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## A NEW USE FOR MACHINE GUNS．

It is gratifying to know that the machine gun， hitherte exclusively devoted to the deadly purpeses of war，may possibly find place among the useful arts of peace．At a recent meeting in London of the Maxim－ Nordenfelt Guns and Ammunition Company the chair man，Admiral Sir Edmund Commerell，alluded to their present Maxim guns as the finest pieces of workman－ ship te be seen anywhere．He said their 0303 Maxim gun had cut dewn a tree seventeen inches in dia－ meter in one minute．（A director：＂A quarter of a minute．＂）He（the admiral）would throw in the other three－quarters．He would not only defy any ethergun te de this，but he would give any battalion in her
Majesty＇s service five hours＇firing as much as they liked，at whatever range theypleased，and they would not de the same thing．
This indicates that perhaps the machine gun could be used in felling forestrees in place of saws and axes． While the gun appears to be efficacious on seventeen inch trees，probably it would be stuck if directed against some of the larger trees，such as those of Wash－ ington，where a diameter of six feet is not uncommon． The mach ine gun operates with great precision，and perhaps it could be applied with success te all sizes $\bullet$ lumber trees；on the score of econ＠my，h॰wever，preb ably it would fail．

## ACCIDENTS ON TROLLEY CAR LINES．

It is a fair general assertion that of all forms of energy and of all metheds of transfer and transforma－ tion of energies these dependent on electricity appreach the nearest to perfection viewed from the standpoints
of adaptation te varying conditions．The block system on railreads involving the automatic operation of hun dreds of semaphores or visual signals，and perhaps the turning of switches and other work，may be executed by hydraulic and pneumatic power，but its operations are controlled by electricity．By the use of electricity enforced blocking has been devised in various shapes， applicable especially to systems of electrically pre pelled railway cars．Geing to the very base of the science we find in counter－electrometive force an un－ failing regulator of the electric motor，se much se that the speed of a motor can be controlled by simply changing the intensity of the field of force．
An electric read receiving its enerry from a distant station through miles of aerial or underground wire offers，it would be suppesed，exceptionally faverable conditions for contrel from the central station．It would seem clear and evident that there is every chance for automatic control and blocking in a deriving all its power from an electric eonductor Years ago，when some of the original electric reads
had proved disappointing to their projectors，the fail ure was attributed to toe cheap construction．The aspect of things has change greatly in the last five years．Electric reads are more expensively equipped， and，from the technical side，are great successes．Yet it is a great error to suppose that they are perfect． The recent indictments brought against them for de streying water pipes and gas mains by electrelysis are of their circuits designed to prevent such occurrences or to reduce the extent of damage．These troubles are or to reduce the extent of damage．These troubles ar of life，which attends upon the operation of such reads in cities，is considered．In Brooklyn，the number of deaths and casualties due te collision with and running －ver by trolley cars is large．Most of these casualties
are the result of excessive speed．The cars are far heavier than ordinary street cars，and their energy when in rapid motion，is very great．At high speed， especially if the rails are slippery，they require some distance to stop．In the time a persen would occupy te cross their track they might run their © wn length． to cross their track they might run
There have been many suggestions made for pre－ venting this less of life．Under present cenditions it is invited．An engine of many horse pewer，capable $\bullet$ moving at twenty miles an hour or more，is put inte the entire control of a motorman of not the highest grade of intelligence．He has complete contrel of his car as regards its speed．If going at a high rate of speed，he has only a hand brake to control it with
Inventors have designed fenders for the purpese saving life and limb of feet passengers cressing trelley car tracks．Many are tolerably effectual，and ccca sionally we hear of some one whose life was saved by the fender．The fenders，like the brake，are generally purely mechanical．But with preper regulation－ speed and preper brakes ne one should ever be run

If it was an affair of steam street cars running over people，and automatic devices were to be asked for to prevent it，inventors would at once seek te utilize the electric current for the purpese．The curious aspect of the present case is that in a system prepelled by electricity hardly any effort is apparent to utilize the current for securing automatic contrel of the 也pera tions．Nething would be easier than to apply a regu lator te each car which would restrict its speed to any desired rate．The city laws state what is the lezal
speed．No better enforcer of the law could be found
than the electric current itself．At present it is the in－ strument of constant transgression．The braking of the cars could be effected by electricity even more effectually than by air．At present the hand brake is esteemed sufficient．The means are present in abund ance fャr perfect contr•l and blocking；they are used t render both impessible．
As the electric street car only became a success when m•ney was put int the systems，se will they be ren dered safe only by the use of more refined appliances． The floeds of electric energy distributed $\bullet$ ver the lines give the requisite for attaining safety．The rest is in the hands of the law，of inventors，and of the compa nies themselves．In the near future we shall liave elec tric lines withent any ground connections to corred all neighboring pipes－they will work on a completely insulated metallic circuit．The circuit will be of low resistance t $\bullet$ avoid loss of energy．It is to be b七ped that they will then be regulated by advanced instead of crude metheds，and that the great quantity of sur plus energy available will be utilized to prevent acci－ dents of all kinds，not to cause them．

## Amateur Blacksmithing．

The amateur light blacksmith，says the N．Y．Sun may get from his work a deal of discipline and pleasure It requires for success mederately streng hands，a cer－ tain mechanical deftness that is instinctive with many persons，a degree of taste，and a true eye．Nine－tenth of the amateur work in all departments of art and me chanics is bad，and Venetian iren work is ne exception －the rule．The worst preducts of the amateur light blacksmith are almost as bad as some things turned out when hammered brass was in faver with amateurs．
The outfit of the light blacksmith costs from $\$ 3.50$ to $\$ 10$ ，and includes a vise $\bullet$ peculiar pattern，a binding teel，a pair of pliers，a pair of shears for cutting iren， and half a dezen smaller tools，together with the necessary materials．The bulk of the material con sists of narrow，pliant iren strips，to be bent int curved forms in making the bedy of the design．Then there are small connecting pieces，and a variety of tiny ornaments ready formed for those that don＇t care t exercise their inventive genius in designing such things．

The amateur may buy his designs or may invent them from such hints as he may get out of his ow brain．One amateur in fifty perhaps can be trusted －design．As a matter of fact，any man with an eye form and detail can easily evolve effective design by the aid of the thousand and one ebjects wrought in the style of the Venetian blacksmiths new te be seen in nearly all parts of New York．Amateurs make lamp stands，candle sticks，lanterns，vase h๒lders，grills for leors and wind•ws，brackets，picture frames，mirrer rames，wall hooks，screens and half a dozen other things of like character．The grill work gives the largest scope for the amateur＇s skill and invention， though a screen may be made highly effective．Rigid frames are sold as the bases of grill work，screens and ther large pieces．The amateur either blackens his bright iren with lampblack or buys a prepared paint for the purpese．The object is to obtain a lusterles surface．Sometimes the iron is left bright，when it is iable to rust．Neat h七usewives，h $\bullet$ wever，find that the black iren shews dust in a shecking manner．No selder is used in the work，and the small iren binder erve instead of rivets．
Brass，copper，and aluminum are used by amateurs in the same way as iren，either alone or in composition． Sometimes a general design of black iron is relieved by a line of brass or copper here and there，and ec－ casionally a design mainly of brass or copper is height－ ened by the presence of black ir•n．Aluminum，which is a disappointing metal，is liable te have a crude ef－ fect unless handled with rare taste．
＇The Venetian iren work craze has the merit of being nexpensive and of enabling a really tasteful and skilled amateur to give hirhly individual and effect－ ve decoration te an otherwise commonplace reom．

## of silver

MM．Lumiere Brothers find that one of the most xpeditious and，at the same time，a very simple and conomical methed of silvering mirrors is to utilize the well－knセwn reducing properties possessed by＂forma－ in．＂which，as peinted eut some months are in these pages，is a strong solution of formic aldehyde．They use a bath of ammoniacal silver nitrate，which，it is to be noted，should barely contain an excess of amme－ nia．To this is added quant．suff．of a selution con－ taining one per cent of formic aldehyde．The mixture is poured quickly ever the clean glass plate se as to cever it immediately．In five minutes the deposition of the silver is complete，and the mirror can be washed and dried．

M．Dieulafor，whe with his wife explered the ruins f Susa，has been elected to the French Academie des Inscriptions．Mme．Dieulafey not only received the Legion of Honor for her share in the work，but also
the right to wear men＇s clothes in public．


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