SUGGESTIONS FOR INVENTORS.

There are at least two classes of inventors which are particulars. Inventors of one class are brimful of ideas, and are able to make choice of a large number sity for it, but have not an exhaustless fountain of eons. ideas, and are, therefore, dependent upon what they ventions are needed, or how to go about it to get this valuable information, the following hints are given.

ventors of this class can work:

Bicycles, although brought to great perfection, seem being copied from Young's "General Astronomy." to us to require something neater and better than the endless chain and sprocket wheel for connecting the crank shaft and drive wheel. Rowboats, especially such as are used by sea-going vessels, ought to be provided with better means of propulsion than the ancient would apply to pleasure boats.

In these days apartment houses and flats are extenvenience in moving, house cleaning, storage, etc., the journey. furniture should all be made so as to knock down and furniture should be connected so that they will not becommon use to such an extent that the difference would not be readily noticeable.

Any good food product made in a new form and put come the attractive power of the mighty central mass. up in an attractive shape takes well, and large fortunes conveniences for ladies or gentlemen are apt to prove profitable; toys are an unending source of profit to the inventor who strikes a vein of "taking" things, and so we might go on with an endless variety of subjects, great and small, which only await the wideawake inventor.

*** JUPITER'S NEW MOON.

great Lick telescope a few days ago quite as unex- to be the abode of life. A world only 100 miles or so pectedly as the two satellites of Mars swam into the in diameter parts with its heat very rapidly, and we E. Barnard nor Asauh Hall was looking for new or stellar space. hitherto unseen worlds when they achieved immor-

by the intrusion of Barnard's fifth satellite among maze of intricate and rapid motions.

centrifugal force of 26,000 miles per hour at the Jovian equator and compare it with the centripetal force of widely distinguished from each other in two important the planet's prodigious attracting mass. The latter greatly preponderates, and if calculations are not at fault, the giant planet has been holding itself firmly of valuable subjects for invention, and seldom or together for countless ages, and the active little world never seek suggestions. Inventors of the other class discovered by Barnard has been pursuing its rapid are ingenious, able to invent when they see a neces- journey for a corresponding period of astronomical

We can better appreciate the significance, or percan obtain from others in the way of suggestions. For haps we should say the insignificance, of this little the latter class, who frequently inquire as to what in- moon by comparing it with the other Jovian satellites and our own moon. With the exception of the minute orbs moving around Mars, it is he smallest known An inventor who has neither a large fortune nor ex- satellite of the solar system. But there are many ashaustless patience can make greater progress by work- teroids which rival it in diminutiveness; these, however, ing out small, simple inventions than by attempting are only half as far away as the Jovian system, and are great things. Here are a few subjects on which in- not dimmed by proximity to his overpowering luster. Following is a table of Jupiter's moons-the outer four

	Distance.	Diameter.	Period.	
Barnard's	113,000	10 0		12h.
Io	261,000	2,500	1d.	18h.
Ептора	415,000	2,100	3d.	13h.
Ganymede	664.000	3,550	7d.	4h.
Calypro	1,167,000	2,960	16d.	17h.

oar. Such means should be something like the modern The second column gives the distance in miles from screw propeller, substituting man power for steam the center of the planet. As Jupiter has a diameter of power. The important part of this invention would 86,000 miles, Barnard's moon is only 70,000 miles from lie in the motor to be operated by the men. It should 'its surface, or less than one-third the distance of our be very simple and so constructed that, although un- moon from the earth. As our moon is 240,000 miles used and exposed to the weather, it would still be distant, has a diameter of 2,160 miles, and makes a ready for instant use at any time. The same device siderial revolution in 27 days and 8 hours, it will be seen that it approximates the satellite Io in distance from its primary, and Europa in size. But note sively used for dwelling places, and where room is the great disparity in periods. While Io, a little economized to such an extent, furniture should be further away than the moon, darts around Jupiter in made to conform to the conditions: that is, to facilitate 42 hours, our plodding satellite consumes 656 hours, or the delivery of furniture to such places and for con- nearly sixteen times Io's period to accomplish a shorter

This is striking evidence of the overwhelming mass fold up flat or nearly so. The parts of each piece of j of Jupiter as compared with its retinue of satellites. While it would require but 50 of our moons to equal come separated and mismatched or lost, and when set the bulk of the earth, and 81 to equal its mass, it would up ready for use, the furniture should resemble that in $^{!}$ require 316 earths to equal the mass and 1,300 to equal the bulk of Jupiter. These Jovian moons, then, are forced to move with high centrifugal velocity to over-

Comparing these moons with some of the other are being made on this class of inventions. Articles, planets, we find that Calypso has nearly the same of wearing apparel, especially those used by ladies, if diameter as Mercury, and Ganymede would equal the novel and pleasing, go without much urging. Pocket bulk of Mars if its diameter were 650 miles greater. Titan, the sixth moon of Saturn, is the only other satellite which equals Ganymede in size.

Are these Jovian and Saturnian worlds, with nearly half the earth's diameter, inhabited? Probably not. They may have low forms of animal and vegetable life, but the conditions do not seem favorable for the development of intelligent beings. If they have oceans and atmospheres, their vast primaries would The discovery of a new secondary planet is an event produce such enormous tides that scarcely any porof no small importance in the world of astronomy. tion of the habitable land would escape overflow. Of The fifth moon of Jupiter came into the ken of the course we cannot even imagine the Barnard satellite field of the Washington telescope in 1877. Neither E. may fairly assume that its surface is as cold as inter-

But suppose a human being were permitted to step tality by a keenness of vision which enabled their upon the surface of Io, what a magnificent celestial practiced eyes and trained intellects to perceive what panorama would be unrolled to his gaze! Mighty had escaped a host of other observers in the same Jupiter, with an apparent diameter 43 times that of our moon, would cover an area of the starry heavens The discovery of the new Jovian satellite disturbs 20 degrees in diameter. He would hide the entire conthat nice geometrical progression which aided students stellation of Orion at one time. Unlike the unchanging to memorize the number of moons belonging to the face of our dead moon, which reflects only 17 per cent solar system. Beginning with the earth and proceed- of the sun's rays, his surface is covered with great ing outwardly the account stood as follows: The earth masses of brilliant vapor swirling and rolling and one, Mars two, Jupiter four, Saturn eight, Uranus four, heaving in billows of tremendous agitation and reand Neptune one, total twenty. We might reason-flecting 62 per cent of the sun's rays. And in addition, ably hope to find another satellite revolving around four balls, of lesser light, varying in size, and exhibit-Neptune, thus perfecting the geometrical sequence, ing all the phases from slender crescents to full-orbed but the harmony of arrangement is utterly destroyed globes, would be seen gliding across the heavens in a

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Jupiter's moons.

DREDGING THE HONOLULU HARBOR BAR. Questions at once arise in the mind of the physicist, A matter of interest to engineers and of great value What is the meaning of this little lunar world? What relation does it sustain to the Jovian system?¹ to commerce is the accomplishment of the work of What light does it throw upon the process of world cutting a channel 200 feet wide and 30 feet deep making? Are Jupiter and the other giant planets through the bar at the entrance of the harbor of Honstill engaged in throwing off new masses from their olulu, Hawaiian Islands. bulging equators? The harbor is a deep, narrow channel, extending

The rapid diurnal rotation of both Jupiter and from the shore line out to the deep waters of the open Saturn, giving objects on their surface an enormous sea-a distance of about 7,000 feet. It is flanked on centrifugal motion, lends color to the latter conjecture, both sides by extensive mud and sand flats, which are and we notice that this theory has been broached by bounded on the seaward side by a line of coral reefs of a writer in the Chicago Post. But is it tenable? Ju- irregular depth, upon which the surf is continually piter has long since cooled down from a gaseous to at breaking. The width of the channel directly in front least a semi-solid condition, and is about one-third of the city is from 800 to 900 feet, gradually contracting heavier than water. It is true that the velocity of its to a width of about 450 feet at its mouth. The bar is diurnal motion has caused its equator to protrude so situated near the outer end of the channel, is about that the planet presents an oblate appearance in a 1,100 feet in length above the plane of 30 feet depth, telescope of moderate power, and measurements show and has on its apex a minimum depth of 21 feet at low that its equatorial diameter is 5,300 miles greater than tide. Inside of the bar, the depth of the harbor varies its polar; but it is a simple problem to compute the from 18 to 39 feet. The average rise of ordinary tides