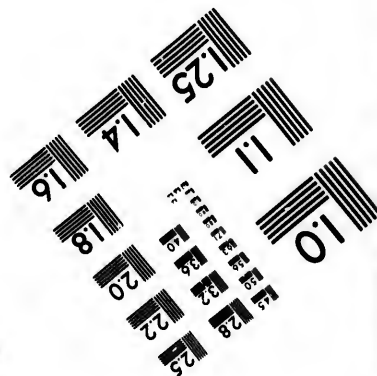
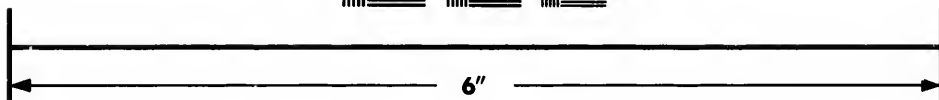
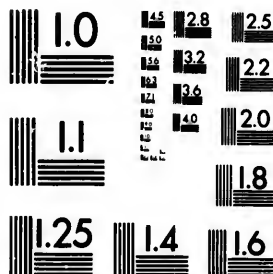


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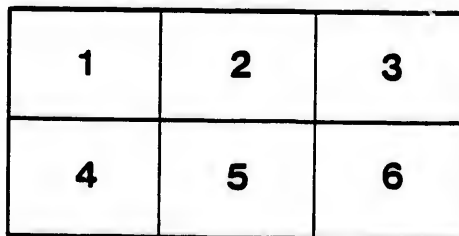
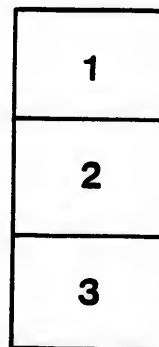
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SPECIFICATIONS AND INSTRUCTIONS

FOR

6
CONSTRUCTING AND WORKING
HOUGH'S SOPER IMPROVED BEE-HIVE ;

ALSO, THE PRACTICAL WORKING OF

FIFTY-THREE PROPOSITIONS

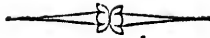
CLEARLY ELUCIDATED ; WITH A NUMBER OF VALUABLE RECIPES
FOR THE

MANAGEMENT OF BEEES ;

LIKEWISE,

SPECIFICATION AND WORKING OF

HOUGH'S EUREKA FUMIGATOR.



SARNIA :

PRINTED AT THE "OBSERVER" STEAM JOB PRESS.

1870.

ENTERED according to Act of Parliament
of Canada, in the Year One Thousand Eight
Hundred and Seventy, by WILLIAM S. HOUGH,
in the Office of the Minister of Agriculture.

INTRODUCTION.



THE OBJECT OF THE WRITER WAS ORIGINALLY to defer publishing, until he could mature and complete a highly illuminated Octavo Volume,—although it might require years to do so. Being often urged by his friends to give them a brief Hand Book, he consented; but circumstances occurred which at the present prevent him, and in its stead, to those who have a right to use his Hive, he offers a *Synopsis* of his private Memoranda.

Few men can more earnestly desire the development of a thorough, sound, *practical* knowledge of Bee culture, than he does.

The Text Books on this subject are numerous, many of them excellent, all profitable for the bee-keeper to read,—but none free from errors; errors which have been demonstrated to be such, by good bee-keepers who never had, nor will have any aspirations for notoriety beyond the limits of their Bee yard, and are therefore honorable and unbiassed by prejudice in their decision.

How is it that so many errors are incorporated among so much that is good in so many authors?

Perhaps the cause may be assigned to this fact: the author goes through a series of experiments with some pet hive, confining his observations to his own Apiary, obstinately refusing to recognise any additional ideas brought to light by any other party, or illustrated by the aid of any other Hive,—thus imagining himself *the oracle* on all matters pertaining to Bees.

Had he travelled through the length and breadth of any great extent of country, dissected and transferred the contents of many hundred hives, in as many different localities, positions, and situations, and carefully observed the results of his varied operations, he would have obtained a kaleidoscopic, instead of a microscopic view; he would have learned that which would have soon divested him of his vanity. There are doubtless many men who are competent to do the subject justice, were they disposed to make the required sacrifices, and treat it with the patience and fairness which it merits.

The writer has never seen a treatise on Bees, however limited, that did not contain valuable thoughts. He has never examined a hive that did not exhibit some important features; and with the many hundred bee-keepers with whom it has been his privilege to converse, he has never met one, however humble or inattentive to the subject, but was able to throw out some valuable suggestions; and they are kindly remembered and treasured, and at some future time he may venture to make use of their names with reference to facts, which he hopes eventually to collate in his proposed treatise.

In this brief synopsis of private memoranda, it is impossible to *discuss* a single point,—to give illustrations,—to make remarks of a scientific or speculative nature,—to trace and retrace cause and effect, and draw comparisons,—or to even give more than a portion of his own *modus operandi*.

In disposing of territorial right to what the writer conscientiously believes to be a very superior hive, it became necessary to instruct parties in the various uses and advantages of its component parts. To do this intelligently, it also became necessary to arrange the information under heads, or in statements. Instructions have long been given practically to the parties in their Apiaries, and by lessons orally in their homes. The writer believes they will give him credit for the patient and continuous manner in which he tried faithfully to fulfill his promises. But the business

has extended so, that he can no longer pursue this course, and do justice to all. In making the numerous references from one number to another, it is supposed that the reader has acquired knowledge and experience with bees, sufficient to enable him to discover and quickly select the desired passage in the number. It must be remembered that the ideas contained in it, when found, are to be followed only as isolated landmarks; the intervening spaces and details to be filled by his judgment, and varied by his skill and discretion, as the case may require. The writer has desired not to interfere with other men, other hives, or other systems; nor can anything of the kind be truthfully asserted.

He covets the unbiassed opinion and decision of those only, who are willing to employ the time, and a comparatively trifling expense necessary to test the whole matter.

There are ample proofs that he has spared no pains nor time which he could personally devote, in order to gratify the desire of, and impart pleasant and useful information to those with whom it has been his privilege to associate in the consideration of these things; and he sincerely hopes that neither envy nor unkind feelings will be entertained, through misapprehensions, by either friend or stranger, until at least they have learned his real desires and feelings with regard to the promotion of useful information. He also sincerely hopes that the reader, by the help of these brief and abrupt remarks, and the hints scattered through the memoranda, aided by a Hive possessing the component parts adapted to them, will *think*, and *reflect*, and *study*, on each item that presents itself for consideration in his own Apiary, and with due reflection bring the full strength of his judgment, supported by his experience, in every experiment that he cautiously ventures on; ever remembering that nine tenths of what he learns about these things, must be acquired by comparing this with that, or these with those facts: and as he passes on in life, with his own hand, on memory's tablet, pencilling down and filling in the details of this volume, until its ready truths become of more practical

value to him than the entire collected Apiarian Library could be. These remarks, as the memoranda themselves, are designed solely for agents who have assumed the responsibility of teaching the people to whom they have, or may communicate this system.

In observing Bees, the observer cannot fail in being struck at times with the amusing views presented; their almost comical movements; their dignified communications with one another; their domestic, respectful, and attentive behaviour to each other: we might venture to add, their strict observance of Bee etiquette;—all of which tend to excite a writer to amusing descriptions. Even flowery thoughts are suggested, and poetic effusions might be pardoned; but here there is neither time nor space.

When the writer published the Circular containing the following statements, he had never read a treatise on Bees, either large or small, of any description; and whatever definitions and instructions he imparted relating to them, he considered his own, so far as his knowledge of other men's movements were concerned. He also thought at that time, (1863), that his conclusions were simply what any ordinary bee-keeper, who had the leisure, and possessed the will, the appliances, and a hive with the component parts adapted to his experiments, could have easily arrived at. He then predicted, and with a pleasure that *was* free from envy, that his views would be adopted and verified by those whose facilities and abilities would enable them to discover, improve, and progress, to a point which his humble position prevented him. But it is to be regretted that leading Apiarians have, from selfish motives, expressed more delight in annoying and trying to despatch each other, than in abandoning cherished but erroneous opinions, for the development of new truths. As a very hastily written letter to an indulgent friend, so are these fragments of his private memoranda offered to whomsoever may receive them.

DIRECTIONS TO AGENTS.



FIRST: Take the hive entirely to pieces. Take the winter hive, F, placing it on the table; then take the brood hive, E, arrange seven guides on it, equally distant from each other, previously placing the bridge, X, on the bottom of the winter hive, crosswise of it, and three inches in rear of the entrance. Then place it into the winter hive, when it will rest on the band rim, D; then place the feeding board, C, C, immediately upon the centre of the guides. Place the rack, Z, properly on the guides; also, arrange the cloth, A, A, properly on the rack. Fit the surplus hive, S, on the cloth, and the glass, Y, over the aperture through it, covering it with the cap, A, over all. This is the form of hive for winter quarters, in which way it remains from September till May.

The next form is that which it has in summer quarters. First: Unfold the hive again; place the ground board, J, on the table, under the rear end of which place the bevel blocks, R; then on it place the bottom board, I, on which arrange the brood hive, E, and as far in the rear as the button, Q, will allow. On the brood hive arrange the glass, D, D; over the entrance, K, K, place the regulator, P, through which insert the knob, O. Elevate the regulator as high as the knob will permit; over the glass place the cap, A, also place in front of bevel hive, E, on bottom board, I, miller blocks, F. A portion of the time it also has the following additional parts attached to it:—Remove the glass, D, D, and inside the cap, A, place the surplus hive, S, having arranged in it six guides, T, by equal spaces, on which replace the glass, and complete by closing the cap. This last beautifully provides for storing surplus honey, the hive continuing in this form from May to September.

NON-SWARMING FORM OF HIVE.

Place the winter hive, F, on the table; in it arrange four guides, E, E, (the complement belonging to the hive is nine); over the guides adjust the dividing board, K, said letter being in front of board, on which place upon the pencilled lines the brood hive, E; on this arrange the surplus hive, S, as prepared in summer quarters, covering it with the cap in front of brood hive. Arrange miller blocks as previously. Open the three entrances by elevating the regulators. This telescopic view of the hive gives a capacity for 150lbs. of honey.



SPECIFICATIONS

OF

HOUGH'S SOPER IMPROVED BEE-HIVE.

A

Is a lid of the cap attached to the band, B, in the rear by hinges, and in the front by a hook and eye. The cheapness and simplicity of this cover, excels that of any other hive. This fact depends upon the internal construction of the hive. The glass covering the otherwise exposed portion, when it is seamed with propolis by the bees, the upper portion of the hive becomes impervious to moisture, or attacks from the bee moth. The facilities for making observations, through the glass, D, D, by so simple a movement as elevating the lid, A, cannot be found elsewhere. The bee-keeper being compelled to lift heavy caps and covers, often crushing his bees thereby, he is deterred finally from making those pleasing and frequent observations which are profitable to him, and rapidly develop a reliable knowledge of the wants and habits of bees.

B

Is a band, constituting, with the lid, what we term the "cap of the hive." Its chief object is to protect the interior of

the hive from the heat of summer and the cold of winter. In connection with the surplus hive, S, it constitutes a double wall. It is perforated with six ventilators marked, F, F, forming a complete circulating medium for the air. It may also be removed as easily as the caps or covers from other hives. It has a lighting board, C, from which a passage communicates with the surplus hive, S, which passage is protected by a regulator, P, which is adjusted by a knob, O, the regulator being open partially, or entirely closed as the case may require.

N. B.—Please remove the cap and lay it aside.

D, D,

Is a glass which forms the real cover of the bees and honey. Properly speaking it is a transparent honey board, sometimes used above the surplus hive, S, sometimes immediately over the brood hive, E. The advantages of this are: in the surplus hive, S, at any time, a single glance shows us whether the bees have come up from the brood hive, E; whether they have commenced their comb straight on the guides, T; when the comb is filled in any one of them, and it may profitably removed; and when the surplus hive is entirely filled, and ought to be replenished with empty guides. Used over the brood hive, we learn the progress which our bees are making daily, preparatory to natural or artificial swarming; whether millers have made a lodgement in the hive; what progress the bees are making with their winter stores; the comparative condition of the comb; indications of the condition of the Queen; natural swarms when first put in, easily anticipated and defeated in indefinite movements and intentions. In artificial or section swarms, where strict attention is required, and various dangers constantly threaten, the use and benefit of the glass will be found invaluable. It is arranged above the guide tops in such a way as to facilitate the movement of the bees without loss of room. Unlike opaque honey boards, it can be removed from the surplus or brood hive,

without killing a single bee, as we readily perceive their locality while loosening it. The above are a few of the advantages of the glass.

N. B.—Please remove glass and lay aside.

S

Is the surplus hive, in form and construction the same as the brood hive, except in depth. It contains six comb guides, designed to receive surplus honey. The advantages of this hive over various surplus boxes are, that a given guide, containing a portion of comb, filled and furnished, may be taken out when desired; and that portion removed, and the unfinished part of the comb left in the guide, and returned to the bees, which is a very great saving in bee labor. The construction of the hive is such, that any number of them containing honey, may replace those guides in the brood hive which do not, and thus supply the bees with natural food, when there is a deficiency. The guides are settled in a rabbet, and so formed that the comb touches neither bottom, sides, or top of the hive, allowing the bees to pass in any given direction on to the point from which they started, facilitating greatly their labor. It also has the advantage of an entrance, U, on its own level. (Remove three of the guides). In their place, with the notched corners next the side of the surplus hive, resting on the top of the guides of the brood hive, place the section bottom, W, of the surplus hive, on which, and in the same manner that a guide is suspended in the rabbets, place the contractor, V, which, it will be perceived, will exclude the bees from one half the surplus hive. The advantage is, that moderate swarms, in poor seasons, will frequently deposit honey in three of the guides, when they would refuse to do so were they permitted to enter the entire surplus hive. (Place the glass, D, D, for a moment on the surplus hive and observe the appearance. Remove entire contents of surplus hive, also the surplus hive itself).

N. B.—Please remove surplus hive, S, and place glass, D, D, on brood hive, E.

E

Is the brood hive, or constant home of the bees. It is rabbetted to receive the ends of the guide tops, in the same manner, and for the same purpose as described in surplus hive, S. A little below its upper edge, a band rim surrounds it, for the purpose of excluding water, and supporting the cap, A, above the surplus hive, S. It also sustains the surplus hive, and brood hive, when arranged for winter quarters in the winter hive. (Please remove and replace the glass at the conclusion of each of the following details). E also contains a brood board, G, G, which insert in the hive in the same manner as a guide. Remove all the guides from the hive, except one, which adjust on the right hand side, the same distance from the side of the hive that it would be, were all the guides in and properly arranged, the brood board being the same distance from it, (the guide), that a guide ought to be, observing that M, M, on the brood board, is towards the front. Next arrange H, H, the artificial brood block, with the rabbet downward, the open edge toward the entrance of the hive, open end of rabbet fitted close to notch, M, M, in brood board. (*Please replace glass and observe*). To understand the great advantages of this arrangement, and the firm foundation on which it places artificial swarming, suppose that the enclosed guide had just been taken from a colony; that it was full of comb filled with honey and young brood, and well covered with working bees, they would feel that this section of the hive was as warm, as well stored, as full of bees, and therefore practically enabled to carry on the various divisions of labor with the same order and courage, as if they were seven times stronger; they pass readily through the notch, M, M, of the brood board, emerging from the pathway under the artificial brood block. Slide the left-hand miller block, F, towards the right-hand one, until within an inch, which guards the entrance from robbers. As you observe through

the glass that the bees are multiplying and demanding more room, slide the brood board toward the left side of the hive, sufficiently to receive an additional empty guide. Repeat this process, enlarging the entrance to the hive according to the demand of the bees, until the hive is filled, when it should be removed. Suppose a hive to be divided into two equal parts, or simply double, making an artificial swarm, the brood board used precisely in the same manner, proves of equal value to both. A natural swarm placed in the hive, improves with wonderful rapidity by a like use of the brood board. Take from any hive all the guides of comb which are not completely covered by the bees, drawing the brood board up to the last comb remaining in the hive, and that hive becomes positively miller proof. The brood board may be gradually withdrawn and the same combs gradually returned, as the bees increase in numbers sufficiently to cover them. This is valuable to small swarms, by adding warmth and protection during winter.

Return the seven guides, removing the brood board and artificial brood block; place the feeding board, C, C, over the centre, resting upon the guides. Over this, likewise, resting upon the guides, place the rack, Z, which cover with the cloth, A, A, in such a way as to make it extend equally on all sides; over the aperture in it place the glass, Y, then adjust the cap of the hive properly to its place; open the lid of same, remove the glass, Y, and we have before us the simplest, safest, and most pleasing method of feeding bees known. The feed is easily turned on to the feeding board, and with the glass thus re-adjusted, we readily notice when the food is exhausted. It is also where robbers will never disturb them; the bees do not escape; nor are they ever annoyed; and may be fed with perfect safety at any season of the year. (In very hot weather, the screening, L, L, may be used in the place of the glass on the brood Hive).

N. B.—Please clear top of brood hive, leaving the guides.

B, B,

Is a hiver, a necessary and component part of the hive. Place it the long way of it, centrally and lengthwise on the guides. Observe the dimensions of it should be the same as the surplus hive, S, in order that the cap, A, may receive it in the same manner that it does that hive. In order to comply with the requirements of the Patent Office, and confine the model within its proper limits, it has been diminished in size. Its principle features are a screen, at the top the entire size, and three sides working transversely. It is used as the first locality of the swarm, either as a natural or artificial one. The slides are lowered to accommodate the bees in ascending into it, after which it is fitted over the brood hive, E, and the cap, A, adjusted in position, where it remains until it is deemed expedient to remove it.

N. B.—Please lay aside all the parts of the hive under examination.

I and J.

First, place J upon the table, on which adjust, according to the pencilled lines, the compound bottom board, I, that letter being near the letter J, on which adjust the miller blocks, F; the straight edges in rear on the pencilled lines, and the grooved ends toward each other, over G, the places for deposit of bee moth larvæ.

Next elevate the rear of the ground board, J, and adjust under it the bevel blocks, R, which should give an angle of 45 degrees, inclining forward. Turn the button, Q, upward, which gives communication with the chamber formed by I and J, the cross-bar, N, N, under the screen, H, holds H level, so that the regulator, P, on the brood hive, E, will always nicely fit it when desired. The combination, as it now appears, belongs entirely to the brood hive, E. E is arranged with the rear against the button, Q, which brings the front nicely against the blocks, F, and the regulator, P,

immediately over the cross bar, N, N. The advantages derived from the compound bottom board are, that it forms a miller trap, a robber trap, a drone trap, and an excellent ventilator, which avoids strong currents of air. Comb dust or Indian meal deposited on G, under the blocks, F, with the warm air from the hive, forms an irresistible attraction to the bee moth, which enters the cavity by means of the notches in the blocks, F. Robbers discovering the aperture in the rear unguarded, prefer that entrance. Attracted by the light to H, and by the bees working above them, they struggle for egress until they die; thus ever guarding the hive in the absence of the bee-keeper, but not interrupting the bees in honest labor. At the season of the year when drones are being expelled, if I is advanced forward $1\frac{1}{2}$ in. the drones will easily and readily collect themselves under the screen, H, where they will perish, thus saving the bees the labor of destroying them. The angle of position given the hive is defensive, is labor-saving to bees in cleaning the hive; protects young bees, and yet secures slow and steady ventilation.

N. B.—Please lay aside E, H, and J, and place upon the table, L, the winter hive.

L

Is the winter hive, which is first designed to form a double wall for winter protection, which it does by receiving brood hive, E, that rests on it, supported by band rim, D, which elevates the bees sufficiently to admit of the winter accumulations of refuse material, without detriment to them. It has a central bottom ventilator, which is aided by seven smaller ones that communicate with the air between the walls; a regulator, P, and knob, Q, are applied to this hive likewise; the handles, M, facilitate the handling of the whole hive. The sides of E are rabbetted down, to receive the guides, s as in the brood hive. One peculiarity in the construction of the entire hive is, that any guide from any one of the hives is received in the rabbets of any other

hive ; hence E may be used when desired, (and it is often), temporarily as a brood hive. When the bee-keeper desires his bees to make surplus honey, and not swarm at all, fill E with guides, and on it fit the dividing board, K, that letter being over the letter E, on K ; adjust brood hive, E, upon the pencilled lines ; on brood hive, E, arrange surplus hive, S, and use as heretofore described. The bees ascend from E to S, and descend from E to L, giving ample room for the season, and the best inducements to employ it. Adjust cap, A, with the lid elevated, glass on ; miller blocks, F, on the front of K, against E. As the guides, E, are arranged transversely to the guides in e, the dividing board, K, is placed between e and L. Being perforated conveniently, it breaks the connection, and prevents the bees extending the combs onward from e, thus inducing them to follow the desired lines indicated by the L guides. As formerly, observe its appearance.

When the Hive is used in the winter form, the bridge X, (see rack Z), is placed crosswise of E (winter hive), a little forward of J, J, ventilator. The rack Z gives the same space when E is in winter quarters, above the guides, that will be found below them in L. The object of this vacuum is to give ample space for feeding at the warmest point in the hive ; also to give warm and unbroken communication with the top of every comb in the hive, enabling the bees to easily obtain all the natural food they may have stored, even in the coldest weather, and prevents the necessity of their leaving open spaces through central portions of the comb. In bottom of L, Q, Q, are loose buttons to e.— See No. 14.

The hive is as durable as any hive can be made, every joint being rabbetted and nailed from two directions. It is highly ornamental to a yard. It is also a capital observing hive (even the common ones), rapidly teaching the beginner how to manage profitably and pleasantly. It is really an individual bee house, and with care will last, without covering, half a generation. Please observe the simplicity of its construction and the vast compass of its ends, found in its

component parts, forming a complete circle of power, controlling the bees at all points, guarding against every danger and fully meeting every want. There are a number of points valuable in themselves yet unmentioned.



ADDENDA TO SPECIFICATIONS.

BROOD BOARD.

The brood board is designed to diminish the capacity of the hive to the number of bees which it contains, and rightly adjusted, it ever keeps the hive in this relation to the bees. The great importance of its use will appear when you have used it judiciously two seasons. In impoverished stocks, it should crowd them for room closely for a few days. Used with new colonies (small ones, natural or artificial), it will be found of great value.

Given to swarms ultimately intended to be united, it will cause them to fill the few guides they are allowed to retain, to the bottom, concentrating their work, and in the end avoiding several guides partly filled with comb. In winter quarters, it may be aslo quite valuable. It concentrates labor, contributes warmth, energy and confidence. Ever remember to force your bees to cover their comb, and you can do so by the aid of this board. When used with divided swarms, attention will be required, or, when you do not wish it, the bees may suddenly and unexpectedly swarm. If it is necessary to remove queen cells in order to safely secure its benefit, do it. The process *will* repay you for the trouble.

Use the brood board whenever, and wherever you can. Do not, however, put it in the hive and forget to adjust it as occasion may require, and finally leave it there. The use of it offers the first and best security ever presented, as a safeguard for many of your operations. It will make a hive practically proof against the bee moth. See the adjustment of it, letter E of specification.

BEE CATCHER.

This instrument was formerly used with this hive for experimental purposes, previous to the development of safe principles of action in controlling bees by fumigation. It is constructed with nine or seven tongues; if used on the workers, nine; if on the drones, seven. The angle at which the tongues are suspended, the distance at which they rest from the floor of the instrument, the contiguous partitions which prevent two bees from escaping while one would enter, and the facility of their action, is that which gives them their efficacy. It is quite difficult to give a written intelligible description of it. Practically, it is now of little value; but there are some experiments which it is utterly impossible to demonstrate without its aid. See Nos. 40 to 42. In its construction, in order to give satisfaction, it requires as much nicety of action as a watch. It was once used in transferring bees, also in removing them from the surplus hive, which it will do very handsomely. Those who delight in novel experiments would be amused by it, and perhaps by its aid ultimately receive some suggestions which would lead them to important and profitable results.

 THE GLASS.

The great aid which a glass top, or immediate cover,—a transparent honey-board, if you choose the term,—affords us in giving timely knowledge as to when a given thing should be done, and as to the result of the work after it is done, will appear at almost every step of the operation, as referred to and described in the various numbers. It is the only place in the hive that a glass is of any practical value. Do not use a substitute in any case, for any great length of time, or you will surely neglect your bees.

 ROBBING.

If by neglect robbers have made a lodgement in a hive, it may be removed two or three rods from its stand; rap

sharply on it occasionally, for five or six minutes, which will expel the robbers from it, close the entrance, and return it to the stand. About sundown open it to admit any native bees which may be outside. The use of Recipe No. 1, as referred to in No. 50, will usually be sufficient. The robber entrance, in the rear, and the space between the ground board and the bottom board, should be kept perfectly clear from spider webs, or the robbers will not enter it. See Nos. 2, 4, and 14, Note I. See uses of Regulator and Miller Blocks in Specification.

HOUGH'S SYSTEM
OF
BEE-KEEPING.

The following are some of the secrets of successful Bee-keeping :

No. 1.

How the old stock of Bees may be kept strong and active for any number of years.

Why will bees naturally soon be diminished, in this or any other hive? Why will not a certain swarm be as good at the end of five or six years, as at the close of two or three?

Bees are rapidly hatching or developing; rapidly dying; one generation quickly succeeds another. In the first place, as time passes, the decline of a colony of bees may be attributed chiefly to two primary causes. The Queen ultimately becomes infertile (No. 45). On the maturity of the bee, the vestiges of the nymph state are deposited in the brood cells, thus contracting the cells so that the queen is driven to the margin of the combs, scattering her brood in

unprotected positions. In this respect each succeeding generation becomes one step nearer the end of the colony. In the fertility of the queen and the diminution of the brood cells, will be noticed the two causes referred to. How may I avoid these consequences? If I remove the queen at the end of two years, or so often as I discover the bees diminishing from her default, supplying the hive with a young healthy queen, or allowing the bees to mature one (No. 46), I shall remedy the first named difficulty, and lead the bees back to their original condition. My hives should all in summer face the south, bearing one point east, as near the ground as can be, and secure the elevation in the rear, (see I and J of specification). But in winter the entrance should face the north. For the sake of uniformity, commencing on the east or west side of my hives, I lift out two or three combs (No. 51), annually from each hive; cut the brood comb out, (Nos. 7 and 8), leaving the honey, if in good condition; if not, remove it, supplying empty guides. By rotating through my hives from year to year in this manner, I not only understand the real condition of my bees, but also by supplying new healthy brood comb, remove the second cause, why the old stock of bees runs down. Other contingencies are described and explained elsewhere.—Hough's Soper Improved Hive.

Hough's system, as taught in his oral lessons, should engage the attention of bee-keepers to the importance of number one in the most emphatic manner, holding that it is the basis of successful bee-keeping; see strictly to it, then, that your hive has a *fertile* queen; that there is no comb older in it than two years. The glass over the top of the guides is cheap, and almost an invaluable facility for making the discoveries as early as the importance of this statement demands.

No. 2.

How bees can be made to throw off one, two, or three swarms in one year.

First, we will define the terms "artificial swarming", "transferring," and "dividing." By artificial swarming we mean driving as many bees from any kind of a hive, as would be equivalent to a natural swarm, treating it the same as a natural swarm. By transferring, we mean as above, but in addition, we take all the bees, then remove the combs (No. 14), which they occupied, fitting them in the guides of a moveable comb hive, returning the bees on the combs so set up (No. 14). By dividing, we have reference directly to manipulating the guides of a moveable comb hive, P. Our hive is arranged in summer quarters (see hive as arranged under summer quarters). About the middle of May, with this object in view, we begin more carefully to observe the bees, by raising the lid of the hive and looking through the glass downward among the combs. A single glance, informs us of the comparative progress of the bees towards swarming. When the space between the glass and the guides seems to be well filled with bees, we conclude they are sufficiently matured to *divide*. We then operate on the swarm according to the instructions under No. 24. Removing the glass, we select a guide and remove it according to instructions under No. 51. If on close inspection of the same we find the usual number of bees and quantity of brood, we remove three guides, arranging them on one side in an empty brood hive, in the same order in which they were in the parent hive; then place a brood board $\frac{3}{4}$ of an inch from the guide nearest the middle of the hive. The brood board should also be placed the same way in the parent hive, and the entrance through it closed to exclude the bees from the unoccupied part. Place each hive one yard right and left from the original position of the parent hive, and treat it according to No. 46. The above is a case of dividing. (See Nos. 14 and 47). If the season prove very favorable, and the queens very energetic and fertile,

when each of these hives is sufficiently developed they may again be divided, or only one more may be formed from the two. Observe here the remarks on the brood board.

No. 3.

How bees can be prevented from swarming, when it is desired they should make surplus honey.

Among the more immediately practical and desirable parts of these memoranda, strictly and satisfactorily demonstrated, none are more difficult. For the preliminary arrangement, see instructions to Agents for the different forms of the hive, and a portion of letter L in the specifications. There are two different classes of circumstances under which we may desire to secure the benefit of the above. First, when we do not wish the bees to swarm at all, remove the two outside guides of the brood hive, which will generally be found to contain little or no brood early in the season; place these two guides in the centre of the winter hive, supplying their place with empty guides. This forms a beginning on a right line. The glass should be kept between the surplus and brood hive, until the winter hive is partly filled, when it may be removed. These instructions given, with the careful attention of the bee-keeper, will generally secure the desired result. With this idea in view, which this statement is designed to convey, only hives containing very strong swarms should be employed, as non-swarmling, for profit. The second case is where the bee-keeper desires to secure one swarm only from a given hive, and then directs the energy of the bees to surplus making. (See uses of section bottom board and contractor, letter S of specifications, also No. 2.) Observe while sliding the brood board over, and supplying guides, the progress of the bees towards swarming. After the division begin to check that tendency by the early use of the surplus hive as referred to. The early adaptation of space in the surplus and brood hives, to the numbers and wants of the bees, will generally prevent a divided hive from swarming; but requires skill and sharp attention in some instances.

If in paying the attention which is due to those cases, it is observed that the bees refuse to build the amount of comb which they apparently ought to, it may be anticipated that they are determined to throw off a swarm, in which case examine the brood sections and remove the queen cells, which undoubtedly will be found when the proper attention has been given. These instances of obstinacy will rarely occur. A few non-swarving hives on a yard, aside from other considerations, form a very desirable reserve from which to replenish with bees and stores, some of the weak and unfortunate ones. A judicious use of this hive and system, in non-swarving, will become a source of protection and safety to the entire apiary, and place it on a more secure foundation than it otherwise could rest.

No. 4.

How the Bee-keeper may divide his swarm in several parts when he wishes to experiment in that way.

This statement is designed for the benefit of bee-keepers who have been thoroughly acquainted with this hive and system, at least two years, and who have a great many hives on their yard. For the preliminary arrangement of the component parts, see uses of brood board and artificial brood block under letter E of specification. Also Nos. 2, 49, 18, and 46. When the bee-keeper desires (and which in this uncertain climate is always the more discreet course, by whatever means he may choose to accomplish it), to simply double his hives of bees by this process, he can safely achieve it. After having removed the guide from the parent hive, and arranged all according to the references, replace it with an empty guide and arrange the surplus hive according to circumstances, as described and directed under letter S of specification. Some attention may be necessary to prevent the bees of the parent hive from swarming, and to direct their attention to surplus making. As their loss is comparatively little by the removal of the guide, it may be necessary to proceed as directed according to section 2, No.

3. The guide selected should be one well stored with food, brood, and bees; and as early as the warmth of the season will permit, secure the queen of the parent hive, and place her on the said guide after it is arranged in the hive. If she proves fertile it may not be necessary to give her the benefit of No. 46. By this course the bee-keeper will certainly obtain handsome return of surplus honey from the parent hive, and insure to himself one swarm of bees. It never should be attempted without a reserve force at hand, which he feels willing to employ according to No. 46. If he wishes to make several swarms in the same way from the same hive, he must altogether dispense with the surplus hive. He should not, however, attempt this extremity without first having well tested his own skill in a more limited way. Should an attempt be made by the bees to interfere with the section swarm, use, according to No. 35, a few drops of Recipe No. 1.

No. 5.

How Bees can be prevented from flying away to the forest in swarming time.

The above refers to a natural swarm of bees. After they have been properly secured in this hive, having been arranged according to instructions on the compound bottom board (See No. 47), draw the miller blocks towards each other, until the space between them is one and a half inches, for medium swarms; more or less for larger or smaller ones. Settle the regulator until the passage for the bees is three sixteenths of an inch, scant in height, or by close observation adjust it so that the working bees only can barely pass under it. Observe through the glass above them, and when the bees show signs of contentment and industry, begin to give them more space; the inclination to leave the clean hive will not be entertained by them long. See treatment of natural swarms. This treatment will also apply to artificial swarms. See what is meant definitely by that term in No. 2.

No. 6.

How bees can be returned to the parent hive again in case of small swarms.

Small swarms are generally thrown off at a period of the season when it would be far more remunerative to return them to the parent hive, than to allow them to work on their own account. To do so, after they have settled sufficiently to hive them, saturate them, taking five minutes to do so, with Recipe No. 2. Secure them in the hiver during this operation. If the queen can be observed, confine her in a queen cage. If she is not detected in this first operation, throw them out of the hiver pretty sharply upon a white cloth, placing the hiver in a proper position for the bees to re-enter, when very likely the queen will be discovered. If not, repeat the process until that object is attained, when the bees may be safely returned to the parent hive, and expected to remain. If the bees of the parent hive are not as closely engaged in gathering stores as circumstances would seem to warrant, it would be well to treat them according to section 2, of No. 3. The queen in the cage may either be destroyed, or exchanged for a less valuable one in some other hive. The bees may be returned to the parent hive, or united with the weakest stock, in which case, see Nos. 34 and 50. Late small swarms will pay one hundred per cent. more, when returned to the parent hive, or united with some stock which requires aid, than in any other way. Should three swarms unfortunately at any time issue at once, forming one cluster, a thoughtful person, in contemplating the above operation, will readily perceive how he might secure the three queens, and divide the bees into three parts, and thus obtain the three swarms as they were originally. (See No. 46).

No. 7.

How Bees can collect and elaborate wax without visiting flowers.

As is now quite well known, wax is not a production of nature, similar to honey or pollen. The bee is so organised

that it is the result of external secretion on the body of the bee. In other words, it is to the bee what tallow or lard is to the beef or the hog—literally bee fat. The class of bees on which the production of wax devolves, require plenty of food and rest. It will be observed in looking through the glass top of this hive, that many of the bees are apparently idle. When so appearing, they are frequently awaiting the accumulation of the precious atoms; even nights and foul weather are improved in elaborating this production. On some occasions half the bees in the hive are engaged at it.

No. 8.

How Comb is constructed, and its great value to the bees, consisting of twenty or twenty-five pounds of honey to every pound of comb.

Having in No. 7 briefly hinted at the origin from which the material is derived that forms the combs, we add, that the minute atoms, which in their highest degree of refinement are almost as valuable as silver, are conveyed by the bees to the point where building is prosecuted, and constructed into cells with great patience and admirable skill. The labor, the time employed, and the number of bees engaged in building cells sufficient to enclose twenty-five pounds of honey, are equal to collecting and filling them with honey. The benefit of the bee-keeper, from observing these ideas intimated, will be found by improving the following suggestions, and the hive is well arranged for that purpose. In removing surplus honey, be careful not to injure the unfilled combs, or portions of them. Put them where they will be safe from the moths and mice, and at the proper time return them to the bees the following season. In arranging medium swarms in winter quarters, there may be combs found which contain little or no stores. Remove them, taking the same care of them, and adjusting the brood board in their place, according to instructions under that head.

In removing sections of objectionable brood comb, cut out only such portions as the bee-keeper in his judgment deems necessary. Wilful waste, in this matter, is very highly censurable in the bee keeper.

No. 9.

How bee bread is obtained, and what from.

Bee bread, or pollen, is a production of nature derived from flowers; is flower dust, literally flour of the flowers. It is collected and packed in cavities on the legs of the bee, and conveyed and deposited in the cells in a similar manner to honey. A proper supply of it adds greatly to the health of the bees, induces early breeding, and indicates a fertile queen. See No. 11.

No. 10.

How any man can tell whether honey is passing in or out of the hive.

This number refers to a case of robbing not readily detected by the ordinary indications. It is a slow but steady process of extracting, by stealthy and more energetic bees. Little or no resistance is offered by them; little if any pollen is noticed going in the hive; and the careless observer will sometimes fail to detect it until the work of destruction is consummated. Upon examining the combs (see No. 51), when lifted out, it will be found that they are comparatively destitute of brood; that they are queenless, or have but a feeble and infertile one. Remove a part of the combs, insert the brood board, and use as in Nos. 1 and 4. Remove the queen, if any, (See Nos. 13 and 27), and work the hive according to No. 46; and the bees will soon rally. In order to detect a case referred to in No. 10, by casual observation, it would be noticed that those which had not yet entered the hive for plunder, show signs of fear as they approach the entrance, and those leaving with their load, will rise and move off quite differently from those leaving in search of

honey. If any doubt is entertained in the matter, observe a strong hive in prime working order, and carefully compare the actions of the bees of the two given hives. It may be advisable to use a little of Recipe No. 1. See Robbing, in Addenda.

No. 11.

How Bee bread can be easily furnished when desired.

First see Recipe No. 8, for ingredients. The flour should be put in a book-muslin sack, through which dust it slowly on the syrup, stirring well in the mean time. The white of the egg should be completely beaten to a foam, and well incorporated with the syrup. The salt should be placed in a separate dish. On the feeding board place a sufficient number of straws, cut the proper length to prevent the bees from becoming fouled with the food. On the straws pour the quantity the board will hold, which can be conveniently done by removing the small glass which is above it. The first of September is by far the better time for supplying a deficient hive with winter stores. Feed at sundown, to prevent attracting the attention of the other bees, remembering to contract the entrance by the use of the miller blocks. It will be easily understood how the second part of the Recipe may be used without further description. Most hives, though very well stored, would be benefitted by feeding a small quantity, and return the expense with interest, in the shape of early brood the following season. Great caution should be observed in not spilling the food, or slopping it in the hive so as to cause it to run out towards the entrance, thereby inducing other bees to attack and disturb them.

No. 12.

How weak late swarms, or old ones which have dwindled away, may be saved.

First, as to weak swarms. Operate on the bees according to No. 24, removing the guides (see No. 51). Ascertain if

possible the cause of the feebleness; remove all the guides which the bees cannot cover, inserting the brood board, and treat according to No. 27. Also give them the benefit of instructions under No. 46, always remembering, in such cases, that the entrance should be no larger than the bees actually employ. Sometimes the swarm might be revived according to instructions under No. 6. The bee-keeper must be governed in his action by the number and strength of his stock. As to late swarms, see No. 6. For instructions as to old stocks which have dwindled, see No. 1, and carefully observe it. This portion of the statement refers more directly to the old style of hives, in which the combs are not moveable. It will be necessary to operate on the bees (see No. 24), taking them out of the hive, and the hive to pieces, removing the combs, and setting them up in the guides, after which they may be arranged and treated exactly as the first case referred to in this statement for transferring combs (No. 14).

No. 13.

How, by two modes, when a swarm has lost its queen, it may be saved.

If a swarm is queenless, it loses its energy; it ceases to labor as the bees of other hives do, the bees only going on the wing from absolute necessity. They seem to be regardless of the internal state of their hive; do not care to accumulate stores; make little or no effort to defend those they have, and if not destroyed by the bee moth, or absorbed by robbers, they will often gradually wander from the hive, locating themselves with other swarms, leaving their own home tenantless. A hive in this state, on a fine day, when other bees are working well, may be supposed to be queenless by a few moments' observation. When this opinion is entertained, treat it as a weak swarm, as in No. 12. Be sure, however, that there is no queen in the hive, then capture one from any strong stock which may be able to spare it. She should be secured in a queen cage, and

suspended between the guides of the queenless hive among the bees. All unoccupied combs should be removed, and brood board inserted. At the expiration of three days let the queen out among the bees,—many authors to the contrary notwithstanding; yet it is a positive fact that a queenless swarm will sometimes kill a queen when given to them without the above precaution. If the above treatment is employed in the early part of the working season, it is not likely that any further attention will be required, but if late in the season, it might be well to give them the benefit of Nos. 46 and 11. If the bee-keeper desires, instead of supplying a queen, after examining, cleansing, and removing unoccupied combs, he may exchange, (see No. 51), one of the remaining guides for one from a strong brood, well filled with unsealed stock, if possible containing a queen cell; then do as directed by No. 46. When the guides of comb are removed, and brood board supplied on any occasion, keep the combs safe from moths, and eventually and gradually return them as they may be required. The importance of a healthy queen may be inferred from No. 1.

No. 14.

How by several safe methods, a swarm of bees may be transferred from a tree or old hive, into another hive.

This statement has direct reference to the several parts of the operations included in removing bees from any locality, and permanently arranging them in a moveable comb hive. See first part of No. 2. To convey a general idea: Select an old style of hive, and then operate on it according to instructions under No. 24; perforate the top with five one-and-a-half inch holes, so arranged as to admit the fumes, and communicate and permeate all the spaces in the hive; then invert the hive, supported six inches from the ground; place the fumes under it; in the meantime adjust the hives so that the slides will descend until they touch the ends of the combs. One half minute at a time is sufficient for

fumigation; the intervening time to be occupied in rapping sharply with a small rod on all sides of the hive. The screen of the hiver should be covered with a cloth, which can be raised at any time to ascertain the progress of the bees in ascending. When most of the bees are up, remove the hiver very gently to the stand formerly occupied by the bees, occasionally returning to the hiver; in the meantime observing Nos. 4, 7, and 18. Loosen the combs from the sides of the hive with a suitable instrument, (a handsaw plate is good), then remove that side of the hive which can be most easily loosened, and either of the adjoining sides. A piece of the comb should be adjusted as a cover, over the remaining portion of the hive. With a knife loosen the combs from the top of the hive (which is now the bottom), in the meantime, gently driving the remaining bees to seek shelter under the comb in the corner of the hive; arrange the combs upon the table on their top ends, in such a way that the brood will not be injured; select the best comb; lay it upon the table; place a guide over it; and with a knife cut it to fit nicely in the guide. The top of the comb must invariably be against the top of the guide. Provided with a number of slats, thirteen inches long, three-eighths of an inch wide, one-eighth of an inch in thickness, with light brads, secure two of these slats on the bottom and top of the guide, in such a way as to hold the comb in it safely. On the other side fasten two more slats opposite those already arranged. When pieces of comb are filled in, additional slats are sometimes required. Trim the ends of the slats down to the guide. It is now ready to adjust in the rabbet of the hive. Put no more comb in the hive, than what the bees will be able to cover, using the brood board if it is only a medium swarm. The balance of the comb may be set up in the guides and laid away for future use. Adjust the hive now on the compound bottom board. See hive, summer quarters, letter E of Specification. The balance of the bees convey to the hiver, and throwing them in front of it, they will readily enter. Sprinkle cold water

around the hiver freely, until all the bees settle nicely. Put the hiver now on the brood hive, the slides resting crosswise on the tops of the guides. Press gently down until the hiver fits closely, and a little of the fumes slowly driven through the screen of the hiver will induce the bees to descend and take possession of the combs. During this part of the operation the entrance to the brood hive should be kept closed. As soon as the bees have left the hiver, remove it, and adjust the glass in its place. The operation of taking the combs down, and setting them up, should be performed in as secluded a place as possible, in order to avoid attracting the attention of the other bees. Contract the entrance with the miller blocks, according to circumstances. If robbers insist on annoying the transferred swarm, introduce a few drops of Recipe No. 1; also see No. 50. Some of the unemployed comb from the dissected hive, can often be given immediately with profit to some young thriving colony. The hive at first should be arranged so nearly level, that should honey drip from the comb it would not work outside upon the bottom board. The robber entrance, from the beginning, should be kept closed, until the bees have learned accurately the entrance to their new home. Answers to the various questions relative to the condition of the comb, which may be observed when dissecting, will be found in the numbers which include such questions. Circumstances will always be found connected with this operation, which will compel the bee-keeper to exercise his judgment and vary in the details every time he may transfer a swarm of bees. He should be deliberate as a clock in his action, and yet as speedy in accomplishing his purpose as possible. Should the hive dissected prove to be sufficiently stored, plenty of brood, and bees enough for two medium natural swarms, use the winter hive instead of the brood hive, filling nine guides with the best comb, putting the bees in as before described, where they may remain a few days; at the end of which, place a brood hive right and left of the winter hive; lift the guides out of the winter hive, com-

mencing at one side, placing the first guide in the brood hive on the right, the second guide in the brood hive on the left, and so on until all the guides are removed from the winter hive. In dividing from the winter hive, endeavor to select a time when the bees have returned from their labor, are equally distributed, and quietly reposing upon the combs. Arrange the brood hive, and treat exactly as given in No. 2. When bees are divided at the time of transferring the combs, and before they have repaired and become acquainted with the transferred combs, this often leads to great confusion among them, and to unsatisfactory results to the bee-keeper. This mode gives ample time for the bees to recover from their surprise, and handsomely avoids the disagreeable results otherwise often incurred by the inexperienced.

See Brood Board; also latter part of No. 12. Another mode of transferring bees is by the use of the bee-catcher, which see.

No. 15.

How drones may be prevented from hatching, or destroyed immediately after, which is sometimes important.

The bee-keeper, in observing a great number of hives, will occasionally notice one in which there appears to be more drones in proportion than there ought to be. On examining the combs he will observe the same preponderance of drone brood over the working brood. If the difference is not very great, cutting the drone brood out, thereby giving the bees an opportunity of replacing it with working brood cells, may remedy it for that season. Should the case be an extreme one, he had better, in addition to the above, remove the queen, destroying her and supplying another, (see No. 13); or remove some of the guides and insert brood board, allowing them to rear their own queen, being aided according to No. 46. On examination, if there are no more drone brood cells than there apparently ought

to be, and the comb is not over two years old, the cells may be uncapped, and either of the above courses taken to replenish the hive. The drones may be destroyed by adjusting the regulator about one or two, P. M., or when it is observed most drones are flying, lowering it to the queen gauge as directed in No. 5. Advance the bottom board forward on the ground board, until there is space enough for the drones to enter between the two, which they will either do, or collect at some point at nightfall, where they may be easily destroyed by sweeping them into a dish of hot water. There is invariably a greater accumulation, either in the form of honey or winter stores, in those hives in which the drones are destroyed about the middle of August.

No. 16.

How to estimate the comparative number of bees in a given hive.

The density of a swarm of bees, when it has settled in a cluster, varies with the temperature, the time they are on the wing previous to clustering, and the amount of provision they carry with them for the journey. A little cold water slowly dripped on the cluster will sometimes cause it to contract one fourth in dimensions. A column of bees twelve inches long and six inches square, will sometimes contain over 17,000 bees; a pint may contain considerably over 2000. Swarms vary from 16,000 to 30,000.

No. 17.

How to take spare honey from any part of the hive.

Without disparagement to other hives, this statement has direct reference to the superior advantages offered the bee-keeper, when he desires to obtain any given portion of comb, located either in the surplus hive, brood hive, or winter hive. A careful examination of the construction of the hive will explain it more clearly than any further description could. See portion of remarks under No. 9; also Nos. 24 and 51.

No. 18.

How, when by accident, a swarm has lost its queen, one may be supplied.

This No. refers to natural or artificial swarms, to which there have been given no comb, or which have formed none. First, in transferring bees when they have been driven into the hive and removed to the old stand, (see No. 14), it sometimes happens that the queen has lingered behind with the remaining bees, therefore it is frequently necessary, as heretofore stated, to notice their movements for a little; and if the signs referred to in No. 47 are indicated, immediately insert a fine piece of brood comb in the hive, which will quiet the bees for a time, until the queen, with the remaining bees, are restored. Sometimes the bee-keeper, for the sake of illustration, when handling a purely artificial swarm (See No. 2), instead of placing the hiver over the guides as in No. 14, desires to throw them on the cloth in front of the hive, driving them leisurely in through the entrance. Unless the cloth is large, held smoothly and firmly, and well under the hive, the queen may get astray, be injured, or lost altogether. Though the bees may soon rise in the hive, they will quickly give evidence of their loss (see No. 47), in which case, before the bees have time to wander over the yard, which they very soon will do, with all possible speed procure a guide from some adjoining hive (See No. 5), well stored with unsealed brood. In giving this guide to the bees, slide the glass to one side, *only* sufficient to admit it. A third case may occur, when hiving natural swarms from similar causes, close attention at the time of hiving, with a thorough knowledge of the hives on the yard, would enable the bee-keeper to lay his hand on the remedy in a moment and save them. When queens have not been fertilized, and there is no brood in the hive from which they came for that purpose, unless the bees have been some time located, in case the queen is lost, the chances are that the bee-keeper will not become cognizant of the fact till it is too late to remedy it. How

ever, should he detect it in time, the above is the more speedy mode of treating it. In all of the above cases, after the bees have subsided from their confusion, the bee-keeper can deliberately pursue any course his resources will permit.

No. 19.

Why bees cluster around the outside of the hive, and do not swarm perhaps at all.

Occasionally very warm weather, ill ventilation, the effluvia of the bees—either, or all combined,—may become the cause. Sometimes foul weather deters the bees from swarming until there is a fatal collision between the queen which should become the permanent one of the hive, and that of the former season. This event will deter their swarming for a time, and for several reasons it might do so altogether. Sometimes the bees are not successful in maturing a queen to replace the old one in case of swarming. When this case runs through the whole season, and, it may be, two or three consecutive seasons, the primary cause may be discovered in the undue influence which the old queen has obtained over the colony. She perseveres until she is admitted to approach and destroy her rivals, while in the nymph state, or gain access to them when they are yet too young for self defence. In observing the bees gathered sulkily in a cluster forgetful of their powerful instinct for industry, they seem to say to their fellow bees, “Work on, if you please; we feel but little interest in the commonwealth; we shall continue to express our disapprobation of her majesty’s conduct as long as she refuses to lead us out and form us into an independent colony.” A close observer will admit that the cluster shows some of the symptoms of a queenless hive. In this case may be found a powerful argument in favor of judicious artificial swarming. By having recourse to this process, the old queen, who is reluctant to leave the stores and accumulations of her home, in terror and alarm hastens out with the bees in a far less dignified manner than if it

had been a premeditated and voluntary act on her part; in other words, she is compelled to agree with the bees whenever the judgment of the bee-keeper shall dictate. For treatment of this case see, Nos. 24 and 25; then Nos. 2 and 4.

No. 20.

Why bees do not swarm regularly.

That is, at the end of nine or ten days, why is there not a second swarm thrown off, and in two or three days from that time, a third, and so on? Precisely the same causes as those referred to in No. 19, with very little variation, with the exception of one cause, namely:—The queen first occupying the hive, after the first swarm, remains mistress of it, until the following season; therefore the bees do not refuse to swarm a second time on account of her reluctance to leave the hive, although her instinctive jealousy might in some cases account for it as formerly described; and we believe it would be fortunate for the bee-keeper in this climate, where such sudden and excessive changes frequently occur, thereby often injuring the brood, and depriving the bees of their winter stores, if second swarms were never thrown off. It certainly would place the Apiary in a much safer condition if the surplus energy and strength of any given hive so inclined, were drawn off in the shape of surplus honey, or by transposition.—See No. 46.

No. 21.

Why bees sometimes return to the parent hive after swarming.

There are various causes for this uncertain movement. Sometimes the queen is feeble, deformed, or heavily laden, and falls to the ground, being unable to rise. The bees, in their rapid, irregular, and confused movements, losing all trace of her, have no alternative but to return. Sometimes it is evident the queen herself becomes confused, before discovering a suitable place to light, and attempts to return,

but does not always succeed in reaching her own hive. Sometimes it is also evident that she not only deliberately returns after clustering, but likewise wilfully abandons a clean sweet hive, and most likely under the influence of a capricious desire, aided, perhaps incited, in the first instance by a few dissatisfied bees. Various trifling incidents, almost imperceptible to the observation of man, doubtless exercise a controlling influence in such sudden and unexpected decisions. In some of the above cases it would be well to search for the queen, when and where there is any probability of her having fallen.

No. 22.

Why Bees sometimes refuse to collect surplus honey.

Many bee-keepers expect their bees to collect surplus honey for them, when the flowers scarcely supply enough for their daily consumption. Some colonies refuse to direct their labors to the surplus hive. Having prepared a number of queen cells, they are predetermined to throw off a swarm. Sometimes the surplus arrangement consists of an old, small, and uncleansed box, to which they can only gain admittance through an *inch auger hole*. Sometimes in their haste ascending the wrong comb, being compelled to descend and reascend before they can even approach that *diminutive* entrance. A few, however, persevere against all these disadvantages; had the hive been so constructed that it held unbroken and immediate communication, and been also arranged so that those bees which preferred to do so, could enter and emerge directly from the surplus hive, not only would they have been saved much labor, been greatly encouraged thereby, but also, in many cases, when they either utterly refused, or finally abandoned their work, they would have complied with the wishes of the bee-keeper. See letter S; also uses of surplus hive, letter E of specifications. Also arrangement of surplus hive, under Nos. 2, 3, and 4.

No. 23.

How a given swarm may be made to collect very much more honey than they ordinarily do.

We may fairly suppose the reader has by this time noted many labor saving points in the hive. To make a fair test, we will suppose that of two hives selected, one shall be this hive worked by these instructions, the other an old box hive, left to run at random, (which is what we mean by the term ordinary), each containing, as near as we can judge, the same quantity of bees, stores, and brood. As early as the weather will permit, take off a first class artificial swarm, see No. 2, (giving it no comb, to make test equal), using the brood board; also eventually, the contractor of the surplus hive. The hive from which the artificial swarm was taken, if properly managed, will soon rally. The swarm in the old box hive will often linger for two weeks after the artificial swarm has commenced its regular labor. What is still more unfortunate, it may not swarm at all. Two weeks' advantage is sometimes sufficient for the artificial swarm to fill its hive half, or more than half full. Should the natural swarm be thrown off the box hive, at the end of the period referred to, by the time they are fully in working order we may fairly venture to let the bees of the artificial swarm into the surplus hive. The hive containing the artificial swarm, (as this system requires all these hives), should be arranged at least one rod distant from any other hive. See under No. 1. Sometimes the period referred to proves to be in the midst of the best honey harvest. The advantages of the hive, the gain of time, the location, and the treatment, in the hands of a skillful and attentive bee-keeper, will show a gain in favor of the artificial swarm.

No. 24.

How any person can perform every experiment and operation he can possibly wish, and not get stung.

Fear of the resentment manifested by bees when they are disturbed, has veiled from the eye of man many of the movements, operations, and habits of bees, for many ages. The terror imposed by their anger has deterred the bee-keeper from examining and interfering when they were attacked by their enemies; and rather than risk the consequences of joining in the contest, he has preferred to be an inactive spectator, while his bees were being destroyed. Scores of large Apiaries have gone to ruin, when, had it not been for this, the progress of destruction might have been easily arrested, and the bees saved.

THE BEE PROTECTOR.—This is a simple protection, easily constructed by any person. Take common mosquito netting one yard in length and three-fourths of a yard in breadth; sized so as to be able to rim in a piece of elastic in each hem; the one long enough to fit the crown of the hat at the band; the other to fit the throat. Sew the two ends together, and it is ready for use. Put it on the hat in such a way that the rim may be inside and the crown out. The other end passed over the head, brings the elastic round the throat, and the hat properly on the head. It may be put off and on in a minute, and may be carried in the vest pocket. Though there are several patent bee hats in use, it is admitted by all who use this, to be by far the most simple and cheap, and affords the most complete protection to the head and neck. I have only space to add, that I know not how to say enough in favor of its adoption, well knowing, that the more it is used, the more will bees be taken care of. To protect the hands, it is sufficient for all ordinary purposes to wash them well with a strong solution of Recipe No. 6. The protection above referred to prepares the bee-keeper for all preliminary examinations and ordinary observations. If the nature of his observations or operations require the subjugation of the bees, he may gently slide the

glass, and while doing so, turn half a gill of Recipe No. 10, so as to fall equally on the tops of the combs and bees, but not to the bottom of the hive. See Nos. 25 and 15.

No. 25.

How to administer a certain material which operates on the Bees in a similar manner to chloroform on man.

Great caution should be used in fumigating bees. Many bee-keepers have a careless habit of throwing dirt, chips, foul weeds, or anything on the fire that will create smoke, thus permeating the hive with poisonous fumes and offensive scents, which may not leave it for months. Instances are not wanting of bees being destroyed suddenly, while filling themselves from the cells. A few inhalations of the noxious vapors arising from some unknown substance, (shall we say maliciously gathered into the fumigating material), was the cause. See Recipe No. 9. If he desires to produce local effects, or expel the bees altogether, take a piece of the substance referred to in Recipe No. 9, about three inches square and an inch or two in thickness. See No. 14. Secure a judicious use of the fumes by employing the fumigator. Long experience and close observation have satisfied me, that the fumes of this material are the most inoffensive, cleansing, and yet effectual in accomplishing the desired end,—of any that I have ever used. There are competent witnesses who can testify,—Scientific Authors to the contrary notwithstanding,—that irascible bees, when all food was beyond their reach, without any perceptible injury to themselves, have been rendered docile by this means.

No. 26.

How to prevent diarrhœa, which in Spring time often destroys thousands of bees.

The instructions for arranging bees in winter quarters, if strictly observed, will prevent nine cases out of ten. (See remarks on that point, letter L of Specifications; also uses

of cloth, A, A; also form of hive; winter quarters; instructions to agents. See also fatality to bees, 1869 and 1870.) There is no mistake in the winter arrangement proving a wholesome preventive, if all that relates thereto is carefully performed.

No. 27.

How, when the Queen becomes infertile—which is a death-blow to the colony,—the difficulty may be overcome.

If we carefully observe a strong stock at the height of its labors, we shall in some cases perceive sixty bees enter the hive, and sixty depart in one minute. By a rational and moderate mathematical calculation, we easily conclude that six quarts may be deposited in the hive in one day. Reducing the calculation to one bushel a week, will give us some idea of the vast work performed by a strong colony of bees during a favorable season. When we also consider how brief the life of a working bee is when constantly at labor, and that in all these operations, the uninterrupted routine of successive generations of bees revolving round the queen as if she were the pivot or imaginary centre of harmony, and from her energy and fecundity, the vitality, strength and prosperity appear to continuously radiate,—any deformity or feebleness, especially infertility connected with her, must necessarily paralyse and destroy the usefulness of the workers. They appear to lose all desire to accumulate stores, as they clearly foresee that their utter extinction is at hand. When it appears that the Queen in any certain stock is becoming infertile, and might be easily replaced by a more prolific one, proceed according to instructions in Nos. 13 and 18, and their references. On examination of the combs it will be found, as compared with those of other hives, that they contain by far too great a preponderance of drones and drone brood, which is an unmistakable sign of infertility. After having supplied either a queen or queen cell, or an unsealed brood, and diminished the capacity of the hive according to the stock it contains, restore it to the condition

of a strong stock according to the resources of the Apiary, and as directed in similar cases. (See No. 46). The bee-keeper can readily direct his attention to the condition of the queen, as the merits of the case demand.

No. 28.

How a nucleus may be formed in the parlor, from which a young healthy Queen may be taken when desired. Those nuclei will pay richly, a queen being almost equal in value to a new colony.

Construct a case, the ends and bottom consisting of wood, with the sides and top of glass, on the same plan as the brood hive, containing only space enough for one guide well stored with comb, food, brood, and bees. Select such guide from a good stock, putting the queen in it. Drop it in the rabbets of the case referred to. Shield the glass portions from cold and light, either with wooden doors, or a heavy cloth cover. Arrange the end of it on the sill of the window in such a way as to receive the light equally on the sides, when observations are made. Make an aperture through the sash, of the required size for that number of bees to work. In a few days, or as soon as the bees are well located, the queen may be returned to the parent hive, or any other requiring a queen. All the operations and mysterious movements of the bees concealed in the interior of a heavy stock, are here rendered visible to the eye of the observer, from the beginning to the consummation. And in autumn, when his observations are completed, he may remove it with the bees to any hive in which he may choose to place it for winter security. The advantage of this form of nucleus over that of others, is, that the bee-keeper may exchange the enclosed comb, should he desire to do so, at any time, for any other comb, in any other hive on the yard. It is also one of the most rapid and pleasant teachers in bee culture which a beginner could desire.

No. 29.

How almost every natural swarm of bees may be induced to light in the same place.

Take the dead bees which are found in the bottom of the winter hive in moving it out of winter quarters. String them uniformly until three or four yards are secured. Procure a dark object as near the usual form of a natural swarm of bees as can be; dip them in a strong solution of saltpetre and salt, then wind them carefully around the decoy figure, which should be attached to a light pole, and about the time it is supposed a given hive will swarm. Arrange the pole so as to suspend the decoy in the edge of the shrub or bush and where it will be most prominent to the swarm issuing, When discreetly managed, nineteen out of twenty swarms will be attracted to, and cluster on the decoy. A sprig of bee balm attached, forms a pleasant addition.

No. 30.

How to hunt wild bees with success.

The various kinds of boxes for feeding, capturing, and confining live bees, are so well understood, that a description is scarcely requisite; but provided with one the design of which accommodates and satisfies the hunter, he goes to a remote place where he will be unlikely to be disturbed with domesticated bees, and a locality favorable for attracting wild bees. He should provide himself with whatever propolis, or bee glue, he can obtain, and some old comb, also a pound or two of honey. It is best if contained in unsealed cells, as the live bees appear to work better in such. In employing the propolis and old comb, it should not be consumed by the fire, but used in such a way as to produce the greatest amount of vapor by burning it as slowly as possible. A few drops of Oil of Anise added to it, when the atmosphere is favorable, will convey the fumes to the sensitive perception of the bee, a mile and a half. When a line is discovered and well defined, sometimes, in the rapidity of the pursuit,

it will be necessary to counter line, or line back, having passed the tree. When this is done, it may remain undiscovered, when the hunter will take a position at a right angle to the line already discovered, and cross line. When, in consequence of the difficulties arising from the foliage and shrubbery, it may become necessary for him to be more deliberate in his operations, he will now allow the bees more time, that they may work the stronger, while some of them are loading. If he is provided with a suitable kind of white down from the goose, he may take a little of this and touch it to the honey, and apply it to the bee in such a way that it can fly. It will frighten and prevent her from making those large circles as she rises, in which she is lost to the eye, as it greatly impedes her flight, so that he may follow her. It also causes her to go direct to the tree. The down may be seen at a long distance, even through the foliage. During the progress of these operations, if the hunter's attention is attracted to several lines, and he is provided with different colors, he can color them and time them, selecting the one first which gives the shortest time. We might be more definite on this point, but we suppose those who will engage in it have some general idea of the matter.

No. 31.

How to make hives frost proof.

This hive, arranged in winter quarters according to instructions to Agents, and letter L of specifications, becomes frost proof by the absorption of all moisture arising from the breath of the bees, aided by the double wall. There is sufficient animal heat in any medium swarm so protected, to prevent the frost affecting them. For example, take an old box hive, perforate the top with several large holes, arrange a cloth over it, elevated about one inch and a half above the perforations (see letter Z of specifications); cover with a tight box; make a frame of inch square stuff for the bottom edges of the hive and the bottom board, which gives

the required space between the combs and bottom; bind the sides of the hive closely with a rope of straw, or enclose the whole with a double wall, always remembering to leave the hive in the open air.

No. 32.

How to prevent ants from annoying bees.

The black ants seldom succeed in troubling the bees and obtaining any plunder; the red ant is more adroit, and sometimes succeeds in doing a considerable amount of damage. I have known them to destroy many hives in succession, in a few localities. A piece of green sage, which can always be obtained where ants are troublesome, if used freely on the portions of the hive infested by them, will cause them to abandon it. This hive, when properly made, is seldom or ever disturbed by them.

No. 33.

How any person can eat honey with impunity.

The medical properties existing in the fluids of some flowers, and which to a certain extent tincture the saccharine matter they contain, is poisonous to a few persons. To remove the noxious property, put nine parts honey and one part water in a tin vessel. Thoroughly incorporate by stirring. Set the vessel in a kettle of water; gently simmer the honey, and skim all the scum which arises; evaporate all the water. The slower the operation is performed, the more completely will the honey be purified. The honey will also be greatly improved in flavor.

No. 34.

How, in a pleasant and admirable manner, late swarms, to any number, for the purpose of obtaining food and warmth for winter, may be joined together, and no fighting occur.

This statement supposes a case which ought if possible to be avoided. The bee-keeper sometimes risks late swarms,

hoping the season will favor them, and that they will live through the coming winter. Near autumn he discovers his mistake. In the treatment, for example, there are three such, altogether equal to one. Day by day draw them toward each other, until finally they are immediately together. In some cases they might be ranged together in one move. Let them remain for several days, or until the bees are well located; then operate upon them, and transfer the heaviest combs, and all the bees, into one hive; select the best queen, which will naturally be expected in the best swarm; confine her in a queen cage.—See No. 13. Previous to operating on the bees, administer to each hive, four times in twenty-four hours, a few drops of Recipe No. 1.—See No. 50. For suggestions during the operation, see Nos. 2, 4, and 51. Secure the extra combs safely for next season, to be returned when they may be divided.

No. 35.

How, for the same purpose, the Bee-keeper can take a part of a very large swarm, and add it to a very small swarm, and induce the bees to remain and work harmoniously.

Early in the writer's experience, he accidentally discovered two tendencies which appeared to be permanent and constitutional in the bee, from which he drew the deduction embodied in the above statement. At that time he was not aware they had been noticed by other Apiarians. To secure the benefit of it, the hives should not be less than one rod apart.—See No. 1. If, when the bees are working very strongly, a light stock is removed and placed upon the stand of a strong one, and the strong one returned to the stand of the light one, the light stock will receive the addition of the difference between their field forces. If twenty bees to the minute leave the light one, sixty to the minute the heavy one, the light one will be increased at the rate of forty to the minute, until the field force has returned. The rate will diminish as the bees discover the change, and locate themselves. This sudden and pleasant transformation

of affairs, will surprise and delight both the weak stock and the bee-keeper.—See No. 46.

No. 36.

How at any time the Bee-keeper can take out surplus honey combs, weighing from four to five pounds, detached from each other, and unconnected with the hive. This, in the vicinity of Villages, will enable him to realize twenty-five per cent. more on part of his honey, than he otherwise would.

This statement has direct reference to the advantages of movable comb in surplus hives. It very often happens that it is desirable to procure, for immediate use, only a few pounds of honey. Where it is made in boxes, unless they are very small, and even then, we must wait till they are filled, or wantonly waste the labor of the bees by taking from them unfilled comb.—See Nos. 7, 8, and 18. But by this arrangement in this surplus hive, he may take only so much as is filled, or as may be required. The facility and economy with which small portions may be removed, will often tempt us to avail ourselves of the advantage, and thus sometimes secure a price that could not be had later in the season.

No. 37.

How, when the Bee-keeper desires to leave for Church or business, he can speedily arrange his hives in such a manner as will prevent them from swarming, but in the meantime will not retard their operations in elaborating wax or gathering honey.

It sometimes happens when our bees are on the verge of swarming, that we either are not prepared, or have not the time to divide them when it ought to be done. In this emergency, it may be, that we are compelled to be absent from them, giving them an opportunity to swarm, and for lack of attention, leave us. This loss may be prevented, and also all doubt removed as to what may have occurred

in our absence, and this without any appreciable detriment to the bees, by accurately arranging the regulator on the queen-gauge.—See No. 5. The entrance should be enlarged again, as soon as the necessity for contracting it has ceased.—See No 15.

No. 38.

How, when the Bee-keeper fears that several swarms will come at once, he may allow the first to come out and hive it, and then the others as he is ready for them.

In large Apiaries, where artificial swarming is not adopted, it very frequently occurs that many stocks mature for swarming at the same time. In such cases it has happened that the influence of one swarm upon the wing, over and around those hives, induces others to come out, and so on, until there may be two or three swarms upon the wing at one time. The miller blocks, which are ever ready, and can be adjusted in an instant, will easily and speedily prevent such occurrences.—See No. 5 ; also No. 15.

No. 39.

In the same way one new swarm may be prevented from running into another swarm.

When bees are on the wing in swarming, dark objects, in the form of bee clusters, have a peculiar influence in attracting them; therefore the clusters of bees attached to the sides of hives, frequently bring the swarm down, mingling with them, and the consequence is generally fatal to the queen alighting; and it is much more difficult separating them, than when several swarms have formed one cluster on some object outside the hive. Prompt action at the time would have enabled the bee-keeper measurably to have avoided the difficulty.—See Nos. 5 and 15.

No. 40.

How, when the Bee-keeper wishes to sell, he may, by means of the Bee-catcher, capture the bees in the field from a given hive, the purchaser thereby losing none of them.

Those who are engaged in buying and selling bees and hives, would frequently find themselves aided in their operations, were they able to work the above statement. It also often occurs, that parties who have no bees would purchase a swarm on some particular occasion, could they take them home with them. The Bee catcher, properly adjusted to this hive, will secure all the bees belonging to it in a very short time, without injury to the bees captured, or detriment to the swarm as a whole. It is true, by waiting till night, they could be secured in the hive, but in that case frequently the the bee-keeper would lose his sale, and the buyer his disposition to purchase. As a matter of curiosity at least, the result of a nicely balanced bee-catcher, in a case of this kind, is very pleasant and satisfactory, and indicates to some extent the research and enquiry connected with the experiments which have been conducted in the construction of the component parts of this hive.—See Bee-catcher.

No. 41.

How the Bee-keeper can make a given swarm love and be attached to him.

Select a certain hive, and begin to annoy, tease, and disturb the bees very often, daily, for one week. Their tormentor will discover beyond a doubt, that bees may be taught, and that they are perfectly tractable. The above course is recommended to skeptics, in order to enable them by tangible evidence to decide the point, whether bees may or may not be taught. He will soon be free to admit that their irascibility rapidly develops itself, and that their irate tendencies become so perceptive and watchful, as to make them attentive to sounds and moving objects at consider-

able distances. On the other hand, let the bee-keeper approach a given hive with the caution and respect which their sensitive nature ever seems to demand, divesting himself of all offensive odors, bringing in his hand a peace offering in the form of well sweetened water or honey, and he will find them ready to make with him a covenant of friendship. Every motion about him should have the uniformity and silent steadiness of a clock pendulum. The slightest jar of any portion of the hive will interrupt the truce, and be the signal for hostilities. The beautiful arrangement for feeding bees in this hive, will enable the bee-keeper to test his own adroitness, and the effect of kindness on the bee. By the exercise of extreme caution and gentleness, he will eventually find himself able to remove any comb from the hive, convey it into the house, where the bees on it may be examined by all who desire, then return it again to the hive, without the slightest symptom of resentment having been discovered by their owners. It is an additional evidence that the great laws of gentleness and kindness exert their soothing and controlling influence on all the creatures of God, from the gigantic elephant down to the humblest insect; the effects of which, indeed, are limited only by the means used to that end.

No. 42.

How the Bee-keeper can positively, under certain circumstances, capture a swarm of bees two or three miles distant, without even knowing where the tree is; then supply them with a queen, and make them work the same as his swarms.

The original design of the writer in this statement, by ignorant and pretentious persons, in their inferences, has been greatly abused. His views, as embodied in it, were honest and good. The only object he had in view was to attract attention to the extent of power and control which man might acquire over bees. And he has, without assuming anything to himself, humbly attempted to unfold the

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modus operandi to those who had the curiosity, the leisure, the patience, the perseverance, and the necessary implements sufficiently to gratify their wishes. It never was used with his knowledge or by his consent, as a means of influence, to induce any party to purchase either a Farm Right, or an interest in Territorial Right; and no person can make such allegation. Whenever reference was made to it, it was invariably described as a matter of curiosity and amusement, but of no practical value. Some of the principles included in the operations were understood centuries ago: and men whom the writer has never seen, and altogether independently of him, have by the aid of their own devices, virtually demonstrated this statement. There are many bee hunters who have, without any extra effort or preparation, induced and decoyed bees along, until they were brought to work, in some cases four, in a few cases five miles, and there are exceptional cases that exceed considerably even this distance. Literary skeptics, the circle whose experience is bounded by a few yards outside their *sanctum*, may not be able to comprehend by what means the bees could be identified, and the required proofs rendered clear and satisfactory. Space forbids attempting their enlightenment; but if the desire to gratify curiosity is strong enough to induce them to go to localities suitable for conducting a series of experiments, and they are willing to devote one summer to these operations, they will be able to collect all the evidences which they may desire, to convince themselves; and the writer is willing to aid them all he can.

The first circumstance is, that the bee-keeper should have several moveable comb hives on his yard, two seasons, and that he should be skillful in manipulating the combs. Another circumstance is requisite, that a strong, well defined case of robbing is in progress. Finally, he should have an accurately working Bee-catcher, and well understand its uses. When it is believed that all the bees of the attacking colony have at least once visited the hive attacked, for plunder, (and they are allowed to do so for the sake of experi-

ment), prepare a decoy hive in this way. It should be in color and construction, as nearly as can be, like the one being robbed. Into it place a guide from some strong stock, well filled with food and brood, but free from bees. Alongside of it, in a queen-cage, suspend a queen; arrange the complement of guides; place the hive on a bottom board, containing a screen the size of the bottom of the hive; in the rear, on the bottom of the guides, place a sponge filled with pure water; on the brood hive place the surplus hive, free from guides; on it adjust the glass, raise the lid of the hive one-half inch, fit the bee-catcher securely in the entrance of the brood hive, and the preparations are complete. Close the regulator on the hive being robbed, and remove it to a considerable distance, and place the decoy hive exactly in its position. Those who are acquainted with the ravening perseverance of robbers to enter a defenceless hive, need no further description of this part of the operation. Once in, the tongues of the Bee-catcher are not thronged by retreating bees, as they are immediately attracted to the faint light above, where they attempt to escape.

In the meantime open the hive closed; the robbers confined in it returning home in turn, make the circuit, and also pass the Bee-catcher. Nearly all the bees which have visited the hive will be captured. Convey the captured hive to a shady retreat, and cover with a thick blanket, which should be kept saturated with cold water. In this state leave it five or six days, during which there will be considerable work done in the hive, and the bees will be strongly attached to the new queen, which in the night, during the interval, should be let out of her cage.—See No. 13. If the swarm is very large, additional food may be given them.—See No. 11. The hive should be opened in the evening. When the bees return to their old home, the condition of which is greatly impaired by their loss, they meet their old companions as strangers, and hostile feelings are engendered, partly on account of the odor they convey with them, and with which they have previously been supplied accord-

ing to No. 50; and the consequence is, they prefer their new home, where their last work was performed. On account of superior numbers, the probability is that they will convey back their former plunder. They have been known to do this. In the case described, it matters not whether the bees originally came from a tree or hive; nor does the knowledge or the ignorance of the operator as to the locality affect the case in the least degree. If the operator desires to conduct the experiment at a range beyond that of ordinary robbing, he can easily prepare a case similar to that of hunting wild bees.—See No. 30.

No. 43.

Why the bees sometimes enter the hive freely, when the queen is not there.

This statement has reference more particularly to an artificial swarm, when it has been thrown out of the hiver on a cloth, for the sake of illustration. The aroma of the queen, which is equal in its influence for a time to her presence, pervading the mass of the bees, and the shock which they receive, in their confusion and fear, may lead them to the remotest part of the hive, and therefore, contrary to some otherwise good authority, by the aid of the transparent honey board, we observe the bees quietly reposing along the tops of the guides, evincing satisfaction, though in the meantime the queen, in her ignorance and dismay, may have wandered, and become endangered. The greatest of care should be observed on such occasions, as well with natural as artificial swarms.—See No. 18.

No. 44.

How, when, and where the queen is fertilized,

How? By one of the drones. When? Between the seventh and ninth day after emerging from the queen cell. Where? On the wing, in the open air.

Illustration, for observation: About the seventh day af-

ter the second swarm is hived, when it is noticed the bees give indications of leaving their abode, drop the regulator to the queen gauge, (see No. 5), after which be sure to remove to a respectful distance from the hive, (that the appearance of the locality may not appear changed, thereby deceiving the queen). When the bees settle, the queen has returned, and she may be detected outside the regulator, and on close scrutiny such evidence may be noted as will at once satisfy and convince the observer of the truth of these remarks. Elevate the regulator, and admit her into the hive. The observer may be surprised at his discoveries. There is infinite wisdom, however, made manifest; but our space forbids details. Notice, that in confining queens to prevent flight to the forest, as referred to in No. 5, be careful not to confine so long as to interfere with the time here specified.

No. 45.

Why queens become infertile.

A careful dissection of the queen, the observations being aided by a strong magnifying glass, will make revelations to a methodical observer which will satisfy him on this point. He will notice that the vivifying fluid is deposited in a sac, a little lower in her body than the one which contains the eggs. Each of the eggs, in its passage towards the deposit, absorbs a little of the fluid in the sac referred to, until all is absorbed. As the queen is never fertilized but once, she eventually becomes infertile.

No. 46.

How and when transposition may be employed with profit.

The great benefits derived from transposition can only be fully appreciated by years of experience. By transposition of hives, we mean their positions. For example, placing a weak stock on the stand occupied by a stronger one, and the stronger one on that previously occupied by the weaker

one. It is true that hives may be sometimes transposed without the aid of perfumery, and little or no confusion occur. The chief distinguishing feature by which bees recognize one another, close observation and experiment informs us exists in their native scent. A ewe will discover her lamb in the same way from all others, among a hundred. If we impregnate the bee with certain odors sufficiently powerful to overcome the native scent, bees of different hives becoming thereby uniform in their odor, raise less objection to uniting with one another. The transposition of hives should be made with reference to the numbers of bees we desire to obtain. If transposed during the hours of the day, and on the days of the season when the bees are laboring with the greatest activity, the highest result will follow. By observing this rule it is easy to graduate the number of bees obtained to the quantity desired. Introduce a few drops of Recipe No. 1, by dipping a straw into the phial containing it, and putting the same into each of the hives transposed, evening and morning, previous to transposition. If either of the hives evince hostility after the transposition, a little more might be added. Having provided a weak stock with a fertile queen, if it has not one, transposition is generally sufficient to place it in a safe condition.—See No. 35.

No. 47.

Signs of the presence of a queen in an artificial swarm.

This number refers more especially, but not exclusively, to artificial swarms. What is true in this item of an artificial swarm, is also true of a natural one. In order to avail ourselves of the benefits of the signs here referred to, the advantage of a transparent honey board, it will be seen, is very great. If, when a swarm is introduced into the hive, and the bees readily rise and settle quietly in regular lines along the edges of the tops of the guides, and remain so for fifteen minutes, manifesting contentment during this interval, and express their satisfaction in humming around and

ventilating the entrance of the hive, there can be no mistake about the presence of the queen.

No. 48.

Why bees are so obstinate on some occasions.

In the above statement we refer to the manifestations which bees sometimes make while we are driving, when we are attempting to hive them ; also the occasional reluctance they manifest, in driving an artificial swarm. In the first case, the queen has evidently gone astray somewhere outside the hive, or has been injured in some way that prevents her progressing with it. In the latter case, in her fright she may have retreated into some double comb, and cannot rise directly if she would ; or is so paralyzed with alarm, that she fears to move lest she should encounter fatal danger.—See No. 18.

No. 49.

How the Bee-keeper may know when to make an artificial swarm.

First : we judge it is a strong stock by the large number of bees working, and the amount of labor performed. On elevating the lid, we observe that the space between the glass and the guide tops has a dark appearance, being well filled with bees. Next, we judge the season is sufficiently advanced, so that a swarm may be safely trusted to maintain itself. On removing the guides, (see No. 51), we find abundance of bees, and the combs well filled with brood, and queen cells in progress. When these conditions exist, it is safe to divide, or make an artificial swarm.

No. 50.

How to combine a number of oils, producing an excellent effect in controlling bees.

We here refer to the Recipes. The most careful observations of No. 1 will fail to elicit any evidence that the proper use of the oils specified ever produces any pernicious or injurious effects. They will be found able to destroy distinctive features; and also expel robbers.—See No. 35. No. 2 is soothing in its effect, adhesive in its operation, impeding the movements of the bees by flight. No. 3 is obnoxious to ants, but inoffensive to bees. No. 4 is the best combination for evolving substantial fumes, and for spreading vapors. No. 5, when properly located and used, presents an irresistible attraction to the bee moth. No. 6, when the hands are washed in it, allays the anger of the bees alighting on the hands, and possesses curative power should they be so exasperated as to sting. In No. 7 the first five articles are combined in equal quantities, and used as a liniment on the part affected. The 6th article may be added to the liniment, or in severe cases taken internally in light repeated doses. The 7th article will speedily soothe pain in the head or sickness at the stomach arising from bee stings. For Recipe No. 8, see No. 11. For Recipe No. 9, see No. 25.

No. 51.

How to transpose the guides with safety and profit.

In removing a guide of comb from a hive containing bees, select that one first which it appears can be most easily removed. Commencing at the sides of the hive, with a small suitable lever, which is necessarily operated across the ends of the guides, loosen and move the guide an eighth of an inch nearer the side of the hive. Remove the next one, one-fourth of an inch toward the one first moved, and so on, gaining an additional eighth of an inch on each guide so moved from the guide we design to elevate. It may now

be removed with ease, and also with safety to the bees. If an exception to this should occur, tip the hive over on the rear part of the band rim, when any remaining difficulty may be discovered and quickly remedied. Guides of comb should never be changed ends about, or arranged in any other way than that in which they were built. When a guide is transposed from one hive to another, it may be necessary to re-adjust the guides as before described, which is easily accomplished in this hive, as there are no fixed localities in which to insert it.

No. 52.

How and when to make and locate many sections from an old fashioned hive, for rearing queens.

In transferring (see No. 14), if the bee-keeper desires to avail himself of the benefit of this statement, he should select a very strong stock, heavily stored, and possessing a fertile queen, leaving it at least a mile distant from his own Apiary, and see that it is put into winter quarters, according to the plan of this hive, (see No. 31). In the Spring, when it is sufficiently warm to form artificial swarms, the evening before transferring remove it to an isolated position in his own apiary. In setting up the combs, they should be cut of such a size that two of them eventually will fill a guide of the brood hive, that is, one of these pieces should fill the lower part of the guide the entire length of it, and up to the centre. It would therefore receive another of the same size, resting upon the first one, thus filling the guide. The object in cutting the combs in this way is, that when their use has ceased in the section boxes, they may be all quickly set up and returned to the hive without loss. Put three such combs into a box only large enough to receive them and admit the same space around them which the bees desire in the full sized finished combs of brood hive. The brood and honey should be equally divided in as many section boxes of the above size, as the material on hand will fill. Arrange them in a semi-circle three yards apart. The

bees should then be equally distributed to each section. They should be kept closed for several days, (see portion of No. 42), remembering to place them near the ground, as it adds to their warmth. A double wall is also an advantage. Glass tops aid greatly in giving the necessary attention, and observing their progress. A large number of queens may be secured in this way during the season, and profitably given to diminished swarms. A warm room, suitable for the purpose, would hasten the desired results. Toward the close of the season, when the bee-keeper deems it expedient, he may arrange a hive in the centre of the semi-circle, and introduce into it the combs and bees of the sections, and thus be able to prepare them for winter quarters. The isolated position will cause the bees to drift from their several localities to the central hive.

No. 53.

How the Bee-keeper can, in a good locality, by diligently and cautiously following the instructions given in this Circular, in ten years obtain one thousand swarms from one.

The limited space assigned to the several numbers has compelled us to be very curt and brief in the delineations. Many ideas occurred in each of them, which possibly might have been of value to the bee-keeper: such as hints, cautions, and variations according to circumstances, in the mode of doing a certain thing; likewise in explaining the whys and the wherefores. We will add, that no bee-keeper should make a single movement about his bees, without endeavoring to see clearly the end toward which the movement is tending, and at every step ask himself why he does so and so, and persevere in his reflections and inquiries, until he can answer himself intelligently. On the supposition that a bee-keeper is thoroughly acquainted, by experience, with the practical working of the instructions as indicated under the foregoing numbers, we hope he will find himself able to successfully contend with the bee moth; to protect his bees sufficiently from frost, and from the malaria arising

from the effluvia; to discover deficiencies in the queens, and remedy them, or replace them when lost; to easily prevent contentions and robbing; and promptly meeting whatever emergencies may arise, and regulating and confining their multiplying tendencies (see Nos. 1 and 2), in such a way as to be able to demonstrate the following proposition. This table shows the numbers reached in ten years, from one hive, by simply doubling:

NO. OF YEARS.	NO. OF HIVES.	RESULT.
1	1	2
2	2	4
3	4	8
4	8	16
5	16	32
6	32	64
7	64	128
8	128	256
9	256	512
10	512	1024

The above slow but safe process of multiplying bees secures a broad margin of surplus strength to provide against the various misfortunes and accidents which are annually occurring. The query may arise in the mind of the reader, if doubling the stock annually is by far the safest and most profitable course to take, why then explain how to divide a given stock into several sections. In answer, we say, that we believe it is impossible to succeed even in the simple process of doubling the stock, and holding it firmly on the prescribed line, unless we possess a complete knowledge of subdivisions; understanding clearly all the details connected with such operations, and comprehending all the incidents and emergencies which may arise. If in conversation with a physician he should inform you, that in his study of anatomy he had devoted a great deal of time in dissecting the hand and arm, and reflected carefully on their organization, but that he had not time to pay any attention to the construction and arrangement of the foot; your con-

clusion would be, that his anatomical knowledge of that member must be very deficient, and in case it became diseased, his treatment must be equally defective and uncertain.

CAUTION AS TO DIVIDING HIVES.

In the operation of dividing bees, do not spend time in inspecting merely out of curiosity. It matters little whether the queen is in the parent hive or in the other. That may be quickly ascertained by the drift of the bees. Set the bees close to the ground, and dividing may be performed safely, as early as considerable unsealed brood can be discovered; *never* failing to use the brood board. In making observations for gratification, do so only when the bees are quiet.—See Nos. 46, 47, 49.

SPECIFICATION AND DESCRIPTION
OF
HOUGH'S EUREKA FUMIGATOR.

SPECIFICATION.

THE INVENTION consists in the construction and attachment to the muzzle of a bellows, or force-pump, of a metal cylinder, in which the fumigating substance is placed or suspended, and having a pipe, to which is attached a flexible tube for discharging the fumigating fumes to the bees in their hives, or in lodgements, when the aperture thereto is intricate; and in providing the bellows with a trap door, through which can be inserted a sponge, or other absorbent material, to be saturated with any odoriferous liquid.

The bellows has a stand and a pedal for its convenient use. The fumes of the odoriferous fluid can be ejected from the nozzle of the bellows, by removing the cylinder, or they may be passed out through the cylinder pipe and flexible tube. The letter A represents the pump or bellows, which may be constructed with wooden ends, and flexible girt nailed round them; or it may be made otherwise, as per drawings. In the bellows is fastened by a screw, a sponge, B, or other absorbent material, to contain the odoriferous fluid, which is supplied to it through the hinged door, C. Near the nozzle, D, D, are handles, to which motive power is applied for the operation of the bellows, when ejecting the fluids. To the nozzle, E, or outlet of the bellows, A, is attached a cylinder, F, by the tube, G, sliding thereon; and to the other end of the cylinder is affixed a pipe, H.

The cylinder is constructed in two sections, which overlap each other at the centre, to admit of the fungus, or other fumigating substance being placed or suspended therein, upon a hook or screw, I, and to be fired when required.

The subdivisions of the cylinder fit closely, but should the joint not be sufficiently tight, an elastic band, J, may be stretched over it, to prevent the circulation of air through it. Within the cylinder is a partition, R, of wire gauze, Z, to prevent the issue of sparks by the exit pipe or tube, H.

To the tube, H, may be connected a flexible tube, L, when required, for the purpose of directing the fumes to difficult and particular points not easily accessible, producing local effects.

The bellows rest upon a stand, M, of any required height, according to the elevation of the hives from the ground. The stand has a foot-tread, N, upon which the foot of the operator may be placed, to allow the machine to be worked with one hand. The bellows should be attached to the stand in such a manner as to be readily removed therefrom, should it be desirable to use the machine in such a position as to require it to be worked with both hands. The bellows has a hinged joint, O, which adds to its durability and facility of construction, and a button, P, to keep the trap door tightly and forcibly closed.

The operation of the machine is as follows: The sections of the cylinder are secured, and the fragrant or other fumigating substance being therein upon a screw or hook, and ignited, the sections are then united, and the cylinder pipe slid upon the nozzle of the bellows. The bellows are then operated by the handles, and the outlet pipe directed to the bees. Should the bees be in a locality difficult of access, or from other causes, the flexible tube is connected, and the fumes ejected. Where odorous vapors are to be used, the trap door is raised, and the odoriferous fluid poured upon the sponge, and the bellows set in motion. When it may be required to operate the bellows from the stand, the foot of the operator is placed upon the pedal, and with one of his hands he raises and depresses the upper handle of the bellows.

The bellows can be used with or without the cylinder, and the machine can be applied to the fumigation of rooms

of dwelling houses. It consists of—1st: The cylinder, F, and the use of the flexible tube, L, in continuation with the bellows, or force pump. 2nd: The perforated plate or wire gauze partition, R, and screen, I. 3rd: The stand, M, having a foot pedal, N, for attachment to bellows, and keeping it at any required height. 4th: In providing the bellows with a hinged trap, C, for feeding the sponge, B, and the use of such sponge within the bellows, to be saturated with any odoriferous fluid. 5th: The construction of the bellows, A, with a hinged joint, O.

ADVANTAGES.—That four-fifths of the time employed are saved,—that is, as compared with other processes, systems, and methods. This saving is about equally divided between the preparation and execution of the work. We perform those things in the details of bee culture, by the aid of this invention and discovery, pleasantly, safely, profitably, and with certainty, in one-fifth of the time formerly required for those things, which were then deemed tedious, unpleasant, unsafe, often injurious, and uncertain in the result. Therefore it may be fairly hoped that bee-keepers will give four times the attention they did, and in return receive as manifold pleasure and profit, with the employment of far less time and money. There is scarcely an item in the whole circle of bee culture, but what can be greatly facilitated by the aid of this invention.

HOUGH'S EUREKA FUMIGATOR.

By this recently-invented apparatus, the great desideratum, so long and so earnestly sought by Bee-keepers, is at last obtained. It is a well known fact to practical men, that former modes, systems, and arrangements have been attended with so much annoyance and loss of time, that the Bee-keeper, hurried perhaps with other matters, and displeased with these troubles, neglects a hundred little attentions which his bees urgently demand. If he only knew the exact internal state of a certain swarm of bees, and the corresponding state of the combs, how gladly would he remedy the difficulties under which they labor, and remove the danger which threatens them with speedy destruction.

True, the Bee-keeper can, in movable comb hives, by the former modes of operation, in most cases ultimately accomplish his purpose. He goes to a hive with a certain object in view; he spends an hour or so, but is not yet done, when from the first he felt that he had only fifteen minutes to spare. A few such attempts, and the results soon discourage him, and he begins to neglect the attention due his bees. The smallest leak soon sinks the ship, or carries away the strongest dam,—so the most trifling neglect often ends in the speedy destruction of a colony of bees. On the other hand, if he possessed an arrangement by which, with pleasure and certainty, he could accomplish his purpose—one which was invariably ready for action in *one* minute,—how soon he would be delighted to watch the daily condition of his bees. These desirable facilities are beautifully and conveniently presented to him in the EUREKA FUMIGATOR, so simple in its operation that man, woman, or child may use it with safety, *never* injuring the bees.

Beginning with the surplus hive :

1. To ascertain the progress of comb building.
2. If there are any difficulties or irregularities, to discover and correct the same.
3. To remove sections of honey, or supply the bees with unfilled comb.
4. To remove the surplus hive altogether.
5. Removing the glass.
6. Transposition of the guides.
7. Searching for queens or queen cells.
8. Ascertaining the comparative amount of working or drone brood.
9. The easiest and safest method of feeding bees.
10. Refers to all the varied movements in putting bees into winter quarters.
11. Instructs in cleansing, preparing, and returning them again into summer quarters.
12. For destroying native distinctions in cases where amalgamation is desired.
13. Refers to hiving bees, causing them to enter the hive rapidly, preventing their spreading or loitering.
14. Is used in artificial swarming, causing the bees to move with celerity, greatly abbreviating the whole process.
15. In transferring from gums, old hives or trees, the bees are controlled, driven and directed along the combs, backward or forward, as the case may require, until the dissection is completed; and in almost every conceivable movement with bees, the economy of time and labor will be readily acknowledged in the advantages and conveniences which it affords, in all local as well as general operations,—such as expelling the bee moth, removing sections of diseased comb, &c., &c.

As to the result, it matters not what hive, or how many patents are on the yard, or what system of management the Bee-keeper employs, he will be equally gratified and profited in applying the apparatus to any or either of them.

On the conveyance of Farm Rights, practical instructions will be repeated, until the purchaser expresses himself satisfied.

CONCLUDING REMARKS.

The foregoing statements are of such a nature as to absolutely require ocular demonstration. The manner of safely using Recipe No. 1, designated F, will be carefully explained. But the writer does most earnestly entreat all those parties who may have been definitely instructed in the uses of the Fumigator, never to attempt to convey their knowledge of it, unless accompanied with practical illustrations, given in the most pains-taking and patient manner. The writer originally intended to have given a full definition and explanation of the foregoing numbers; but on reflection he deemed it wiser, and safer to all parties who may hereafter become interested in them, to urge, *that they demand a satisfactory demonstration of their purport.*

FATALITY OF BEES IN 1869.

The above year, in the Western part of Canada, and a few other localities, has proved to be the most disastrous to bees that has ever been experienced by bee-keepers. The extreme wetness of the season so diluted and destroyed the saccharine qualities of the flowers, that very little honey was secured by the bees. We might almost venture to say, that the honey became *acidized* in the flowers, giving it such peculiarly unwholesome qualities, as to create disease among the bees feeding on it, and rendering the hive very foul. There are many Apiaries in the country, where the bees died from the poisonous effects of their food, before they had time to consume what little they had succeeded in accumulating. One bee-keeper informed me that he had honey enough left on his yard to destroy a hundred swarms of bees. In most cases, however, the store was so limited that the bees quickly exhausted it, and consequently

died from starvation. In the cases where the bees were driven from their combs, their food cleansed and returned to them, or artificial food given them on pure comb, they prospered well. A friend of mine who tested the matter during the winter, said he found no difficulty in transferring in cold weather; and he was confident that it would pay well to do so on all occasions, such as are included in the above remarks.

RECIPES

FOR ARTICLES REQUIRED IN

HOUGH'S SYSTEM OF MANAGING BEES.

No. 1—FOR PREVENTING ROBBING, AND FOR UNITING SWARMS; ALSO TRANSPOSITION.

Oil Cummin, 2 drachms.
 Oil Rhodium, 10 drops.
 Oil Wintergreen, 10 drops.
 Oil Bergamot, 10 drops.
 Tincture Musk, 10 drops.
 Otto de Rose, 1 drop.

No. 2—RETURNING NATURAL SWARMS.

1 pint well-sweetened water; 2 drops Oil Peppermint.

No. 3—EXPELLING ANTS.

Juice of Green Sage.

No. 4—HUNTING WILD BEES.

Propolis—old Comb,—and a few drops Oil Anise.

No. 5—TO ATTRACT MILLERS.

Comb Dust and Indian Meal.

No. 6—TO PREVENT BEES STINGING.

A strong Decoction of Salt and Sugar.

No. 7—REMEDY FOR BEE STINGS.

Salt, Soda, Coal Oil, Spirits of Turpentine, Spirits of Ammonia, and Tincture of Lobelia Ethereal. In desperate cases a strong decoction of Plantain and Sweet Milk, drank freely.

No. 8—BEE BREAD.

Syrup of Loaf Sugar, 1 pint; Rye Flour, 1 table-spoon-full; White of one Egg, very hard boiled, finely minced—in 1 pint of Syrup; a little fine dry Salt.

No. 9—TO SUBDUE BEES.

Fumes of Sweet Maple Fungus.

LETTERING FUMIGATOR.

- | | |
|-------------------------------|------------------------------------|
| A—Force Pump or Bel-
lows. | M—Support to Pump. |
| B—Door. | N—Cylinder. |
| C—Handles. | O—Tube to Cylinder. |
| D—Tube to Pump. | P—Screw in Cylinder for
Fungus. |
| E—Stand. | R—Tube to connect to D. |
| F—Pedal. | S—Elastic. |
| G—Sponge. | T—Flexible Tube. |
| H—Hinge to Door. | U—Valve. |
| I—Ring to Door. | V—Screen. |
| J—Screw to Sponge. | W—Fungus. |
| K—Button to Door. | Y—Hinge to Pump. |
| L—Front of Stand. | |

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St. Lawrence Hall has long been regarded as the most popular and fashionable Hotel in Montreal. It has been under the charge of its present proprietor over ten years. The building presents a front of some 300 feet on Great St. James Street, with a depth of over 300 feet, and has over 300 apartments.

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Dinner from	- - - - -	5 to 6½ "
Tea	- - - - -	7 "
Supper	- - - - -	9 "

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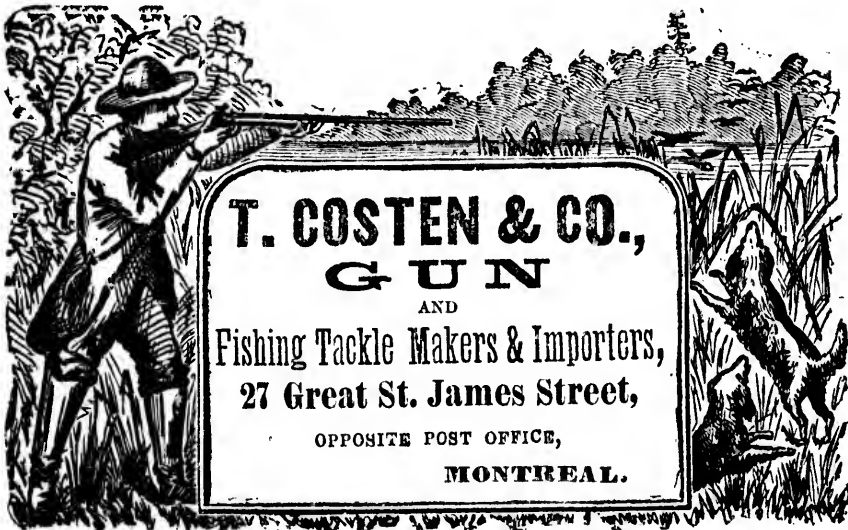
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