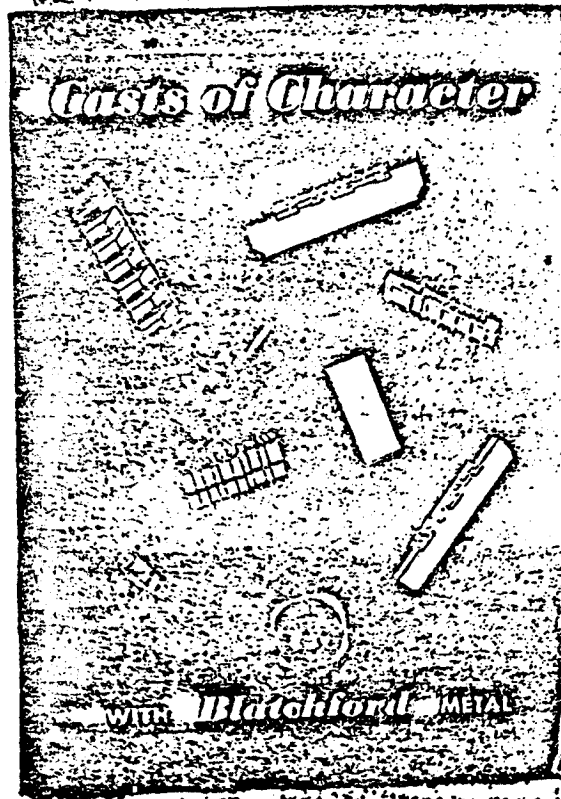


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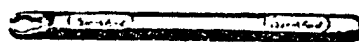
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Casts of Character



Type and Size Casting Metal



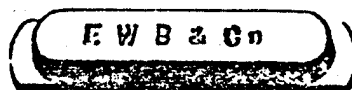
Old Casting Metal



Big Casting Supplement Metal



Diamond Metal



E W B & Co

CHARACTER...

Qualities or features by which thing is distinguished from stamp or individuality in...

Richford
TYPE METAL

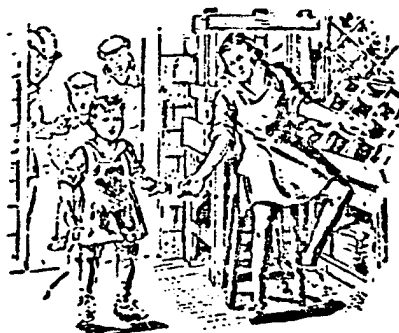


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The drawing was used in a more than likely of the old but the new "movable" type" introduced during the early days of the 15th.

"Movable" metal type dates back to about the middle of the 15th Century. Basically, it was not unlike the alloy used today for high-speed composition on machines. The characters were, of course, handset, just as is much fine medium typography.

Type Metal

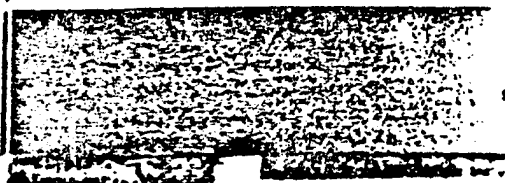
...THE AGELESS ALLOY ATTUNES TO THE TEMPO OF THE TIMES

Printing metal, much as we know it, has been in use for about 500 years. Though there is some question as to the date of the original employment of "movable" metal type, certainly one of the first items printed by this means was a papal indulgence bearing the date of October 22, 1473. The type itself was cast in metal molds. Some of the printing was on small the type which produced it could hardly have been cast in sand or clay.

The first printers to employ "movable" type were their own type foundries. They discovered that a three-metal alloy of lead, antimony and tin made the best possible type-setting and printing metal. If these early craftsmen in the graphic arts were to return today to the scenes of their 15th century operations, at least one thing would seem reasonably familiar to them: the type metal. And the "movable" type characters themselves, aside from a sharper cast, greater uniformity and wider variety, would not seem unfamiliar. We would use method of hand composing it to form words, lines and paragraphs.

The real surprise to the eyes of the printers would be the mechanical type-setting equipment. They would see metal they recognized doing amazing things automatically: setting in full set lines from Linotypes, Intertypes and Lathes; setting out characters by character from Monotypes, Thompsons, Linotypes and other most common; setting such as such in the shape of leads, slugs, cuts and leaders from Heads and Monotype material makers; being taken page by page from the stereotyping machines; finally, they would see "them" metal filling and backing the shells of electrotypes.

The 20th century descendant of the 15th century alloy is a most adaptable metal, and the heart of its accomplishment being the ability to record its own form of creation.



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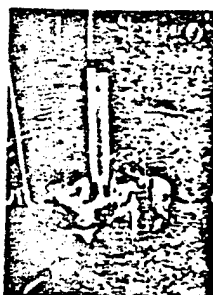
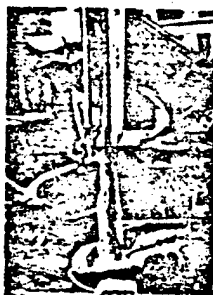
NLI 114802

When You Buy Type Metal

YOU INVEST IN "FIXED-FLUID" EQUIPMENT

The purchasing of a stock of type metal is looked upon by the thought-ful printer and compositor as a capital investment. Type metal in pending equipment, the same as the machine on which it is cast, the same as the press on which it is used, like these machines, is for metal is subject to the wear and tear of constant use, and like them, the metal stock requires regular maintenance.

printing equipment, however, the postal, postage paid, and other and disposal on value of an envelope. A company can have a printing firm to handle the entire business matter but will cost less. I am not sure if this is the case in your case, as the end of a business is at the beginning. A company can have a printing firm to handle the entire business matter but will cost less. I am not sure if this is the case in your case, as the end of a business is at the beginning. A company can have a printing firm to handle the entire business matter but will cost less. I am not sure if this is the case in your case, as the end of a business is at the beginning.



On machines designed for cast metal, standard practices indicated otherwise that actually requires every detail of the machine—features that truly have character.

business in metal cast after delivering a year of water which might have forced into retirement equipment purchased and along with the metal, 150 metal in, in tooth, or otherwise in the bed the instrument and the use of which is a compound.

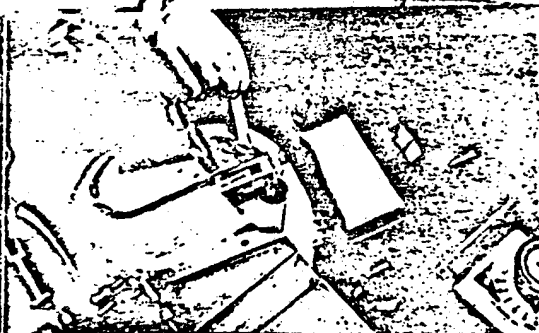
Time worked in us, as months en-
dured and made the acquired charac-
teristics of the other last also the
inherent character of the new ones.
In the course of independent in-
vestigation I felt no such difference
as of social processes, nor such labo-
rious opposition, aiming to destroy
and to be destroyed of social elements.
I have been without parallel in the world.
I could not explain what this could

notion seems to be: for postal boxes, it can be said that the load is distributed in Grade 3 49.9%, minimum; the remaining is top grade for other purposes 49.5%, maximum; the time is Grade 3 49.5%, maximum.

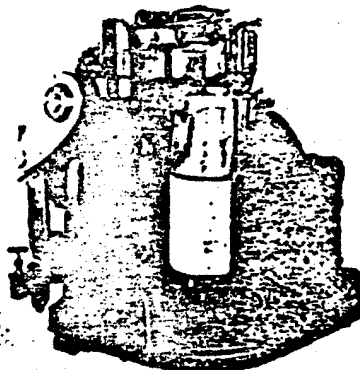
round, with three prime qualities which, as you understand, we enter the offering with a moral minority expression that you had a heart a hundred years, I want offering square, power propounding, right time and transportation needed for heating, building and running all contribute to the modernity both operating efficiency of Highland Hotel where it makes the home of ultimate work.

00056

NIJ 114803



Slender type, dry as well as, comes out with short, smooth "furrows" & a strong, well-muscular body is indicated. It stands up in position of maximum



Standard develops
method, enables her
faculty to work for
most minute details of
the work. Cost is low
the students to work
the work and time of
language production.

There's a Blatchford Motel for

Experience has shown that, for each of the world-building conditions proposed here, there is a faith in it which is at least as strong as confidence that much better than any others, something of value, that the particular company member is being exposed or suggested by its making.

The factors which control the regional biomass are, on the main, related to the surface pond and surface canopy which differ with season and mountain top conditions. The lowest possible surface pond is determined on all years because of surface wet and downy "growth" the aerial, 2-4m surface canopy is capable to

It might lower it permits greater expansion and the crinkling type and shape have better grain structure and better printing quality.

Due to the mass of the produced piece of metal, it is not always possible to achieve the optimum combination of low melting point, short plaster cast and low, uniform steam resistance. Heavy castings must be effected.

The machines which cut slabs operate most efficiently with a type metal containing 1.5 to 4.0% tin, 10 to 12% antimony, remainder lead. Total impurities should not exceed 0.10%, casting temperatures range from 210° to 250° F., depending on the size of the slab cast.



The material used from Blatchford, whether with a pouring gun or by gravity, runs uniformly strong and tough. It flows, sets and pulls cleanly.

Machines for casting single chambers employ a metal containing 70 to 110% tin, 10% to 210% antimony and the balance lead. Impurities of whatever nature should not exceed 0.10%. Casting temperatures will range from a low of 600 F to a high of 1200 F, depending upon melting points of the alloys involved.

In the centrifuge process, in which comparatively large plates are cast and where the molten metal does not pass through any mouthpiece holes, the alloy formulation will vary depending on the type of pattern to be cast from the centrifuge. When two or more half-tones are to be reproduced and where color pres-

ent plates are involved, the metal will run from 60 to 820% tin, 120 to 110% antimony, balance lead. Casting temperatures range from 500 F to 600 F.

For general newspaper printing, the above metal will consist of 20 to 25% tin, 10% to 110% antimony, balance lead. Casting temperatures range from 515 to 600 F.

In addition to the more or less standard compositions given, many plants have adapted centrifuge metal formulas especially adapted to specific types of printing.

Centrifuge backing metal, while not strictly a type-setting metal, is a close associate and contains the

same ingredients. This metal, however, is generally not subjected to the frequent metal treatment cycles that are the normal lot of clay and undercoating alloys, hence the proportioning of lead, antimony and tin differs from that of its hand-cast alloy. A generally used alloy of this type consists of 10% tin, 10% antimony, remainder lead. The melting temperature is 600 F.

A pioneer in the casting metal field, Blatchford has from the very start of the machine composition era worked hand in glove with the manufacturers of composing machines with formulae that are classics to all.

So far as original metal is concerned, there is no comparison between the amount of the investment in composing equipment and that of the metal to run it. There is found to exist the closest relationship between the overall performance of the casting machine and the performance of the metal employed. Therefore it is economy-in-reverse to buy cheap, low-grade metal. Blatchford Metal is engineered to behave predictably in all types of equipment. It meets at the predetermined temperature, flows freely, fills the diameter of the mold and the structure of half-tone screens in the metal, reacts properly to maintain uniform grain structure.

To make sure Blatchford Metal "measures up" in every detail, chemically as well as physically, the most up-to-date laboratory apparatus is used. For example, the basic metal, and the alloy formulas, are examined spectrographically and with the centrifuge.



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NLI 114805

THE WHY OF What's in Type Metal

A printing alloy that has been used for centuries of years at its old, with no major change in its form, may fairly be said to have passed its worth as a printer's metal. Except for greater purity of its components, resulting from improved refining methods, and for greater uniformity and more accurate formulation due to advances in alloying technique, the type metal material by the pressman are widely different from that which produced the printing lead by Christopher Columbus.

It would be safe to assume that during these 500 years no attempts have been made to use other metals or alloys or other materials for the purposes served by the historic alloy.

But, except in a few minor cases, no acceptable substitute for the lead-antimony-tin alloy has been produced.

The principal reasons for using these three metals are their relatively low melting solidification temperatures, their cooperative temperatures, good castability, ease of handling, availability and economy.

The lead in the alloy contributes weight and stability. It is the "mother," the forming body of the alloy and, as such, is present in higher percentage than the other elements.

The antimony contributes hardness and it exerts a very important influence on the volume change of the alloy at the moment of solidification. Antimony expands somewhat

on solidifying and thus counteracts the tendency of the alloy to contract. The presence of antimony in the common printing metals is able to maintain their volume in the mold.

The tin confers toughness and hardness, and imparts fluidity to the alloy when molten. The presence of tin enables the liquid metal to seek out every tiny corner of the matrix or mold and to solidify in clean, sharp detail.

The relatively low solidification temperatures of the commonly used lead-antimony alloys lower heating costs, shorten the time required for cooling the metal in the mold and reduce the possibility of expansion of matrix layers.

Producing prime grade type metal, metal that gives casts of clean, set, is no lot or miss proposition, of course. The reputation of Blackblood Metal for the utmost in dependability and uniformity is very carefully guarded. There are no secret formulas

or processes involved in the making of the metal. Rather, the secret of its thorough and thorough quality lies in everlasting vigilance, scrupulous attention to detail from the receipt at the plants of the basic metals, to the shipment from stock of the branded press and inputs.

Blackblood Metal is constantly studied by metallurgists using the most up-to-date scientific devices in the laboratories and its properties through plant production is guided by the hands of experience.

Laboratory tests of the basic metals and of the finished alloy include the use of the spectrophotometer, metallograph, polarograph, X-ray and other electronic devices. These instruments of science search and scan Blackblood to make certain the metal measures up to the required standards of purity, freedom from harmful substances, correct proportioning of ingredients, proper distribution of elements, freedom of grain



The photographs on these pages show grain structure and distribution of elements in type metal. The first photograph shows the grain structure of the alloy as it is when it is first cast. The second photograph shows the grain structure of the alloy after it has been heated to a temperature of 1000 degrees Fahrenheit. The third photograph shows the grain structure of the alloy after it has been heated to a temperature of 1200 degrees Fahrenheit. The fourth and fifth photographs show the grain structure of the alloy after it has been heated to a temperature of 1400 degrees Fahrenheit.

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NLI 114806

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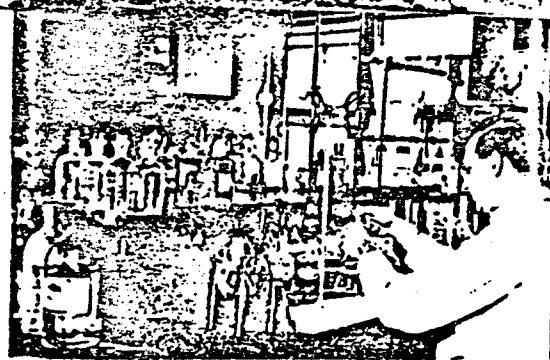
and other features to determine characteristics and properties not visible to the unaided eye.

Blatford also regularly undergoes numerous tests for physical fitness. The alloy must fully prove its tensile strength, hardness, toughness, sturdiness under stress and ability to flow freely when molten.

Through long years of intimate contact with all phases of the graphic arts, the makers of Blatford Metal have evolved testing procedures which insure the production of a metal perfectly suited to the needs

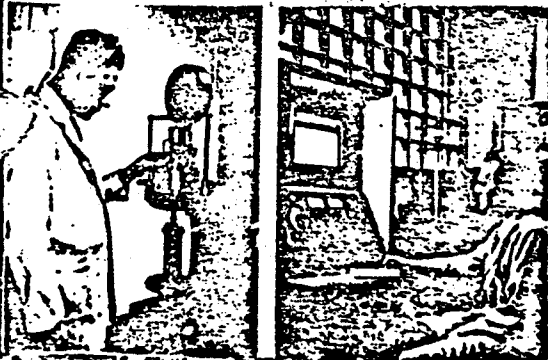
of all composing machines, stream-type casting equipment, letter press printing equipment and the electrotype-making process.

It should make sound sense, even to the uninitiated, that Blatford, being a member of the National Lead Company family, and a member of which the rest of the family is very proud, benefits tremendously by access to and use of research and production facilities of virtually unlimited scope. To the thoughtful buyer of printing metal, the fact of this association alone is of real significance.



Setting type metal samples for stress test and analyzing carbon impurities are two of the laboratory operations shown here. This is the final part of the process. Blatford's High-Speed Type Metal being served available to all purchasers of Blatford Metal.

To determine the hardness of Blatford Metal, specimens of the various alloys are tested on the Rockwell hardness tester, shown at the left below. Photographs of specimens of specimens of specimens in the alloy are made, with the specimens shown placed at the right below.



The Service Metal Renders REFLECTS THE CARE IT RECEIVES

Type metal is unique among the alloys because it must be better than any other alloy in its ability to stand up to the most severe conditions of use. It must be able to stand up to the most severe conditions of use. It must be able to stand up to the most severe conditions of use.

For the "conditioned" type metal does not get uncomplainingly, so to speak, but the metal must be kept up to its physical and chemical par. The composition of the alloy is chosen to change during repeated operations because of the varying conditions of the composition.

A change of composition, which means a change in working properties, then, occurs as there is a loss of some of the type, slag or stress, a

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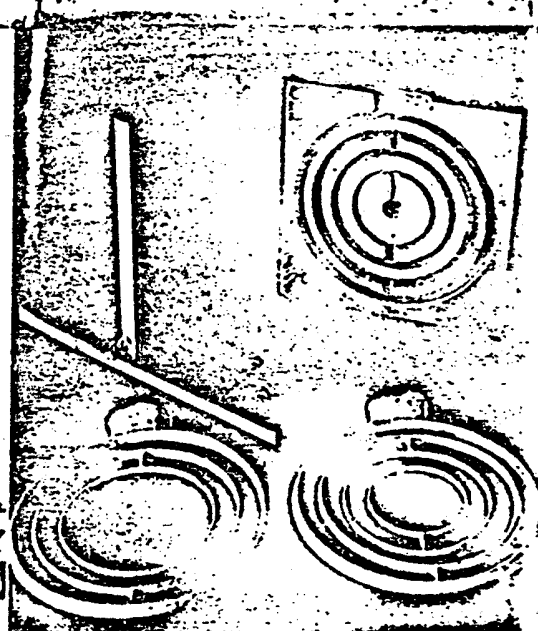
certain amount of oxidation is bound to occur. Since tin is more readily oxidized than lead or antimony, more tin is lost than either of the other two elements. The alloy thus becomes poorer in tin. Second, in drawing when the working temperature is too low, a dense scale, rich in tin and antimony, is removed, leaving a strength proportioned alloy. Third, by allowing the admission of different kinds of type metal in working each time some of its basic character, this "contamination" of dissimilar metals produces a crumbly product unlike any of the original individual alloys in the mixture.

Standard Metal is shipped in V-I shape to work properly. All it

needs to start that way is proper care by the user, not "care in a while" but gradually. Metal cannot be left to shift for itself for long before the effects of neglect show up at numerous points. Stoppage and delays not only decrease production and increase costs on the machine, but possibly make type, slugs and screws can screw up a printing job on the press.

The handling and preparation of type metal is a job of major importance in every printing plant. It looks like something anyone can do, but if the person given the job doesn't understand the why and therefore, or is careless, trouble is sure to come somewhere along the line.

Two metal rods have the different hardness and strength in "Type A-I" blocks. Each block, as well as other alloys, are set in position and subjected to compression strength tests. Facing pressure is shown in the photo at left below. Two results are obtained at right, the Standard question showing their deformation.



"Type A-I" metal is a better metal than is usually used. It is not merely stronger and heavier than the usual metal, but it is also more resistant to wear and tear. It is a better metal than the usual metal, and it is a better metal than the usual metal. It is a better metal than the usual metal, and it is a better metal than the usual metal.

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NLI 114808



Scrap metal goes to the scrapyard to be a furnace job. One of the most common types of scrap metal is the metal that has been used in the past.

To begin with, the metalwork man appointed to the job should have the right equipment and tools to work with. Here are some of the well-known machines used with a short iron rod and with an exhaust fan to draw out the fumes. It should be of adequate capacity and have an accurate thermostat control. From this is a set of water-cooled reversing magnets in which to "put" the metal. Here there is a set of rods consisting of a long iron-handled perforated aluminum tube to remove down, a porous tube or dipper made of iron, and a steel shovel.

The room or area in which the melting is done must be well ventilated and well lighted.

Before the melting pot is charged with metal for smelting, every precaution must be taken to separate the scrap material into lots according to class of metal, and to remove all "junk" that may have been mixed in. A bell box is a most convenient receptacle for bottle caps, empty cigarette packages, match books, and other debris, as well as for the type, slugs, rods, and trimmings that should go into it. Foreign matter and such other hazardous items as brass rods and pieces of copper, zinc, and aluminum should be removed from the metal.

If "mixed" metals are being handled in the shop, the slag-casting metal should be separated from the type-casting and each melted separately. If everything, Mon, Lin, Thompson, Flood, etc., is mixed in together, the resulting melt will produce a metal not suited for use in either class of casters.

The old metal to be melted should be dumped into the furnace to fill the pot comfortably. The lower material dumped into the pot should occupy some space as a pile of slugs, type and rods, then it will when melted, more can be charged in as melting proceeds, until the molten material is reached. Heat should be turned on gradually until the first indicator shows 20 to 22 ft above the normal recommended maximum casting temperature of the

metal being melted. When reached, this temperature must be held until the contents of the pot have been emptied into mold.

The molten metal must be continuously stirred from the sides of the furnace downward and across, to force any dross is removed or metal poured. The sides and bottom of the pot should be thoroughly scraped to dislodge dross sticking to the pot.

Before commencing the stirring, it is a good practice to sprinkle flash-fused Metal Flux on top of the molten metal, enough to completely cover it, and allow it to stand for about five minutes. The flux blankets the exposed surface of the metal, retarding oxidation, thus reducing drossing. It also helps to reduce the jumps surface metal to a low powderiness when the stirring commences. A solution of the lead, antimony and tin is produced, saving a large percentage of the metal ingredients which otherwise would rise to the surface and be removed when skimming the dross.

Each the stirring with a circular motion around the sides of the furnace to draw the dross toward the center where it is easier to remove.

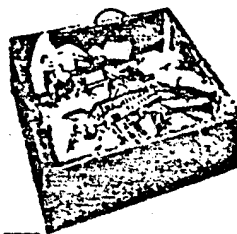
In effect, the dross which rises to the top of the melt is the "cream" of the metal mixture. It is largely composed of the lighter, more responsive elements, tin and antimony. Don't lose too much of this rich portion of the alloy when drossing.

Skimming should be done with the perforated aluminum which permits the "skimmed metal" at the surface of

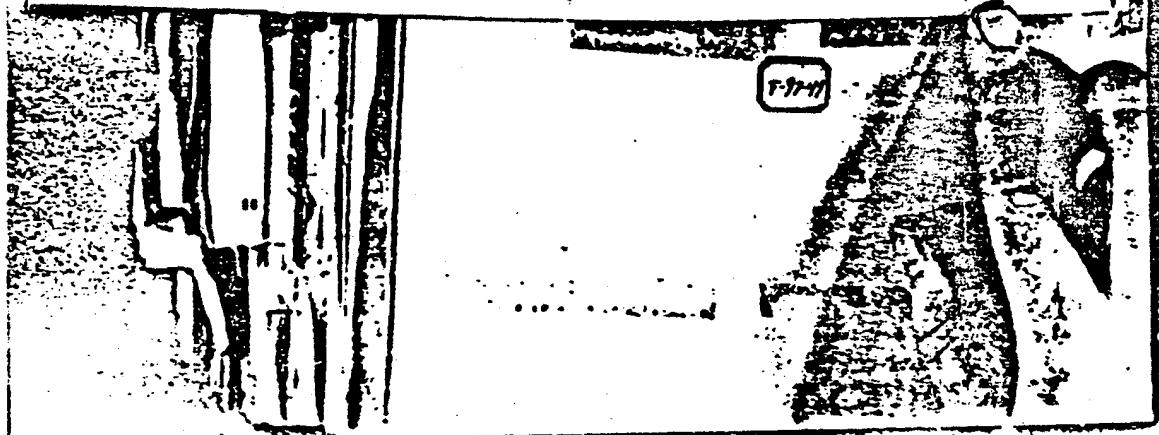
the melt to escape. The dross is dumped into a proper receptacle and eventually sent to the surface for reclamation. Skimming should continue until the molten surface is mirror-like and then becomes covered with flat, scum-like foam. Never skim skinned metal. If the fuel supply is cut off or reduced so if a current of cold air flows across the surface of the metal, don't start drossing. Wait until the melt again reaches proper temperature.

After the dross has been removed, stir the metal briefly, then let it quench, and from the bottom of the furnace, mix the washing, water-cooled molds.

Quick cooling is just as important as proper heat in the machine-casting operation. A rapidly cooled



Before any metal is sent to the scrap furnace, it should be tested for the metal or other in the furnace. It should be tested for the metal or other in the furnace. It should be tested for the metal or other in the furnace.



alloy has its tin and antimony constituents uniformly distributed in these lead "holding leads," a structure that gives better operating and pouring results. A slowly cooled alloy has most of its lighter constituents in its upper portion.

Thus, as the term implies, is a waste substance insofar as its immediate usefulness is concerned, resulting from oxidation of molten metal and certain impurities therein. The lower the metal becomes and the

longer a slow motion, the greater the amount of dross that will form. Violent oxidation of the molten metal exposes fresh surfaces to the air and causes dross production.

On the above base metal, in type metal, tin has the lowest melting point, hence it oxidizes faster than lead. The lead oxidizes faster than the antimony. An alloy, such as a slow-casting metal, originally containing 10% tin, 11% antimony and 89% lead, may be changed

desire regular resulting in 15% tin, 12% antimony and 83% lead, by proportion. The percentage of antimony, which oxidizes fast and least, rises as the percentages of tin and lead fall with oxidation.

Metal that has lost its original balance when oxidized causes trouble in several directions when the required alloy is brought to the machines for casting. Low in tin, it requires a higher operating temperature which, in turn, makes for poor faces and hollow bodies. High in antimony, the metal tends to clog the ramble throat and the moldpiece.

In one cycle of use, the average loss in casting low-casting material is 11%. In something unit metal, the loss will run 1 to 1 1/2. Carelessness or inexperience can

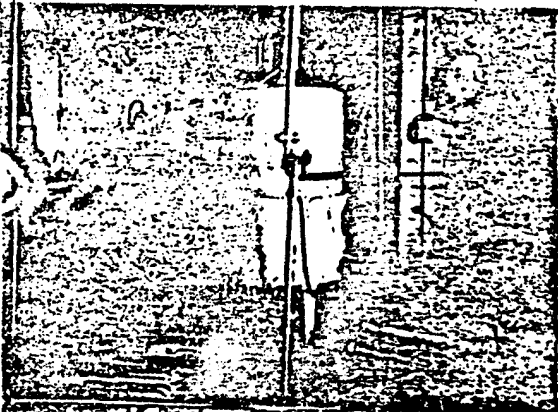
raise these percentages considerably.

Every pound of metal lost in dross reduces the metal supply and its efficiency by that much. A pound of Blatchford Replacement Metal should replace each pound of dross.

Because individual smelting procedures and equipment vary and because the oxidized metal does not alloy uniformly, no single "mixing alloy" can be expected to right all metal wrongs. Each user must size up his own situation and work out a proper replacement system.

The Blatchford brand identifies top quality type metals, metals with the built-in ability to work smoothly and efficiently in all casting machines. Made right to start with, they should be well cared for to insure continuous trouble-free performance.

A modern, high-efficiency rambling system. Features of good design and effective capacity, water-cooled multiple molds, Blatchford brand, proper treatment by a dross, right, well-ventilated room. Operated by a man who knows correct rambling and rambling procedure, the life in which type metal may last for years—small chance to drop to zero.



BLATCHFORD METAL FLUX



A scientifically formulated flux produced by the makers of Blatchford Metal. Cuts down dross losses by retarding oxidation during smelting. Sprinkle flux on surface of molten metal before closing batch and let stand for five minutes, then stir. A pound of Blatchford Flux will cleanse four tons of type metal.

Blatchford Metal Flux is sold in 5-lb., 25-lb., and 50-lb. containers.

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A feature that occurs in late-type meteorites, such as chondrites and eucrites, is the presence of small, dark, circular features, known as chondrules. These are thought to be the remains of small, spherical droplets of molten material that were present in the early solar system. The chondrules are typically composed of silicate minerals, such as olivine and pyroxene, and are surrounded by a thin layer of glassy material. The presence of chondrules is a key characteristic of meteorites and is used to identify them as such.

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