A NEW ROTARY ENGINE.

An ingenious rotary engine, in which the steam is used expansively, has been patented by William F. James, of Phœnix, Arizona Territory.

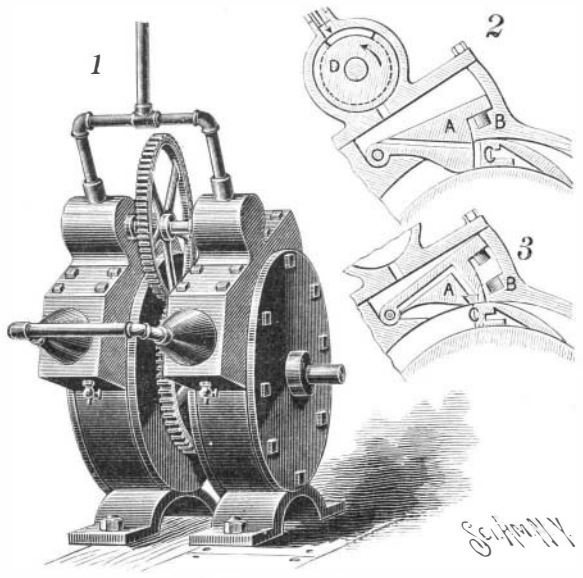
Fig. 1 of the accompanying illustrations is a perspective view of a compound engine; Fig. 2 is a cross-section, showing the cut-off valve and abutment; Fig. 3 is a detail section, showing the valve in a different position.

The cylinder casing is provided with two recesses, one of which serves as an exhaust-chest and the other of which receives the abutment. The piston upon which the abutment bears consists of a block, *C*, secured to the outer surface of the piston disk so as partly to close the steam space. Secured to the block, *C*, is an inclined plate resting on the piston disk. By placing packing plates between the inclined plate and the block, *C*, the depth of the piston in a radial direction may be regulated. The abutment, *A*, is hinged to the outer casing so as to swing up or down in obedience to the action of the rotating piston. The abutment is provided with an extension engaging the wall of the recess; the swinging movement of the abutment is therefore limited. By this means the disk is relieved of the pressure of the abutment without destroying the steam-tight contact. A steam port extends through the abutment and opens at the swinging end so as barely to clear the wall of the steam chamber. When the abutment is in the position shown in Fig. 2, steam is admitted through ports in the abutment recess. To avoid the jar due to the seating of the abutment upon the disk, a dash-pot is employed, entering a hole, *B*, in the casing.

In order to work the steam expansively, a rotary cut-off valve is employed, which is geared with the piston shaft. The gears are of such diameter that the valve and shaft rotate synchronously.

By providing the engine with two or more cylinders the pistons are placed oposite each other, so that there are no dead centers.

It is the inventor's intention to use his rotary engine in connection with a novel life-boat which he has patented and which we described in our issue of October 3, 1896.



JAMES' ROTARY ENGINE.

SOME OSTRICH STORIES.

The ostrich is a curious and remarkable bird, with its enormous body, long legs and small head. The experiences of the ostrich farmers, both in Africa and America, are most interesting, and there are tales without number of the strange antics of the curious birds. Naturally the first thought which occurs on seeing an ostrich is, How fast can it run? When feeding, the stride is only from 20 to 22 inches; when walking, but not feeding, the stride is 26 inches, but when terrified the bird possesses wonderful sprinting qualities and takes steps varying from 11½ to 14 feet. Taking 12 feet as the average, they would cover about 25 miles an hour, but the stories of birds traveling a mile a minute are open to question. Other traits of which we are always hearing is their lack of both suspicion and intelligence. Bushmen clothe themselves in one of their skins, and under cover of this go near enough to kill them with poisoned arrows.

When the bird considers that he has distanced his pursuer, he often puts his head in the sand, thinking he has thereby made himself invisible. Sometimes when hotly pursued he turns upon his enemies and gives severe wounds with his feet. The habits of ostriches are not particularly attractive. They eat fruits, game, vegetables, leaves, tender shoots, insects, snails and any other food that can be picked up, including all kinds of indigestible substances, which they swallow from stupid voracity. They are equally foolish about laying their eggs; they often begin before the spot has been fixed upon for the nest, and the solitary eggs are often found lying forsaken all over the district frequented by the ostrich. The nests are simply holes in the sand and vary from 3 to 6 feet in diameter. In these are laid by a single bird, or many in company, from twelve to fifty or sixty eggs. They are incubated by night and left to the heat of the sun during the day. The males assist in the incubation and also in taking care of the young until they can provide for themselves. When the ostrich chicks are as big as a common fowl, they run with great rapidity.

Europeans do not care for the taste of the ostrich eggs, but bushmen are very fond of them. They weigh from two to three pounds and are equal to twenty-four hen's eggs. The flesh somewhat resembles turkey, but is very tough. It will be remembered that the ostrich has been known from remote times, and their brains were served up as food on the tables of the Romans, and are referred to even in the book of Job.

Ostrich farming has already become a considerable industry in this country, as our readers will remember. Down in Florida, on an ostrich farm, there is an ostrich which acts as watchman, and woe betide the colored gentleman fond of taking fowls which do not belong to him. Such a person was nearly killed by this bird while he was attempting to steal some pheasants. This interesting bird, which has been dubbed "Napoleon," patrols the camp every little while, giving at intervals a cry which may be said to mean "All is well." If anything alarms him, he at once communicates it to his companions by a series of yells as he advances to the attack. The Brooklyn Eagle recently gave an interesting account of the method of procedure of this bird.

When fighting, the ostrich attacks his opponent with his feet with a series of lightning-like but terrific forward kicks. The power behind these efforts would make any government mule die with envy, and when it is known that the feet themselves are like ordinary railroad spikes, and ostriches have been known to disembowel a horse, it can be imagined what chance an unarmed person would stand in a fight. "Napoleon" stands nearly 10 feet high and weighs over 400 pounds. He is a bird of unusual intelligence, and during the day he is violent enough for ordinary purposes. At night, however, he becomes a true demon, and often his keeper is obliged to stand at a distance; and to see his keeper force "Napoleon" back to his pen every morning, with a large fork, is one of the sights of the ostrich farm. The enormous bird screeches with rage and strikes out with his feet, all the while slowly giving way.

One night those on the farm were awakened by a most terrific series of noises. Mingled with the roars of "Napoleon" were the agonizing shrieks of a human being. Rushing to the pens, the cause was soon discovered. There, careening wildly, was a negro, and at his heels followed "Napoleon." The sight was laughable had it not been of a rather serious order. The ostrich would strike out and the negro would make a zigzag run. In the bright moonlight the negro's face was blanched white with the fear of death, and his cries for help moved even the hearts of the attendants to mercy. Finally the negro reached the fence and made an effort to get over but the bird with a final effort struck him, and if the blow had caught the negro squarely, it would undoubtedly have killed him. As it was the blow was a glancing one upon the thigh, which ripped it open and exposed the bone, and for a time it was thought the poor pheasant thief would bleed to death. The fame of this episode has naturally caused the pheasants' quarters to be shunned by other depredators, but notwithstanding this fact, "Napoleon" still keeps guard, and the colored folk of the neighborhood need not have any other lesson.

THE OSTRICH AS A BEAST OF BURDEN.

One of our California correspondents recently took a photographer to the South Pasadena ostrich farm, and after their views had been taken, it occurred to him that a picture of himself on a full-grown, native male ostrich would be interesting to the readers of the SCIENTIFIC AMERICAN. He requested an attendant to catch a bird and cover his head with a sack, which done he vaulted upon the creature. Immediately the photographer adjusted the camera and the attendant snatched the hood from the head of the bird, which immediately rushed away. The venturesome scribe slid safely to the ground after the first hundred yards had been traveled. History records the fact that the natives of Abyssinia frequently ride upon ostriches, but it is not likely that this amusement will become very popular on the ostrich farms of America.

Automobile News.

In Dakota thrashing engines have been used to haul several wagon loads of grain. As many as ten wagons can be transported with the aid of a powerful traction engine.

Fire Chief Croker, of New York city, has been using a steam automobile for going to fires. The results have been so very satisfactory that the use of motor vehicles will undoubtedly be considerably extended in the Department in the near future.

It is likely that automobiles will be shortly permitted to enter Druid Hill Park, Baltimore. The Park Commissioners recently took a ride in an electric vehicle to observe its effect upon the horses. They passed about 400 teams during their ride, and only about 2 per cent of the horses showed any fright, and even these were easily controlled by their drivers.

The Cycle and Automobile show will be held at Madison Square Garden during the week following January 20, 1900. Nearly all of the space, even in the galleries, has already been taken. In fact, it will be impossible to accommodate any more automobile concerns that may desire to exhibit heavy vehicles, for anything which is now given space must be light enough to be carried up on the balcony.

An automobile fire pump is being tested in Paris. The electric motors are operated by a storage battery, and it is arranged so that the power can be changed from the propulsion of the wagon to that of driving the pumps. The cost of operating an electric cab in Paris is, according to The Automobile, $3.97 a day. The calculation is based upon the supposition that the distance traveled per day is 37 miles, of which 9 are to and from the depot and 28 on the trips.

At Alençon, France, motor carriages are used for city ambulance work. The motor quadricycle is coupled to an ambulance carriage of the Lagogue pattern. Its purpose is to go to the succor of some injured person some distance from the town. The driver fetches the doctor and places him comfortably on the front seat of the motocycle. On arriving at his destination, the doctor immediately attends to the needs of the injured person. If necessary the patient is placed in the ambulance-carriage, and all return with all possible speed to the hospital.

The Current Supplement.

The current SUPPLEMENT, No. 1251, has many articles of unusual importance. "Long-Span Bridges" is the first installment of a valuable series forming an address by Prof. W. H. Burr, of Columbia University. It is fully illustrated. "The Highest Aim of the Physicist" is by Prof. Henry A. Rowland. "The Development of Iron Manufacture in the United States in the Past Seventy-five Years" is by John Fritz. "The Rapid Seasoning of Wood Through Electricity" is an illustrated article describing a new process. "New Method of Designing Fabrics" is a fully illustrated article dealing with Herr Jan Szczepanik's remarkable photographic process. It is accompanied by 40 engravings.

Contents.

(Illustrated articles are marked with an asterisk.)