

LAW'S DOUBLE SHEARS AND ENGINE.

The form of lever shears shown in the accompanying illustration is described in *Iron* as a compact and convenient tool for steel melters and for iron works in general. It is intended, as may be seen from the shortness of jaw, for cutting rods, bars, and rails, or for ordinary smiths' purposes, rather than for plate work.

The driving engine is vertical, of the steam hammer class, with T-shaped framings, carrying the guide and swelling out at the bottom to allow the play of the crank. The speed is regulated by the usual Watt's governor and throttle valve. The engine drives a strong main crank shaft, carried by two plummer blocks upon the main framing. This shaft is fitted with a large and heavy fly wheel. A strong pinion flanged up to the pitch line is keyed upon this shaft, and gears into two strong spur wheels in a ratio of about one to three, or more if required, which are also flanged up to the pitch line. These spur wheels are each carried on countershafts by two bearings, each cast upon the main framing with the usual gun metal steps. Upon the outside extremity of these shafts, overhanging the bearings, are two cast steel disk plates, with crank pin of small throw.

The crank pins work in two gun metal sliding blocks, cast hollow, to give the maximum bearing surface with a moderate amount of material. The crank pins thus revolve in the sliding blocks, whilst the latter slide horizontally in a planed slot in the shearing levers. A reciprocating up and down motion is thus produced in the shearing levers. The resistance of shearing is all met in the up stroke of the crank pin, and therefore the pins are arranged opposite to one another in their throw, so that they work alternately and balance the total effect upon the engine. The weight of the lever arms themselves will bring them back to open the shear jaw, so that the working pressure is always on the upper face of the block, and will prevent any liability to knock in the slot, and, therefore, no adjustment of the blocks is required or provided. The gun metal sliding blocks have flanges on the inside faces, so that when once inserted in place they cannot get out of place again.

Both faces of the slot in the punching levers are planed, and upon the outside faces is a planed face arranged radially from the center pin. Bearing upon this radial face is an adjustment plate, so arranged that it can be pressed by a set screw upon the small end of the lever to bring the shears home to their work, and to prevent any jumping away from their work when cutting. The levers themselves are cast iron, faced with steel shear plates at the cutting end, and rocking on iron bearing pins, to which suitable lubricators are provided in the castings. The two levers are arranged for different sizes of jaws, and therefore for different powers. The shears are respectively 12 inches and 15 inches, and the gearing is about 1 to 3 and 1 to 4 respectively, so as to give suitable lengths of leverage to the different resistances. The whole of the different bearings is cast in one solid box bed plate, which serves also as foundation plate for the vertical engine, a suitable gap being provided for the fly wheel.

Prairie Chickens introduced into California by the Railway.

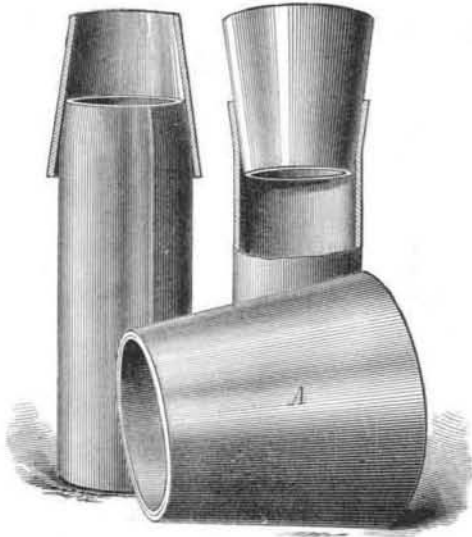
The absence of this choice bird among the feathered game of California is well known, and various efforts had been made by individual enterprise to introduce and acclimate it, but without success; and the possibility of this desirable result has long remained in doubt. But it seems that the bird is solving the problem for us. Starting from the prairies of Nebraska, it has followed the railroad westward, its appearance being noted from time to time in localities along the line, where it had never before been seen.

It has already extended its wanderings into Surprise valley in Northeastern California, and its diffusion over the whole state is now believed to be only a question of time, and reasonable forbearance on the part of gunners.

An expedition, having for its object the thorough examination of the natural resources of Russian Turkestan, is about to leave St. Petersburg. M. de Middendorf, the famous explorer of Siberia, and M. Smirof, Conservator of the Botanical Museum of the University of Kazan, will be among its members.

IMHOF'S STOVE PIPE EXPANDER.

It is scarcely necessary to recall to any one who has ever put up a stove how annoying a task it is to fit together sections of pipe. No matter how nicely these were joined when taken down, it is almost a certainty that they will not go together after a summer's sojourn in the barn or cellar, and to attempt to force them usually ends in bruised fingers and split pipe, and ultimately in sending for the tinman. Mr. Henry Imhof, of Lockport, N. Y., has devised an exceedingly simple means of avoiding all this trouble, the utility of which is so obvious as probably to render it hereafter indispensable in all households where stoves exist. It is merely a hollow truncated cone (A in our engraving), of any suitable dimensions, made of sheet metal or other material. Its use is plain from the illustration. The smaller end of the cone is inserted in the end of the stove pipe and forced into



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the same. The pipe is thus expanded as required. To contract the pipe the end is inserted in the larger opening of the cone, which is forced down as before.

Patented January 1, 1878. For further information address the inventor, box 982, Lockport, N. Y. State and county rights for sale.

Iridescent Glass.

Among the thousands of objects, both curious and artistic, which fill the halls of the Metropolitan Museum of Art in Fourteenth street, there are none to which the eye of the visitor will be attracted with more interest and admiration than the specimens of glass ware which were exhumed by General di Cesnola from the tombs of Idalium, in the Island of Cyprus. This collection of Greek glass, the most extensive known, comprises 1,700 articles of all kinds, shapes, and sizes, plain and colored, incrustated and iridescent. But the specimens to which the attention of the beholder will be

more especially drawn are those which have an opalescent, pearly, or nacreous surface, lustrous as a rainbow, and beyond all description beautiful. Although at the time of their discovery there was some discussion as to whether the exquisite effects which these objects exhibit were not the result of design on the part of the skillful old craftsmen who constructed them, it is now pretty well known that they are due to a sort of decomposition which the glass has undergone during the long lapse of time since they were first placed in the depositories where they have been found. Close examination has not thrown any light on the cause of iridescence in glass, but the theory is that when this substance is exposed to influences which gradually decompose it, its surface becomes covered with delicate laminae, like those of mother-of-pearl, and that the rainbow colors are due to the phenomenon known in optics as interference of light. Similarly the luster of opal is due to refraction caused by the number of parallel plates of which it is composed. The iridescence of Labrador spar may be given as another example, although in this case the plates of which it is composed are much more solidly compacted.

This peculiar alteration in glass has been observed to take place when it has long remained under water or in moist ground, or when it has been exposed to ammoniacal vapors (as in the windows of stables), or to the acid vapors thrown off by volcanic ashes, and especially in glass objects found in ancient burial places.

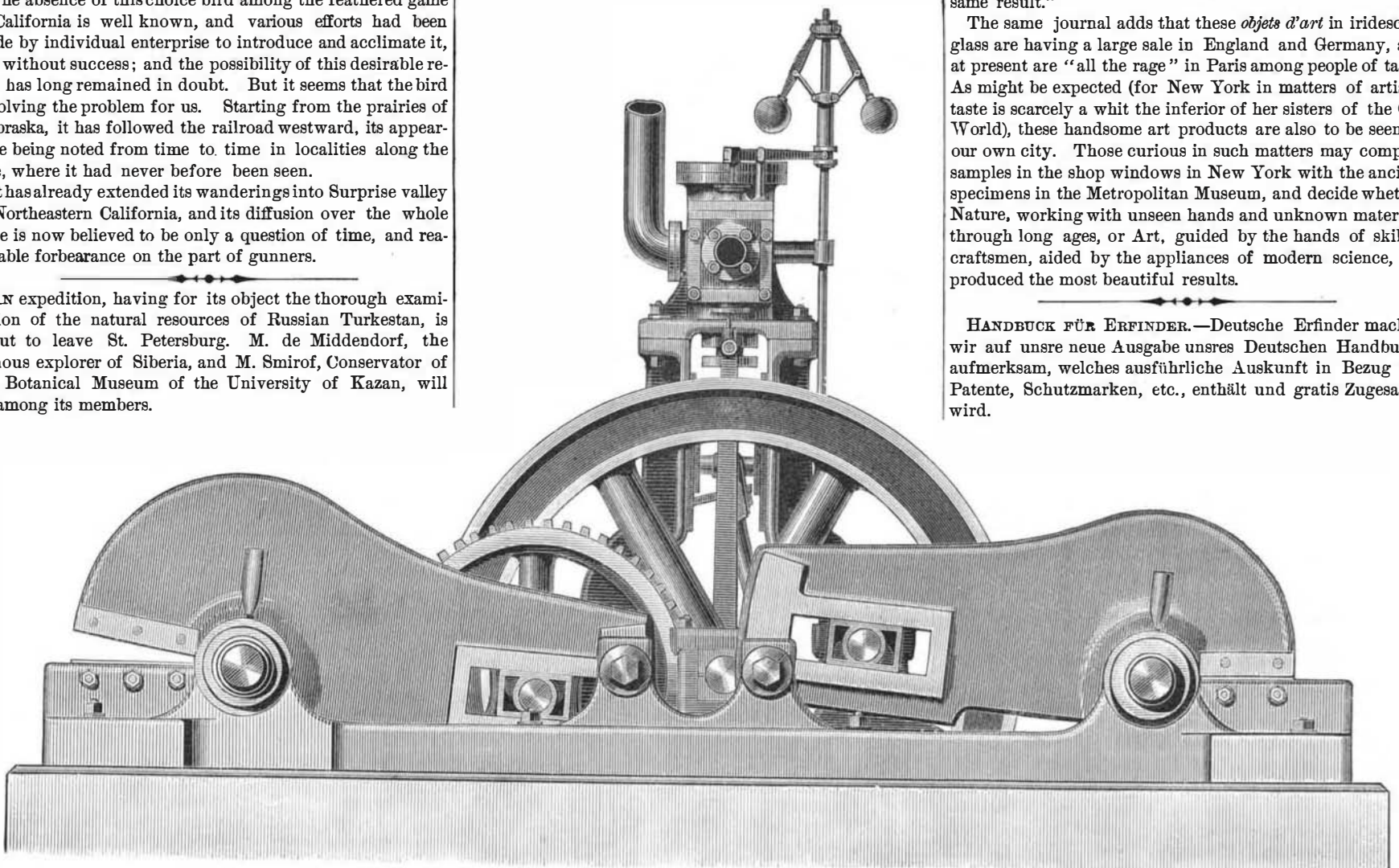
Not very long since two French chemists, MM. Fremy and Clemandot, after numerous experiments to discover a method by which glass might be permanently "iridized," so as to give it the aspect of pearl or of nacre, were rewarded by success. Their process consists in submitting the glass, under the influence of heat and pressure, to the action of water containing fifteen per cent of hydrochloric acid. On the authority of *Industrial Art*, a continental firm of glass manufacturers succeeded, a few years ago, in mastering the secret by which glass during its process of manufacture at times became as many colored as a soap bubble. Their first consignment to England, exhibited under the name of "Russian glass," did not attract as much attention as it deserved; but convinced that the work had in it intrinsic merits deserving of recognition on the part of the public from an art point of view, the exhibitors continued their investigations into the mode of its production; and selecting the most appropriate designs for its display, in the form of the best models of classic art, have produced a multitude of articles which are said to be exquisitely beautiful, and in price so moderate that they will readily come within the reach even of the possessor of a slender purse.

The current number of *Le Propagateur*, in commenting on this new iridescent glass, makes the following remarks in regard to its manufacture:

"In Germany the glass to be iridized is heated and a metallic oxide deposited on its surface by reduction. The oxide forms striæ on the surface, and these determine the phenomenon of iridescence. Bismuth seems to be much used in the principal glass works as the iridizing metal. In fact, M. Peligot, the eminent chemist, who has analyzed these iridescent glasses, found appreciable quantities of bismuth in them. Any metal whatever might, perhaps, produce the same result."

The same journal adds that these *objets d'art* in iridescent glass are having a large sale in England and Germany, and at present are "all the rage" in Paris among people of taste. As might be expected (for New York in matters of artistic taste is scarcely a whit the inferior of her sisters of the Old World), these handsome art products are also to be seen in our own city. Those curious in such matters may compare samples in the shop windows in New York with the ancient specimens in the Metropolitan Museum, and decide whether Nature, working with unseen hands and unknown materials through long ages, or Art, guided by the hands of skilled craftsmen, aided by the appliances of modern science, has produced the most beautiful results.

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