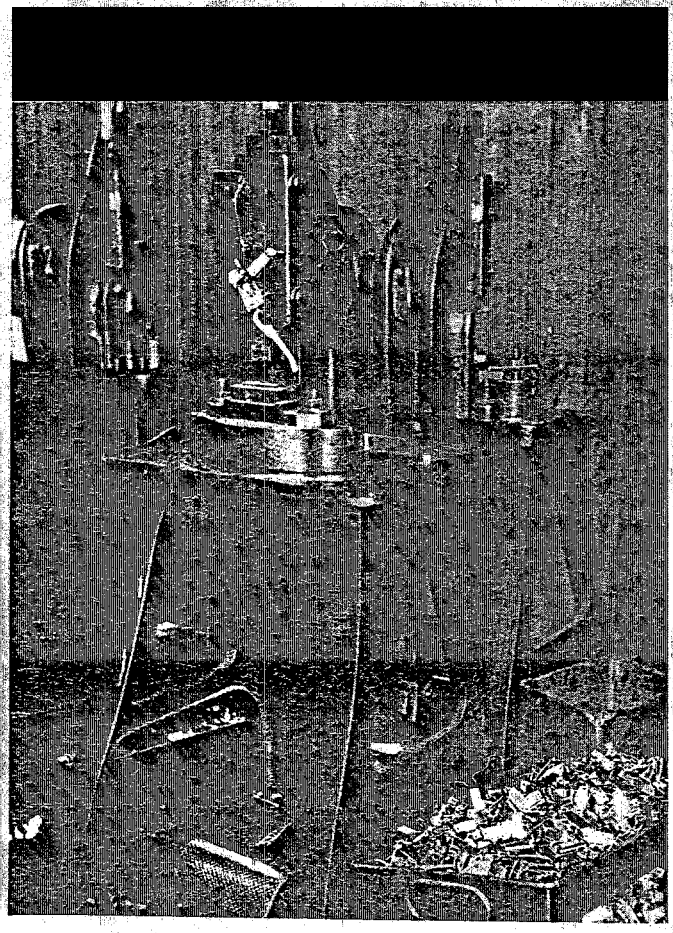
Alkalis and salts of light metals should be administered. Calcium in the form of milk combined with calcium lactate should be given. Sodium thiosulphate intravenously has been suggested.

FOOT PRESS ACCIDENTS

By Herbert L. Reid, Safety Inspector

This type of press is used in many different industries for a variety of purposes. It causes many accidents of a minor nature which require just first aid treatment or cause the loss of only a few days. These accidents are costly to the employer and cause him much inconvenience. He loses the production from the machine besides paying the operator while having his injury dressed. Some years ago, before the practice of guarding foot presses was so advanced as it is today, an employer stated to the writer, "The reason I want to guard this foot press is not because I worry about the operators injuring their fingers but that it takes too much of my time to keep instructing new operators every day or two."

Fig. 1.—FOOT PRESS; AUTOMATIC SWING GUARD
Also cover "A" to guard stop nuts which regulate stroke of ram.

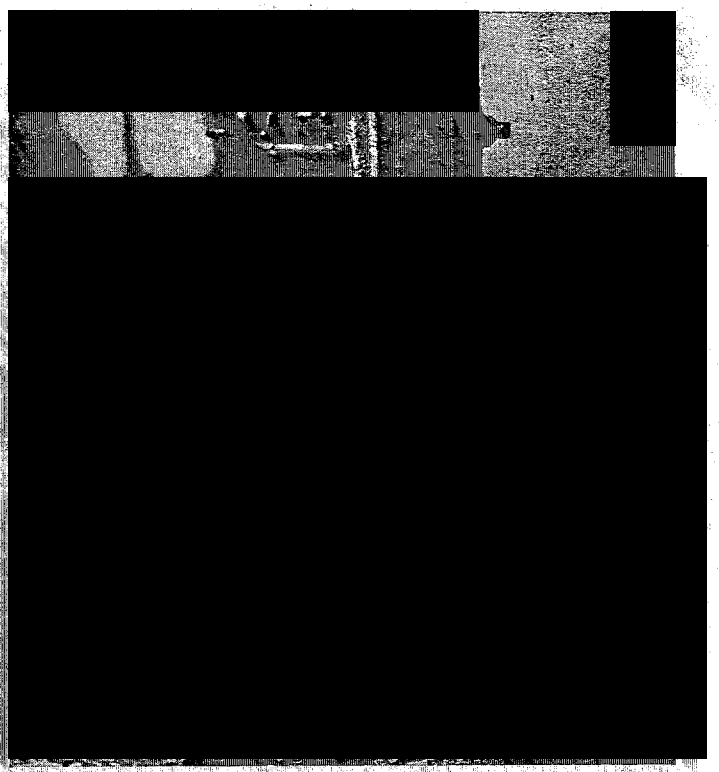


As the majority of the operators of foot presses are under 21 years of age and since the presses are generally grouped close together, there is more or less talking and joking going on between the operators. This is especially so when they have both male and female operators in the same group.

A brief description is given of how thirty accidents occurred on foot presses. In four of these cases the operators' fingers were caught between the punch and the top of the shell as they placed it on the die. One point that should always be emphasized, when instructing a person how to operate a press, is that of the manner in which to grasp the piece when placing it on the die. Operators are prone to use too many fingers to hold the piece or to put them over the top of a shell instead of grasping it on the sides. Three of the above accidents resulted in amputation of part of a finger.

Twenty accidents happened while the operators were placing pieces on the die and before removing their hands they

Fig. 2.—FOOT PRESS; AUTOMATIC GUARD



Fastened to the ram of the press is bar "A" which forces guard "B" across the face of the die as the ram descends. The guard is then returned to its original position by spring "C". Also see Fig. 3.

pushed down on the foot treadle catching their fingers between the punch and die. These presses should be equipped with automatic guards. See Figs. 1–2–3.

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ff pieces of wire.
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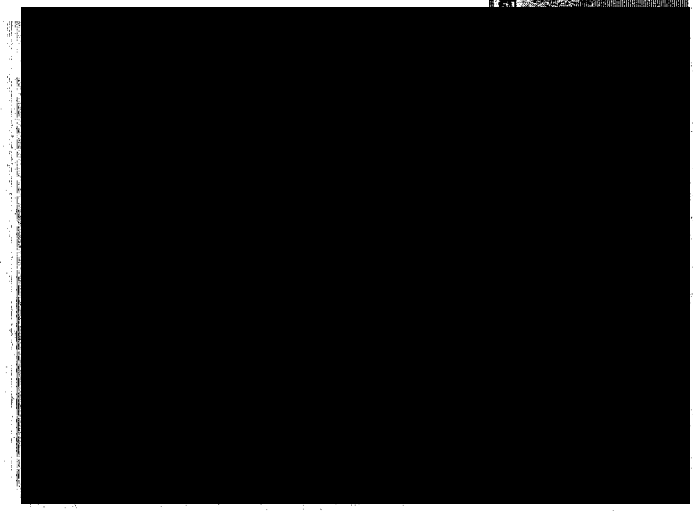

(*Continued from page 5, column 2*)

such as propellers and sheets of metal are ground, buffed or polished, the following hoods are shown, each of which effectively prevents the escape of abraided dust from which it is withdrawn through the exhaust pipes connected to the fans.

In the design of the hoods for the wheels, all of which are provided with protective flanges, the idea of maintaining proper alignment with the wheels has received due consideration. Durable fastenings, rigid rests, least exposure of wheel surface and the enclosure of spindle ends, nuts and flange protection are features of the constructive ideas, which provides safety as well as dust control.

Illustration No. 3

GRINDING WHEEL ON WHICH METAL SHEETS ARE GROUND AND POLISHED

Rear view of the enclosure surrounding the 10-inch wheel, indicated by letter "B". The enclosure consists of a galvanized sheet steel rectangular box twice the width of the largest sheet polished, and of a depth equal to the length of a sheet. Pipe "A" is 4 inches in diameter. "C" shows pyramidal connections to the rectangular prismatic box and are attached to pipes 6 inches in diameter. "D" indicates the manifold 11 inches in diameter at fan inlet. "E" shows exhaust fan. "F" the discharge pipe leading to the separator on the roof, and "G' the hood over wheel.

Want of space in this bulletin limits the number of types of hoods that can be shown. Interested firms may gain further information upon the subject by addressing the Division of Industrial Hygiene, Department of Labor, 80 Centre Street, New York City.

Illustration No. 4

FRONT VIEW OF WHEEL AND ENCLOSURE OF ILLUSTRATION NO. 3

Wheel and rectangular box where polishing of sheets is performed. "G" indicates hood over grinding wheel. "B" shows the metal box. "A" the operator's foot rest, and "C" the bench on which the operator sits while working at the wheel. Two inches static suction is maintained in the three exhaust pipes (1—4 inch and 2—6 inch pipes). The orifice of the 4-inch pipe is as near where dust is disengaged at point of contact with wheel and work is possible, similar to orifices attached to swing frame grinders. An air movement of 210 linear feet per minute is created through each square foot of cross sectional opening of the box. This air movement is sufficient to draw in all dust created by the operation of wheel and work.

WHAT MAN HAS DONE, MAN CAN DO

Many employers think that accidents are inevitable. They had some cause for this belief until recently when "no accident" campaigns were instituted and then it was found that sometimes plants operate for one million hours and more without an accident; that is to say, cases have occurred in plants employing over 400 workers per year without a single lost time accident. It is obvious, therefore, that it would be possible for one man, if he lived long enough, to go 450 years without an accident during work because that has been done in the case of 450 men for one year. The latter is a great, but not an unusual achievement. It results from organization; from a belief that accident prevention is worthwhile. It is better for a plant to organize itself for safety than to pay for the trouble after it has occurred.

The Division of Industrial Hygiene of the New York State Department of Labor has on record hundreds of cases where machines were properly guarded only after the occurrence of a severe accident.

It would help safety if employers were persuaded that there is nothing inevitable about accidents if ordinary precautions are taken and the worker is educated in accident prevention. Every new worker should be shown the points of danger and he should get systematic reminders from time to time of what are the principal causes of accident.

SAFETY AND HEALTH IN THE FACTORY

The Division of Industrial Hygiene, as part of the Department of Labor, provides a medical and safety staff for the service of employers throughout the State of New York. On request, competent members of the staff will be sent to a plant and give advice to employers as to methods of preventing accidents and occupational diseases. Should a manufacturer find that he has a high accident rate or conditions bad for the health of the workers, he can obtain information free, on request, as to how such conditions can best be met.

(*Continued from page 7, column 2*)

Four of the accidents did not occur at the point of operation. In two of the cases the operator was adjusting the set screw on the head of the press to change the length of the stroke. Before they had removed their hands they pushed on the foot treadle and their fingers were caught between the set screw and head of press. In some factories this point is guarded. See Fig. 1.

One accident occurred to an apprentice while standing at the side of a foot press. His foreman was seated in front of the press demonstrating how the operation would be performed. The boy's hand was resting on top of the foot lever where it enters the frame of the machine. When the foreman pushed on the foot lever the boy's finger was caught between the lever and the frame of the machine. The finger was amputated at the first joint.

The other accident also happened in an odd manner. A boy was holding one end of a strip of metal about five inches in length while bending the other end in the press. As he pushed down on the treadle the end he was holding flew up and his thumb was caught between this piece and the projecting end of the bolt which fastens the punch in the ram.

Another accident occurred while trimming gold emblems. During this operation the waste accumulated on the punch and the operator's finger was caught between the edge of the die and the projecting trimmings.

A reduction can be made in the number of accidents occurring on foot presses by constructing the die in a proper manner and equipping the press with a guard.

The photographs show two types of automatic guards that are easy to construct.