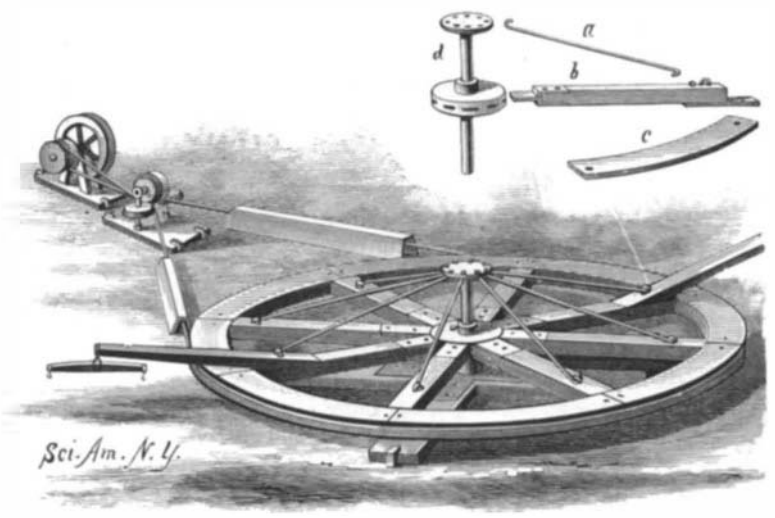
HORSE POWER.

The bed frame or foundation consists of two strong planks crossed at the middle and boxed together: and secured by re-enforcing plates of metal bolted on. The frame is held in position by driving a pointed stake, projecting from the under side of the frame, into the ground; hook headed stakes are placed at the ends of the planks for additional security. In the upper end of the center stake is a deep socket for receiving the vertical spindle that forms the axial support on which the main driving drum revolves. The drum is constructed in sections, in order to be taken apart for ready handling and removal. The cast metal hub is provided with a collar and set screws for fastening it to the spindle, and is formed with sockets for receiving the tenons of the inner ends of the spokes, *b*. On the outer end of the spoke is attached a flat plate which projects beyond the end to receive the ends of the wood fellies, *c*, which abut together on the plates and against the ends of the spokes, where they are detachably fastened by key bolts. On top of the spindle is a disk for staying the spokes and rim by the tension rods, *a;* the rods hook detachably in eye studs placed near the outer ends of the spokes.

The drum thus constructed is grooved in the periphery for working an endless wire to drive a countershaft and pulley, and has one or more sweeps attached for hitching on the horses for turning it. The countershaft to which the rope gives motion by a small pulley is mounted on a bed plate that is staked to the ground by hook headed spikes, and the rope runs between two pairs of grooved faced bevel guide pulleys. These pulleys make a guiding and tightening device, by which the two members of the rope are converged so as to run properly on the driven pulley; when they are shifted toward the driving drum, the rope is tightened as required. In the path of the horses the rope is covered with A-shaped guards.

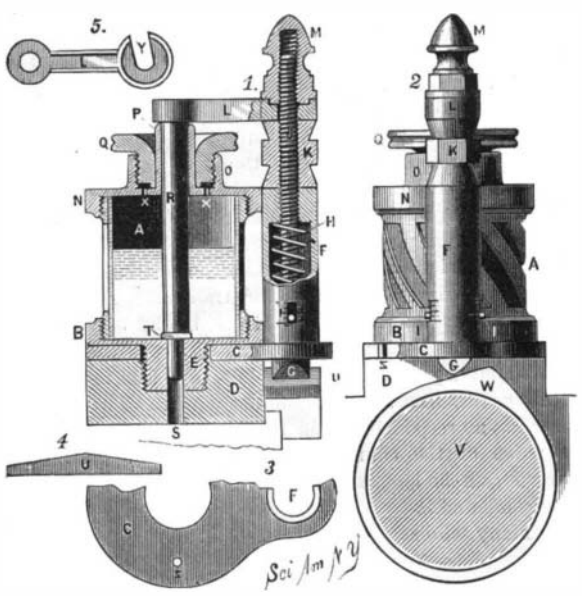
This invention, which can be easily adapted for running corn shellers, feed mills, wood saws, pumps, churns, and other farm machinery, has been patented by Mr. R. F. Rasmussen, of New Albuquerque, New Mexico.



RASMUSSEN'S HORSE POWER.

IMPROVED OIL CUP.

The engraving shows an oil cup designed for locomotives and marine engines, which consumes a minimum quantity of oil, permits no oil to escape when the machinery is not in motion, feeds faster as the speed increases, and which can be filled without interfering with the regulator of feeder. The oil cup, A, is screwed on a plate provided with a neck, E, screwed into the guide, D, and through the plate, C (Fig. 3), which is formed with a tubular standard, F, through which loosely passes a spindle, J, at whose lower end is a beveled projection, G. Surrounding the spindle is a spiral spring pressing it downward. The spindle is guided by a transverse pin passing into vertical slots in the sides of the standard. On that part of the spindle projecting from the standard is screwed the nut, K, upon which an arm, L (Fig. 5), is held by an ornamental nut, M. The arm is provided with a recess for receiving the nut, and with a slit, Y, to allow the spindle to pass into the end of the arm. The cover, N, is formed with an upwardly projecting neck and



IRVINE'S IMPROVED OIL CUP.

with a concentric internally threaded neck, O, between which the filling funnel, Q, is screwed. In the cover between the necks is a series of apertures, *x*. Secured to the arm, L, is the spindle, R, in the lower end of which is a pin fitting in an aperture extending through the neck, E. If a reciprocating piece of machinery is to be oiled, a beveled block, U, is fixed so as to act on the beveled projection of the spindle. If a revolving shaft is to be oiled, a cam projection, W, is arranged so as to force the spindle upward at each revolution.

Every time the spindle, J, is raised, the spindle, R, is also raised, and a small quantity of oil is allowed to pass through the hole, S, to the moving part. By means of the nuts the spindles can be regulated so as to feed any quantity of oil. Marked on the standard is a gauge that shows the stroke of the spindle. By partly unscrewing the funnel, oil can find its way to the cup through the holes, *x*. A full set of these oil cups, used for fifteen months on an engine on the C. N. O. & T. P. Railway, has given entire satisfaction.

This invention has been patented by Mr. J. J. Irvine, and further information will be furnished by Messrs. J. J. Irvine and Bro., of 108 William Street, Chattanooga, Tenn.

Tale Weight of Currency and Bills.

A corresponden t having asked of us how many bills, $1, $5, etc., it took to make one pound avoirdupois, also how many of the different pieces of our metallic currency to make the same weight, we referred the inquiry to Hon. Thomas C. Acton, U. S. Assistant Treasurer at New York, who kindly furnishes us with the following:

"Four hundred and fifteen new one dollar U. S. notes, from actual test, are equivalent in weight to one pound avoirdupois, and the number of notes should be the same of any denomination. It is not, however, perfectly reliable, as the paper upon which the notes are printed often varies in thickness to the extent of one hundred notes in a package of one thousand.

"One pound avoirdupois contains seven thousand grains; thus, by ascertaining the weight of each coin it is a simple computation to arrive at the number of pieces to the pound.

"As the legal tolerance at the mint of one and a half grains upon each silver piece must be taken into consideration, I have caused one pound avoirdupois of each denomination to be weighed, and you have the result in valuation by tale as follows, viz.:

"1 pound avoirdupois,	1 cent pieces	....	= $1.43 +	new.
"	"	2	"	(discontinued).	1.46 —	"
"	"	3	"	.....	7 32	old.
"	"	5	"	.....	4.60	new.
"	"	10	"	silver.....	18.10	"
"	"	$5		"	18.10	"
"	"	50		"	18.10	"
"	"	$ standard,		"	17.00	"

Novel Plan for Producing Diamonds.

To transmute the baser form of carbon into the priceless diamond has been the dream of alchemists for ages. The latest enthusiast in this field has gone to the trouble of erecting quite an extensive apparatus, by which, with the help of a force of nature, in the manifestation of a flash of lightning, he hopes to attain some tangible result. The experimenter, who is a correspondent of *English Mechanics*, described his device as follows in a recent issue of that publication: "If a source of heat could be obtained of sufficient intensity to liquefy carbon or charcoal," he asks, "would it on cooling assume the same crystallized form as glass? The question is, How can a heat be obtained some thousand times greater than can be produced by any quantity of galvanic cells or dynamo machines? I propose to utilize a flash of lightning in the following manner: I have erected in my garden a long iron conductor attached to a wooden spar firmly fixed in the ground, and three wide ropes as stays. This is about forty feet high, and the conductor extends twenty feet above it. On the top of the conductor is fixed a copper ball eight inches in diameter; the rod is attached to the spar by iron clasps insulated with gutta-percha. The rod is bent about two feet from the ground, leading into a wooden box containing a tube of biscuit earthenware, and about one inch inside diameter and one foot long. The end of the rod is connected to a piece of copper wire ½ inch thick, and passes about one inch into the end of the tubes. The other end has a rod connected the same way, and passes down into the earth. The tube is filled with charcoal or any other carbon. Mr. Swan (of electric light celebrity) suggested lamp black; but this or any other conducting material could be inserted. An earthenware tube I consider preferable to glass, for if an explosion took place, which probably it would, the effects on the carbon could be better seen than among broken glass. I have never yet been fortunate enough to have the conductor struck, as thunder-storms are not very frequent in this neighborhood."

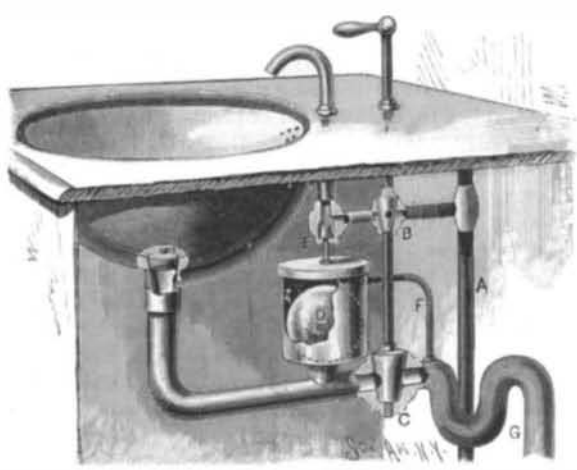
Relations of Sulphurous Acid to the Blood.

Von Ogata has studied this subject in concluding an earlier investigation, and states that the poisonous effects of the free acid rest principally upon the rapid change of the oxyhæmoglobin, whereby the sulphurous acid passes into sulphuric acid at the expense of the oxygen of the blood. Air which held a measured amount of sulphurous acid was conducted through two equal quantities of distilled water and diluted blood. After two liters of air had passed through the water, it (the air) smelt strongly of sulphurous acid, and the water had absorbed a large amount of the gas; the air conducted through blood was, however, without any odor after 8 liters of it had passed through the blood, and the blood itself contained no trace of sulphurous acid, but a corresponding amount of sulphuric acid. An equal mixture of air and sulphurous acid was confined in a receptacle over quicksilver, and the blood, conducted through this, fully absorbed the sulphurous acid. One drop of this blood was added to ten drops of water for spectroscopic examination. The fluid was not red but weakly yellow, and showed in the spectroscope no absorption bands. The instantaneous bleaching of diluted blood by a trace of sulphurous acid was taken advantage of to detect this acid, and it was possible for him with blood in this manner to detect the 0·01 milligramme of sulphurous acid in water. Sulphites do not discolor the blood, not even when acetic or carbonic acid is added. Only by the addition of a strong mineral acid as sulphuric does decoloration ensue. The sulphurous acid works in the organism as well upon the mucous membrane of the air passages and eyes as by disorganization of the oxyhæmoglobin of the blood. The essential cause, however, of death appears to rest in the effects upon the blood, and the gas appears to be a powerful blood poison, as 0·3 per cent in air proved fatal to a number of animals that breathed the mixture for some hours.

COMPOUND AND SELF-ACTING PLUG VALVE FOR WASH BASINS.

The object of the invention herewith illustrated is to prevent the willful waste of water, the overflowing of the basin, and the escape of sewer gas—three very essential points. The inlet pipe has a plug valve, B, to control in a general way the flow of water to the basin, and the discharge pipe has a plug valve, C, to control the flow from the basin. These valves are turned simultaneously by a bar worked by a suitable handle, and their apertures are at right angles with each other, so that one valve will be closed when the other is opened, opening into the discharge pipe is a chamber fitted with a float valve, D, having a stem passing freely through the fixed head of the chamber. Carried at the upper end of the stem is a valve, E, which takes its seat in a casing fitted in a pipe between the valve, B, and the nozzle of the supply pipe. This valve has sufficient play in its casing to leave the passage in the pipe unobstructed and to rise to cut off the flow of water. The small pipe, F, opens into the upper part of the chamber and into the discharge pipe between the valve and trap.

The operation will be readily understood. When the valve, B, in the service pipe is open, the valve, C, in the sewer pipe is closed; the running water then lodges at the valve, C, backs up into the flood chamber, raises the float, D, which controls the valve, E, thereby shutting off the supply of water, at the same time forming an additional



FORD'S COMPOUND AND SELF-ACTING PLUG VALVE FOR WASH BASINS.

water seal or trap, in front of the valve, C, which, the inventor claims, absolutely prevents the escape of sewer gas. As will be quickly perceived, this seal cannot be siphoned out.

Additional information regarding this invention may be obtained by addressing the patentee, Mr. Thomas P. Ford, Jr., 263 Eckford Street, Greenpoint, Brooklyn, N. Y.

Remedy for Rhus Poisoning.

Fluid extract of serpentaria has been used with remarkable success. It is best applied by placing cloths moistened with the extract upon the affected parts, without any friction. Two or three applications generally effect a cure.