

TUSAYAN KATCINAS.

In the Fifteenth Annual Report of the Bureau of Ethnology to the Smithsonian Institution, 1893-1894, there is an interesting monograph by Mr. Jesse Walter Fewkes, entitled "The Group of Tusayan Ceremonials called Katcinas." By permission of the Director we are able to reproduce two of the illustrations from this interesting monograph. The following is only a brief summary of a part of the monograph. In their use of the word Katcina, the Hopi or Moki apply the term to supernatural beings impersonated by men wearing masks or statuettes in imitation of the same. The dances in which the former appear are likewise called by the same name, which with the orthography "Cachena" is used in descriptions of these dances in the valley of the upper Rio Grande. The present use of the term among the Tusayan Indians leads Mr. Fewkes to consider it as almost a synonym of a supernatural being of subordinate rank to the great deities. Ancestral worship plays a not inconspicuous part in the Hopi conception of a Katcina. Worship, as we understand it, is not a proper term to use in the description of the Indian's methods of approaching his supernatural beings. It involves much which is unknown to him and implies the existence of that which is foreign to his conception. Still, until some better nomenclature, more exactly defining his methods, is suggested, these terms, for their convenience, will still continue in common use. There exist in Hopi mythology many stories of the olden times which form an accompanying body of tradition explaining much of the symbolism and some of the ritual, but nowhere has Mr. Fewkes found a sequence of the ceremonials to closely correspond with the episodes of the myth. The characteristic symbolism is prescribed and strictly conforms to the legend. Anyone who has studied the ceremonial system of the Tusayan Indians will have noticed the predominance of great ceremonials in winter. From harvest time to planting there is a succession of celebrations of most complicated and varied nature, but from planting to harvesting all these rites are much curtailed. The simplest explanation of this condition would be, and probably is, necessity. There is not time enough to devote to great and elaborate ceremonials when the corn must be cared for. Hence, the spring and early summer observances are abbreviated. Although the Pueblo farmer may thoroughly believe in his ceremonial system as efficacious, his human nature is too practical to consume the precious planting time with elaborate ceremonials.

It has been proved by repeated observations of the same ceremonials that there is a great constancy in the way successive presentations of the ritual are carried out year after year. The inevitable modifications resulting from the death of old priests undoubtedly, in course of time, affect individual observances, but their ritual is never voluntarily changed. The Hopi do not get up the ceremony to please the white man. Each observance is traditional and prescribed for a certain time in the year. Mr. Fewkes then gives a tabular view of the sequence of Tusayan celebrations.

Before considering the various ceremonials in which the Katcinas appear, it may be well to say something of the nature of the supernatural beings which figure in them, as made known by the testimony of some of the best known men of the tribe. These deities are generally regarded as animistic and subordinate to the greater gods. They have been called intercessors between man and the high supernatural beings. There are misty legends that long ago the Katcinas, like men, came from the under world and brought with them various charms with which the Hopi are familiar. If there is any one feature which distinguishes a Katcina, it is the use, by some or all of the participants, of a mask or ceremonial helmet. The Katcinas are divided into two groups—the complete and the abbreviated; the former is constant year by year, the latter varying. Altars are present in the complete, absent in abbreviated presentations. A cloud charm altar, or invocation to the six world-quarter deities is sometimes made. Public announcements are not prescribed, the clowns are generally present. Abbreviated Katcinas consist mainly of public dances in which Katcinas, Katcinamanas and clowns take part. The prayer offerings are few in number and the ceremony ends in a feast, there generally being no altars.

Roughly speaking, we may say that the Katcina celebrations are characterized by the presence of individuals who do not appear in the unmasked or nine days' ceremonials. Mr. Fewkes classifies the Katcina

celebration into two large groups which may be called the elaborate and the abbreviated. Under the head of elaborate Katcinas may be included Soyáluña, Katcina's return, Powámú, Pátlilkoñti, Nimánkacina.

Space forbids our describing more than one of these ceremonies; so we will take the Soyáluña, which is distinctly a warrior's observance and has been called the Return Katcina. In one sense it may be so designated, but more strictly it is the return of the war god, regarded as a leader of the gods. The singing of the night songs of the warriors is one of the most effective archaic episodes of the ceremonial of the winter solstice. The following is a slight condensation of Mr. Fewkes' interesting observations on the events and celebrations of 1891.

On December 22 of that year most of the men of the village prepare cotton strings, to the end of which they tie feathers and piñon needles. These are given away during the day to different persons, some receiving from one to two dozen, which they tie in their hair. When a maker of these feathered strings presents one to a friend, he says: "To-morrow all the Katcinas to you grant your wishes;" holding his bundle vertically and moving it with a horizontal motion. At nightfall

After the societies had entered the kiva an invocation to the cardinal points was chanted. At a signal the society raised itself into two irregular groups, one on the north, the other on the south side of the main floor. All then vehemently burst forth into a song, the shield bearer making eccentric dashes among his associates, first to one side and then to the other.

While the song lasted the shield bearer continued these rushes and the assembled groups crouched down and met his dashes by rising and driving him back. He madly oscillated from right to left and swung his shield in rhythm while those near him beat their feet in time. The shield was dashed from face to face and the groups made many motions as if to seize it, but no one did more than touch it with outstretched hand. About eight P. M. a dozen men were collected in the Monkiva, among whom was Lésma, playing a flageolet. The hatchway was guarded by a tiler, and for a nácti there was placed there a wicker skull cap ornamented with a pair of imitation mountain sheep horns. Two hours later the room was densely packed with naked men, their bodies undecorated, wearing small eagle plumes attached to the crown of the head; two women were present. Anawfta, chief of the Kwákwantú, sat

alone on the southern side of the main floor and twelve chiefs sat opposite him.

Ten novices from the other kivas entered gorgeously arrayed in white kilts, with brilliant crowns of feathers and white body decorations, bearing an imitation squash blossom, with spruce sprigs in their left hands and corn in their right hands. As the chiefs took their places Lésma sprinkled the floor of the room near the ladder with moist valley sand, about an inch deep. The novices stepped from the ladder upon this sand and passed up in front of the chiefs, then squatted before them, facing the south, their kilts having been lifted so they sat on the cold floor. Anawfta then crossed over to the south side of the room and seated himself at the east end of the line of chiefs.

At the west wall of the kiva a strange altar had been erected. Lésma had piled against the ledge of this part of the kiva a stack of corn, two or more ears of which had been contributed by the maternal head of each family in the pueblo. At either side and in front of the stack of corn shrubbery had been placed. In the space between the top of the corn pile and the roof wands were placed, and to these wands had been fastened many artificial flowers, four or five inches in diameter, set close together but in no regular line. Nearly in the center of this artificial shrubbery there was a large gourd shell with a convex side turned toward the audience and having an aperture about eight inches in diameter in its center. Through this opening had been thrust the head of an effigy of Pátlilkoñti, the plumed-headed snake, painted black, with a tongue-like appendage protruding from the mouth. When all the assembled priests were seated a moment of solemn stillness ensued, after which Súpela arose, cast a handful of meal toward the effigy of the snake, and said a short prayer in a reverent tone. Then the head of the snake, which was manipulated by an unseen person behind the altar, was observed to rise slowly to the center of the aperture, and a mellow sounding roar, like a blast through a

couch, appeared to come from the mouth, while the whole head was made to quiver and wave. The sound was of short duration, repeated four times; then the head reposed on the lower rim of the ground shell. Presently was heard the sound as of a scapula drawn across a notched stick six times. All the old chiefs in succession cast meal to the effigy and prayed. In response to each the great snake emitted sounds identical to those mentioned above. The spectators then left the kiva and a frenzied dance of strange character occurred. The societies from other kivas came in, and the chief of each declaimed in a half chanting voice which arose to a shriek at the close of the stanza. First he drew back to the fireplace and then with a shuffling gait approached the symbolic opening in the floor called a sípapú.

Anawfta then shouted at the top of his voice and the shufflers sprang in the air and vaulted over the sípapú. Then everybody in the room shouted loudly, and a song and concert followed. A moment later the visiting societies dashed down the ladder, each bearing a splendid shield ornamented with the figure of the sun and a radiating rim of eagle feathers. Each society had its distinctive sun shield, which on entering was handed to the chief. As he received it he stamped on the sípapú and a fierce song was sung; meanwhile two members of the society stood apart from their fellows



RELIGIOUS DANCE AMONG THE TUSAYAN INDIANS.

each man procures a willow wand from three to four feet long and loops upon it all the strings he has received. He then carries his stick to the Mónkiva and places it in the rafters, thus imparting to the ceiling the appearance of a bower of feathers and piñon needles.

All the Kivas were meeting places of the participants, but the Tátaukyamú met at the Mónkiva, where the principal festivities took place. Their chief wore a head dress decorated with symbols of rain clouds and carried a shield upon which was depicted the sun. The chief of a second society carried a shield upon which was drawn a star, and a third chief bore a shield with an antelope drawn upon it. The head dress of the chief Aáwypkiya was adorned with glittering triple horns and on his shield was represented an unknown Katcina. The fifth society was Kwákwantú, or warrior whose chief carried in his hand an effigy of the great snake which was carved from the wooden stalk of the Agave, from which the society was named. He came from the Teivato-Kiva and on his shield was depicted a Kwákwantú in full costume. The sixth society was the Tatelkti, or "knobbed heads;" their shield bearer wore a head dress like a coronet, while on his shield was drawn a black figure with lozenge-shaped eyes. The shield of the chief of the seventh society was adorned with the picture of the Sun Chief.

against the southern wall, facing each other, each holding a squash flower emblem in a bouquet of spruce twigs and an ear of corn in his left hand.

Suddenly the fifteen or twenty members of the society drew back from their chief, who then sprang upon the sfpapû plank and, quickly turning, faced them as all burst forth in ecstatic shouting, with wild flinging of their arms, as they approached the shield bearers. They naturally formed two clusters, and as the shield

bearer dashed his shield in their faces they surged back, to leap again toward him. This assault was maintained in time with the song. The two chieftains joined their men all in ecstatic frenzy and one of them, shaking his shield, sprang from right to left, drawing back his assistants in rhythm with the beating of the feet of all on the floor. After a few moments of most exhaustive movements, some of the weakest staggered up the ladder, and shortly after one of the chiefs fell fainting to

the floor, overcome by exhaustion and the heat of the room. The men who belonged to the Mōñkiva took no part in this exhaustive dance, but stood in readiness to carry those who fainted up the ladder to the outside.

It has been suggested that this assault of the man on the bearer of the sun shield dramatizes the attack of hostile powers on the sun and that the object is to offset malign influences or to draw back the sun from a disappearance suggested by its southern declination.



THE NATACKA CEREMONY AT WALPI.

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

REFRIGERATOR CAR.—Charles S. Hardy, San Diego, Cal. In this car the ice receptacle, while designed to act with thorough efficiency for refrigerating purposes, is arranged to fold clear out of the way of an ordinary non refrigerated cargo. The ice box and draught flues are in the main arranged according to plans set forth in formerly patented inventions of the same inventor, the present patent providing for a swinging floor made in sections, and vertical doorlike sections corresponding to the floor sections and having cleats to support them when opened, with latch devices to hold the doorlike sections closed. When the apparatus is folded against the side of the car it takes up but little room and leaves the car interior practically unobstructed.

CAR COUPLING.—Elisha F. McMurtrey, Rison, Ark. This coupling is of simple construction, and is automatic in operation when coupling with another drawhead from which an ordinary link is projected, the uncoupling being effected from either the top or side of a car. An apron is fitted in the open lower side of the drawhead, and is pivoted in position to rock as the drawhead is met by an opposing drawhead, to guide the link in the proper direction, and release the coupling pin, which drops by gravity into engagement with the link.

Bicycles, Etc.

EXTENSION GEAR.—William E. Golding, Wakefield, N. Y. To enlarge a sprocket wheel on a bicycle, this invention provides a novel form of rim having sprockets on its periphery, while the inner portion of the rim has flanges on both sides to engage opposite faces of the sprocket wheel on the machine. The flanges on the inner face of the rim are adapted to engage the sides of the adjacent sprocket teeth, preventing lateral movement on the sprocket wheel in one direction, and on the opposite face of the rim are bosses adapted to pass between the teeth of the sprocket wheel, and be hammered down in the form of flanges, thus locking the rim on the sprocket wheel.

Mechanical.

BARK PEELING MACHINE.—John T. and George W. Jones, Western Port, Md. To peel or cut the bark from logs before cutting the latter into chips for making wood pulp, these inventors have devised a machine to do the work quickly and without wasteful cutting of the wood fibers. It comprises a set of log-turning and supporting devices and two series of yielding cutter heads arranged on independent axes alternately upon opposite sides of the log table, the cutter heads revolving in opposite directions to cause the pull of one set on the log to neutralize that of the other set. As the log is turned one series of cutter heads takes off a series of rings of bark and the other series strips the intervening portion, a single revolution of the log causing it to be entirely stripped of its bark.

SHEET PAPER DRIER.—Louis Dejonge, Jr., Stapleton, N. Y. This invention covers an improvement on formerly patented inventions of the same in-

ventor, whereby the sheets will be conducted with greater advantage around with the cylinder of the coloring machine, the color being prevented from flowing under or gathering at the edges, simplified clamping devices being employed to deliver the sheets more accurately to the carriers by which the sheets are taken through the drying section of the machine. The drying section of the machine is so constructed that the sheets while wet will be supported throughout their travel in such a manner that they will not buckle, and the sheets will be delivered to a receiver in perfect condition, steam pipes being placed between the various tiers and also at the bottom of the drying frame to facilitate drying.

BAKING POWDER PACKING MACHINE.

—James McNab, Catonsville, Md. As the mixed acid and alkali of baking powders quickly deteriorate when exposed to the air, while arranged in layers the portions in contact form a neutral film between their opposing parts, preventing such deterioration, this invention provides for laying the alkali and acid powders in layers side by side or one upon the other, in such proportions as may be desired, in an accurate and expeditious manner. The machine comprises a belt carrier along which is reciprocated a carriage on which a divider is movable up and down, a pivoted rocking arm being geared with the divider and an operating mechanism connected with the arm. A delivery box is arranged at one end adjacent to the carrier, so that a box may be shipped over the end, a plunger forcing the box and the charge off the delivery plate and bringing a new charge in position to receive a box.

Agricultural.

COTTON CHOPPER.—Frank L. Richter, Moravia, Texas. A combined disk plow and cotton chopper is provided by this invention, one capable of attachment to any form of cultivator, the chopping attachment being so arranged that all surplus plants will be cleanly and quickly cleared from the ground and the standing plants be left at regular intervals. Upon the axle are secured cultivators, in advance of which are the chopping disks, placed at angles to one another, and revolved in close relation to each other at right angles to the cultivator disks, peripheral recesses in one chopping disk registering with corresponding recesses in the other disk. The disk plows, as the machine advances, cultivate the ground between the rows of standing plants, and the machine is of simple, strong and inexpensive construction.

Miscellaneous.

STREET SWEEPER.—Patrick F. Duross, Long Island City, N. Y. This is a device especially adapted for hand use, to take the place of hand brooms and sweepers. It comprises a box or receptacle for the sweepings supported upon wheels and having pivoted to it a hopper to receive the sweepings from a rotary broom, the sweepings being directed into the hopper by a chute which projects under the broom and guides the sweepings into the hopper. The receptacle is open at the upper corner adjacent to the hopper pivot, and the contents of the hopper are dumped into the receptacle by swinging the hopper up so as to fill this opening. At

the lower corner of the receptacle is a door by which it may be emptied.

MUSICAL INSTRUMENT.—Gholson H. Graham, 2418 Magazine Street, New Orleans, La. To facilitate playing stringed instruments, as violins, cellos, etc., this inventor has devised an instrument in which a sounding board is held in a suitable casing, strings being stretched over the sounding board, and the performer will be able to properly play the instrument by manipulating the keys. The instrument has revoluble shafts adapted to be moved laterally, there being a hair-covered wheel on each shaft adapted to engage a corresponding string, and levers connected with the shafts adapted to be actuated by keys, the performer in playing the keys causing a sounding of the strings by the action of the revolving hairs.

SNAP HOOK.—Charles T. Redfield, Glen Haven, N. Y. This is a cheap and strong device in which the shank is provided with a seat with which the hook is adapted to interlock, the hook having a longitudinal and lateral tension, and being adapted to be sprung into and out of engagement with the shank seat, both of which operations may be easily effected in the dark with mittens or gloves on. The device is of especial utility in harness, or it may be constructed for use on vest chains, for snapping on the ring of a watch, for eyeglass holders, etc.

TOOL FOR MINERS' USE.—John D. Campbell, Leesburg, Idaho. This is a combination tool, embracing a candle holder, a powder knife, a fuse cutter, a fuse splitter, a cap crimper, and devices for securing the tool in a beam or suspending it from any convenient support. The tool is compact, and the candle will remain upright while every portion of the tool is being used, the cutters being readily removed for sharpening.

WINDOW CHAIR.—William Timmis, Pittsburg, Pa. This is a chair especially adapted for use as a temporary support in window cleaning, being foldable for placing it in or removing it from a window, and forming a firm and stable support when expanded and duly adjusted. The chair is composed of a retaining bar formed of two sections hinged together and a device for holding them in rigid alignment, transverse bottom bars being attached to two parallel bars, and being formed of hinged foldable sections having locking devices.

SKIRT RACK.—Cyrus H. Devlin and Norman H. Cowles, Bay City, Mich. In display stands or racks for use in stores, this inventor has devised a rack more especially designed for supporting a large number of skirts and trousers in such manner that customers may readily examine without danger of folding or creasing them. The base has a number of sockets in which are standards supporting parallel rods, a bridge piece connecting the rods, on the inner sides of which are fastening devices to support the garments, while allowing of their convenient removal as desired.

QUILTING FRAME.—Nina More, Cutting, N. Y. The parts of this frame are readily detachable, so that the whole thing may be packed away in small space when not in use, but forming a rigid structure when set up. Each side rail carries two extensible legs by which the frame is supported, and may be placed

at the desired height, and the end and side rails are secured together by U-shaped clamps. On the upper face of each rail is a series of pairs of plates carrying clasps to hold the ends of the quilting material and facilitate stretching it as desired.

RIPPING AND STITCH PICKING TOOL.

—James Darmody, New York City. For ripping stitched seams and cutting threads or bastings from the cloth, this tool is made with a body portion having a longitudinally curved cutting edge at one end and a transverse cutting edge at the same end, with a stitch picking hook at its opposite end, the cutting portion of the tool being covered with a shield when the hook portion is being used.

PNEUMATIC WATER RAISING DEVICE.

—Edmund Pitcher, of Keene, and Edmund H. Sargent, of Sunapee, N. H. A windmill or other motor, according to this invention, is connected with an air compressor, and the latter is connected with a reservoir, from which a valved pipe leads to a submerged tank sliding vertically on guide rods, the opening of a valve forcing the water to the desired place of discharge, and the tank rising and falling according to the quantity of air and water in it. This pneumatic pump may be located at any desired distance and depth from the motor and air compressor, and a small pipe may be used for conveying the necessary amount of compressed air to the tank and forcing out the water to the required height.

SIGN.—William W. Reynolds, New York City. This sign consists of a hollow body having the face next to the observer of opaque material and dark color, through which the characters of the sign are cut, while a background within or back of the surface, and turned toward the observer, is of a light-reflecting color or material. The sign is to be illuminated at night by lamps placed within it, but not visible directly from the outside, the illumination being by reflected light from the background.

BOTTLE WASHER.—John Schutz, New York City. This is a machine designed to quickly clean and rinse a case full of bottles at one time. A vertically movable platform supports a box containing the bottles, and is provided with fixed nozzles through which water supply pipes extend, revoluble shafts extending through the pipes and carrying cleaning devices which extend beyond the top of the pipes and are adapted to be closed by the nozzles in the up and down movement of the platform. The cleaning devices are also adapted to pass into the bottles to clean them.

SHADE HANGER.—Ferdinand E. Stahlhut, Carpenter, Ill. According to this invention, the roller of the window shade may be moved to any point along the window frame, so that the shade may admit the light from the top or the bottom, or be adjusted as desired in other respects. These different adjustments are effected by drawing on a cord which extends down at the side of the window frame, where it is attached to a suitable cleat, the entire construction being simple and inexpensive.

IMPROVED BED.—David D. Toal and Richard Wilson, New York City. This invention provides a novel form of hammock, or suspended bed, sup-